



Improving Income of Private Ukrainian
Agricultural Producers
Through Agricultural Extension

Cooperative Agreement No: 121-A-00-02-00001-00

Funded by
The United States Agency for International Development
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19 Nizhniy Val Street
254071 Kyiv, Ukraine

Project Final Report

June 2005

Submitted by

International Programs
Louisiana State University Agricultural Center
Baton Rouge, Louisiana

In association with

Vinnytsia State Agriculture University
Vinnytsia Oblast

International Center for Scientific Culture
World Laboratory Ukraine Branch

Uman State Agrarian University
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June 15, 2005

Mr. Oleksandr Muliar, Cognizant Technical Officer
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Dear Sasho:

**Project Final Report, "Improving Income of Private Ukrainian Agricultural Producers through
Agricultural Extension" Project, Cooperative Agreement No: 121-A-00-02-00001-00**

Please find enclosed the Project Final Report for the above project which ended February 28, 2005. This report has been prepared in accordance with Section A5 – III, "Program Reporting", in our Cooperative Agreement. A hard copy will be delivered to you by Fedex courier service. As required in our Cooperative Agreement, one copy of this report will also be sent to the USAID Development Experience Clearinghouse, Attention: Document Acquisitions, 1611 Kent Street, Suite 200, Arlington, VA 22209-2111.

The opportunity provided to the LSU AgCenter to implement this project is greatly appreciated. We are especially indebted to you for the excellent guidance and advice throughout the program.

With best wishes,

Sincerely,

Lakshman Velupillai, Director
International Programs, and
H. Rouse Caffey Professor
LSU AgCenter

cc:	Dr. Richardson	Mr. Brock	Mrs. Blackwell	Dr. Loyanych
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List of Acronyms

BMP	Best Management Practice
CHPO	Commercial Home Plot Owner
HPO	Home Plot Owner
ISS	Information Support System.
LSU	Louisiano State University
LSU AgCenter	Louisiana State University Agricultural Center
PCO	LSU Project Coordinating Office
USAID	United States Agency for International Development
VSAU	Vinnytsia State Agricultural University

Definitions of Terms

For purposes of focus and accountability, operational definitions of terms used in this report are given below.

Average gross income (private farmers). Used interchangeably with and as a proxy measure of agricultural productivity of private farmers. Calculated by (1) multiplying total production of crop and livestock commodities by prevailing commodity prices averaged for a six-month period, (2) subtracting total cost of production inputs, and (3) averaging the difference. Includes only private farmers who (1) harvested 100 hectares or less, and (2) had a calculated gross income in the range of (-) \$100 and (+) \$65,000.

Average gross income (home plot owners). Used interchangeably with and as a proxy measure of agricultural productivity. Calculated by (1) multiplying total production of crop and livestock commodities by prevailing commodity prices averaged for a six-month period, (2) subtracting total cost of production inputs, and (3) averaging the difference. Includes only HPOs who (1) harvested 20 hectares or less, and (2) had a calculated gross income in the range of (-) \$100 and (+) \$65,000.

Home Plot Owner (HPO). A person engaged in agricultural production for sale and/or personal family consumption of agricultural commodities grown on land associated with the home.

Registered Private Farmer. Used interchangeably with private farmer, refers to a person registering his/her farm with the local oblast authority for the purpose of engaging in agricultural production.

1. Executive Summary

This Project Final Report summarizes program activities and accomplishments of the project titled: "Improving Income of Private Ukrainian Agricultural Producers through Agricultural Extension". As a part of the requirement in the Cooperative Agreement, this report provides a summary of accomplishments, program activities, results and their significance to USAID, the implementation methodology adopted by the implementing partners, and conclusions and recommendations.

In 1998 the LSU AgCenter and its Ukrainian partners, the World Laboratory, Ukraine Branch in Kyiv and the Vinnytsia State Agricultural University (VSAU), were awarded a Cooperative Agreement by USAID to implement a three-year agricultural support program in Vinnytsia Oblast. To respond to the education and service needs of the Vinnytsia private farmer, this program established the Ukrainian Center for Private Farmer Training and Outreach (the Vinnytsia Center) in Vinnytsia Oblast. Three factors stood out in the success of the Vinnytsia Center: (a) the grass roots, constituency-based approach, (b) the links with educational and research institutions, and (c) the change in the political climate in terms of positive attitudes of village, raion, and oblast administrations towards the needs of private farmers.

Gratified by and desirous of building on the success of the above project, USAID approved a follow-on project, also for three years (2002-2005), to replicate the Vinnytsia Center's extension model (program) at the Uman agricultural academy in Cherkasy on the east and Kamyanyets-Podilsky academy in Khmelnytsky on the west of Vinnytsia Oblast. It was expected that the expanded project would have a good chance of success because of similar agro-climatic zones and agricultural practices, but more importantly, since theoretically-sound, empirically-tested technical and educational concepts of the model would be applied in designing and conducting the outreach education program of the project.

Section 3 of this report summarizes project accomplishments, while Section 5 provides greater detail and discussion on project implementation methodology, activities, and accomplishments.

Youth Development to prepare tomorrow's leaders and involve parents and concerned adults was an essential part of the outreach effort emphasized by the LSU AgCenter and its Ukrainian partners throughout the life of the project. A small grants program to build people's capacity to work in groups and associations to further common goals of agricultural, economic, and social development was also an integral part of the outreach effort. The LSU AgCenter stressed the important role of Ukrainian women, both in its local staff, and in their participation in training programs, particularly those conducted in the U.S. Further, the implementers were sensitive to the needs of women stakeholders in all of the outreach programs conducted by the project, including the small grants program.

The LSU AgCenter placed significant emphasis on internal evaluation from the very outset, and considers this aspect as an integral part of overall project management. As a result, three evaluations, at the beginning, mid point and end of the project were conducted by the LSU AgCenter specialists for the program. The methodology and results of these evaluations of the outreach programs for private farmers and home plot owners (HPOs) are summarized in Section 6. Full reports of the evaluations are appended to this project final report as Attachments #1 and #2.

The LSU AgCenter encouraged both its participating specialists and local Ukrainian staff to publish project findings at local, national, and international forums. Eleven scientific publications and/or international conference presentations were produced as shown in Attachment #3.

This Final Report draws several conclusions and recommendations emerging from program implementation and the program's impact on stakeholders and beneficiaries. While this project and its predecessor accomplished much in terms of improving agricultural productivity and establishing the model for extension advisory systems in Ukraine, much needs to be done in the future to sustain the momentum established by this project. The recent passage of the Law on Extension Advisory Services is an important landmark. However, implementing the Law and its components as well as

strengthening the currently inadequate institutional capacity that will be required to meet this challenge are some key issues that will need to be addressed. These aspects are discussed in Section 7.

2. Introduction and Background

In 1998, the LSU AgCenter along with its Ukrainian partners, the World Laboratory, Ukraine Branch in Kyiv and the Vinnytsia State Agricultural University (VSAU), were awarded a Cooperative Agreement by USAID to implement a three-year agricultural support program in Vinnytsia Oblast. To respond to the education and service needs of the Vinnytsia private farmer, this program established the Ukrainian Center for Private Farmer Training and Outreach (the Vinnytsia Center) in Vinnytsia Oblast. The Vinnytsia Center addressed three important areas: (a) the needs of new farm enterprises, (b) the service and information needs of operating farmers, and (c) the training and educational needs of all persons engaged in or planning to engage in privatized farming. A major emphasis of the project was to engage the Vinnytsia farmer with the scientific and educational community so that together they would develop a shared vision of how privatized agricultural production should evolve in Vinnytsia. The project was concentrated in one oblast using the rationale of a grass roots approach wherein individual farmers interacted directly with specialists and researchers to ensure that the technical assistance provided accurately matched local farmers' needs.

By the end of the project in 2001, the Vinnytsia Center succeeded in (a) establishing a fully operational private farmer and agribusiness support Center within the existing VSAU structure, (b) instituting an outreach and education program delivering valuable, science-based information to the private farming sector in the oblast, (c) training a cadre of competent outreach educators at university and raion levels capable of designing and conducting outreach and support programs for farmers and agribusinesses, (d) organizing 27 local offices at the raion level, supported partly by local resources, (e) establishing a viable computer-based information support system, (f) initiating a relevant research program with useful dialogue between scientists and farmers, (g) linking the agribusiness sector and farmers in mutually beneficial ways, (h) gaining political and economic support of raion and oblast administrations, and (i) enabling farmers to learn and adopt recommended crop and livestock management/business practices thus contributing to increased agricultural income.

Three factors stood out in the success of the Vinnytsia Center: (a) the grass roots, constituency-based approach, (b) the links with educational and research institutions, and (c) the change in the political climate in terms of positive attitudes of village, raion, and oblast administrations towards the needs of private farmers.

Gratified by and desirous of building on the success of the project, USAID approved a follow-on project, also for three years (2002-2005), to replicate the Vinnytsia Center's extension model (program) at the Uman agricultural academy in Cherkasy Oblast on the east and Kamyanets-Podilsky academy in Khmelnytsky Oblast on the west of Vinnytsia Oblast. It was expected that the expanded project would have a high chance of success because of similar agro-climatic zones and agricultural practices, but more importantly, since theoretically-sound, empirically-tested technical and educational concepts of the model would be applied in designing and conducting the outreach education program of the project. It was also argued that a coordinated effort in the three oblasts would enable effective harnessing of local resources and collaboration between agribusinesses and communities throughout the region. Finally, it made sense to optimize the USAID's capacity-building investment in VSAU to further impact agricultural improvement in Vinnytsia as well as the new oblasts.

The expanded project began on March 1, 2002 and formally ended on February 28, 2005. Besides the three education and outreach centers organized in the target oblasts (Cherkasy, Khmelnytsky, and Vinnytsia), the LSU AgCenter established a project coordinating unit (LSU Project Coordinating Office) located physically in Vinnytsia and staffed primarily by experienced US-trained Ukrainian agricultural specialists to oversee the activities of the three oblast centers. Each oblast center, in turn, was staffed with the necessary complement of university faculty and raion specialists to design, plan, and conduct educational activities for private agriculturists in the oblast.

3. Summary of Accomplishments

The project objective of improving the agricultural productivity at the small farmer and home plot level entailed numerous activities. These activities involved education, outreach, and information systems. This Final Report documents in detail the specific results and impact of all project interventions. This section summarizes key accomplishments.

Based upon the results, which includes the opinion of project stakeholders, reported in this document, it can be stated that the objective of improving the agricultural productivity of the private farmer and HPO in the three target oblasts of Vinnytsia, Cherkasy, and Khmelnytsky was achieved. Education programs conducted over the life of the project enabled project clients (private farmers and HPOs) to increase their knowledge and adoption of crop, livestock, and environmental best management practices (BMPs) in their agricultural operations, which in turn contributed to the improvement in agricultural production performance. The project was also responsible in some measure for significant social, economic, and environmental changes and improvements in the lives and livelihoods of small private farmers and HPOs as they continue to move from a centralized, "command-and-control" agricultural production system to a market-driven economy.

Highlighted below are some project achievements by component:

Extension Component

Formal Education and Resource Libraries

- The project emphasized professional development of faculty and raion specialists. This emphasis was systematically planned and executed. A core group was trained at the LSU AgCenter to serve as the professional development resource – brains trust - of each oblast center.
- Besides the learning and teaching aspects of professional development, faculty and raion specialists utilized their new knowledge and methodologies to prepare and publish valuable materials.
- A highly significant accomplishment of the project is the publication in Ukrainian of a 231-page book on the theory and practice of extension, which has since been approved by the Ministry of Education, Government of Ukraine, and recommended to agricultural universities/academies/colleges for adoption as a textbook on extension theory and practice.
- This activity and focus of the project have resulted in the enhancement of the skills and knowledge of 150 extension personnel in the three oblasts. This critical mass will no doubt serve as an invaluable resource at the national, regional, and local levels in the future.
- Certificate programs were also provided for farmers by oblast center personnel, resulting in technical and managerial training of 818 farmers and HPOs.
- Project-assigned university faculty and raion specialists contributed to the development of each oblast center library. This effort resulted in the acquisition of 2,000 volumes of textbooks on extension and related social science disciplines, Ukrainian translations of teaching notes on extension topics culled from standard references in the discipline, journal and newspaper articles, course outlines and curricula in extension education, brochures, and bulletins.

Outreach

The core around which all project activities revolved and project success depended was the outreach program which was designed as a needs-based, interactive educational process consisting of a variety of approaches. This outreach sub-component focused on three program areas — Agricultural Production and Management Support, Business and Market Development, and Research Coordination. The overall accomplishments under outreach are:

For private farmers

- Educational participation increased by 167 % by project end,
- New agricultural technology learned in the education programs of the project leading to technology adoption increased by 77%,
- Increased adoption of technologies increased the use of quality inputs by 66%,
- Crop yield increased significantly by 37%, and
- Agricultural productivity (average gross income) increased by 104%.

Likewise, the corresponding increases noted at the end-of-project evaluation for HPOs were 689% for educational participation; 50% for technology adoption; 131% for quality input use; 79% for yield increase; and 154% for productivity increase.

Information Support System Component

An important component of the project was Information Support Systems (ISS). The introduction of this component into the project framework and the results produced has significance to the programs implemented by USAID in Ukraine. Coming into the market-based system from a centrally-planned economic framework, the value of information provided at the appropriate time of need was not fully realized at the individual farm worker level. However, after the demise of the collective farm system, and the advent of the private farmer and household plot owner, information on production technology, weather, markets/prices, and availability of farm inputs became critical to the success of farm operations.

The second significant impact of this activity was the creation of transparency — availability of information to anyone and everyone whenever they needed it. This helped producers, processors, and marketers to be on a level playing field to seek and acquire information.

Given the above two significant needs in agriculture, the project produced positive impact on the producers in the target oblasts. At the conclusion of the project, unblocked software on all elements of the ISS was submitted to USAID. These included:

1. Seven Computer-aided Atlases in crop production.
2. Eleven Directories in livestock production.
3. Program software on Farm Business Book-keeping and Accounting.
4. Program software on Farm Business Planning.
5. Web based information systems via website for the project, including an interactive site for Business Information Exchange, Q & A Board, News, and Virtual Commodity Exchange.

Overall economic impact

Overall economic impact of the project on agricultural production was estimated based on information from an end-of-project survey of the production of 280 private farmers and HPOs, prevailing crop/livestock prices in the oblasts, and

crop/livestock budgets developed by project faculty. It is estimated that over the time period 2001-2004, the following changes occurred in the three oblasts:

The average increase in the areas of wheat, barley, and corn harvested was 40%.

The average increase in the yields of wheat, barley, corn, and sugar beet was from 4-96%.

The average increase in the numbers of swine, poultry, and dairy cows was 174%.

The average increase in the income of each producer was \$15,900 (83% change), and \$5,400 (85% change) in the profit of each producer.

4. Project Goal and Objective

The overall goal of the project was to improve the income of private agricultural producers through an agricultural extension program.

The specified objective of the project was to increase agricultural productivity at the small farmer and home plot owner (HPOs) levels.

5. Project Implementation Methodology, Components, Activities and Results, and their significance to USAID

5.A. Project Implementation Methodology

Project implementation included administrative policies and procedures, formal education and outreach education activities and programs, and program and personnel performance evaluations.

Administratively, the LSU AgCenter had a Project Coordinating Office (PCO) in Vinnytsia to oversee and coordinate the administrative and programmatic aspects of the three oblast centers' programs. Policies and procedures were established for personnel recruitment and assignment, job performance, and supervision, an annual program planning and quarterly reporting system was put in place to monitor progress of the project's work, and regular monthly meetings were held with center coordinators. An advisory council composed of representatives of USAID, the Chancellor of the LSU AgCenter, and project stakeholders met each year with the project staff to review the project's progress and recommend future directions.

Implementing the different program components involved consultations and planning among the project partners followed by actual conduct of formal and informal education programs and the coordination of research. Mutual sharing and exchange of ideas among project staff (center coordinators, supervising faculty, raion specialists, university specialists, LSU project coordination office staff) and active involvement of grass-roots stakeholders (private farmers, HPOs, agribusiness, women entrepreneurs) regarding their program needs helped ensure that the education programs and activities conducted were relevant and useful.

Project evaluation included two dimensions: personnel and program. Evaluation of the job performance of employees was a key activity to assist in supervisory counseling and personnel placement and salary decisions. Systems were put in place and procedural guidelines established and followed to facilitate the process. Program evaluation as an indispensable tool to provide information on the various educational activities and programs conducted and to enable judgments to be made about the impact of the project was a high priority for project managers. Consequently, program evaluation planning began at the outset of the project and over the course of the project three internal evaluations — baseline, mid point, and end of project — were designed, planned, and conducted by the project staff and specialists.

In any project, an overall implementation strategy and specific methodologies are essential for ensuring that goals, activities, and assessments of effectiveness are well-planned and executed. For the project staff, the specific implementation methodologies briefly mentioned above provided guidance and direction. Of primary significance to USAID, as one of the important lessons learned, is the emphasis that was placed on program evaluation from the very outset of the project. The impact of the project would have been difficult to support and document had this not been done. Of secondary significance to USAID was the procedures put in place by the project to collect data and information to regularly report on project progress. This proved to be helpful in assembling the necessary data and information to prepare needed reports in a timely fashion.

5.B. Project Components

The project had two components: (a) Extension, and (b) Information Systems.

The Extension component had two sub-components: (a) Education and (b) Outreach.

Two important lessons were learned from the earlier project with regard to the value of formal education. The first lesson was to ensure the allocation and training of sufficient faculty to plan and conduct extension education programs. The second lesson was the critical need to provide for sufficient textbooks and other source documents in Ukrainian in the discipline of extension education and related social science disciplines to support extension courses.

From the very outset, it was planned to require the allocation of needed faculty and the commitment of sufficient time of these faculty to fulfill formal extension education responsibilities at each oblast center/agricultural institution. In addition, it was planned that 10 subject-matter faculty would be assigned primary responsibility for outreach and other project activities. Other activities envisaged were (a) a faculty development program in extension theory and practice and agricultural subject matter to improve process and technical skills of selected center faculty, and (b) orientation and follow-on training of raion-level specialists to enable them to run raion extension offices and teach farmers. It was also planned to operate a special two-year, formal education program to train at least 100 farmers in each oblast in crop and livestock production technology, marketing, and business planning.

To further strengthen formal education, a resource library was to be set up at each Center consisting of at least 500 volumes of textbooks, references, journals, technical bulletins, and reports in extension education and related social science disciplines. Efforts were planned to abstract information from English-language and Russian-language textbooks in extension education, and procure and/or prepare Ukrainian version outlines and notes needed for the formal extension education curriculum.

With regard to the Outreach sub-component, the Vinnytsia Center's outreach model was planned to be replicated in Cherkasy and Khmelnytsky oblasts. Organizationally, each Oblast Center would have a coordinating office at the agricultural academy overseeing the work of specialists in all raions of the oblast. A printing facility would be established at the PCO to enable publication of materials to support the outreach activities with fact sheets, bulletins, leaflets, management record books and forms, etc. Subject-matter focus of the outreach program would cover three program areas: Agricultural Production and Management Support, Business Market Development, and Research Coordination.

In the Agricultural Production and Management Support program area, it was envisaged that farmers, HPOs, owners of land shares, members of commodity cooperatives, and producer associations would participate in education programs on a variety of crop and livestock production and management subjects utilizing workshops, demonstrations, seminars, individual consultations, and other teaching methods and techniques. Soil testing facilities of staff, laboratory space, and equipment would enable specialists in the oblasts to provide soil analyses and recommendations to their clientele.

The soils laboratory at the Vinnytsia Oblast Center was planned to be expanded to test seeds, fertilizers, water, and feeds for all three oblasts, and soils laboratories established in the other Centers for basic soil analysis.

In the Business and Market Development program area, educational opportunities were anticipated in input use, producer and marketing associations, agribusiness links and partnerships, and assistance to HPOs.

Input use. Agricultural producers do not have ready access to or knowledge of modern inputs and technologies. Facilitating access to and educating farmers and HPOs on quality inputs and input use would lead to more productive farms and increased profits. In addition, fostering environmentally conscious behaviors/actions would help reduce and/or prevent agro-chemical contamination of Ukrainian soils. A key activity of the project was educating farmers and HPOs on optimal use of high-quality inputs as opposed to poorer quality inputs.

Producer and marketing associations. Realizing the need for private producers to organize themselves into effective associations to better address their needs and solve problems, the project envisioned (a) creating effective grower associations, commodity groups, and cooperatives of private farmers and HPOs, (b) expanding the Information Support System (ISS) into a "virtual commodity exchange" assisting growers and buyers in all raions, and (c) implementing a small grants program to facilitate farmer and HPO access to resources thus helping them to overcome financial and educational constraints in forming input and marketing cooperatives.

Agribusiness links and partnerships. Specific activities envisaged in the project for developing and strengthening links and partnerships with agribusiness included (a) input and technology focused-education programs, (b) field demonstrations on farmers' land to showcase improved input and technology use, (c) commodity-based associations and environmentally conscious approaches to agriculture, and (d) development of agricultural cooperatives, farmers' stores, and exhibitions.

Assistance to commercial home plot owners (CHPOs). It is estimated that CHPOs (persons who produce a marketable surplus) contribute more than 90% of domestically produced fruits and vegetables sold in Ukraine and over 60% of the animal protein products produced in the country. Working with at least 100 CHPOs per oblast, the project was expected to (a) establish baseline data on CHPOs, (b) identify and prioritize CHPO needs and problems, (c) devise ways for organizing group action by CHPOs, including identifying and utilizing community leaders, and (d) develop at least 10 farmers' markets as outlets for CHPO produce and entrepreneurial connections with customers.

In the Research Coordination program area, the project was expected to assist in identifying research areas, encouraging coordination of research efforts, and disseminating research results from local, regional, and national levels to researchers, extension specialists, and farmers. Specifically, the project would (a) develop a database for the three oblasts that would provide researchers with Internet access to relevant and appropriate research information, (b) develop and implement a system for evaluating current and proposed research based on productivity and relevance to farmer needs, (c) establish a resource inventory and administrative options in Cherkasy and Khmelnytsky oblasts similar to that in Vinnytsia, and (d) ensure inclusion of research specialists on extension advisory committees and extension specialists on research coordinating committees at all levels.

The Information Systems component (ISS) was initiated in the earlier project in Vinnytsia oblast. It was planned to extend ISS to the new oblasts by integrating outreach, education, and research into a unique agricultural development tool, employing computer-based technology and Internet-linkages. Utilizing a variety of databases and interactive programs, the ISS would be used to assist farmers with the information needed to diagnose and solve problems, and make more informed decisions in their agricultural production and marketing operations. Tasks expected to be done were (a) develop, install, and maintain appropriate computer-based and Internet-linked software to support information needs of private farmers, (b) accumulate and distribute agricultural information through raion specialists

and the Internet, and (c) provide Internet-based assistance to private farmers regarding accounting and business information exchange.

5.B.1. a. Component: Extension, Sub-component: Education

Activities and results under this subcomponent are summarized below.

Extension Professional Development: The professional development of faculty and raion specialists in technical and program areas was systematically planned and followed all through the project. Faculty and raion specialists were involved in formal orientation and continuing education programs to learn and apply in their work basic theories and practical applications of extension education and related social science disciplines. The following examples of learning opportunities/training events will illustrate the professional development strategy that was used to ensure that project faculty were well-prepared to perform their technical and educational responsibilities.

In May-June 2002, the coordinators and six senior faculty/administrators from the Cherkasy and Khmelnytsky Centers attended an intensive three-week training program at the LSU Agricultural Center to better understand their role as extension educators and program managers in the project. Major topics covered included Extension Theory and Practice, Extension in Action, Partnerships, Research and Extension, and Curriculum Development. Learning occurred through lectures, field trips, and experiential activities. This core group of trained faculty/administrators served as the professional development resource (brains trust and teaching) of each Center.

In the first year of the project, 32 additional faculty at the agricultural academies in Cherkasy and Khmelnytsky were selected to serve as extension and technical subject matter resource persons. They received basic training in extension methodology and adult learning principles organized by the Faculty Development Committee of the PCO and were called upon through the term of the project to assist in teaching raion specialists how to plan, implement, and evaluate extension programs.

A Faculty Development Committee comprising one extension-trained faculty from each of the three centers and the Assistant Director of Training and Outreach, PCO, planned, implemented, and evaluated needed formal professional development activities for university and raion specialists through the life of the project. In addition, committee members contributed to the preparation, translation, and publication of education materials for use in orientation and follow-on training, and materials for the resource libraries that were developed at the oblast centers.

All raion specialists in Cherkasy and Khmelnytsky, upon first employment, participated in 10 days of orientation training spread over a period of three months to familiarize them with their job responsibilities and to learn the basics of extension program planning, implementation, and evaluation, computer skills, and the ISS.

Additional learning opportunities were provided to both university faculty and raion specialists, as needed. For example, before the intermediate and final evaluations of the project's outreach program were conducted, workshops were organized to familiarize raion specialists with the sampling procedure, the survey instruments, and how to conduct personal interviews.

Besides the learning and teaching aspects of professional development, university faculty and raion specialists utilized their knowledge to prepare and publish technical subject-matter materials thus contributing to their personal and collective scholarship as professionals as well as expanding the educational resources available in the project. Fact sheets, handouts, journal and newspaper articles, brochures, and radio/television scripts on a variety of subject matter subjects were produced.

A highly significant achievement of the project which testifies to the project faculty's scholarship is the publication in Ukrainian of a 231-page book on the theory and practice of extension. The material for this book was compiled from a number of sources (English, Russian, and Ukrainian) by the Faculty Development Committee. The book has been approved by the Ministry of Education, Government of Ukraine, and recommended to agricultural universities/academies/colleges for adoption as a textbook on extension in the agricultural curricula of these institutions.

The Faculty Development Committee was also involved in a comprehensive research study undertaken in the second year of the project to determine the extent to which program development concepts learned by university faculty and raion specialists were transferred and applied in their jobs. The issue of learning transfer in the workplace is significant because of the large investment that organizations make to training of their staff. The results of the study showed that both raion specialists and university faculty transferred and utilized much of what they had learned in the training sessions to their work. The results were presented as a technical paper in the 16th European Seminar in Extension Education, Eger, Hungary, September 2003.

These professional development activities have resulted in building the knowledge and skills of a nucleus of about 150 extension personnel at the agricultural universities and academies in the three oblasts. These individuals will no doubt serve as an invaluable resource at the national, oblast, and local levels for future outreach efforts of the Ministry of Agriculture, agricultural universities, NGOs, and other entities.

Farmer Education. Formal training courses in marketing, crop and livestock production technology, and business planning were provided for farmers by the oblast centers during the term of the project. The training programs consisted of class-room sessions which lasted from 2-3 weeks to 1-3 months and were planned according to the clients' interests and needs. The main themes of these programs were agricultural production, farm accounting, and labor safety. A total of 218 farmers and future farmers studied agricultural production and accounting, and over 600 farmers participated in labor safety training.

Resource Libraries. All through the project, assigned university faculty and raion specialists contributed to the development of each Center's library of educational and technical subject-matter resources. By project end, these libraries had acquired nearly 2,000 volumes of English textbooks in Extension and related social science disciplines, Ukrainian translations of teaching notes on important extension topics culled from standard references in the discipline, journal and newspaper articles, course outlines and curricula in extension education, brochures, and bulletins. In view of the near absence of publications on extension education in Ukraine and the growing need for high quality reference material for teaching, research, and developmental purposes, these resource libraries will be very valuable in future.

5.B.1.b. Component: Extension, Sub-component: Outreach

Outreach - the provision of technical knowledge to farmers and HPOs in the three oblasts from the research/teaching systems in Ukraine through a need-based, interactive educational process - is the core around which all project activities revolved and project success depended.

One of the fundamental practices followed in the design and implementation of this sub-component was the involvement of project stakeholders — private farmers, HPOs, agribusiness, farmers associations, raion and oblast administrations, research and teaching institutions, and other grass roots organizations — in decisions about the education programs that would be conducted in the oblasts. This was accomplished through the formation of and regular input from raion and oblast-level commodity and subject matter advisory committees in each oblast composed of various vested interests which had a stake in the conduct and outcomes of these programs. Recommendations of these committees were used by project staff to plan need-based village and raion level education programs in the three oblasts.

The rationale of the outreach sub-component was that participation in educational activities organized by the project for private farmers and HPOs would, over a period of time, enable them to learn new agricultural technology, use more higher quality agricultural inputs, and select and apply appropriate technological recommendations in their agricultural operations, which would result in increased crop and livestock production and overall agricultural productivity. A before-after educational intervention evaluation design provided evidence that substantiated this rationale. Comprehensive technical reports of the focus, methodology, and results of these evaluations of the outreach programs undertaken with farmers and HPOs are appended to this report (Attachment # 1 and Attachment #2). Summary tables excerpted from these reports for private farmers (Table 1) and HPOs (Table 2) show significant increases in the core elements of this rationale, i.e., participation in education programs, technology adoption, input use, crop yield, and productivity from the beginning to the end of the project. Baseline (2002), end-of-project (2004), and change information (2004 over 2002) are shown for each element.

For private farmers (Table 1), educational participation, as measured by number of individuals served by the project's extension staff, increased from 1,259 at the beginning of the project to 3,374 at the end of the project (167.9% increase). New agricultural technology learned in the education programs influenced farmer adoption of recommended technology, which increased by 77.0% over the life of the project. Increased technology adoption resulted in greater input use and cost (66.7% increase). This contributed to a significantly higher overall crop yield (37.2% increase), and an increase of 104.4% in agricultural productivity (average gross income).

Table 1. Change among private farmers in Cherkasy and Khmelnytsky oblasts as a result of the project's educational intervention, 2002-2004

Project performance indicator	Measure	Baseline 2002	End-of-Project 2004	Change in 2004 over 2002	
				Quantity	Percent
Educational participation ^a	# of persons	1,259	3,374	(+) 2,115	(+) 167.9
Technology adoption ^b	% farmers	42.1	74.5	(+) 32.4	(+) 77.0
Input cost ^c	\$	2,446.0	4,078.6	(+) 1,632.6	(+) 66.7
Yield ^d	c/ha	33.8	46.4	(+) 12.6	(+) 37.2
Productivity ^e	\$	7,784.0	15,916.0	(+) 8,132.0	(+) 104.4

^a Number of different individuals who participated in workshops, seminars, demonstrations, and office and farm visits organized by Center faculty/raion specialists.

^b % farmers who "always" or "mostly" adopted 27 crop and livestock management practices

^c Per farmer average cost of seeds, livestock feed, organic fertilizers, chemical fertilizers, crop protection chemicals, fuel. Baseline figure calculated by multiplying the reported quantities by the prevailing input prices for a six-month period. End-of-project figure is actual cost reported by farmers.

^d Average aggregate yield of wheat, rye, barley, buckwheat, corn, sugar beet, potatoes, vegetables (carrots, cabbage, cucumbers, tomatoes, onions), fruits (apples, plums).

^e Defined as average gross income and calculated by (1) multiplying total production of crop and livestock commodities by prevailing commodity prices averaged for a six-month period, (2) subtracting total cost of production inputs, and (3) averaging the difference. Includes only producers who (1) harvested not more than 100 hectares, and (2) had a calculated gross income in the range of (-) \$100 and (+) \$65,000.

For HPOs (Table 2), educational participation, as measured by number of individuals served by the project's extension staff, increased from 858 at the beginning of the project to 6,673 at the end of the project (689.4% increase). New agricultural technology learned in the education programs influenced HPO adoption of recommended technology, which increased by 50.0% over the life of the project. Increased technology adoption resulted in greater input use and cost (131.5% increase). This contributed to a significantly higher overall crop yield (79.8% increase), and an increase of 154.8% in agricultural productivity (average gross income).

Table 2. Change among home plot owners (HPOs) in Cherkasy, Khmelnytsky, and Vinnytsia oblasts as a result of the project's educational intervention, 2002-2004

Project performance indicator	Measure	Baseline 2002-2003	End-of-Project 2004	Change in 2004 over 2002	
				Quantity	Percent
Educational participation ^a	# of persons	858	6,773	(+) 5,915	(+) 689.4
Technology adoption ^b	% HPOs	46.1	69.1	(+) 23.0	(+) 50.0
Input cost ^c	\$	463.0	1,072.0	(+) 609.0	(+) 131.5
Yield ^d	c/ha	35.6	64.0	(+) 28.4	(+) 79.8
Productivity ^e	\$	1,935.0	4,931.0	(+) 2,996.0	(+) 154.8

Note: Data are based on random samples of HPOs from the three oblasts. Total number of HPOs sampled: Baseline (Intermediate Evaluation, 2003) - 240; End-of-project - 655.

^a Number of different HPOs who participated in workshops, seminars, demonstrations, and office and farm visits organized by Center faculty/raion specialists.

^b % HPOs who "always" or "mostly" adopted crop and livestock management practices. (Baseline: 17 practices reported in the publication "Agricultural Activity of Households in Ukraine, Statistical Yearbook, 2002, State Statistics Committee of Ukraine, Kyiv, 2002; End-of-project: 27 practices).

^c Per HPO average cost of seeds, livestock feed, organic fertilizers, chemical fertilizers, crop protection chemicals, fuel. Baseline figure determined by multiplying quantities of these inputs indicated by HPOs in the Intermediate Evaluation Report, Table 41, by the prevailing input prices for a six-month period. End-of-project figure is self-reported cost.

^d Average aggregate yield of wheat, rye, barley, buckwheat, corn, sugar beet, potatoes, vegetables (carrots, cabbage, cucumbers, tomatoes, onions), fruits (apples, plums).

^e Defined as average gross income and calculated by (1) multiplying total production of crop and livestock commodities by prevailing commodity prices averaged for a six-month period, (2) subtracting total cost of production inputs, and (3) averaging the difference. Includes only HPOs who (1) harvested not more than 20 hectares, and (2) had a calculated gross income in the range of (-) \$100 and (+) \$65,000.

The above tables provide conclusive evidence that the project was successful in changing the educational behavior of both private farmers and HPOs which enabled them to improve crop yields and income.

The outreach sub-component focused on three program areas – Agricultural Production and Management Support, Business and Market Development, and Research Coordination. Significant activities/results are presented in each program area.

5.B.1.b.1 Program sub-component: Outreach; Program Area: Agricultural Production and Management Support

Educational Activities

In all three oblasts, a variety of educational activities were used in outreach education programs to interface with the project's clients – private farmers, HPOs, and others. Tables 3-5 provide data on the number of client contacts in different educational activities in each oblast/the overall project for the three project years (2002-2003, 2003-2004, and 2004-2005).

Table 3. Number of contacts with project clients in Vinnytsia, Khmelnytsky, and Cherkasy oblasts through individual consultations, visits, and seminars, Ukraine Project, March 1, 2002-February 28, 2003

Type of client interface	Number of contacts by oblast a			
	Vinnytsia	Khmelnytsky	Cherkasy	Total
University faculty consultations	1,125	1,729	2,741	14,916
Raion specialist consultations (all clients)	13,476	1,767	1,091	16,334
➤ Farmers	6,724	857	489	8070
➤ HPOs	3,958	490	278	4,726
➤ People who wish to farm	719	54	52	825
➤ Women farmers	596	60	35	691
➤ Farmer's wives	673	167	111	951
➤ Other clients	1,647	139	126	1,912
Visits (client to specialist; specialist to client)	15,136	1,932	1,279	18,347
Seminars (farmers) b	3,354	760	1,151	5,265
Seminars (HPOs) c	815	168	98	1,081
Information Assistance (ISS/Other) d	10,446	1,729	2,741	14,916
All types of client interface	44,352	8,085	9,101	61,528

a Same persons in a client type could be contacted many times over (repeatedly) in the year

b Number of seminars for farmers: Vinnytsia (129); Khmelnytsky (31); Cherkasy (59); Total (219)

c Number of seminars for HPOs: Vinnytsia (52); Khmelnytsky (10); Cherkasy (9); Total (71)

d Information Support System and other general information assistance

Table 4. Number of contacts with project clients in Vinnytsia, Khmelnytsky, and Cherkasy oblasts through individual consultations, visits, and seminars, Ukraine Project, March 1, 2003-February 28, 2004

Type of client interface	Number of contacts by oblast			
	Vinnytsia	Khmelnytsky	Cherkasy	Total
University faculty consultations	228	956	491	1,675
Raion specialist consultations (all clients)	6,276	8,391	4,479	19,144
➤ Farmers	2,734	4,102	2,322	9,158
➤ HPOs	1,804	2,838	1,207	5,849
➤ People who wish to farm	271	191	152	614
➤ Women farmers	245	295	129	579
➤ Farmer's wives	323	478	198	999
➤ Other clients	899	577	469	1,945
Visits (client to specialist; specialist to client)	5,928	5,681	4,303	15,942
Seminars (farmers)	835	1713	1,651	4,199
Seminars (HPOs)	500	631	450	1,581
Information Assistance (ISS/Other)	5,337	2,845	4,980	13,162
All types of client interface	19,104	20,217	16,354	55,675

a Same persons in a client type could be contacted many times over (repeatedly) in the year

b Number of seminars for farmers: Vinnytsia (37); Khmelnytsky (70); Cherkasy (91); Total (198)

c Number of seminars for HPOs: Vinnytsia (27); Khmelnytsky (36); Cherkasy (30); Total (93)

d Information Support System and other general information assistance

Table 5. Number of contacts with project clients in Vinnytsia, Khmelnytsky, and Cherkasy oblasts through individual consultations, visits, and seminars, Ukraine Project, March 1, 2004-February 28, 2005

Type of client interface	Number of contacts by oblast			
	Vinnytsia	Khmelnytsky	Cherkasy	Total
University faculty consultations	213	740	888	1,841
Raion specialist consultations (all clients)	4,604	10,611	6,723	21,938
➤ Farmers	1,852	5,001	3,440	10,293
➤ HPOs	1,612	3,465	1,842	6,919
➤ People who wish to farm	226	357	253	836
➤ Women farmers	194	275	219	688
➤ Farmer's wives	219	563	347	1,129
➤ Other clients	501	950	622	2,073
Visits (client to specialist; specialist to client)	4,113	9,428	6,529	20,070
Seminars (farmers)	811	1,895	2,852	5,558
Seminars (HPOs)	357	967	580	1,904
Information Assistance (ISS/Other)	2,399	5,950	7,631	15,980
All types of client interface	12,497	29,591	25,203	67,291

a Same persons in a client type could be contacted many times over (repeatedly) in the year

b Number of seminars for farmers: Vinnytsia (39); Khmelnytsky (94); Cherkasy (149); Total (282)

c Number of seminars for HPOs: Vinnytsia (17); Khmelnytsky (67); Cherkasy (31); Total (115)

d Information Support System and other general information assistance

These data show that total client contacts in all three oblasts were about 60,000 per year. With 80 professional staff in the project, the average number of contacts per faculty/specialist was approximately 750 per year, or 3 contacts per workday. Considering that a majority of these client contacts were face-to-face (individual or in seminars) this is a good staff-client ratio, and suggests that much of the educational assistance to answer questions, solve problems, and provide needed information was personalized. Khmelnytsky and Cherkasy oblasts picked up and maintained a fairly high level of contacts in the second and third years, while Vinnytsia, which was externally funded for only the first year of the expansion, dropped in number of contacts.

In addition to the above contacts, publications and radio and television programs were used to disseminate information to project clients. Over the three years of the project, 593 brochures in the Farmers' Library series, 314 fact sheets, and 754 newspaper articles were produced and distributed to project clients and other concerned individuals and organizations at local, oblast, and national levels. Project faculty also produced and broadcast 376 radio programs and 117 television programs conveying information about agricultural subjects and publicizing the project's work. These materials were designed and produced through the publishing/printing facility established at the PCO. This facility enabled faculty to design and publish education and public relations materials to enhance the project's outreach effort.

A wide range of subject matter covering the gamut of crop and livestock production, management, marketing, economics, and legal aspects was covered through these different contact methods over the term of the project. Topics for the different contact methods were chosen based on relevance and appropriateness to the contact methods, the agricultural season, client needs, and commodity and raion/oblast advisory committee suggestions. For example, *seminars*, a significant teaching/learning opportunity used in the winter season when farmers were free from agricultural operations and which attracted high participation from project clients, included topics on all cultural aspects of the major agricultural commodities (cereal grains, sugar beet, potatoes, vegetables, beef and dairy cattle, pigs, and poultry), integrated and conventional pest management systems, farm accounting and tax issues, financial planning and management, organized marketing and several other topics.

A significant topic of the outreach effort worthy of mention is the *legal education of project clients*. Because of the importance of legal aspects of agricultural production, including land tenure and titling, legal services were provided by qualified lawyers at all three oblast centers to project clients. Through the term of the project, intensive, personalized legal services and seminars were provided to over 3,000 farmers and HPOs. In addition to a formal basic course on legal literacy and seminars on various legal issues such as land titling, farm/farming rules, regulations, and taxes, oral consultations and written advice were given on an individual basis as a personalized service to farmers and HPOs. On these occasions, and as the opportunity arose, samples of farm and cooperative bylaws, agreements and contracts and other legal documents such as laws, decrees, orders, and other formal instruments were shared with project clients.

Agricultural demonstrations

Agricultural demonstrations are a valuable method of testing and showcasing research findings in field conditions. In the second and third years of the project, agricultural (crop and livestock) demonstrations and field days, in conjunction with these demonstrations, were extensively used to demonstrate and promote selected, seasonal cultural recommendations for major commodities of economic importance in each oblast. Established procedures for organizing planned demonstrations on farmers'/HPOs' fields in the several raions were followed and monitored by raion specialists/university faculty in collaboration with agribusiness companies that provided required inputs of feeds, fertilizers, seeds, chemicals, etc. for distribution to and use by farmers/HPOs in their demonstrations. Farmers/HPOs were intimately involved in the entire process. Upon successful completion of the demonstrations, the results and recommendations were shared by the cooperating farmers/HPOs and the project faculty with other project clients at field days. These field days were well publicized and typically attracted a number of project clients, who were able to thus learn and evaluate the recommendations emerging from the demonstrations. Over the second and third years of the project, over 150 demonstrations on a variety of crop and livestock production practices/recommendations were conducted and as many field days were organized. Some examples of demonstrations conducted include improved varieties/hybrids of wheat, sugar beet, vegetables and potatoes; production practices for vegetables, sunflower, corn, potatoes, sugar beet, soybean, buckwheat, and barley; pasture management; growth regulators for crops; IPM; weed and insect control; fertilization of cereal grains, intensive horticulture (Dutch) production; and apple tree pruning. Besides the farmers/HPOs on whose farms the demonstrations were laid, over 2,000 project clients attended the field days. As an example of the impact demonstrations can have, Cherkasy Oblast farmer Oleksander Lakutin who cooperated in a tomato varieties demonstration earned an additional 5,000 UAH/hectare or an additional 30,000 UAH on 6 hectares of his tomato crop through proper greenhouse care and manual planting of seedlings and use of recommended fertilizers/fertilization rates. Fifteen farmers and HPOs who attended the field day on his farm "Demetra" took away valuable information which if applied by them could increase the impact of this one demonstration in other parts of the oblast.

Exhibitions

Project staff participated in a number of raion, oblast, and national agricultural exhibitions to publicize significant project activities and feature crop and livestock practices adopted by farmers/HPOs and the resulting products. These participation opportunities earned favorable publicity for the project and highlighted significant achievements of project clients.

Work of Oblast Soils Laboratories

The Vinnytsia Center soils laboratory established in the earlier project continued to function through the term of this project. Soils laboratories were set up in the latter part of the second year in the other two oblast centers.

All laboratories provided soil analysis and fertilizer recommendation services to farmers and HPOs in their respective oblasts. In three years, the Vinnytsia soils laboratory performed 614 soil analyses and provided fertilizer recommendations on the basis of these analyses to farmers, HPOs, and companies requesting this service. In a little over a year, 657 soil samples were analyzed and recommendations made in Cherkasy and Khmelnytsky.

The Vinnytsia laboratory also assisted project clients with analyses of 88 water samples and 34 feed grains samples.

In addition to diagnostic assistance, the soils laboratories produced fact sheets on soil and water sampling for raion specialists, farmers and HPOs, publicized their laboratory services through mass media outlets, and cooperated with agribusiness companies on basic and special soil, fertilizer, and feed analyses.

Integrated Pest Management

An Initial Environmental Examination (IEE) of the project in July 2002, four months after its scheduled start date, determined that two outreach activities, (a) pesticide use demonstrations which had been conducted on farmers' fields, and (b) lists of pesticides and pesticide recommendations being given to farmers were being conducted by the project staff outside the IPM context and without the proper needed training of staff and clients. However, the IEE concluded that these activities did not have a negative impact. In response to this determination, several corrective and long-range steps were taken by the project to modify and implement pest management outreach work. These steps are described below.

1. Raion specialists immediately stopped providing lists of pesticides and recommendations for pesticide use to farmers from the ISS database. All further requests from project clients in this regard began to be referred to appropriate Ukrainian sources.
2. An entomologist on the project faculty, Ms. T. Butkaluk, was assigned to lead IPM implementation. Following consultations with project/ World Laboratory staff on the IPM approach, the IPM leader prepared a list of recommendations for all partners, raion specialists and faculty consultants to ensure that they recommended or taught only integrated methods of pest control.
3. World Laboratory programmers began to revise the ISS Atlas of Agronomic Crops to include alternatives to pesticides for pest management and to reflect an IPM context. When the revision was completed, the Atlas showed IPM as a component of an integrated crop management approach, and described it as a decision-support system for addressing pest management problems by integrating data, knowledge, technologies, and decision making procedures that minimize economic, social, and ecological risks and preserve farming efficiency. It also included information on alternative, non-chemical methods of plant protection (cultural, biological, mechanical) to comply with an IPM approach to pest management problems.
4. One faculty member from each oblast center with pest management expertise was recruited as a consultant. Together with the IPM leader, they formed the IPM committee and were intimately connected with the pest management outreach effort.
5. Employees responsible for IPM implementation from all oblast centers met at the project office to plan seminars and other educational activities for farmers and HPOs devoted to the correct application of pest control methods and safe use of chemical products.
6. University faculty/raion specialist training activities were revised to include all aspects of an IPM program and to emphasize the "last resort" principle for pesticide use. A series of workshops emphasizing the IPM approach was held for raion specialists in two oblasts (Cherkasy and Khmelnytsky) in 2002 and in Vinnytsia oblast in 2003.

7. Properly trained raion specialists through the remainder of the project conducted a total of 83 IPM seminars and workshops involving 1,533 farmers and HPOs, and organized 27 field days to demonstrate the IPM approach to 402 farmers and HPOs.

8. Recommendations for demonstration plot implementation were developed and introduced to the raion specialists. The IPM leader together with personnel from each oblast visited all plots where the pest management approach was being demonstrated. Much attention was given to the promotion of alternative methods. For example, in a field day in village Kam'yanka, Lypovets raion, the demonstrations showed that several coverings of potatoes with soil after germination protected the crop from Colorado potato beetles and phythoftora. The plant pathologist from the raion's plant protection station, O. Bernada, participated in the field day and gave recommendations to HPOs about plant protection techniques to be used on small home plots. Biological methods of pest management were shown in demonstration plots in Cherkasy oblast, and cultural methods in demonstration plots in Khmelnytsky oblast.

9. The IPM approach was promoted through newspaper articles and brochures published by the project office and oblast centers. IPM issues were highlighted in 33 publications: 5 in Vinnytsia; 18 in Cherkasy; and 10 in Khmelnytsky. The titles and authorship of some of these are given below.

- a) IPM recommended for winter wheat. G. Starynsky and O. Tanasov, Khmelnytsky Center
- b) IPM in growing vegetable crops. I. Mostov'yak, Cherkasy Center
- c) IPM in growing sugar beets. I. Mostov'yak, Cherkasy Center
- d) Complex of plant protection means for potato. V. Melnyk, Khmelnytsky Center
- e) Production of early varieties of potato on home plots and farms. V. Melnyk, Khmelnytsky Center
- f) How we can protect transplants from stem rot. V. Batsey, Khmelnytsky Center
- g) Cultural and mechanical methods of weed control. S. Tanasov, Khmelnytsky Center
- h) American white butterfly. V. Kushneryk, V. Tankocheyev, and S. Tanasov, Khmelnytsky Center
- i) Technologies of potato production. V. Melnyk, Khmelnytsky Center
- j) Recommendations on vegetable transplants production in green and hot houses. V. Ovcharuk and V. Bukshiy, Khmelnytsky Center
- k) Sugar beet protection from pests and disease. G. Starynsky and S. Tanasov, Khmelnytsky Center
- l) Some peculiarities of peas protection. G. Starynsky and S. Tanasov, Khmelnytsky Center

10. An IPM model for field crop management was developed by Ukrainian scientists P. Lisovy and O. Trybel. This model includes (a) evaluation of agricultural background; (b) determination of economic injury threshold; (c) planning and timing of plant protection measures; (d) resistant varieties, cultural methods, and biological control; (e) recurring evaluation of actual field conditions and adjustment of protective methods; and (f) evaluation of pest management measures. Use of this model ensures the most extensive and most efficient use of agricultural inputs, and is reported to result in a 50% reduction in pesticide use and a 60% reduction in the production cost of a ton of produce.

A review of the project's activities with regard to pesticide use was conducted in June 2004 by USAID IPM advisor, Dr. Robert Hedlund. The review determined that the measures taken by the project as listed above had ensured that the pest management outreach program was in compliance with USAID regulations on pesticide use.

5.B.1. b.2 Program sub-component: Outreach; Program Area: Business and Market Development

Input Use

Educating private farmers and HPOs on economically optimal use of high-quality inputs as opposed to the current use of poorer quality inputs was the major focus of this part of the business and market development outreach effort.

Important activities undertaken in this regard by each oblast center included (a) designating input/marketing specialists

in each oblast center to initiate, establish, and oversee input supply and market databases in conjunction with the ISS system, train and support raion specialists, provide numerous individual consultations to project clients, organize and conduct seminars on inputs and marketing issues, and participate in agricultural and trade exhibitions, conferences, and other events and activities at oblast and national levels, (b) establishing contacts and relationships with agribusiness companies to provide input assistance for the project's agricultural demonstrations conducted in the several raions and information about agribusinesses' input supply and market support activities to farmers and HPOs, (c) gathering and disseminating oblast-specific information to raion specialists/farmers/HPOs on input availability, use, market prices, etc. to support farmer and HPO education programs, and (d) conducting seminars, demonstrations, and individual consultations to increase client awareness of quality inputs and their importance in increasing agricultural production/productivity. The impact of this effort over the duration of the project may be seen in the significant increase in input cost incurred by farmers and HPOs as indicated earlier in Tables 1 and 2 of this report. Comparing baseline to end-of-project data (Table 1), the average annual input cost per farmer increased from \$2,446.00 to \$4,078.60 (66.7%). For HPOs (Table 2), the average annual increase per HPO was from \$463.00 to \$1,072.00 (131.5%). Since cost is related to quantity, it is expected that higher cost reflects greater input use. It is also expected that the participation of agribusiness companies in input use demonstrations, seminars and assistance to farmers would have encouraged project clients to use better quality inputs.

Producer and Marketing Associations

Through the term of the project, the input/marketing specialists in the three oblasts and raion specialists/other university faculty encouraged farmers and HPOs to form grower and marketing associations as a means of procuring needed inputs, receiving and sharing information, and marketing their produce at terms and conditions beneficial to them. Situational analyses by input/marketing specialists revealed that there were very few existing functional agricultural associations, cooperatives or commodity groups in the oblasts with which project faculty could work. Second, wherever raion or oblast level farmers associations were found they had their own political and resource problems which prevented them from engaging in proactive and productive endeavors. Third, with a few exceptions, commodity groups which offer a common platform for producers of similar interests were practically nonexistent. Finally, agricultural cooperatives were not favored by producers because of their negative view of the former collective farms and collective farm operations. This meant that some kind of incentive would have to be provided to clients if they were to break out of their mold to realize the benefits of coming together and engaging in group activities. Therefore, the small grants program became the chief tool in the outreach effort to engage groups of private farmers and HPOs in production and marketing functions. The Information Support System (ISS) was the other tool used to meet both individual and group needs for production and marketing information. The small grants program, particularly the work and results with producer and marketing associations, is described below. ISS work is described in the ISS component of this report.

The purpose of the small grants program was to provide small amounts of seed money to enable small farmers and HPOs to band together in an association or other type of group effort so that they might gain access to needed resources, implement need-based agricultural projects, and build human and organizational capacity. The program was intended to support the formation and work of agricultural associations. It was not meant to provide grants to individual farmers. Particular emphasis in these associations was placed on marketing, and education and training. Specific guidelines were developed for oblasts to request grants. These included information on the purpose, focus areas, selection criteria, application procedures and format, and evaluation and monitoring of grants.

Through the life of the project, 19 projects were supported with grants of \$2,500 or less. All three oblasts participated. Projects funded in Cherkasy included village/raion level associations of vegetable growers, intensive orchard growers, and dairy producers, an agricultural service cooperative, and a farmers' cooperative store. In Khmelnytsky, grant funds supported village level associations of beekeepers, potato producers, medicinal herbs producers, vegetable producers, poultry producers, and fish producers, and an information center for farmers and HPOs in Kyamenets-Podilsky raion.

Village level projects supported in Vinnytsia were associations of intensive orchard producers, soybean producers, and potato and vegetable producers, agricultural service cooperatives in Maydan and Ilkivka villages, and a farmers association in Bershad raion.

Project faculty worked closely with the different grower associations to provide startup assistance, and information and material resources needed by association members to sustain production and/or marketing activities and realize optimal returns. Seminars, demonstrations, field days, publications, and other educational activities were organized for the benefit of association members. Topics covered in these activities related to specific phases of production and/or marketing of the commodity of interest to individual associations.

An evaluation of the program involving 110 private farmers and 211 HPOs as survey respondents in 13 projects in the three oblasts showed that nearly all respondents considered the information provided in educational programs in their projects to be useful and indicated they were using or intended to use the information in their agricultural operations. Membership in the 19 associations formed under these projects doubled from 476 in 2002 at the start of the small grants program to 939 in 2004, as the project drew to a close. The breakdown of members in the three oblasts was Cherkasy, 219, Khmelnytsky 341, and Vinnytsia 379.

Activities of the associations established in the project, including the small grants program, had significant economic and social impacts in the three oblasts. Over 380 permanent and seasonal jobs were created in rural areas as a result of the promotion of producer associations and service cooperatives, and direct technical assistance to farmers and HPOs. The total economic value of jobs created in 2004 is estimated at \$192,000. Leadership capacity of members increased and material and technical assistance was provided to village institutions, individuals, and communities. Some examples of this assistance are shown below:

<i>Beneficiaries</i>	<i>Type of assistance</i>
Schools	Vegetable supply, transportation services, organization of festivals and tours, horticultural training
Kindergartens	Vegetable supply, organization of festivals
Village councils	Financial assistance, transportation services
Handicapped	Food supply, transportation services
Lonely people	Tillage, transplants, transportation
Pensioners	Tillage, food supply, transportation, seed and transplants
Village communities	Transportation services, road construction

In summary, the small grants program was a valuable facet of the project's outreach work with producer and marketing associations and could be a model of how to motivate, grow, and assist people to derive personal and community benefits and thus improve their lives.

Agribusiness Links and Partnerships

The purpose of this program area in the outreach effort was to link agribusiness companies with farmers and HPOs so that both partners in such linkages could derive mutual benefits. Agribusiness, with its technical production, processing and marketing expertise and its material resources in the form of needed agricultural inputs, has a stake in the agricultural activities of its clients. Farmers and HPOs, for their part, stand to benefit from the specialized information, advice, and material assistance that agribusiness can provide.

Project faculty used various methods to establish farmer/HPO-agribusiness linkages including initial surveys of the services provided by existing agribusiness to private farmers and HPOs in the three oblasts, organizing focus group discussions of company representatives, private farmers and HPOs to determine interests, needs and other issues, and

arranging for agribusiness companies to participate in the educational programs (demonstrations, seminars, field days, input trials, exhibitions, etc.) conducted for project clients in which the companies displayed, provided information about, and/or distributed their brand products.

Over the term of the project, the oblasts reported that a number of agribusiness companies had participated in the outreach effort. Some examples of companies which contributed and /or gave their products to farmers and HPOs included in Cherkasy, Krokus, Sortnasineovich, Nuhneme Zaden, Svit Roslyn, Udana (distributed seeds) Erna (discounted agricultural equipment), Agro risk Ltd (provided information on agricultural insurance terms), and Presence (distributed pest management chemicals); in Khmelnytsky, Stefes Agro, Agro Sphera, and Research and Production Center "Energy" (gave demonstration plot inputs); and in Vinnytsia, Azmol (discounted fuels and lubricants), Svityaz and Sady Ukraina (gave seeds for demonstrations), Urrzapchastyna (provided information on agricultural machinery), and Cash and Carry canneries (provided information on marketing of vegetables and fruits).

In addition, a monthly project bulletin "Agribusiness and the Market for Farmers" was regularly published and distributed by the PCO to private farmers and HPOs in all three oblasts.

Assistance to Commercial HPOs (CHPO)

The aim of this part of the Business and Market Development program was to (a) establish baseline data of the agricultural production, processing, and marketing operations of HPOs as well as their needs and problems to enable a relevant education and assistance program to be mounted on their behalf, (b) devise ways for organizing group action by HPOs, including identifying and utilizing community leaders, and (c) develop farmers markets as outlets for HPO produce and entrepreneurial connection with customers. This agenda was rather problematic to implement in some specific aspects because of (a) the lack of a written record at the oblast/local levels of the personal/family characteristics and household agricultural production and marketing operations of HPOs, and (b) the difficulty of distinguishing between (i) HPOs and private farmers in educational programs, and (ii) non-commercial HPOs and commercial HPOs, who in the project proposal were defined as those who had a marketable agricultural surplus and actually sold this produce in the market. As such, HPO assistance got off to a slower start than private farmer outreach, and not all of the envisaged tasks could be fully implemented by the end of the project. Furthermore, although a working definition of a CHPO was agreed upon by the project staff after initial contacts with HPOs, namely an individual home plot owner with one hectare or more of land cultivated in agricultural/horticultural crops who employed full-time or part-time labor, it was not possible in practice to separate such individuals for specifically targeted CHPO programs and yet maintain an open and inclusive outreach effort for all HPOs. Therefore, whenever HPO programs were planned, implemented, and evaluated, no distinction was made between CHPOs, as defined in the project, and other HPOs.

The activities that were planned and implemented and the results achieved are described below.

Through the first 6-9 months of the project, the seminars, workshops, demonstrations, and field days that were specifically planned for private farmers attracted HPOs. Project staff in the three oblasts began to maintain an identification and brief description of the HPOs attending these education programs so as to plan and implement seminars and other educational activities tailored to their specific needs and problems.

Toward the end of the first year, data on various aspects of HPO operations in the three oblasts, including personal characteristics (age, education, income), family composition, some agricultural production and marketing information, and knowledge and use of selected crop and livestock husbandry practices was excerpted from the publication "Agricultural Activity of Households in Ukraine, Statistical Yearbook, 2002" issued by the State Statistics of Ukraine, Kyiv, and included in a document establishing baseline information on HPOs in the three oblasts. Additional information on selected agricultural inputs, and production and disposal aspects of HPO operations as well as HPO learning and use

of agricultural practices gathered in a midpoint survey (September 2003) was added to this document as a benchmark for comparison with end-of-project data obtained in 2004.

In the second and third years of the project, individual raion specialist/university faculty consultations were provided to HPOs on an as-needed basis, and seminars, workshops, agricultural demonstrations, and field days targeted towards HPOs were conducted. The numbers of HPO contacts made in the three oblasts through these educational activities were shown in Tables 3-5 of this report. Results of the mid-point evaluation (September 2003) were described in a detailed technical report submitted with the project's seventh quarter report.

The end-of-project evaluation for HPOs was a comprehensive survey of random samples of HPOs in the three oblasts on personal and family characteristics, agricultural production, harvesting, processing, and disposal/marketing operations, and HPO perceptions of the changes resulting from the project's outreach program. The full report of this evaluation is included as attachment #3, and a summary of the results can be found in Section 6, Project Evaluation.

The small grants program enabled project staff to bring HPOs into growers and marketing associations in all three oblasts. These associations were formed in Cherkasy (beekeepers, vegetable producers), Khmelnytsky (beekeepers, medicinal plants), and Vinnytsia (dairy).

With regard to the establishment of farmers markets for HPOs to market their produce, an example was the farm store organized in Haldaivo village, Monastyryshche raion, Cherkasy oblast, two farmers stores in Khmelnytsky oblast in Starokostiantyniv raion for beekeepers' and fishermen's products, and a livestock market in Zhazhkiv raion, Cherkasy oblast, which was established in cooperation with PFID Project. Additionally, information on advantages and disadvantages of various marketing techniques and outlets and other market aspects was provided in the marketing education programs conducted in all oblasts. As a result, 20 groups of HPOs in Khmelnytsky oblast signed agreements with existing farmers' markets to sell their products.

5.B.1.b.3 Program sub-component: Outreach; Program Area: Research Coordination

The goal of this program area was to enable the academic institutions in the three oblasts establish links with oblast level research institutions to identify potential research areas, optimize use of available resources, encourage coordination of research efforts, and disseminate results of research from local, regional, and national level institutions to researchers, extension specialists, and farmers/HPOs.

In pursuing this goal, agreements were signed by the LSU Project Coordinating Office/oblast centers with 12 research stations in the three oblasts to enable the stations' researchers and academic/outreach staff of the oblast centers collaborate with each other to advance a needs-based research agenda of inventorying existing research findings, setting up and further expanding the research database, and disseminating research results to raion specialists and farmers/HPOs.

The main objectives of and results obtained in the research coordination program area are summarized:

Development and utilization of a research results database in the ISS. This was developed in printed and electronic format. It contained 97 existing agricultural research items, 224 research station projects, and 263 theses and dissertations. The database was repeatedly used as needed in the three oblasts by university faculty/raion specialists, faculty of the agricultural universities/academies, and researchers at 12 research stations. In addition, 358 farmers and HPOs accessed the database for their specific research questions. The project's website recorded 41,818 visitors to the data base.

Development and implementation of an effective research evaluation system. A case example of how this objective was followed is described. A survey was conducted to determine use of research results in demonstrations of the utility of

superior cover crops and leaving land fallow, and new varieties of winter wheat and their impact on farm productivity. Analysis of the data from 73 farmers in 27 raions in Cherkasy and Khmelnytsky revealed:

Arable land area of all farmers surveyed was 3,435 hectares, or 30% of their total land holding. Land under crops was 89%, both crops and livestock 8%, and livestock 3%. Yields on the new variety demonstration plots increased by 0.8 tons/hectare for buckwheat and by 1.5 tons/hectare for wheat over the regular varieties. The increase in yield planted to cover crops was 1.1 tons/hectare while the fallow land showed a 1.8 tons/hectare increase. Productivity (actual profit) of the demonstration plots land and projected productivity of the total land owned by the farmers based on the demonstration results were as follows:

<i>Measure</i>	<i>Actual profit (demonstrations) (UAH)</i>	<i>Projected profit (total land) (UAH)</i>
Crop production	1,085,120	3,661,925
Livestock production	65,036	474,763
Crops and livestock	1,150,156	4,136,688
Per farm	15,755	56,667

Research Resources Inventory in Khmelnytsky and Cherkasy oblasts. Work on this objective was begun through visits made by two LSU AgCenter specialists, James Devillier and Walter Morrison, to the following research stations in Cherkasy and Khmelnytsky oblasts.

- ◆ Khmelnytsky Oblast Research Station
- ◆ Crimea Medicinal Plant Research Station, Staroushytsia affiliation
- ◆ Khmelnytsky Oblast Center for Monitoring, Soil Fertility Protection and Food Quality
- ◆ Khmelnytsky oblast breeding farm
- ◆ Podilya State Agrarian and Engineering University
- ◆ Cherkasy Institute of Agricultural and Industrial Production and its affiliate in the town of Smila
- ◆ Institute of Sugar Beet Production, Uman affiliate
- ◆ Cherkasy Oblast Scientific Technology Center of Soil Fertility Protection and Food Quality
- ◆ Sugar beet Research Station, Verkhnyachka village
- ◆ Mliiv Institute of Horticulture named after Symyrenko
- ◆ Uman breeding farm
- ◆ Uman State Agricultural University

Oblast and commodity research-extension committees promoting a problem-oriented research agenda. This objective was followed by the establishment and operation of research-extension committees consisting of scientists, extension specialists, and farmers in Cherkasy and Khmelnytsky oblasts. Active committees in Cherkasy oblast were the Cherkasy Oblast Research-Extension Committee, and commodity research-extension committees in grain crops, industrial crops, fruits, vegetables, and livestock and beekeeping. Active committees in Khmelnytsky oblast were the Khmelnytsky Oblast Research-Extension Committee, and commodity research-extension committees in grain crops, potatoes, vegetables and horticulture, livestock production, and beekeeping.

Examples of the impact of these committees are given to emphasize their significant role in agricultural production.

A farmer in Khmelnytsky oblast, who was a member of the oblast research-extension committee, initiated research projects on his farm on soil fertility protection (cover crops and fallow land), new buckwheat and wheat varieties, and new biological preparations in crop production. He also assisted in disseminating results of the research. His private farm was used as a site for conducting seminars, field days, and visits involving 169 people and giving 35 individual consultations.

The project's collaboration with the Soil Fertility Center included membership in the Research Advisory Committee, research responses to 7 farm inquiries, obtaining state subsidy for lime for 3 farms, developing agrochemical maps for the area totaling 216 hectares, development of an oblast level soil fertility program, 11 soil fertility researchers using the project database, and joint publication of 3 scientific articles and brochures.

Research results from this collaboration were applied on three farms. On one farm, budgets for soil liming were prepared for 80 hectares of land, government compensation of 30,000 UAH was received and a profit of 52,000 UAH was obtained. On a second farm, land quality documentation for 10 hectares of land helped the farmer obtain government compensation of 30,000 UAH. On a third farm, finely ground lime was applied to 150 hectares, resulting in an 800% decrease in the cost of lime applied, and other savings of 84,300 UAH.

The results of existing and new research findings were used by the oblast centers to conduct a variety of seminars, workshops, agricultural demonstrations, and field days for growers. Outreach staff and researchers collaborated in these educational activities. Periodic surveys were made of the impact of research results used in farmers' fields through demonstrations. For example, in Cherkasy, one such survey of 38 farmers and 5 HPOs involving 550 hectares of land, revealed that by following grain crop production practices these producers received an additional return of 707 UAH per hectare.

Another significant activity was the publication of research findings as brochures by each oblast center. These brochures described existing and/or new research findings useful to producers, and added to the resource libraries of the centers.

5.B.1.b.4 Program sub-component: Outreach; Youth Development

Youth development is a key component of extension and outreach programs, worldwide. Youth development programs and projects are recognized and valued for (a) the benefits that young people can gain from learning and practicing knowledge and skills imparted in organized education and developmental activities, and (b) the support that is engendered among parents and adults for strengthening individuals, families, and communities.

About midway through the project, faculty realized that the basic needs of young village children in the project oblasts, such as belonging, acceptance, security, achievement, independence, and recognition could be better met if they were made a key target of the outreach effort. Therefore, it was decided to make youth development a program focus and establish youth clubs in village schools with the cooperation of school personnel and volunteer leaders in the village communities. By the end of the project, 8 clubs had been organized in a number of village schools in all three oblasts. From a modest beginning, the number of club members eventually grew to over 270, a variety of projects and educational and developmental activities were conducted for club members in which they actively participated, and a volunteer leadership program was initiated to involve adults in the village communities.

Examples of club projects planned and conducted by raion specialists/university faculty included 15 Young Master Farmer Clubs in all three oblasts involving over 400 children; projects/clubs on environmental protection, computer and machine operating skills, handicrafts, cultural history research, English learning, and home economics in Khmelnytsky Oblast; projects/clubs on potato varieties and potato production technology, greenhouse and window plants, intensive horticulture, grafting fruits trees/bushes, ornamental gardening, and environmental protection in Cherkasy Oblast; and projects/clubs on Pig Chain, Goat Chain, handicrafts, youth newspaper publishing, English, mechanical skills, leadership, support for elderly residents, and a village history museum in Vinnytsia Oblast.

Educational methods used in regular club/project meetings included lectures, lectures-discussions, method and result demonstrations, exhibits, exhibitions, seminars, and workshops on subjects related to their projects. In addition, club members were provided the opportunity to practice what they learned in club meetings and other educational experiences in hands-on projects either at the school sites or in their homes/home agricultural plots. A key principle

observed by project faculty in the youth development program was seeking ways to emphasize to clients the need to strengthen the children-parents-school-community link and foster broad community cooperation. Youth development projects/clubs offer an excellent means to reach this goal.

An exemplary success in the youth development program was the Pig Chain project in Vinnytsia Oblast. The idea of the chain was to give children 3-month old piglets which they would raise scientifically on the condition that two sows from the first litter would be given to other club members to extend the chain. In July 2002, five children received piglets and raised them according to recommendations. In May-June 2003, they distributed two of the offspring that were born. This enabled eight more children to join the project in September-October 2003. This stimulated a Goat Chain project. Ten children joined the project with the same idea and the goal of producing goat milk.

The youth development program had significant impact on participants. Young children learned new ideas and skills in specific subject matter areas, and developed social and life skills which will be useful to them in future. Parents, teachers, and other adults supported the children and assisted in the projects in different ways thus deriving personal satisfaction and a feeling of contributing to community life. Village schools and communities became stronger and better equipped to fulfill their roles in the broader community. Without the program none of these things would have happened. It could be concluded, therefore, that adding the youth development program to the outreach effort was a tactical success that provided immediate rewards and assures future dividends.

5.B.2. Information Systems

Information Systems was designed as a key component of the project to complement the Extension component. It was designed as a unique integrating element that links outreach, education, and research coordination for private farmer support in Ukraine. Based on the positive experience of Information Systems as a unique agricultural development tool in the preceding project implemented by the LSU AgCenter in Ukraine in Vinnytsia Oblast, it was incorporated in the new effort. This component was also designed to link outreach specialists, researchers, and educators at the oblast, regional, and national levels.

For this component, the World Laboratory worked closely with the PCO in Vinnytsia to execute the provision of information and marketing support to the farming sector in the three oblasts via computer-based technologies and Internet-linked systems utilizing databases and interactive programs for problem solving for farmers, as well as the use of the system as a marketing tool.

The component, named as Information Support Systems (ISS) was developed under the previous project as a computer-based system that combines geographic (farmers' land data), technological (data on production technologies), and business/ market data systems into an interactive decision- support system. In the roll out phase, the ISS was expanded and adopted to create databases of farmers in Cherkasy and Khmelnytsky oblasts, while updating and supplementing the data on Vinnytsia oblast. As in Vinnytsia oblast, digital maps of natural and climatic conditions were created for the new oblasts, and the databases on crops and varieties, pests and crop diseases were supplemented to accommodate the peculiarities in the additional oblasts. The local markets/farm inputs database established in the preceding project in Vinnytsia oblast was expanded to accommodate the additional oblasts.

Information in the ISS developed in the project included data on private farmers in Vinnytsia, Cherkasy, and Khmelnytsky oblasts; data on crop varieties, fertilizers, and protection chemicals registered in Ukraine; information on agricultural machinery; and a database on weeds, pests, and diseases. In addition, the database was used for computer-aided identification of weed plants, crop diseases, and insect pests. Information on livestock production/health systems was also incorporated in these databases. This decision making component was used in the project outreach effort to help farmers with building crop rotation schemes and flowcharts, computing fertilizer schemes, choosing herbicides against specific weed groups, economic analysis of farm operations, and computerized

bookkeeping. The component was also used to provide research coordination assistance in the form of a database of resources and research programs. Finally, based upon the requirements of the Environmental Impact Assessment conducted by USAID, integrated pest management approaches were incorporated in all ISS subcomponent software and atlases.

In summary, the ISS functions implemented the following tasks:

- ❑ Developed, installed and maintained the appropriate software to support information needs of farm owners
- ❑ Developed, incorporated and maintained Internet-based software for the same purposes and users
- ❑ Accumulated and distributed agrarian information through raion specialists and the Internet
- ❑ Provided Internet-based services to private farmers regarding accounting, business information exchange between potential sellers and buyers, and consulting via electronic means.

The introduction of this component into the project framework, and the results produced have significance to the programs implemented by USAID in Ukraine. In 1998, when USAID approved the previous project to support private farmers in Vinnytsia oblast, the project began activities in an information-starved environment in agriculture. This environment was partly due to the prior collective farm culture in which information exchange on farming activities was restricted to the management level, which then provided guidance to farmers in the collectives. The value of information provided at the appropriate time of need was not fully realized at the individual farm worker level. However, after the demise of the collective farm system, and the advent of the private farmer and household plot owner, information on weather, markets/prices, and availability of farm inputs became critical to the success of farm operations.

The second significant impact of this activity was the creation of transparency — availability of information to anyone and everyone whenever they needed it. This helped producers, processors, and marketers to be on a level playing field for their information needs.

Given the above two significant needs in agriculture, the project has produced positive impact on the producers in the target oblasts. Numerous instances were noted where farmers benefited through the availability of timely information on fuel prices, weather conditions conducive to planting, availability of markets for produce, and other information needs.

At the conclusion of the project, unblocked software on all elements of the ISS was submitted to USAID. These included:

1. Seven Computer aided Atlases in crop production
2. Eleven Directories in livestock production
3. Program software on Farm Business Book-keeping and Accounting
4. Program software on Farm Business Planning
5. Web based information systems via website for the project, including an interactive site for Business Information Exchange, Q & A Board, News, and Virtual Commodity Exchange

The complete list is shown in Attachment # 4.

The information dissemination methods utilized in the Information Systems component primarily included field visits by program engineers, data collection from the field and a variety of other sources, including local university specialist personnel, program development, and field testing. While this approach to the tasks was generally successful, perhaps

more interaction with field personnel in refining the programs would have been useful. It must be realized, however, that information incorporated in the databases and program software needs to be constantly updated to keep up with changes in technology, the production environment (new pests and diseases, for example), and the market. Since project resources alone were used to develop and test the programs and data bases, the responsibility of maintaining and further augmenting the information systems rests in Ukrainian hands. The World Laboratory will most likely address this need through a variety of means, including fee-based services and sales.

5. C. Cooperation with Other Projects, Agencies, and Organizations

Opportunities for cooperation with other projects, agencies, and institutions in facilitating and enhancing the project's agenda were actively sought and followed. In several instances, the project staff were invited or co-opted by other entities to engage in cooperative endeavors for mutual benefit. A summary of these cooperative endeavors is given below, identifying the cooperating project, agency, or institution and describing the specific activities/roles in which project staff were engaged with them as well as any significant outcomes of the relationships.

National Association of Advisory Services of Ukraine (Dorada). Project staff were actively and closely involved with this association which comprised most of the agricultural advisory services in Ukraine and was set up to provide a platform for exchange of experiences on outreach/extension work and for discussions on designing and implementing a national advisory system for Ukraine, including needed legislation to establish and implement such a system. Project staff made presentations and participated in discussions, conferences, and work groups organized by the association. Of particular interest to the association was the development of the national law for setting up and implementing a national agricultural advisory system in the country, including registration and certification of state advisory services and advisers, and standards, criteria, and monitoring systems for extension/advisory work. Project staff attended and played an active role in assisting the association move forward on this initiative at the International Conference on National Advisory System Development, Kyiv (February 2004), the International Conference on Service and Credit Cooperative Development, Kamyanyets-Podilsky (April 2004), and the Accreditation Board, Work Group on Policies, Standards, and Criteria/International Conference on the National Law for Agricultural Advisory Services, Kyiv, (June 2004). The national law which was developed as a result of the above and other efforts has now been passed by Parliament and awaits implementation.

Ministry of Agrarian Policy, National Agricultural University of Ukraine, Ukrainian Academy of Agrarian Science. Project staff worked with concerned faculty and staff of these institutions on the development and implementation of the national law on agricultural advisory services to seek their input and support. As opportunities arose, the staff also participated in conferences, agricultural exhibitions, and other events conducted by these institutions to publicize and promote the project's activities and accomplishments.

Agricultural Marketing Project. Project staff cooperated with the staff of this USAID-assisted project to conduct marketing seminars for raion specialists and producers, organize meetings and roundtable discussions with agribusiness, disseminate price information to producers, and exchange publications on marketing. Demonstrations were developed and implemented in Cherkasy Oblast to show producers improved production technologies and marketing opportunities for their products.

Heifer Project International. Twenty six dairy heifers were provided by Heifer Project International to producers in Maidan village, Vinnytsia, at the beginning of the project. These animals were successfully raised according to recommendations and under the supervision of project staff, and their progeny, as per the agreement with the donors, given to other producers. The project's investment was pasture maintenance and a small grant program, which assisted the village community to purchase a tractor (used) and establish a veterinary and milk testing facility. In 2004, the village community registered a service cooperative, which now engages milk producers and helps them to sell their products with better profits.

Toward the end of the project, 10 dairy heifers were given to producers in the village Halaidovo, Cherkasy oblast and 10 in Lisovody, Khmelnytskyi oblast. Both sites registered agricultural cooperatives and currently are implementing a project of establishing milk collecting points.

Winrock International. Winrock staff assisted in the early stages of the project with training of raion specialists and clients on how to run a business.

Citizens Network for Foreign Assistance (CNFA). CNFA volunteers assisted project staff in seminars for farmers and HPOs on marketing and potato production.

Ukrainian Institute of Scientific and Technical Information. The project obtained a copy of a large FAO data base on various agricultural topics and the right to access existing information and enlarge the data base with information generated by scientists. This was especially useful in expanding the ISS data base.

TACIS Projects. There was mutual exchange of information between our project staff and TACIS project staff on our respective work experiences and accomplishments. The project staff also assisted TACIS projects in training of their staff in extension program development and methods.

Ukraine Land Titling Initiative Program. Project staff utilized the technical resources and staff of this program to conduct seminars on land titling for our project clients. Legal advice and expertise of the program staff was also used in developing legal documents for our farmers and HPOs.

DCA Credit Guarantee Program. This program considered the recommendations of our project staff on credit worthiness of the project's farmers and HPOs who applied to the DCA program for loans.

Peace Corps. Two Peace Corps volunteers were assigned to the project for a total of 1.5 years and assisted with the youth development program.

Raion Administrations. All through the project, raion administrations in the oblasts provided needed office space, equipment, and other resources to enable the raion specialists do their work.

5. D. Estimation of Economic Impact on Agricultural Production in Target Oblasts

As discussed in the next section, the project implementers placed great emphasis on program evaluation throughout the life of the project. These evaluations focused on the program components and sub components, including outreach activities, development of farmer organizations, etc. As reported elsewhere in this report, these evaluations have shown that the project has produced significant impact in most of the measured parameters, such as gross income, crop yield, etc. While these are valid results, and demonstrate the effectiveness of the approaches taken by the project, an attempt was made by project staff to conduct an integrated study to demonstrate the overall economic impact of the project on stakeholders. To conduct this study, project staff developed a methodology, targeted clients, and conducted surveys to obtain the needed data.

The methodology developed required a listing of farmer and HPO clients who consistently participated in project activities, including education and outreach, agricultural associations/groups, the small grants program, marketing assistance, and legal assistance. This list was used to compile an 'oblast list', from which a random selection of a total of 280 private farmers and HPOs were selected for the surveys. Survey forms developed were focused on gathering comparative data for the 2001 and 2004 crop seasons. Raion specialists selected to conduct this survey were given a one-day training program on the conduct of the survey. Data from these surveys were supplemented by crop/livestock

prices obtained from oblast agricultural boards and by cost indicators taken from the crop/livestock budgets developed by the project faculty.

Some of the evaluation results showing significant increases between 2001 and 2004 in crop and livestock production are indicated below.

1. The average increase in the areas of wheat, barley, and corn harvested in the three oblasts was 39.8%. The breakdown of the increase for each of these crops by oblast is given below:

<i>Crop</i>	<i>% increase in crop area harvested (2004 over 2001)</i>			
	<i>Vinnytsia oblast</i>	<i>Khmelnysky oblast</i>	<i>Cherkasy oblast</i>	<i>All oblasts</i>
Wheat	23.4	15.0	18.1	18.8
Barley	110.8	9.6	30.4	50.3
Corn	37.3	15.5	93.6	48.8
All crops	57.2	13.4	47.4	39.8

2. The average increase in the yields of wheat, barley, corn, and sugar beet was 32.6%. The breakdown of the increase in yield for each of these crops for all three oblasts is given below:

<i>Crop</i>	<i>Yield (centners/hectare)</i>		<i>Yield increase (2004 over 2001)</i>	
	<i>2001</i>	<i>2004</i>	<i>Quantity (c/ha)</i>	<i>%</i>
Wheat	29.8	37.8	8.0	26.8
Barley	26.1	32.8	6.7	25.6
Corn	45.6	65.0	19.4	42.5
Sugar beet	242.0	328.0	86.0	35.5

3. The average increase in the numbers of swine, poultry, and dairy cows was 174%. The breakdown for each species in Cherkasy and Khmelnytsky is shown below. Vinnytsia did not provide information.

<i>Livestock</i>	<i>% increase in number of head of livestock (2004 over 2001)</i>		
	<i>Khmelnysky oblast</i>	<i>Cherkasy oblast</i>	<i>All oblasts</i>
Swine	116.9	209.1	163.0
Poultry	65.6	569.3	317.4
Dairy cows	-10.5	93.6	41.5
All livestock	57.5	290.6	174.0

4. Annual milk production increased in all three oblasts between 2001 and 2004. The increase was 51.6% in Cherkasy, 30.8% in Khmelnytsky, and 14.3% in Vinnytsia.

5. Gross income of all 280 respondents in the three oblasts increased by \$4,400,000, and their total profit was \$1,500,000 higher than in 2001. Average income per producer increased by \$15,900 (83% change), while average profit per producer was \$5,400 (85% increase) more than at the beginning of the project.

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6. Project Evaluation

The LSU AgCenter placed significant emphasis on internal evaluation from the very outset, and considers this aspect as an integral part of overall project management. As a result, three evaluations, at the beginning, mid point and end of the project were conducted by the LSU AgCenter specialists for the program. The beginning and mid-point evaluations provided the baseline data for making comparisons on project performance and agricultural production performance indicators with the end of project evaluation data.

The methodology and summary results of the end-of-project evaluations of the outreach programs for private farmers and home plot owners (HPOs) are given below. Full reports of these evaluations are included as attachment # 2 and attachment #3 of this project final report.

As indicated above, the earlier evaluations provided benchmark data, and are not discussed.

Methodology

For both the private farmer and HPO evaluations, a single group, before-after treatment survey design was used. Baseline and end-of-project interviews of random samples of 250 private farmers and 250 HPOs in each oblast gave self-reported information on key performance indicators, personal attributes, agricultural operations, and educational behavior of private farmers and HPOs.

Raion specialists attended a one-day training session to learn personal interview techniques, become familiar with the two survey instruments, and practice with a peer.

A random sample of 250 private farmers was selected in each oblast for personal interviews by raion specialists using a list obtained from the responsible authority. Primary and alternate respondent lists were prepared. If a farmer on the primary list refused to be interviewed or could not be found after two attempts the next name on the alternate list was chosen.

Descriptive statistics were used to make before-after educational intervention comparisons and to describe farmer characteristics, agricultural operations, and educational behavior of the respondents.

Summary Results of the Private Farmers Evaluation

The average gross income of private farmers doubled over the three-year period. This increase came from the larger quantities of crops produced on more land (55.2%) with higher crop yields (37.2%) and greater farm input use/costs (66.7%). A majority of farmers were positive about their agricultural situations, indicating increases in gross income and net profit of their crop and livestock operations.

There were significant gains in farmers' knowledge (33.8%) and use (77.0%) of best management practices (BMPs) in crop and livestock production, a pre-requisite to the increased crop yields registered over the life of the project

Toward the end of the project farmers were more likely to take agricultural credit and acquire additional farm assets such as buildings/structures and machinery and equipment, thus demonstrating choice, risk-taking, and capital investment in a free market system.

As the project progressed more farmers adopted business planning and management skills and practices, and used organized over unorganized market outlets.

The project was seen by farmers as a key (and often sole) source of technical, environmental, and legal information, benefiting from a computer technology-based information system which helped them with production and management decisions and problems.

Farmers felt that significant social, economic, and environmental changes/impacts occurred in the project's sphere of influence, and regarded the project as an important contributor to these changes/impacts.

Summary Results of the HPO Evaluation

The average gross income of HPOs increased one-and-a-half times over the three-year period. This increase came from increased use of recommended technology (50.0%), greater use of farm input use (131.5%) and higher crop yields (79.8%). A majority of HPOs were pleased with their agricultural situations, indicating increases in gross income and net profit of their crop and livestock operations.

Over the life of the project, HPOs became better business managers of home plot operations and used more organized than unorganized market outlets to sell their produce.

The project was seen by HPOs as a key (and often sole) source of technical, environmental, and legal information, benefiting from a computer technology-based information system which helped them with production and management decisions and problems.

HPOs felt that significant social, economic, and environmental changes/impacts occurred in the project's sphere of influence, and regarded the project as an important contributor to these changes/impacts.

Conclusions

From the above results, it could be concluded that the project's goal of increasing the agricultural productivity of private farmers and HPOs was achieved. Education programs conducted over the life of the project enabled them to increase their knowledge and adoption of crop, livestock, and environmental best management practices (BMPs) in their agricultural operations, which in turn contributed to the improvement in agricultural production performance. The project was also responsible in some measure for the significant social, economic, and environmental changes witnessed over the life of the project.

It could also be concluded that the project brought about desired change and improvement in the lives and livelihoods of small private farmers and HPOs as they continue to move from a centralized, "command-and-control" agricultural production system to a market-driven economy.

7. Conclusions and Recommendations

This section discusses the main conclusions drawn by the implementer, and provides recommendations regarding any unfinished work and direction for program continuation.

Several broad conclusions can be drawn from the project experience.

1. Over the past decade, different models of advisory services were established in various locations in Ukraine through public organizations and donor funded programs. While these programs proved useful and relevant in their specific instances, a majority of them did not connect programmatically with agricultural research and agricultural education institutions. This project's thrust was mainly to build and successfully demonstrate effective relationships among, and the integration of research, teaching and extension. This integrated approach which has a proven record of success elsewhere in the world, has been demonstrated by this project in Ukraine. Through this approach, the project firmly

established the economic and social value of the integrated extension/advisory services concept to provide benefits to producers and agribusinesses and to ensure the responsible management of natural resources in the targeted oblasts, and to demonstrate the important role of agriculture in engineering and sustaining economic development, and utilizing in a responsible manner the country's natural resources.

2. The project played a key role in the consensus building process leading to the draft and passage of the National Law on Agricultural Advisory Services in Ukraine in June 2004, thereby lending legitimacy for and potential funding to advisory service providers in Ukraine. Program implementers believe that the project has built the necessary local capacity and foundation for the next steps in establishing policies and procedures for implementing the national law.
3. The concept of involving local institutions of agricultural education and agricultural research to provide science-based, unbiased, and current information to producers and agribusiness was successfully demonstrated.
4. The value of providing information on inputs, technologies, and markets in a transparent manner to the benefit of all end-users was amply demonstrated.
5. The project experience demonstrates that at this early stage of development of a national network of regional advisory service providers, state level funding is necessary as most producers cannot at this time afford fee-based services.

These broad conclusions suggest that the project has achieved its mandates. However, a number of issues still need sustained dialogue and support to create a national network of service providers who will take advantage of the provisions in the national law to operate under a standardized environment for program development, implementation, quality control, and financing. The extension advisory systems that have operated in the country over the past decade, including this project, resulted from both perceived need and market demand in the agricultural and agribusiness sectors. These systems have also evolved to meet the newer and specialized needs of various segments of the agricultural and agribusiness sectors, especially home plot owners who make a significant contribution to the agricultural and national economy. Ukrainian society also now understands the need for a national advisory system as evidenced by the passage of the national law which provides state financial and moral support to sustain a national system.

While the law no doubt provides the much needed focus and impetus for the vision, mission, and creation of the national system, many issues still remain to be addressed. These stem from two realities: a) the presence of contrasting models of advisory services adopted in various parts of the country, and b) the segregation of agricultural research and extension education functions. A sampling of these issues and constraints include:

1. Insufficient involvement of advisory services in identifying the needs in science and education to meet the needs of farms and rural populations
2. Greater orientation of agricultural education and research institutions to the needs of the larger agricultural enterprises despite the growing share of agricultural products from the smaller private farms and households
3. Insufficient attention by agricultural education institutions to the training of specialists in agricultural extension, rural development and agribusiness
4. Lack of understanding of the functions and tasks of extension by local administrative bodies
5. Competition, rather than cooperation, among advisory services, agricultural education, and agricultural research institutions
6. The need for a suitable framework for implementing the law, including standards, and lack of capacity among current advisory service providers
7. Lack of a unified system for the dissemination of research-based agricultural technologies

Project implementers believe that addressing the above issues/constraints would lead to a vibrant, proactive, and relevant extension advisory system that is consistent with the provisions of the national law. Because advisory services with different philosophies are now functioning at the regional level, integrating these services into a national network to function effectively at the national, regional, and local levels is an important issue. The basic foundation for a unified, national system will be dependent on the functional integration of research, extension, and agricultural education. The needed impetus for this at the national level is the existing Association of Advisory Services (Dorada), which can play a key role in this regard.

8. Attachments

Attachment # 1 Final Evaluation Report of Private Farmers Outreach Education Program

Attachment # 2 . Final Evaluation Report of HPO Outreach Education Program

Attachment # 3 List of Publications and Conference Presentations

Attachment # 4 . List of Software Produced in the Information Support System (ISS)

Attachment#1

Final Evaluation Report (Private Farmers Outreach)

**Improving Income of Private Ukrainian Agricultural Producers through Agricultural Extension
USAID Cooperative Agreement: 121-A-00-02-00001-00**

**Final Evaluation Report of
Private Farmers Outreach Education**

June 2005

Submitted by

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**USAID Project: Improving Income of Private Ukrainian Agricultural Producers
through Agricultural Extension, 2002-2005**

**Final Evaluation Report of Private Farmers Outreach Education
Summary**

Project Background

A three-year extension education project intended to improve agricultural production of small private farmers in three oblasts – Cherkasy, Khmelnytsky, and Vinnytsia - in Ukraine began on March 1, 2002 and ended on February 28, 2005. Funded by the US Agency for International Development (USAID), the Louisiana State University Agricultural Center (LSU AgCenter), as Project contractor, partnered with the World Laboratory, Ukraine Branch, Kiev and state agricultural universities/academies in the three oblasts to organize, plan, conduct, and evaluate education programs targeting private farmers.

Organized through a state agricultural university/academy in each oblast, the Project covered 67 raions (counties) and involved approximately 3,500 private farmers. Selected university/academy faculty possessing advanced degrees in different agricultural disciplines and raion specialists (county agents) with a basic agricultural degree were recruited and trained in extension program development and adult education methods. Subsequently, for a period of 2-3 years, educational seminars, workshops, demonstrations, and personal consultations were planned and conducted by the faculty and raion specialists in a number of crop and livestock production, management, and marketing subjects to enable farmers to learn and apply research-based technology in their agricultural operations. The programs in each oblast were managed and supervised by an Oblast Center Coordinator with university faculty assisting in the management operations.

Evaluation Methodology

Evaluations included gathering baseline (September 2002) and end-of-project information (September 2004). It was anticipated that focused education programs conducted on a variety of subjects over two crop growing seasons would enable private farmers to learn and apply recommended technology in their agricultural operations, resulting in gains in agricultural performance and overall productivity.

In both the baseline and end-of-project evaluations, 250 farmers were randomly selected in each oblast for personal interviews by the raion specialists. Lists of registered private farmers in the three oblasts were obtained from the respective oblast authorities. Samples were drawn from these lists using a computerized random numbers table. Primary and alternate lists of sample respondents were prepared. If a farmer on the primary list refused to be interviewed or could not be found after two attempts by the raion specialist the next name on the alternate list was chosen.

Raion specialists took part in a one-day training session to learn personal interview techniques, become familiar with the survey instruments, and practiced interviewing. In the practice session, each raion specialist interviewed a fellow raion specialist to get the experience of a real-life encounter.

Information gathered in the surveys covered personal attributes of farmers, their agricultural operations, including production, management, and marketing of cereal and horticultural crops and livestock products, farm assets, their knowledge and adoption of agricultural best management practices, and their attitudes and aspirations.

Personal Attributes, Agricultural Operations, and Educational Behavior of Private Farmers (Cherkasy, Khmelnytsky and Vinnytsia oblasts)

Personal Attributes

Private farmers were relatively young (mean age 45.8 years), predominantly male (90.3%), received their education largely at a technical college (30.7%) or a university (52.0%), lived in the same household with a spouse (90.3%), children (93.5%) and/or a parent (17.3%), engaged in farming as a full-time occupation (85.8%) and primary income source (85.8%), and were members of local/oblast farmers' associations (76.3%). They perceived multiple benefits of this organizational affiliation, such as information sharing and farm operations assistance, and valued organizational participation to improve input, market, and credit conditions.

Agricultural Operations

Nearly one-third of the farmers began private farming operations between 1991 and 1995 (31.2%), two-fifths between 1996 and 2000 (41.0%), and one-fourth from 2001 to 2004 (27.8%).

Most farmers (83.5%) acquired their private farming land by a title from the village council. However, leasing land (44.4% of farmers) and family land-shares (32.8%) were also significant methods used to acquire land. The total area of land held by private farmers from these three sources was 58,186 hectares for an average farm size per farmer of 88.4 hectares. The area held under lease was more than one-half of the total land.

Most farms (62.4%) were single, undivided pieces of land. As many as 22.6% of the farms were broken into two pieces, while 15% were divided into 3, 4, 5, or 6-12 pieces. It would appear that farmers whose land is divided into many pieces would encounter some difficulty in effectively managing their agricultural operations.

Farmers had a variety of farm buildings and structures on their farms, such as garages, covered grain storage, animal shelters, machinery sheds, and workshops. The average area of farm buildings and structures was 2,427.3 sq meters. Also, 72 farmers (10.9%) added 9,101 sq. meters of new buildings/structures in 2003-2004, or an average for these farmers of 126.4 sq meters.

Farmers owned or exchanged with other farmers the farm machinery and equipment needed for their farm operations. Nearly a third of the farmers (30.4%) purchased a variety of additional machinery and equipment in 2003/2004. Tractors (38) were the most numerous purchase, followed by cultivators (20), combines (18), planters (13), and disk harrows (9).

Wheat and barley were the principal cereal crops grown by 69.8% and 69.6% of farmers, respectively. Other significant row crops grown were buckwheat (36.0% farmers), corn (30.0% farmers), sugar beet (24.9% farmers), and sunflower (21.4% farmers). Potatoes were raised by 7.6% of the farmers, vegetables (carrots, cabbage, cucumbers, tomatoes, onions) by 13.4%, and apples by 2.1%. Total harvested area under row and horticultural crops was 36,828.5 hectares and the total crop produced was 1,710, 087.2 centners. Most of the production was sold (85.0%), the balance used in the home and/or kept for seed. Twenty two other crops were raised on a total of 2,281 hectares. The main crop was soybean (664.2 ha). Other significant crops raised were peas (395.2 ha), millet (202.0 ha), flax (172.0 ha) and chicory (164 ha).

Livestock products produced in 2004 totaled 46,865 centners of milk, and 6,846 centners of beef, pork, and poultry. These products were primarily sold to consumers, with small percentages used in the home. In addition, 140,450 eggs were sold.

Products made on the farm were limited to a few farmers (about 5%). The only products made and sold in some significant quantity were flour, bran, sunflower oil, milk products, and canned vegetables, fruits, berries and juice.

The majority of farmers (55.3%) sold their farm produce themselves. But, significant proportions also used agribusiness companies (43.9%), processors (42.2%), or government organizations/enterprises (34.6%).

For farmers reporting input use/cost, the largest cost was seeds (average of \$3,133.40). Salaries/wages, labor, fuel, and livestock feed were the next largest costs, the average ranging from \$2,694.20 to \$2,197.40. The costs of chemical fertilizers (\$1,601.40) and crop protection chemicals (\$1,148.50) were at an intermediate level. Organic fertilizers had the lowest average cost (\$609.20)

It is interesting that 55.0% of farmers gave out salaries/wages to employees and 26.0% hired paid labor to supplement family labor. This indicates a trend toward cash transactions, which might signify a growth in business entrepreneurship. This is a healthy and positive sign for a privatized, market-based economic system.

The project was most frequently mentioned (333 times) as a source of assistance, either in receiving actual inputs, and/or information regarding input use. Agribusiness companies were next with 110 mentions. Much less frequently mentioned were agricultural boards/departments (38 mentions), other farmers (28 mentions), and farmers' associations (14 mentions). The state government and collective enterprises received the least number of mentions, 8 and 6, respectively.

Written farm plans were developed prior to the 2004 agricultural season by 71.0% of farmers on production, 44.9% on business operations, and only 21.2% on marketing. This pattern is to be expected because the experience and comfort level of farmers is much greater for production operations than for business and marketing, which are more complex to do and surrounded by a measure of uncertainty.

A majority of farmers (54.0%) did not prepare written plans. Many of them felt that plans were not necessary (40.1%) or useful (11.7%). This appears to reflect a negative attitude. A third reason – planning is too complicated (23.6%) – is related to knowledge and appears to be less difficult to overcome.

A majority of the respondents who prepared plans (56.0%) said they received help in preparation. Raion/university specialists was the most cited source of help (92.0%). Family members came next at 54.7%, followed by other farmers/friends (33.0%). Nearly one-fifth of the respondents relied on an agricultural board representative (17.7%) or a staff (bookkeeper/economist) of a reformed collective (17.3%). It is interesting that agricultural service cooperatives and private consulting companies were hardly mentioned.

Only one-fourth of farmers took agricultural credit in 2003/2004. Reasons given by farmers as to why they did not take credit were high interest rate (61.0%), not wishing to go into debt/take the risk (60.2%), and complicated loan procedures (56.8%). Many of them did not have collateral/security (43.8%), or did not wish to take short-term loans (42.9%) with large repayment amounts (41.9%). Nearly one-third said they did not need credit (32.8%) or that credit was not available when they needed it (32.0%).

For those farmers who took agricultural credit, the average loan was \$7,243.30 and the average interest rate was 20.1%.

The most common source of agricultural credit was a bank (72.6% of respondents who took loans). Friends/family members were next (25.5%), followed by a credit union (11.1%). Agribusiness companies were cited by only 3.1% of the respondents.

Educational Behavior

Level of farmer participation in education programs was highest in reading project publications (94.2%), attending education programs in their raions (83.5%), and reading the farmers library column produced by the project for use by local newspapers (79.2%). Lower levels of participation were found listening to radio programs (44.2%), watching television programs (39.5%), and attending university education programs (38.2%) or education programs in other raions (28.3%).

Farmers frequently visited university and raion specialists in their offices for information and consultation. Specialists made farm visits less frequently. Most farmers (86.3%) visited specialists' offices once a week, once in two weeks, or once a month. Fewer farmers (78.4%) said that specialists visited farms as frequently.

Farmers were more satisfied with information received in education programs involving some form of personal contact with an extension professional such as workshops/seminars, field days, demonstrations, and visits compared to impersonal contact methods such as radio and television. There was a high level of satisfaction with newsletters and technical pamphlets issued by the project due to their utility and quality, and retention/reference value.

All participants found the information to be more or less useful. None of them said the information was not useful.

From a choice of five information sources for 13 subject-matter topics, the project was the most used source for all topics, with 72.1% of farmers indicating it as their overall choice. The Ministry of Agricultural Policy/Agro-Industrial Complex was the second choice (16.4%), followed by the Oblast college/university/research station (12.1%), other farmers (10.8%), and agribusiness (6.1%).

Choice trends for the several topics are interesting. For example, the Ministry was seen as a useful source for land titles, tax laws, and legal issues; the college/university/research station for agricultural production technologies; other farmers for agricultural marketing and markets; and agribusiness companies for farm machinery, equipment, supplies, and plant protection technology.

Nearly four-fifths of farmers (78.8%) indicated that raion specialists had helped them in solving problems using the ISS, a computerized agricultural information database developed and distributed to all raion specialists by the World Laboratory, Ukraine Branch, Kiev. Only 8.9% said they had not been helped, and 12.3% were uncertain. Numerous examples of topics/problems in several information categories where farmers had been helped are included in the detailed report. The wide range of topics/problems shows the diversity of help received, the versatility of the ISS information database, and the ability of raion specialists to use ISS in assisting farmers.

The few farmers who did not receive help from raion specialists said that information on specific subjects when needed was either not available or outdated (14 farmers), or indicated equipment/technical difficulties or lack of success in obtaining funds/inputs (5 farmers). Interestingly, 10 farmers said they did not need ISS-raion specialist help and tried to solve problems on their own.

Overall, the ISS-raion specialists system was regarded by farmers as a valuable source of information and help in solving problems.

Crop, livestock, and environmental best management practices (BMPs) were taught to farmers in education programs so they could learn and adopt these practices in their agricultural operations.

With regard to learning BMP recommendations, 92.7% of farmers gained knowledge of 14 crop production BMP recommendations, 62.8% knew 13 livestock production BMP recommendations, and 93.8% learned about 6 environmental BMP recommendations.

The range of farmers having knowledge of specific crop BMP recommendations was 99.7% to 69.2%, 73.0% to 42.7% for livestock BMP recommendations, and 98.6% to 86.4% for environmental BMP recommendations.

With regard to adopting BMP recommendations, farmers were grouped into three categories – full adopters (always or mostly following recommendation), partial adopters (sometimes or rarely following recommendations) or non-adopters (not following recommendations). Overall, 72.1% of farmers fully adopted recommendations for 14 crop BMPs. The range of full adoption was 98.9% to 18.5%. With regard to livestock BMPs, overall, 68.9% of farmers fully adopted the 13 practices included in this group. The range of full adoption was from 86.1% to 34.1%. The overall full adoption percentage of 6 environmental BMPs (73.6%) was slightly more than BMPs in the other two groups. The adoption percentage range for environmental BMPs was 94.7% to 50.4%.

That a significant percentage of farmers were in the partial and non-adopter categories for several specific BMPs in all three groups (crop, livestock, and environmental) is a concern for extension educators. It would be important for them to focus programming efforts to increase the adoption level of those practices. Specifically, 4 crop BMPs require to be stressed, i.e. no-till planting, soil testing every three years, using lime as recommended, and irrigating as needed. Three livestock BMPs, namely proper milking equipment/maintenance, raising improved pastures, and practicing rotational grazing, and one environmental BMP, biological plant protection, should receive the same educational emphasis.

The move toward a market-driven economy and the spread of democracy and political freedom over the last 15 years of Ukraine's independence have created an environment in which people can see positive changes in their lives and can increase their desire and hope for a better future for themselves, their families, and their communities. To determine how attitudes and aspirations of people might have changed due to the more open and free socio-political environment as well as the work of the project, 13 attitude/aspiration statements were posed to farmers and they were asked to indicate if they agreed, did not have an opinion, or disagreed with the statements. Their responses are summarized as percentages of farmers who fell into these response categories for each statement and overall for all statements. Mean A/A scores for each practice and all practices were also determined.

Both measures – percentages and means – show that farmers are very positive. Overall, for the set of 13 statements the high mean score of 2.71 on a score range of 0-3 (negative to positive) suggests a high positive regard for various aspects of their personal, family, community, and societal lives. Two positive statements – Farmers should rely on their own resources rather than the government, and I trust the government – elicited a lukewarm to negative response. This can be interpreted as an extension of the public's thinking from the communist era when people depended on the social security net of government and at the same time distrusted it for intruding into their private lives.

Project and Farmer Performance and Farmers' Perceptions (Cherkasy and Khmelnytsky oblasts)

Comparisons between baseline and end-of-project information provided evidence of (a) project performance, and (b) farmers' agricultural production performance. The end-of-project survey provided information on farmers' perceptions of changes/impacts resulting from the project's educational intervention.

Project Performance

Five indicators - educational participation, technology use (adoption), input use (cost), crop yield, and productivity (average gross income) - were selected to assess the project's performance or success in reaching the goal of improving income of private farmers. The rationale was that participation in education programs over a period of time leads to increased use of agricultural technology and production inputs, resulting in increased crop yields and overall productivity (defined as gross income).

- All indicators showed positive changes over the three years of the project. Educational participation, measured as number of individuals served by the project's extension staff, increased from 1,259 at the beginning of the project to 3,374 at the end of the project (167.9% increase). New agricultural technology learned in the education programs influenced adoption of recommended technology, which increased by 77.0% over the life of the project. Increased technology adoption resulted in greater input use and cost (66.7%),. This contributed to a significantly higher overall crop yield (37.2%), and an increase of 104.4% in agricultural productivity (average gross income). Thus, the project was successful in changing the educational behavior of private farmers which enabled them to improve crop yields and income.

Farmers' Agricultural Production Performance

Indicators chosen to assess agricultural production performance of farmers registered significant positive gains over the life of the project.

- Larger quantities of grain/horticulture crops and livestock products were produced by farmers in 2004 compared with 2002. The average quantity of grain/horticulture crops produced per farmer registered a 77.8% increase. For beef, pork, and poultry, the average quantity produced per farmer increased by 33.3%. The average per producer amounts of crop and livestock products sold in 2004 were substantially higher than in 2002 – 198.6% for crop products; 345.7% for beef, pork and poultry, and 69.0% for eggs.
- Total amount of credit taken increased by 10%, and number of farmers using credit increased by 153%. But the average amount of credit taken per farmer decreased by 56.5%.
- There was a slight rise in the area of farm buildings per farmer (2.3%), while 31.3% of farmers acquired new farm machinery and equipment.
- The proportion of crop and livestock production sold through organized markets increased by 32.1%.
- That farmers are becoming better managers is seen in the significant increase (32.1%) in the number of farmers who developed written production, business, and marketing plans toward the end of the project.
- Over three-fourths of farmers indicated using the project as their primary source of agricultural information technology.

- 83.9% of farmers were assisted by raion specialists and faculty to solve operational problems using the computerized information support system (ISS).
- Knowledge and use of crop and livestock production and management best management practices (BMPs) showed significant gains - 33.8% more farmers knew BMP recommendations, and 77.0% more farmers followed BMP recommendations in 2004 compared with 2002.

Farmers' Perceptions of Changes/Impacts from Participation in the Project

Responses of farmers to end-of-project survey questions provided their perceptions of changes in their agricultural situation, and economic, social, and environmental impacts in their communities resulting from the project's educational intervention.

- Over 80% of farmers indicated that their gross income and net profit from crop production increased over the period of the project, while over 60% of them said gross income/net profit from livestock production increased.
- Over 50% of farmers indicated improved performance per animal in their dairy, beef, swine, and poultry operations.
- A majority of farmers felt the project had an economic impact on community life in terms of overall economic improvement, as well as specifically increasing agricultural incomes, savings, and purchases of consumer goods.
- Social impacts of the project were seen by a majority of farmers in their increased participation in community groups and the benefits they personally received in agricultural operations from such participation. Nearly four-fifths (78.1%) said they had joined a village or raion group and cited the group's achievements as a result of the project's educational intervention.
- There was significant personal and family involvement of farmers in community events and activities which proved to be mutually beneficial to them and the community. Nearly two-thirds (64.5%) indicated they were invited to participate in meetings of administrative entities (village council, raion administration, Ministry of Agriculture).
- Four-fifths of farmers indicated that the project's environmental education programs had influenced individual and community behaviors/actions to protect and preserve the environment. Some examples of environmentally conscious behaviors/actions by farmers included use of chemicals at recommended/lower rates to protect crops and promote optimum growth, following biological methods of pest management/plant protection, and using plant residues as organic fertilizer instead of burning them.

**USAID Project: Improving Income of Private Ukrainian Agricultural Producers
through Agricultural Extension, 2002-2005**

**Final Evaluation Report of Private Farmers Outreach Education
Technical Report**

Project Background

A three-year extension education program to improve the agricultural production performance of small private farmers in three oblasts – Cherkasy, Khmelnytsky, and Vinnytsia - of Ukraine was begun in March 2002 under the joint auspices of the Louisiana State University Agricultural Center (LSU AgCenter) and the Government of Ukraine with funding from the US Agency for Agricultural Development (USAID). Earlier, from October 1998 to September 2001, a similar education program in Vinnytsia Oblast, also funded by USAID, was successfully completed. An evaluation of that program was helpful in determining the program's impact and providing useful programming lessons for the new project.

Organized through a state agricultural university/academy in each oblast, the new education program covered 67 raions (counties) and involved approximately 3,500 private farmers. Selected university/academy faculty possessing advanced degrees in different agricultural disciplines and raion specialists (county agents) with a basic agricultural degree were recruited and trained in extension program development and adult education methods. Subsequently, for a period of two years, educational seminars, workshops, demonstrations, and personal consultations were planned and conducted by the faculty and raion specialists in a number of crop and livestock production, management, and marketing subjects to enable farmers to learn and apply research-based technology in their agricultural operations. The programs in each oblast were managed and supervised by an Oblast Center Coordinator with university faculty assisting in the management operations.

Project Evaluation

At the outset, an evaluation plan to assess the effectiveness of the education program was developed and followed. The plan included baseline surveys of private farmers in Cherkasy and Khmelnytsky oblasts (September 2002), and intermediate (September 2003) and end-of-project surveys (September 2004) in all three oblasts to provide before-after measurements of the program which might demonstrate its effectiveness in improving performance of private farmers. The rationale was that a period of two crop growing seasons and focused education programs conducted on a variety of subjects would enable private farmers to learn and apply recommended technology in their agricultural operations, resulting in gains in agricultural performance and overall productivity.

In the baseline survey in Cherkasy and Khmelnytsky oblasts and the end-of-project survey in all three oblasts, 250 farmers were randomly selected in each oblast (150 in Vinnytsia) for personal interviews by the raion specialists. Lists of the populations of registered private farmers in the three oblasts were obtained from the respective oblast authorities. For the end-of-project survey in 2004, there were 1,128 registered private farmers in the Cherkasy population list, 1,038 registered private farmers in the Khmelnytsky population list, and 1,208 registered private farmers in the Vinnytsia population list. Random samples were drawn from these lists using a computerized random numbers table. Primary and alternate lists of sample respondents were prepared. If a farmer on the primary list refused to be interviewed or could not be found after two attempts by the raion specialist the next name on the alternate list was chosen. A similar procedure was employed in the benchmark surveys in 2002.

Raion specialists underwent a one-day training session in which they were trained in the personal interview technique, gained familiarity with the survey instrument, and practiced interviewing. In the practice session, each raion specialist interviewed a fellow raion specialist to get the experience of a real-life encounter.

Information was gathered on personal attributes of farmers, their agricultural operations, including production, management, and marketing of cereal and horticultural crops and livestock products, farm assets, their knowledge and adoption of agricultural best management practices, and their attitudes and aspirations.

The intermediate evaluation in 2003 was limited to determining (a) learning, use, and application of new technology, and (b) crop and livestock production and marketing situations of private farmers and home plot owners (HPOs). The value in doing this evaluation was to assess HPO involvement and performance in all three oblasts and to provide a benchmark, albeit limited, for Vinnytsia private farmers who were not surveyed in the initial baseline survey in 2002. A sample size of 100 private farmers and 100 HPOs from each oblast was targeted. Samples were randomly chosen from lists of those individuals who attended education programs in the previous year.

Data in the baseline, intermediate, and end-of-project evaluations were analyzed for frequencies and means. Reports of the results of these evaluations were presented at appropriate times to assess progress and outcomes of the project.

This evaluation report is essentially focused on the end-of-project survey (2004) of private farmers in the three oblasts. It also uses results of the baseline survey (2002) in two oblasts to compare with the results from the end-of-project survey. The report has two sections. Section 1 describes personal attributes, agricultural operations, and educational behavior of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts as determined by the end-of-project survey (2004). Section 2 documents the influence of the education programs conducted in Cherkasy and Khmelnytsky oblasts on the agricultural production performance of private farmers by comparing baseline and end-of-project information on selected performance indicators and farmers' perceptions of changes.

Evaluation Findings

Evaluation findings are presented in two sections. Section 1 describes personal attributes, agricultural operations, and educational behavior of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts as determined by the end-of-project survey (2004). Section 2 documents the influence of the education programs conducted in Cherkasy and Khmelnytsky oblasts on the agricultural production performance of private farmers by comparing baseline and end-of-project information on selected performance indicators and farmers' perceptions of changes.

Section 1: Personal Attributes, Agricultural Operations, and Educational Behavior of Private Farmers in Cherkasy, Khmelnytsky, and Vinnytsya oblasts (2004)

Personal Attributes of Private Farmers

Age. The mean age of private farmers in the sample was 45.8 years, with slightly more than one-third of them under 50 years of age (Table 1). This suggests that farmers are a relatively young group in the population studied.

Table 1: Age of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Age (years)	Number of farmers	% of farmers
30 or under	51	7.8
31-40	142	21.8
41-50	248	37.8
51-60	169	25.8
Over 60	45	6.8
Total	655	100.0

Mean age = 45.8 years

Gender. Over 90% of farmers in the sample were male, and 9.7% were female (Table 2).

Table 2: Gender of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Gender	Number of farmers	% of farmers
Male	594	90.3
Female	64	9.7
Total	658	100.0

Highest Level of Education. Farmers in the sample were well-educated, with 52% indicating they had a university degree, and 30.7% reporting that they had finished a technical college program (Table 3). Slightly over 15% had a high school diploma (6.7%) or had completed vocational school (9.2%). Appendix Table 1 shows for each education level completed the number and percent of farmers who pursued different specializations.

Table 3: Highest level of education of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Highest level of education	Number of farmers	% of farmers
8 years school	2	0.3
High School	44	6.7
Vocational school	60	9.2
Technical college	201	30.7
University degree	341	52.0
Master's degree	5	0.8
Candidate of Science	2	0.3
Total	655	100.0

Composition of Household. Parents, spouses, and children were the main relatives living in the farmer's household (Table 4). Spouses and children inhabited over 90% of the households; parents were reported in 17.3% of the households. As might be expected, all relatives helped with the farming operations.

Table 4 : Relatives living in private farmers households, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Relative living in household	Number and percent of households		Average age of relative	Number of relatives helping with farming operation	
	n	%	years	n	%
Parent	114	17.3	60.4	99	90.0
Spouse	594	90.3	42.7	554	92.2
Child	615	93.5	19.6	437	77.4
Other	78	11.9	33.9	63	82.9

Occupation and Income. Table 5 shows that for a majority of farmers (85.8%), farming was a full-time occupation and the major income source for the family (85.8%). A significant source of family income besides farming was sale of home plot produce (61.6%). Salaries from other jobs held by spouses (34.9%) and farmers (20.5%) were also reported as an income source.

Table 5 : Occupation and income of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Variable	Number of farmers	% of farmers
Farming as occupation		
Full-time	558	85.8
Part-time	92	14.2
Total	640	100.0
Farming as major family income source		
Yes	558	85.8
No	92	14.2
Total	640	100.0
Other family income sources ^a		
Sale of home plot produce	400	61.6
Salary from spouse's job ^b	224	34.9
Salary from farmer's job ^c	131	20.5
Government pension	112	17.6
Non-agricultural business	60	9.5

^a Income sources other than those listed – Type and number of respondents: Child care assistance (1); Construction site work (1); Daughter's salary (1); Gas station owner (2); Lease agricultural machinery (1); Mother's/parents' government pension (4); Private store (2); Customized services, i.e., grain harvesting (1), machinery (1); tillage (3); weddings (1); Sell spares of farm machinery (2); Sell honey (1); Unemployment subsidy (1).

^b Type of job and number of respondents: Accounting/clerical (5); Collective enterprise (1); Forestry department (1); Inspector in bakery (1); Milking woman (1); Teacher (9).

^c Type of job and number of respondents: Agricultural mechanic (1); Agronomist in private enterprise (2); Cannery employee (1); Clerical (1); Deputy Head of LAN collective farm (1); Engineer in bakery (1); Forestry department (1); Engine repair (1); Security guard (1); Director of seed production plant; Manager of private storage company (1); Teacher (1); Transport service (1).

Organizational Affiliation, Benefits and Interests. A majority of farmers (76.3%) belonged to a farmers association (Table 6). Affiliation with a civic/social group was small (9.4% farmers) and with an agricultural cooperative even smaller (2.2% farmers).

Most farmers felt they benefited in the sharing of information and in specific agricultural operations by belonging to groups and organizations. Fewer farmers felt that there was any political benefit from belonging, reflecting perhaps their technical bias, and an as-yet unrealized appreciation of the strength of organizational affiliation.

A majority of farmers was interested in joining groups and organizations to participate in and take advantage of different agricultural and community related activities to improve their situations, influence agricultural research and education, and plan projects. Once again, there appeared to be limited awareness of how groups could influence involvement in political issues.

Table 6: Organizational affiliation and perceived benefits and Interest in belonging to groups and organizations, private farmers, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Variable	Number of farmers	% of farmers
<i>Groups and organizations belonged to ^a</i>		
Farmers association	501	76.3
Civic/social group	59	9.4
Agricultural cooperative	14	2.2
Women's association	9	1.4
<i>Benefits perceived by belonging to groups and organizations</i>		
Information sharing	517	86.6
Selling agricultural produce	411	69.4
Buying agricultural inputs	404	67.9
Farm operations assistance	369	61.9
Support for political issues	137	23.3
<i>Interest in joining groups and organizations to participate in following activities ^b</i>		
Improve input conditions	616	95.4
Improve market conditions	605	93.8
Improve credit conditions	555	86.2
Influence agricultural research	524	82.6
Influence agricultural education	524	82.3
Plan farm projects	450	71.1
Plan community projects	393	62.7
Support political issues	207	32.3

^a Other groups belonged to and number of mentions: Advisory Committee (4), Association of Vegetable Producers (2), Association of Taxpayers (1), Orchard Growers of Ukraine (1), Raion Council (3);

^b Other interests indicated and number of mentions: Engage in orchard production (1); How to set up an agricultural cooperative (1); Influence price parity for agricultural commodities (1); Influence price policy in the country (1).

Agricultural Operations of Private Farmers

Length of Time in Private Farming. Table 7 shows when farmers started private farming on their own and when their farms were officially registered.

Nearly one-third began private farming operations between 1991 and 1995 (31.2%), two-fifths between 1996 and 2000 (41.0%), and one-fourth in the last four years (27.8%). The time periods during which their farms were officially registered tracks the length of time they have been involved in farming on their own.

Table 7: When started as private farmer and officially registered farm, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Time period	Started as private farmer		Officially registered farm	
	Number	%	Number	%
1991-1995	201	31.2	190	29.5
1996-2000	264	41.0	239	37.1
2001-2004	179	27.8	215	33.4
Total	644	100.0	644	100.0

Acquisition and Area of Private Farming Land. Most farmers (83.5%) acquired their private farming land by a title from the village council (Table 8). Other methods included leasing (44.4% of farmers) and family land-shares (32.8% of farmers). The total area of land held by private farmers from these three sources was 58,186 hectares for an average farm size per farmer of 88.4 hectares. The area held under lease was more than one-half of the total land area.

Table 8: Mode of acquisition and area of farmland held by private farmers of Cherkasy, Khmelnytsky, and Vinnytsia oblasts

How land acquired ^a	Number and percent of farmers		Area (hectares)	
	Number	%	Total	Average
Village council title	545	83.5	19,384	35.5 ^b
Leased	280	44.4	34,469	123.1 ^b
Family landshares	204	32.8	4,333	21.2 ^b
Total	---	---	58,186	88.4 ^c

^a Other acquisition methods mentioned and number of hectares: Fallow land (168 hectares, Khmelnytsky); Land reserve (77 hectares, Cherkasy); Land shares of other people besides family (85 hectares, Khmelnytsky).

^b Average number of hectares for each land acquisition method

^c Average number of hectares per farmer for all land acquisition methods

Breakdown of Farmland. Table 9 shows the number of pieces of land into which farms were distributed. Most farms (62.4%) were single, undivided pieces. One hundred forty eight farms (22.6%) were made up of two pieces of land. The remaining farms (15%) were divided into 3, 4, 5, or 6-12 pieces. It would appear that farmers whose land is divided into many pieces would encounter some difficulty in effectively managing their agricultural operations.

Table 9: Number of pieces of land into which farms of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts are divided

Number of pieces of land	Number and percent of farmers	
	Number	%
One	408	62.4
Two	148	22.6
Three	44	6.6
Four	16	2.6
Five	16	2.6
Six-twelve	21	3.2
Total	652	100.0

Other Farm Assets. Besides land, other farm assets owned or used by farmers are farm buildings and structures and farm equipment and machinery.

Various buildings and structures owned by farmers are shown in Table 10. The average age and average area of each building/structure are also indicated. Considering all buildings/structures, the average area for the sample of farmers was 2427.3 sq meters. Also, 72 farmers (10.9%) added a total area of 9,101 sq. meters of new buildings/structures in 2003-2004, or an average for these farmers of 126.4 sq meters.

Table 11 presents the proportions of farmers who used, owned, leased/borrowed, and loaned/shared various items of farm machinery and equipment during 2004. Table 12 shows the number of units of the same items of farm machinery and equipment owned, leased/borrowed, and loaned/shared in 2004. It appears that farmers own or exchange the farm machinery and equipment that they need for their farm operations. Nearly a third of the farmers (30.4% or 200 farmers) purchased additional machinery and equipment during 2003/2004. Items and number of units of each item purchased are shown in Table 13.

Table 10: Buildings and structures on farms of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Building/structure	Number and percent of farmers		Average age (years)	Average area (sq. meters)
	N	%		
Garage	315	47.9	57.2	90.2
Covered grain storage	260	39.5	59.8	432.9
Cattle barn/shed	248	37.7	115.9	245.8
Machinery shed	206	31.3	25.9	1,085.4
Underground vegetable/fruit storage	176	26.7	18.2	53.9
Hangar	106	16.1	35.7	328.0
Workshop (metal, carpentry)	100	15.2	14.9	82.8
Bunker	10	1.5	12.8	131.6
All buildings/structures	---	---	---	2427.3

Other buildings/structures and area mentioned: Khmelnytsky - Grain drying/cleaning facility (9 sq. meters); Shed (30 sq. meters); Cherkasy - Apiary (41 sq. meters); Canteen (40 sq. meters); Mill (480 sq. meters); Sausage-making facility (360 sq. meters); Vinnytsia - Tobacco drying facility (1,260 sq. meters).

Table 11: Machinery and equipment used on farm by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Item	Number and percent of farmers by type of use (N=658)							
	Used in farm operation		Owned		Leased/ borrowed		Loaned/shared	
	n	%	N	% ^a	n	% ^a	N	% ^a
Truck	518	78.7	316	61.0	200	38.6	65	12.5
Car	452	68.7	429	94.9	17	3.8	41	9.0
Horse cart	104	15.8	83	79.8	20	19.2	8	7.7
Tractor	639	97.1	526	82.3	143	22.4	67	10.5
Trailer	537	81.6	440	81.9	99	18.4	54	10.1
Cultivator	619	94.1	376	76.9	138	22.3	70	11.3
Planter	70	10.6	56	80.0	20	28.6	6	8.6
Combine	581	88.3	261	44.9	305	52.5	83	14.3
Sprayer	439	66.7	224	51.0	183	41.9	68	15.5
Seeder	602	91.5	411	68.3	175	29.1	86	14.3
Milking machine	20	3.0	18	90.0	---	---	---	---
Feed mill	82	12.5	78	95.1	3	3.7	2	2.4
Power tiller (hand)	18	2.7	15	83.3	0	0.0	1	5.6
Power mower	165	25.1	127	77.0	5	21.2	25	15.2

^a % of those farmers who used different items: for example, 518 farmers used trucks; 316 of these 518 farmers (61.0%) owned their own truck; 200 of these 518 farmers (38.6%) leased/borrowed a truck; 65 of these 518 farmers (12.5%) loaned/shared a truck..

Other equipment owned and number of units: Plough (25); Disk harrow (9); Fertilizer/manure spreader (2); Drip irrigation equipment (1); Grain cleaner (1); Sunflower processing equipment (1); Root drying (1); Bus (1); Roller (1); Mattock (1).

Table 12: Number of units of machinery and equipment owned, leased/borrowed, loaned/shared by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Item	Units owned	Units leased/ borrowed	Units loaned/ shared	Total units
Truck	473	257	75	805
Car	466	18	43	527
Horse cart	119	49	8	176
Tractor	981	220	92	1293
Trailer	749	143	69	961
Cultivator	776	173	82	1031
Planter	61	22	6	89
Combine	353	350	85	788
Sprayer	233	184	68	485
Seeder	618	210	100	928
Milking machine	522	---	---	522
Feed mill	87	4	2	93
Power tiller (hand)	15	---	---	15
Power mower	50	40	26	216

Table 13: Machinery and equipment purchased by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2003-2004

Item of machinery/equipment	Number of units purchased
Tractor	38
Cultivator	20
Combine	18
Planter	13
Sprayer	13
Plough	10
Disk harrow	8
Car/truck	8
Trailer	6
Drip irrigation equipment	2
Fodder chopper	2
Seeding machine	2
Seed coating machine	1
Grain cleaner	1
Milking equipment	1
Coulter chisel	1
Extruder	1
Deep pump	1
Water storage tank	1
Fertilizer spreader	1
Sunflower oil processor	1
Mower	1

Crop and Livestock Production and Disposal in 2004. Tables 14 and 15 show the different row (cereals/grains) crops and horticultural crops cultivated by farmers in the 2004 crop season. Information for each crop includes number and percent of farmers growing the crop, area harvested (total and average per farmer), amounts of the crop produced (total production and average yield per hectare), and the amounts of the crop sold, used in the home, and kept for seed (totals and averages per farmer). Table 16 gives the number of hectares of other row and horticultural crops raised in 2004.

Wheat and barley were the principal cereal crops grown by 69.8% and 69.6% of farmers, respectively (Table 14). Other significant row crops grown were buckwheat (36.0% of farmers), corn (30.0% of farmers), sugar beet (24.9% of farmers), and sunflower (21.4% of farmers). Potatoes were raised by 7.6% of the farmers, vegetables (carrots, cabbage, cucumbers, tomatoes, onions) by 13.4%, and apples by 2.1% (Table 15). Total harvested area under row and horticultural crops was 36,828.5 hectares and the total crop produced was 1,710, 087.2 centners. Most of the production was sold (85.0%), the balance used in the home and/or kept for seed.

Twenty two other crops were raised on a total of 2,281 hectares (Table 16). The main crop was soybean (664.2 ha). Other significant crops raised were peas (395.2 ha), millet (202.0 ha), flax (172.0 ha) and chicory (164 ha).

Table 14: Row crop production and disposal by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Crop	Unit of measure	Quantity
Wheat		
Number of wheat producers	Number	459
% of all producers	%	69.8
Area harvested (hectares)	Total	15,202.7
	Average	33.7
Amount produced (centners)	Total	517,174.0
	Yield/ha	34.0
Amount sold (centners)	Total	463,020.0
	Average	1,154.7
Amount used in home (centners)	Total	46,870.1
	Average	152.2
Amount kept for seed (centners)	Total	55,616.1
	Average	151.5
Rye		
Number of rye producers	Number	60
% of all producers	%	9.1
Area harvested (hectares)	Total	1,560.0
	Average	26.4
Amount produced (centners)	Total	42,802.5
	Yield/ha	27.4
Amount sold (centners)	Total	30,141.0
	Average	627.9
Amount used in home (centners)	Total	5,933.5
	Average	296.7
Amount kept for seed (centners)	Total	2,752.0
	Average	72.4
Barley		
Number of barley producers	Number	458
% of all producers	%	69.6
Area harvested (hectares)	Total	13,923.0
	Average	30.7
Amount produced (centners)	Total	414,789.5
	Yield/ha	29.8
Amount sold (centners)	Total	284,758.1
	Average	715.5
Amount used in home (centners)	Total	48,942.3
	Average	156.9
Amount kept for seed (centners)	Total	39,633.6
	Average	111.3
Buckwheat		
Number of buckwheat producers	Number	237
% of all producers	%	36.0
Area harvested (hectares)	Total	3,533.0
	Average	14.8
Amount produced (centners)	Total	37,821.6
	Yield/ha	10.7
Amount sold (centners)	Total	27,945.6
	Average	140.4
Amount used in home (centners)	Total	2,560.9
	Average	22.9
Amount kept for seed (centners)	Total	3,445.8
	Average	22.3
Corn		
Number of corn producers	Number	200
% of all producers	%	30.4
Area harvested (hectares)	Total	7,112.8
	Average	38.2

Amount produced (centners)	Total	352,726.0
	Yield/ha	49.6
Amount sold (centners)	Total	310,717.0
	Average	1,929.9
Amount used in home (centners)	Total	25,306.0
	Average	245.7
Amount kept for seed (centners)	Total	1,654.0
	Average	97.3
Sugarbeet		
Number of producers	Number	164
% of all producers	%	24.9
Area harvested (hectares)	Total	2,457.7
	Average	15.1
Amount produced (centners)	Total	632,562.0
	Yield/ha	257.4
Amount sold (centners)	Total	594,843.0
	Average	4,218.7
Sunflower		
Number of producers	Number	141
% of all producers	%	21.4
Area harvested (hectares)	Total	4,631.3
	Average	34.3
Amount produced (centners)	Total	79,315.0
	Yield/ha	17.1
Amount sold (centners)	Total	61,787.3
	Average	537.3
Amount used in home (centners)	Total	2,367.2
	Average	45.5
Amount kept for seed (centners)	Total	488.5
	Average	25.7
Green forage, silage, hay		
Number of forage/silage/hay producers	Number	61
% of all farmers	%	9.3
Area harvested (hectares)	Total	1,653.7
	Average	28.0
Amount produced (centners)	Total	159,375.0
	Yield/ha	96.3
Amount sold (centners)	Total	17,205.0
	Average	1,075.3
Amount used in home (centners)	Total	132,597.0
	Average	5,524.9

Total = Total amount for those producers who harvested, produced, sold, or used crop in the home in 2004.
Average = Average amount per producer who harvested, produced, sold, or used crop in the home in 2004.

Table 15: Horticultural crop production and disposal by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Crop	Unit of measure	Quantity ^a
Potatoes		
Number of potato producers	Number	50
% of all farmers	%	7.6
Area harvested (hectares)	Total	79.5
	Average	1.9
Amount produced (centners)	Total	16,125.0
	Yield/ha	202.8
Amount sold (centners)	Total	9,541.0
	Average	251.1
Amount used in home (centners)	Total	2,257.0
	Average	56.4
Amount kept for seed (centners)	Total	2,248.0
	Average	52.3
Carrots		
Number of carrot producers	Number	15
% of all farmers	%	2.3
Area harvested (hectares)	Total	21.3
	Average	1.4
Amount produced (centners)	Total	3,651.0
	Yield/ha	171.4
Amount sold (centners)	Total	3,292.0
	Average	253.2
Amount used in home (centners)	Total	146.0
	Average	16.2
Amount kept for seed (centners)	Total	210.0
	Average	105.0
Cabbage		
Number of cabbage producers	Number	24
% of all farmers	%	3.6
Area harvested (hectares)	Total	59.5
	Average	2.5
Amount produced (centners)	Total	11,860.0
	Yield/ha	199.3
Amount sold (centners)	Total	10,410.0
	Average	520.5
Amount used in home (centners)	Total	194.3
	Average	13.9
Amount kept for seed (centners)	Total	300.0
	Average	300.0
Cucumbers		
Number of cucumber producers	Number	13
% of all farmers	%	2.0
Area harvested (hectares)	Total	21.6
	Average	1.8
Amount produced (centners)	Total	1,659.0
	Yield/ha	76.8
Amount sold (centners)	Total	1,351.0
	Average	112.6
Amount used in home (centners)	Total	30.0
	Average	5.0
Tomatoes		
Number of tomato producers	Number	23
% of all farmers	%	3.5
Area harvested (hectares)	Total	179.4
	Average	8.2
Amount produced (centners)	Total	20,524.0
	Yield/ha	114.4

Amount sold (centners)	Total	1,351.0
	Average	112.6
Amount used in home (centners)	Total	149.5
	Average	13.6
Onions		
Number of onion producers	Number	13
% of all farmers	%	2.0
Area harvested (hectares)	Total	24.0
	Average	1.9
Amount produced (centners)	Total	1,967.0
	Yield/ha	82.0
Amount sold (centners)	Total	1,762.0
	Average	135.6
Amount used in home (centners)	Total	127.0
	Average	31.8
Amount kept for seed (centners)	Total	31.0
	Average	15.5
Apples		
Number of apple producers	Number	14
% of all farmers	%	2.1
Area harvested (hectares)	Total	85.1
	Average	6.6
Amount produced (centners)	Total	1,944.0
	Yield/ha	22.8
Amount sold (centners)	Total	1,751.4
	Average	291.9
Amount used in home (centners)	Total	12.6
	Average	3.2

^a Plums: 4 farmers produced 5.1 centners on 2 hectares; Young fruit trees for planting: 3 farmers sold 5,000 trees.
Total = Total amount for those producers who harvested, produced, sold, or used crop in the home in 2004.
Average = Average amount per producer who harvested, produced, sold, or used crop in home in 2004.

Table 16: Number of hectares of other crops raised in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Other crop	Number of hectares
Soybean	664.2
Peas	395.2
Summer/spring wheat	361.0
Millet	202.0
Flax/flax for grain	172.0
Chicory	164.0
Winter rape/rape	79.5
Triticale	55.0
Medicinal crops (herbs)	42.0
Kidney beans	32.0
Oats	19.5
Watermelon	19.0
Mustard	16.9
Tobacco	15.0
Young orchard	10.0
Cover crops	8.0
Vegetable seeds	7.7
Currants/black currants	6.0
Table beets	5.0
Vetch	5.0
Berries	2.0
Grapes	0.7
Total	2,281.7

Table 17 indicates the different livestock raised by farmers in 2004. The information presented shows the number and percent of producers raising animals of different species, total and average number of animals of each species owned by these producers, total amounts of animal products produced and the quantities per animal, and the amounts of animal products sold and used in the home (totals and averages per farmer). The number of head of other livestock species raised in 2004 and the quantities of products produced are shown in Table 18.

Livestock products produced in 2004 totaled 46,865 centners of milk, and 6,846 centners of beef, pork, and poultry. The bulk of these products was sold to consumers. In addition, 140,450 eggs were sold.

Table 17: Livestock production and disposal by private farmers in Cherkasy, Khmelnytsky and Vinnytsia oblasts in 2004

Livestock or livestock product	Unit of measure	Quantity ^a
Dairy		
Number of dairy producers	Number	156
% of all farmers	%	23.7
Number of milking cows	Total	1,642.0
	Average	10.5
Milk produced (tons)	Total	4,740.5
	Per cow	2.9
Milk sold (tons)	Total	3,614.3
	Average	26.8
Milk used in home (tons)	Total	331.1
	Average	2.6
Beef		
Number of beef producers	Number	86
% of all farmers	%	13.1
Number of beef cattle	Total	1,436.0
	Average	16.7
Beef produced (centners)	Total	3,288.4
	Per head	2.3
Beef sold (centners)	Total	2,757.1
	Average	40.6
Beef used in home (centners)	Total	219.6
	Average	12.9
Breeding sows		
Number of breeders	Number	39
% of all farmers	%	5.9
Number of breeding sows	Total	337.0
	Average	8.6
Number produced	Total	1678.0
	Average	69.9
Number sold	Total	1,075.0
	Average	53.8
Number used in home	Total	459
	Average	27.0
Swine		
Number of swine producers	Number	217
% of all farmers	%	33.0
Number of swine	Total	3,598.0
	Average	16.6
Pork produced (centners)	Total	4,224.1
	Per head	1.2
Pork sold (centners)	Total	3,552.7
	Average	21.9
Pork used in home (centners)	Total	899.3
	Average	4.9

Chicken (Broilers)		
Number of broiler producers	Number	126
% of all farmers	%	19.1
Number of broilers	Total	4,251.0
	Average	33.7
Broilers produced (kgs)	Total	8,891.0
	Per bird	2.1
Broilers sold (kgs)	Total	1,235.0
	Average	58.1
Broilers used in home (kgs)	Total	7,479.0
	Average	70.6
Ducks		
Number of duck producers	Number	69
% of all farmers	%	10.5
Number of ducks	Total	1,970.0
	Average	28.6
Ducks produced (kgs)	Total	4057.0
	Per bird	2.1
Ducks sold (kgs)	Total	1,682
	Average	84.1
Ducks used in home (kgs)	Total	2,729.5
	Average	51.5
Geese		
Number of geese producers	Number	72
% of all farmers	%	10.9
Number of geese	Total	3,930.0
	Average	53.8
Geese produced (kgs)	Total	17,955.0
	Per bird	4.6
Geese sold (kgs)	Total	9,215.0
	Average	460.8
Geese used in home (kgs)	Total	8,195.0
	Average	136.6
Eggs^a		
Number of egg producers	Number	108
% of all farmers	%	16.4
Number of eggs produced	Total	358,548
	Average	3,382
Number of eggs sold	Total	147,700
	Average	2,237
Number of eggs used in home	Total	208,948
	Average	1,009
Honey		
Number of honey producers	Number	14
% of all farmers	%	2.1
Honey produced (kgs)	Total	9,165.0
	Average	654.6
Honey sold (kgs)	Total	8,715.0
	Average	670.4
Honey used in home (kgs)	Total	359.0
	Average	44.9

^a Rabbits: 10 farmers raised 270 animals; 8 farmers on average produced 63 kg; 2 farmers on average sold 80 kg.
Total = Total amount for those producers who raised animals, and produced, sold or used animal products in the home in 2004.
Average = Average amount per producer who raised animals, and produced, sold or used animal products in the home in 2004.

Table 18: - Number of head of other livestock raised and quantities of products produced in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Other livestock	Number of head	Quantity of product
Bee hives (families)	110	---
Horses	4	---
Ostrich	6	600 kg ostrich meat
Sheep	79	45 centners lamb meat
Turkey	55	180 kg turkey meat
Young pigs	28	---

Production and Disposal of On-farm Products. Products made on the farm were limited to a few farmers (about 5%). The only products made and sold in some significant quantity were flour, bran, sunflower oil, milk products, and canned vegetables, fruits, berries and juice (Table 19).

Table 19: Production and disposal of products made on the farm, Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Product ^a	Produced on farm			Sold from farm			Used in home		
	n/% farmers ^b	Quantity (centners)		n/% farmers	Quantity (centners)		n/% farmers	Quantity (centners)	
		Total	Av		Total	Av		Total	Av
Flour	37/5.6	25,200	681.1	32/4.9	5825	176.5	27/4.1	468	17.3
Bran	31/4.7	3754	121.1	13/2.0	2602	200.1	23/3.5	1319	57.3
Cereals	24/3.7	552	23.0	19/2.9	479	25.2	18/2.7	58	3.2
Bread	11/1.7	19964	1814.6	4/0.6	19936	4984.0	8/1.2	564	70.4
Sf oil ^c	23/3.5	2636	114.6	22/3.3	2592	117.8	9/1.4	42	4.6
Meat pr	35/5.3	1012	28.9	31/4.7	724	23.3	33/5.0	288	8.7
Milk pr	27/4.1	9263	343.1	26/4.0	8398	323.0	16/2.4	861	33.1
Canned ^d	10/1.5	2533	253.3	3/0.5	2510	836.7	9/1.5	24	2.5
Dry fruits	5/0.8	51	10.2	2/0.3	50	25.0	5/0.8	2	0.4

^a Other products made: Oilcakes (1,230 centners); Chaff/husk/crushed grain (200 centners); Sugar (110 centners); Feed concentrate (80 centners).

^b Total number of farmers=658

^c Sunflower oil

^d Canned vegetables, fruits, berries, juice

Sale of Crop, Horticultural, and Livestock Products. Table 20 shows the percentages of farmers using various sales methods/outlets. A majority of farmers engaged in personal sales (55.3%). A significant proportion of farmers favored agribusiness companies (43.9%), processors (42.2%) or government organizations/enterprises (34.5%). Wholesale dealers (11.2%) and agricultural products stock exchanges (9.9%) were the least preferred methods.

Table 20: Methods/outlets used to sell farm produce, Cherkasy, Khmelnytsky and Vinnytsia oblasts in 2004

Sales method/outlet ^a	Number and % of farmers using sales method/outlet (N=658)	
	number	%
Personal sale	364	55.3
Agribusiness company	289	43.9
Processor	278	42.2
Government organization/enterprise	227	34.5
Other farmers	166	25.2
Wholesale dealer	74	11.2
Agricultural products stock exchange	65	9.9

^a Other outlet: Supermarket (1 mention)

Cost of Inputs and Sources of Assistance. The cost of various production inputs purchased by farmers is indicated in Table 21. For farmers reporting input use/cost, the largest cost was for seeds (\$3,133.0). Salaries/wages, labor, fuel, and livestock feed were the next largest costs, the average ranging from \$2,694.0 to \$2,197.0. The costs of chemical fertilizers (\$1,601.0) and crop protection chemicals (\$1,148.0) were at an intermediate level. Organic fertilizers had the lowest average cost (\$609.0)

It is interesting that 55.0% of farmers gave out salaries/wages to employees and 26.0% hired paid labor to supplement family labor. This indicates a trend toward cash transactions, which might signify a growth in business entrepreneurship. This is a healthy and positive sign for a privatized, market-based economic system.

Other inputs used and their costs are indicated in Table 22. Seedlings, machinery spares, and machinery lease costs were the highest among other inputs reported.

Farmers indicated that they received actual inputs and/or information regarding input use and cost from various sources (Table 23). The project was most frequently mentioned (333 times) as a source of assistance. Agribusiness companies were next with 110 mentions. Other sources include agricultural boards/departments (38 mentions), other farmers (28 mentions), and farmers' associations (14 mentions). The state government and collective enterprises received the least number of mentions, 8 and 6, respectively.

Table 21: Cost of inputs used in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Input	Number and percent of farmers		Reported cost (\$)	
	Number	%	Total	Average
Seeds	605	91.9	1,895,701.0	3,133.0
Salaries/wages	362	55.0	975,296.0	2,694.0
Labor	171	26.0	444,927.0	2,601.0
Fuel	593	90.1	1,353,967.0	2,283.0
Livestock feed	169	25.7	371,371.0	2,197.0
Chemical fertilizers	556	84.5	890,412.0	1,601.0
Crop protection chemicals	447	67.9	513,421.0	1,148.0
Organic fertilizers	137	20.8	83,471.0	609.0

Table 22: Cost of other inputs used in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Input	Reported cost (US \$)
Seedlings	32,701.90
Machinery spares	11,308.90
Machinery lease	3,154.70
Services	849.00
Transport	377.40
Geese	377.40
Tax	136.60
Combine threshing	56.60

Table 23: Sources of input assistance to farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Source of input assistance	Number of mentions
Center/Oblast advisory service	333
Agribusiness companies ^a	110
Agricultural board/department	38
Other farmers	28
Farmers Association	14
Compensation from state government ^b	8
Collective enterprise	6

^a Free supply of various inputs by such companies as Cherkasy Azot, Veres, Leda, Zoria-Mais, Vuzyviy ASgrimatke, Rise, Agropostach, Eridon, Raiagrochim, Agrosoyz, Agrochem, Terra Invest.(Cherkasy and Vinnytsya oblasts).

^b US\$ 1,580 subsidy for growing winter/spring/summer crops and applying fertilizers (Khmelnytsky Oblast).

Farm Planning. The following four tables (24-27) relate to farm planning by farmers.

Table 24 shows that written plans were developed prior to the 2004 agricultural season by 71.0% of farmers on production, 44.9% on business operations, and only 21.2% on marketing. This pattern is to be expected because the experience and comfort level of farmers is much greater for production operations than for business and marketing, which are more complex and subject to uncertainties of the marketplace.

The fact that a majority of farmers (54.0%) did not prepare written plans is a matter of concern for program educators (Table 24). Table 25 gives their reasons for not preparing plans. Many of them felt that plans were not necessary (40.1%) or useful (11.7%). This appears to reflect a negative attitude. A third reason – planning is too complicated (23.6%) – is related to knowledge and may be easier to overcome. Another reason for not planning given by one farmer was the government's uncertain and unstable price policies.

A majority of the respondents who prepared plans (56.0%) said they received help in preparation (Table 26). Raion/university specialists was the most cited source of help (92.0%) (Table 27). Family members came next at 54.7%, followed by other farmers/friends (33.0%). Nearly one-fifth of the respondents relied on an agricultural board representative (17.7%) or a staff (bookkeeper/economist) of a reformed collective (17.3%). It is interesting that agricultural service cooperatives and private consulting companies were barely mentioned.

Table 24: Written plans for crop and livestock operations developed for and prior to the 2004 agricultural season by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Type of plan	Number and percent of farmers					
	Developing written plans		Not developing written plans		Total number of respondents	
	n	%	n	%	n	%
Production	462	71.0	189	29.0	651	100.0
Business	282	44.9	346	55.1	628	100.0
Marketing	132	21.2	492	78.8	624	100.0
One or more	292	46.0	342	54.0	634	100.0

Table 25: Reasons private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts did not prepare written plans for the 2004 agricultural season

Reason given	Number of respondents (N=342)	% of respondents (N=342)
Don't think plans are necessary	137	40.1
Planning is too complicated	81	23.6
Don't think plans are useful	40	11.7

Table 26: Assistance received by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in preparing written plans for the 2004 agricultural season

Assistance received	Number of respondents	% of respondents
Yes	300	56.0
No (plans prepared by respondent)	236	44.0
Total	536	100.0

Table 27: Persons assisting private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts to prepare written plans for the 2004 agricultural season

Person assisting respondent	Number of respondents assisted (N=300)	% of respondents assisted (N=300)
Raion/university specialist	276	92.0
Family member	164	54.7
Farmer or friend	99	33.0
Agricultural board representative	53	17.7
Reformed collective farm staff	52	17.3
Agricultural service cooperative	7	2.3
Private consulting company	3	1.0

Agricultural Credit. The next four tables (28-31) deal with agricultural credit used by farmers.

Only one-fourth of farmers took agricultural credit in 2003/2004 (Table 28). A variety of reasons was given by the remaining three-fourths of farmers as to why they did not take credit (Table 29). A majority of them cited high interest rate (61.0%), not wishing to go into debt/take the risk (60.2%), and complicated loan procedures (56.8%). Many of them did not have collateral/security (43.8%), or did not wish to avail of short-term loans (42.9%) with large repayment amounts (41.9%). Nearly one-third said they did not need credit (32.8%) or that credit was not available when they needed it (32.0%).

For those farmers who took agricultural credit, the average loan was \$7,243.30 and the average interest rate was 20.1% (Table 30).

The most common source of agricultural credit was a bank (72.6% of respondents who took loans) (Table 31). Friends/family members were next (25.5%), followed by a credit union (11.1%). Agribusiness companies were cited by only 3.1% of the respondents.

Table 28: Agricultural credit taken by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia in 2003/2004

Credit taken	Number and percent of farmers	
	n	%
Yes	161	25.0
No	482	75.0
Total	643	100.0

Table 29: Reasons given by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia for not taking agricultural credit in 2003/2004

Reason	Number of respondents (N=482)	% of respondents (N=482)
Interest rate was too high	294	61.0
Did not want to go into debt/take risk	290	60.2
Loan procedures were too complex	274	56.8
Did not have collateral/security	211	43.8
Only short-term loan was available	207	42.9
Repayment amount was too large	202	41.9
Did not need	158	32.8
Loan was not available when I needed	154	32.0
Minimum loan was too high	128	26.6

Table 30: Particulars of agricultural credit taken by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2003/2004

Particulars of credit	Number of respondents	Quantity (\$)	
		Total	Average
Value of all loans in 2003/2004 (\$)	158	1,144,475.0	7,243.0
Interest rate of all loans (%/yr)	136	---	20.0
Length of all loans (months)	146	---	12.0

Table 31: Sources of agricultural credit used by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2003/2004

Credit source	Number of respondents (N=161)	% of respondents (N=161)
Bank	117	72.6
Friend/family member	41	25.5
Credit union	18	11.1
Agribusiness company	5	3.1

Other sources of credit; Khmelnytsky - Corporation Ukrpromsad (1 mention); Cherkasy – Farmers Association (1 mention), Farmers State Support Fund (5 mentions, one farmer received US\$ 3,396.20 for planting winter wheat), Entrepreneurs Association (1 mention); Vinnytsia – State Fund (1 mention).

Participation of Farmers in Educational Programs

First Contact with Project. Table 32 indicates that the largest number of farmers (40.1%) first learned about the project in 2002, when it started. Another 38.0% learned about the project in the next two years – 2003-2004. Farmers who said their first contact was during 1998-2000 were from Vinnytsia Oblast, where the first project was conducted.

Most farmers (86.0%) first learned about the project from their raion specialists (Table 33). Other sources indicated by a small number of farmers were other farmers (5.8%), friends (3.5%), government officials (2.0%), media (1.7%) and agribusiness dealers/enterprises (1.0%).

Table 32: Year private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts first learned about the project

Year first learned about Project	Number of farmers	% of farmers
1998-2001 ^a	141	21.9
2002	258	40.1
2003-2004	245	38.0
Total	644	100.0

^a Includes primarily Vinnytsia farmers from the earlier project (1998-2001)

Table 33: How private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts first learned about the project

Source first learned about Project	Number of farmers	% of farmers
Raion specialist/university specialist	559	86.0
Farmers Association	38	5.8
Friend (farmer, social circle)	23	3.5
Government official (village, raion, oblast)	13	2.0
Media (newspaper, radio, TV, flyer)	11	1.7
Agribusiness dealer/enterprise	6	1.0
Total	650	100.0

Level of Educational Participation. Table 34 shows how often farmers participated in different education programs of the project. Farmers indicated participating very often or often in reading project publications (94.2%), attending raion education programs in their raions (83.5%), and reading the farmers library column produced by the project for use by local newspapers (79.2%). Smaller numbers of farmers said they listened to radio programs (44.2%), watched television programs (39.5%), attended university education programs (38.2%), or education programs in other raions (28.3%).

The frequency of visits between farmers and raion/university specialists in terms of specialists making visits to farmers' fields and farmers coming to the offices of specialists is shown in Table 35. The percentages of farmers reporting on the relative frequency of these types of visits were greater for farmers making office visits than for specialists making farm visits. Overall, most farmers (70.9%) reported that visits occurred once a month or once in two weeks.

Table 34: How often private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts participated in education programs of the Project in last three years (2002-2004)

Type of education program participation	Number of respondents	How often attended education program (% respondents)		
		Very often/often	Sometimes	Seldom/never
Read publications	633	94.2	4.7	1.1
Attended raion education programs	643	83.5	15.1	1.4
Read farmers library	601	79.2	15.6	5.2
Listened to radio programs	548	44.2	38.0	17.8
Watched television programs	524	39.5	37.8	22.7
Attended university education programs	584	38.2	28.1	33.7
Attended other raion programs	586	28.3	43.2	28.5

Table 35: Frequency of visits between private farmers and raion/university specialists for receiving information and advice in last three years (2002-2004), Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Frequency of visits	Number and percent of farmers indicating type of visit			
	Specialists visited farmers on their farms		Farmers visited specialists in their offices	
	n	%	n	%
Once a week	60	9.2	100	15.4
Once in two weeks	154	23.7	205	31.6
Once a month	296	45.5	255	39.3
Once in 2-3 months	108	16.6	67	10.3
Once in 4-6 months	27	4.2	16	2.5
Once a year	4	0.6	3	0.5
Never	1	0.2	3	0.5

Reactions on Educational Participation. The extent to which farmers were very satisfied or satisfied with the information received in education programs was greater for programs which involved some form of personal contact with an extension professional such as workshops/seminars, field days, demonstrations, and visits compared to impersonal contact methods such as radio and television (Table 36). It is interesting to note the high level of satisfaction with newsletters and technical pamphlets issued by the project, perhaps due to the utility and quality of their content, and retention/reference value.

All participants found the information to be more or less useful. None of them said the information was not useful (Table 37).

Table 36: How satisfied were private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts with the agricultural, environmental, credit, legal and other information received in education programs in which they participated

Education program	Number of respondents	How satisfied with education programs (% respondents)			
		Very satisfied	Fairly satisfied	Somewhat satisfied	Dissatisfied
Workshops/seminars	633	31.1	66.0	2.7	0.2
Field days	600	31.5	65.0	3.3	0.2
Demonstrations	558	31.2	63.6	4.7	0.5
Specialists' farm visits	564	27.0	66.8	4.4	1.8
Farmers' office visits	624	34.6	61.0	4.3	0.2
Consultations	627	32.5	64.4	2.6	0.5
Radio programs	467	6.6	54.0	31.0	8.4
TV programs	427	5.8	49.0	34.9	10.3
Newsletters	610	30.7	63.3	5.7	0.3
Technical pamphlets	627	37.8	59.5	2.5	0.0

Table 37: How useful was the agricultural, environmental, credit, legal and other information received in education programs in which private farmers in Cherkasy, Khmelnytsky, and Vinnytsia participated

Usefulness of information	Number of farmers	% of farmers
Very useful	266	41.2
Fairly useful	233	36.1
Useful	145	22.5
Not useful	1	0.2
Total	645	100.0

Use of information Sources. Farmers were offered five information sources and asked to indicate for each of 13 subject-matter topics which sources they used. The responses in Table 38 indicate that the most used source for all topics was the project, with 72.1% of farmers indicating it as their overall choice. The Ministry of Agricultural Policy/Agro-Industrial Complex was the second choice (16.4%), followed by the Oblast college/university/research station (12.1%), other farmers (10.8%), and agribusiness (6.1%).

It is interesting to observe the choice trends for the several topics. For example, the Ministry was seen as a useful source for land titles, tax laws, and legal issues; the college/university/research station for agricultural production technologies; other farmers for agricultural marketing and markets, and agribusiness companies for farm machinery, equipment, supplies, and for plant protection technology.

Table 38: Sources of information of various subject matter topics used by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts over a three-year period, 2002-2004

Subject-matter topic	Percent farmers using different information sources (N=658)				
	Project	Ministry/agro-industrial complex	College/University Research Station	Other farmers	Agri-business
Legal issues in farming	82.7	22.9	10.5	11.9	1.2
Tax laws, rules, regulations	74.5	32.2	10.2	8.1	0.6
Obtaining land titles	68.2	40.7	5.5	13.2	0.5
Farm business planning/management	76.6	15.7	12.5	8.2	2.4
Obtaining farm credit	67.9	24.0	2.6	13.7	5.3
Crop production technology	88.6	12.5	25.8	14.7	4.9
Livestock production technology	57.3	5.9	16.1	5.5	1.5
Vegetable production technology	67.9	6.5	19.1	8.4	2.9
Fruit production technology	58.5	5.5	17.8	6.2	1.1
Farm machinery, equipment, supplies	64.0	13.8	11.2	14.1	23.3
Forming/managing ag cooperatives	68.8	8.2	9.4	5.9	1.1
Plant protection technology	83.0	17.2	8.4	13.5	20.7
Agricultural marketing and markets	79.2	8.1	8.4	17.3	13.2
Overall	72.1	16.4	12.1	10.8	6.1

Information Support System (ISS) Help to Farmers. Nearly four-fifths of farmers (78.8%) indicated that raion specialists had helped them in solving problems using the ISS, a computerized agricultural information database developed and distributed to all raion specialists by the World Laboratory, Ukraine Branch, Kyiv. Only 8.9% said they had not been helped, and 12.3% were uncertain (Table 39).

Table 39: Raion specialists help to private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in solving problems using the Information Support System (ISS)

Raion specialists helped farmers	Number of farmers	% of farmers
Yes	505	78.8
No	57	8.9
Uncertain	79	12.3
Total	641	100.0

Farmers who received help from raion specialists gave a number of general and specific examples of topics/problems of such help/problem solving. These are listed in Table 40 grouped under six information categories showing the number of mentions of each topic/problem. The wide range of topics/problems mentioned in these categories shows the diversity of help received, the versatility of the ISS information database, and the ability of raion specialists to use ISS in assisting farmers.

Those farmers who did not receive help from raion specialists gave various examples/reasons as to why they did not receive help. These examples/reasons are presented in Table 41 along with numbers of mentions. Ten farmers said they did not need help and tried to solve problems on their own. Fourteen farmers indicated that information on specific subjects they needed was either not available or outdated. The remaining five farmers cited system equipment/technology difficulties or lack of success in obtaining needed funds/inputs.

Overall, the ISS-raion specialists system was regarded by farmers as a valuable source of information and help in solving problems.

Table 40: Examples of help received from raion specialists using ISS information to solve problems of farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

Topic/Problem (general and specific)	Number of mentions
Information Category: Crop Production Cultural Practices	
Wheat	
Using regionally recommended and locally adapted winter wheat varieties	9
Protecting winter wheat (rust disease, insects, plant damage identification using anthers)	6
IPM for winter wheat	4
Document preparation to receive winter wheat subsidies	4
Winter and spring wheat marketing	2
Procuring spring wheat seeds	1
Fertilization of winter wheat	1
Controlling weeds on winter wheat	1
Barley	
IPM for barley	6
Choosing spring barley/early maturing (short vegetative period) varieties	4
New seeds of brewing barley purchased/used	3
Herbicides for spring barley applied	2
Barley growing costs estimated	1

Assistance in marketing of barley	1
Buckwheat	
Choosing recommended buckwheat varieties	2
Assistance in sale of buckwheat/buckwheat seed	2
Understanding buckwheat production technology	1
Applying pest management measures to buckwheat	1
Using buckwheat in a crop rotation	1
Grading (sorting) buckwheat	1
Soybean	
Choosing and buying recommended soybean varieties	7
Understanding and applying new soybean production technology	4
Purchasing pesticides for use on soybean	2
Applying herbicides on soybean	1
IPM for soybean	1
Sugar beet	
IPM for sugar beet	3
Choosing and applying the herbicide GOL	3
Understanding and applying sugar beet production technology	2
Applying fertilizers to sugar beet	1
Sugar beet fertilization and protection system applied	1
Identifying weeds in sugar beet fields	1
Selecting better varieties and hybrids of sugar beet	1
Understanding and controlling for insects and diseases of sugar beet	1
Corn	
Choosing better and higher-yielding com varieties/hybrids	12
IPM for corn	4
Applying herbicides and chemical protection measures for corn	3
Solving problem of corn hybrid ripening	1
Fertilizer rates for corn	1
Sunflower	
High quality sunflower seeds/hybrids/French selection purchased ("Raiz" farm)	6
Herbicides for sunflower applied	4
IPM for sunflower	3
Diseases in sunflower fields identified and remedies applied	2
Sunflower varieties with high oil content selected/purchased	1
Recommended protection measures on sunflower taken	1
Sunflower seed sowing plots determined	1
Information Category: Horticultural Production Cultural Practices	
Potatoes	
Better potato varieties (including sorted, Elite) selected and purchased at economical prices	17
Potato diseases controlled	2
Assistance in sorting (grading) of potatoes	1

Early potato growing technology used	1
Potato "atlas" used	1
Recommended potato production technology followed	1
Potato planter/cultivator/other equipment purchased	1
IPM for potato	1
Potato budget sheets used	1
Other vegetables (Tomatoes, Onions, Cucumbers, Carrots, Peas, Beans)	
Improved/recommended vegetable varieties selected and appropriate production technology used	16
IPM for cabbage (2), cucumber (1), tomato (3), vegetables (1)	7
Horticulture/vegetable "atlas" used	6
Insects and diseases of vegetables identified and controlled	6
Tomato varieties/hybrid recommendations followed	4
Biological preparations to protect onions/Onion varieties	3
Trellis net for trailing cucumber vines purchased	2
Phytophthora on tomatoes controlled	1
Herbicides on vegetables applied	1
A refrigerator for vegetables built	1
Herb production literature (books) purchased	1
Medicinal plants cultivated	1
Fruits	
Intensive (Dutch) orchard technology learned and practiced	3
Fruit varieties selection, production technology understood and used	2
Varieties, technology, and diseases of currants/black currants learned and practiced	2
Cockchafer in new orchards controlled	2
Productive varieties of apple trees selected for planting in orchard	1
Causes and control of apple tree diseases determined and followed	1
Fruit trees planting area determined	1
Information Category: Livestock Husbandry Practices	
Forage, feed rations, feeding recommendations followed (dairy cows, beef, poultry, horses, pork)	8
Bee-keeping advice received and bee-garden management practiced	8
Beef cattle and swine diseases prevented/treated/controlled	7
Beef cattle and swine breeds procurement and raising information received and used	4
Pedigree hogs purchased from farms	1
Stocking fish address obtained	1
Assistance in identifying and treating geese diseases	1
Ostrich raising technology found	1
Information Category: Plant Health/Protection	
IPM for crops (General)	22
Plant protection chemicals and their purchase/appropriate use	22
Plant protection technology (general)	18
Weed control methods and optimum use of herbicides	14
Following pesticide recommendations and pesticide applications	7

Understanding and using pest control methods/measures	5
Information Category: Farm Planning and Management	
<i>Production Planning and Management Decisions</i>	
Selection, source, purchase, sowing, and optimal use of regionally/locally adapted varieties/grains	42
Need, selection, source, discount purchase, calculation for fertilization/fertilizers for crops/grains	3
Need, selection, source, discount purchase, and optimal use of herbicides/pesticides	3
Use of crop atlases	3
Use of inputs and production planning	3
Harvesting crops and grains	2
Crop rotation	2
Purchase of organic fertilizers	1
Seed production	2
Weather forecasting on the Internet	1
<i>Business and Financial Planning and Management Decisions</i>	
Legal and managerial issues (obtaining land title/share certificate; preparing documents to establish a farm enterprise, register farm; develop bylaws for the farm)	36
Farm bookkeeping and accounting (preparing farmers' diaries; installing/using computerized business accounting program; training of farmers)	25
Managing and utilizing price fluctuations/discounts/subsidies for farm inputs (land, fuel, fertilizer, seed, plant protection chemicals)	21
Finding and leasing farm machinery, equipment, spare parts, supplies (using lists of manufacturers, dealers, service centers)	18
Business planning and business plan development (to obtain agricultural credit)	12
Using a financial reporting system	8
Preparing and reporting personal and business taxes	5
Understanding and preparing crop budgets (sheets, elements)	3
Managing price fluctuations of agricultural products	3
How to run a successful farm business	2
Setting up an agricultural service cooperative	1
<i>Information Category: Marketing Agricultural Products</i>	
Understanding optimum marketing of farm produce (principles, methods/channels, outlets, prices)	22
Conducting market surveys/research	2
Following grain markets and prices	1
Barley and spring wheat marketing	1

Table 41: Examples of raion specialists not being able to help farmers using ISS information to solve problems of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

Topic/Problem (general and specific)	Number of mentions
Don't need help/try to solve problems on own	10
ISS information on pesticides, marketing farm produces, markets is outdated	5
No information available in ISS on animal diseases, barley varieties, new crop varieties	3
No information available in ISS on leasing of agricultural machinery, including tractors	2
No information available in ISS on marketing of farm products	2
Computer accounting program did not work	1
Don't trust the information in ISS	1
Winter crop subsidy was not obtained	1
Long-term credit could not be taken	1
Information/help for stocking my pond was not provided	1
Poor internet connection reduces the efficiency of ISS	1
List of soybean processing equipment could not be obtained	1

Farmers' Knowledge of Agricultural Best Management Practices (BMPs). The next three tables (Tables 42, 43, 44) show percentages of farmers who indicated knowing or not knowing the recommendations associated with crop, livestock, and environmental best management practices.

Overall, 92.7% of farmers had knowledge of recommendations for crop production BMPs (Table 42), 62.8% knew livestock production BMP recommendations (Table 43), and 93.8% had knowledge of environmental BMP recommendations (Table 44).

The range of farmers having knowledge of specific crop BMP recommendations was 99.7% to 69.2% (Table 42), 73.0% to 42.7% for livestock BMP recommendations (Table 43), and 98.6% to 86.4% for environmental BMP recommendations (Table 44).

The information on percentages of farmers who did not know specific recommendations in the three areas is useful to program educators for targeting weaker knowledge areas in future education programs.

Table 42: Knowledge of crop best management practices (BMPs) possessed by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Best management practice (crops)	Number of respondents	Percent of respondents who knew/did not know recommendation		
		Knew	Did not know	Total
Controlling weeds	647	99.7	0.3	100.0
Planting recommended varieties	649	99.4	0.6	100.0
Using recommended seeding rate	649	99.4	0.6	100.0
Planting at right time	648	99.2	0.8	100.0
Controlling insects	645	99.1	0.9	100.0
Using correct row spacing	647	98.8	1.2	100.0
Harvesting properly	644	98.0	2.0	100.0
Using recommended fertilizers	647	97.2	2.8	100.0
Maintaining farm records	637	96.5	3.5	100.0
Following recommended crop rotation	645	95.7	4.3	100.0
Soil testing every three years	643	85.8	14.2	100.0
No-till planting	642	81.6	18.4	100.0
Using lime as recommended	641	78.6	21.4	100.0
Irrigating as needed	637	69.2	30.8	100.0
Overall	---	92.7	7.3	100.0

Table 43: Knowledge of livestock best management practices (BMPs) possessed by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Best management practice (Livestock)	Number of respondents	Percent of respondents who knew/did not know recommendation		
		Knew	Did not know	Total
Sanitary housing facility	370	73.0	27.0	100.0
Selecting or buying superior stock	269	72.6	27.4	100.0
Regular health check by veterinarian	370	70.8	29.2	100.0
Culling unproductive animals	364	69.0	31.0	100.0
Feeding balanced concentrate mixture	366	68.0	32.0	100.0
Up-to-date on required immunizations	364	65.7	34.3	100.0
Proper record-keeping	364	64.0	36.0	100.0
Using artificial insemination	365	63.0	37.0	100.0
Sanitary milking operations	363	60.1	39.9	100.0
Controlling internal/external parasites	361	57.3	42.7	100.0
Raising improved pastures	360	53.9	46.1	100.0
Practicing rotational grazing	358	50.3	49.7	100.0
Proper milking equipment/maintenance	359	48.7	51.3	100.0
Overall	---	62.8	38.2	100.0

Table 44: Knowledge of environmental best management practices (BMPs) possessed by private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Best management practice (Environment)	Number of respondents	Percent of respondents who knew/did not know recommendation		
		Knew	Did not know	Total
Plant protection – cultural	638	98.6	1.4	100.0
Plant protection – chemical	638	98.4	1.6	100.0
Not burning post-harvest stubble	631	97.3	2.7	100.0
Handling animal sludge liquor	617	95.1	4.9	100.0
Plant protection – biological	629	87.3	12.7	100.0
Plant protection – cultural, chemical, biological	616	86.4	13.6	100.0
Overall	---	93.8	6.2	100.0

Adoption of Agricultural Best Management Practices (BMPs) by Farmers. The next three tables (Tables 45, 46, 47) present information on the adoption of recommendations associated with crop, livestock, and environmental best management practices (BMPs). Farmers who had knowledge of specific practices were asked to indicate the extent to which they followed the recommendations for those practices. A 5-point response scale was provided with ratings of 4 for always following recommendations, 3 for mostly following, 2 for sometimes following, 1 for rarely following, and 0 for not following. Farmers were placed into three categories according to their responses – full adopters if always or mostly following; partial adopters if sometimes following, and non-adopters if rarely following or not following. Percentages of farmers falling into these three categories were determined. In addition, the mean adoption score for each practice was calculated by summarizing and averaging scaled responses. Overall adoption percentages and the overall adoption means shown in the tables are for all practices in each of the three BMP groups, i.e., crop, livestock, and environmental.

Overall, 72.1% of farmers fully adopted recommendations for 14 crop BMPs. The range of adoption for this category of farmers was 98.9% to 18.5% (Table 45). With regard to livestock BMPs, overall, 68.9% of farmers fully adopted the 13 practices included in this group. The range of full adoption was from 86.1% to 34.1% (Table 46). The overall full adoption percentage of 6 environmental BMPs (73.6%) was slightly more than for BMPs in the other two groups. The adoption percentage range for environmental BMPs was 94.7% to 50.4% (Table 47).

The fact that significant percentages of farmers were in the partial and non-adopter categories for several specific BMPs in all three groups (crop, livestock, and environmental) should concern extension educators. It would be important for them to focus programming efforts to increase the adoption level of those practices.

Mean adoption scores are an alternative and convenient way of analyzing and interpreting data. They provide essentially the same information as percentages on an adoption continuum. Mean scores from 2.5-4.0 can be interpreted as full adoption; scores from 1.5-2.49 indicate partial adoption, and scores below 1.5 suggest non-adoption. According to this interpretive scale, four crop BMPs require program educators' attention, i.e., no-till planting, soil testing every three years, using lime as recommended, and irrigating as needed. Three livestock BMPs, namely proper milking equipment/maintenance, raising improved pastures, and practicing rotational grazing, and one environmental BMP, biological plant protection, should receive the same educational focus.

Table 45: Adoption of crop best management practices (BMPs) among private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Best management practice (Crop)	Number of farmers ^a	Adoption score ^b	Adoption category ^c (% farmers)			Total
			Full adopters	Partial adopters	Non adopters	
Using recommended seeding rate	643	3.6	98.9	1.1	0.0	100.0
Planting at right time	640	3.5	97.6	2.0	0.4	100.0
Harvesting properly	627	3.5	97.3	2.1	0.6	100.0
Using correct row spacing	637	3.5	96.0	3.5	5.5	100.0
Planting recommended varieties	644	3.3	92.5	6.4	1.1	100.0
Properly controlling weeds	643	3.3	92.4	7.0	0.6	100.0
Maintaining farm records	614	3.3	85.5	9.9	6.6	100.0
Properly controlling insects	638	3.2	86.0	9.2	4.8	100.0
Using recommended fertilizers	627	2.9	77.2	15.8	7.0	100.0
Following recommended crop rotation	615	2.9	73.0	20.0	6.2	100.0
No-till planting	523	1.9	45.5	18.0	36.5	100.0
Soil testing every three years	550	1.6	31.8	17.5	50.8	100.0
Using lime as recommended	502	1.1	19.9	14.5	65.5	100.0
Irrigating as needed	436	0.9	18.5	5.5	76.0	100.0
All BMPs (average)	595	3.0	72.1	9.5	18.4	100.0

^a Farmers who said they knew different BMPs.

^b Mean based on a 5-point rating scale with farmers indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).

^c Full adopters – always or mostly followed practices; partial adopters – sometimes followed practices; non adopters – rarely or did not follow practices.

Table 46: Adoption of livestock best management practices (BMPs) among private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Best management practice (Livestock)	Number of farmers ^a	Adoption score ^b	Adoption category ^c (% farmers)			Total
			Full adopters	Partial adopters	Non adopters	
Sanitary housing facilities	267	3.1	86.1	4.1	9.8	100.0
Sanitary milking operations	215	3.0	84.6	0.0	15.4	100.0
Regular health check by veterinarian	258	3.0	82.1	6.2	11.7	100.0
Up-to-date on required immunizations	236	3.1	80.5	8.5	11.0	100.0
Controlling internal/external parasites	205	2.9	77.0	8.8	14.2	100.0
Culling unproductive animals	250	2.9	76.4	9.6	14.0	100.0
Selecting/buying superior stock	263	2.8	75.0	11.8	12.2	100.0
Proper record-keeping	232	2.8	74.6	9.1	16.3	100.0
Using artificial insemination	228	2.7	68.9	8.8	22.3	100.0
Feeding balanced concentrate mixture	245	2.7	65.3	20.0	14.7	100.0
Proper milking equipment/maintenance	173	2.1	53.8	6.4	40.2	100.0
Raising improved pastures	192	1.7	37.0	12.5	50.5	100.0
Practicing rotational grazing	176	1.6	34.1	14.8	51.1	100.0
All BMPs (average)	226	2.7	68.9	9.3	21.8	100.0

^a Farmers who said they knew different BMPs.

^b Mean based on a 5-point rating scale with farmers indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).

^c Full adopters – always or mostly followed practices; partial adopters – sometimes followed practices; non adopters – rarely or did not follow practices.

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Table 47: Adoption of environmental best management practices (BMPs) among private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Best management practice (Environment)	Number of farmers ^a	Adoption score ^b	Adoption category ^c (% farmers)			
			Full adopters	Partial adopters	Non adopters	Total
Plant protection – cultural	626	3.3	94.7	4.6	0.7	100.0
Plant protection – chemical	625	3.3	90.9	7.4	1.7	100.0
Not burning post-harvest stubble	614	3.0	72.1	16.9	11.0	100.0
Handling animal sludge liquor	583	2.7	71.5	12.0	16.5	100.0
Plant protection – cultural, chemical, biological	531	2.5	61.8	18.8	19.4	100.0
Plant protection – biological	547	2.1	50.4	13.9	45.7	100.0
All BMPs (average)	588	2.8	73.6	12.3	14.1	100.0

^a Farmers who said they knew different BMPs.

^b Mean based on a 5-point rating scale with farmers indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).

^c Full adopters – always or mostly followed practices; partial adopters – sometimes followed practices; non adopters – rarely or did not follow practices.

Attitudes and Aspirations of Farmers. The move toward a market-driven economy and the spread of democracy and political freedom over the last 15 years of Ukraine's independence have created an environment in which people can see positive changes in their lives and raise their desires and hopes for a better future for themselves, their families, and their communities. It is important, therefore, to determine how attitudes and aspirations of people might have changed not only due to the more favorable social environment but also how the project might have contributed to these changes.

Following this line of thinking, 13 attitude/aspiration (A/A) statements (12 positive and 1 negative) were posed to farmers and they were asked to indicate if they agreed, did not have an opinion, or disagreed with the statements. Their responses are summarized as percentages of farmers who fell into these response categories for each statement and overall for all statements. Mean A/A scores for each practice and all practices were also determined. One negative statement was reverse scored for frame of reference consistency. The results of this analysis are presented in Table 48.

Both measures – percentages and means – show that farmers are very positive. Overall, for the set of 13 statements the high mean score of 2.71 on a score range of 0-3 (negative to positive) suggests a high positive regard for various aspects of their personal, family, community, and social life. Two positive statements – Farmers should rely on their own resources rather than the government, and I trust the government – elicited a lukewarm to negative response. This can be interpreted as an extension of the public's thinking from the communist era when people depended on the social security net of government and at the same time distrusted it for intruding into their private lives.

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Table 48: Attitudes and aspirations of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Attitude/Aspiration (AA)statement	Number of farmers	Mean A/A score ^a	Extent of agreement with A/A statement (% farmers)			
			Agree	No opinion	Disagree	Total
Farmers must use science-based crop and livestock information to be successful	642	2.98	98.3	0.0	1.7	100.0
Village councils should treat all people equally	639	2.96	97.0	2.0	1.0	100.0
I look forward to a better life for my family	641	2.94	95.8	2.2	2.0	100.0
I like to take responsibility for my actions	636	2.93	94.0	5.0	1.0	100.0
I want to be a successful farmer making a good income by following scientific methods	641	2.91	94.4	2.7	3.0	100.0
My outlook on life and the world is positive	639	2.88	90.0	8.3	1.7	100.0
If farmers join together they can be stronger and more successful than as individuals	644	2.85	88.0	8.5	3.5	100.0
I trust people with whom I have agricultural transactions	637	2.84	87.3	9.9	2.8	100.0
The next generation of Ukrainians will be much better off than our generation	643	2.84	86.2	11.7	2.2	100.0
Government should give farmers money when they have financial difficulties	547	2.80	85.5	8.8	5.7	100.0
I am confident that our oblast has a bright future	632	2.65	71.5	22.3	6.2	100.0
I feel we were better off in collective farms than in the new private farming system ^b	638	2.34	13.5	19.6	66.9	100.0
Farmers should rely on their own resources rather than the government	638	2.13	49.7	13.6	36.7	100.0
I trust the government	638	1.91	22.1	26.3	41.6	100.0
Overall (average)	633	2.71	77.3	10.1	12.6	100.0

^a Based on a 3-point response scale: 3=agree; 2=no opinion; 1=disagree.

^b Negative statement: mean calculated by reverse scoring responses (1=agree; 2=no opinion; 3=disagree)

Section 2. Project and Farmer Performance and Perceptions of Private Farmers in Cherkasy and Khmelnytsky Oblasts

This section assesses the overall performance of the project in Cherkasy and Khmelnytsky oblasts as judged on 5 core indicators and the performance of farmers in these oblasts on 13 selected agricultural production indicators over the 3-year term of the Project. This is done by comparing information from the baseline and end-of-project surveys conducted in 2002 and 2004, respectively. Additionally, in the end-of-project survey, farmers responded to questions about the changes they perceived the project brought about in their agricultural operations, as well as the economic, social, and environmental impacts of the project in their communities. This information is included.

Project Performance

Five indicators - educational participation, technology use (adoption), input use/cost, crop yield, and productivity (average gross income) - were specified in the project proposal to assess its success in reaching the goal of improving income of private farmers. The program logic of these indicators is that participation in education programs over a period of time leads to increased use of agricultural technology and production inputs, resulting in increased crop yields and overall productivity (defined as gross income).

Table 49 compares baseline and end-of-project information for these indicators. For each indicator, the measurement unit, baseline and end-of-project quantities, and changes in these quantities (absolute and percentage values) as a result of the project's educational intervention are presented.

All indicators showed positive changes over the three years of the project. Educational participation of farmers, as measured by number of individuals served by the project's Extension staff, increased from 1,259 at the beginning of the project to 3,374 at the end of the project (167.9% increase). New agricultural technology learned in the education programs influenced adoption of recommended technology, which increased by 77.0% over the life of the project. Increased technology adoption resulted in greater input use and cost (66.7% increase). This contributed to a significantly higher overall crop yield (37.2% increase), and an increase of 104.4% in agricultural productivity (average gross income). Thus, the project was successful in changing the educational behavior of private farmers which enabled them to improve crop yields and income.

Farmers' Agricultural Production Performance

The baseline/end-of-project comparison of indicators of farmers' agricultural production performance shows positive changes over the three-year life of the project. (Table 50)

- Larger quantities of grain/horticulture crops and livestock products were produced by farmers in 2004 compared to 2002. The average quantity of grain/horticulture crops produced per farmer registered a 77.8% increase. For beef, pork, and poultry the average quantity produced per farmer increased by 33.3%. The average per producer amounts of crop and livestock products sold in 2004 were also higher - 198.6% for crop products, 345.7% for beef, pork, and poultry, and 69.0% for eggs.
- Total amount of credit taken increased 10%, and the number of farmers using credit increased by 153%. But, the average credit per farmer saw a decrease of 56.5%.
- There was a slight rise in the area of farm buildings per farmer (2.3%), and 31.3% of farmers acquired new farm machinery and equipment.

Table 49: Project performance in Cherkasy and Khmelnytsky oblasts as a result of the educational intervention with private farmers, 2002-2004

Project performance indicator	Measure	Baseline 2002	End-of-Project 2004	Change in 2004 over 2002	
				Quantity	Percent
Educational participation ^a	# of persons	1,259	3,374	(+) 2,115	(+) 167.9
Technology adoption ^b	% farmers	42.1	74.5	(+) 32.4	(+) 77.0
Input cost ^c	\$	2,446.0	4,078.6	(+) 1,632.6	(+) 66.7
Yield ^d	c/ha	33.8	46.4	(+) 12.6	(+) 37.2
Productivity ^e	\$	7,784.0	15,916.0	(+) 8,132.0	(+) 104.4

^a Number of different individuals who participated in workshops, seminars, demonstrations, and office and farm visits organized by Center faculty/raion specialists.

^b % farmers who "always" or "mostly" adopted 27 crop and livestock management practices

^c Per farmer average cost of seeds, livestock feed, organic fertilizers, chemical fertilizers, crop protection chemicals, fuel. Baseline figure calculated by multiplying the reported quantities by the prevailing input prices for a six-month period. End-of-project figure is actual cost reported by farmers.

^d Average aggregate yield of wheat, rye, barley, buckwheat, corn, sugar beet, potatoes, vegetables (carrots, cabbage, cucumbers, tomatoes, onions), fruits (apples, plums)

^e Defined as average gross income and calculated by (1) multiplying total production of crop and livestock commodities by prevailing commodity prices averaged for a six-month period, (2) subtracting total cost of production inputs, and (3) averaging the difference. Includes only producers who (1) harvested not more than 100 hectares, and (2) had a calculated gross income in the range of (-) \$100 and (+) \$65,000.

- The proportion of crop and livestock production sold through organized markets increased by 32.1%.
- That farmers are becoming better managers is seen in the significant increase (32.1%) in the number of farmers who developed written production, business, and marketing plans toward the end of the project.
- Over three-fourths of farmers indicated using the project as their primary source of agricultural information technology, and 83.9% were assisted by raion specialists and faculty to solve operational problems using the computerized information support system (ISS).
- Knowledge and use of crop and livestock production and management best management practices (BMPs) showed significant gains - 33.8% more farmers knew and 77.0% more farmers used these practices in 2004 compared with 2002.

Table 50. Changes in the agricultural operations of private farmers of Cherkasy and Khmelnytsky oblasts as a result of the project's educational intervention, 2002-2004

Production Indicator	Measure	Baseline 2002	End-of-Project 2004	Change in 2004 over 2002	
				Quantity	Percent
Crops¹					
Area harvested – total	Hectares	23,726.0	36,828.5	(+) 13,102.5	(+) 55.2
Area harvested – av/producer	Hectares	22.8	26.3	(+) 3.5	(+) 15.4
Amount produced – total	Centners	751,745.3	1,710,087.2	(+) 958,341.9	(+) 127.5
Amount produced – av/producer	Centners	717.9	1,276.2	(+) 558.3	(+) 77.8
Amount sold – total	Centners	499,999.0	1,493,107.7	(+) 993,108.7	(+) 198.6
Amount sold – av/producer	Centners	596.7	1,265.4	(+) 668.7	(+) 112.1
Milk²					
Amount produced – total	Centners	6,413.5	46,865.0	(+) 40,451.5	(+) 404.5
Amount produced – av/producer	Centners	75.4	366.1	(+) 290.7	(+) 385.5
Amount sold – total	Centners	3,117.0	41,316.0	(+) 38,199.0	(+) 1,145.9
Amount sold – av/producer	Centners	52.8	338.6	(+) 285.8	(+) 541.3
Beef, pork, poultry					
Amount produced – total	Centners	2,089.6	6,846.0	(+) 4,756.4	(+) 198.9
Amount produced – av/producer	Centners	11.7	15.8	(+) 3.9	(+) 33.3
Amount sold – total	Centners	1,241.0	5,530.6	(+) 4,289.6	(+) 345.7
Amount sold – av/producer	Centners	9.3	21.7	(+) 12.4	(+) 133.3
Eggs					
Number sold – total	Number	83,100	140,450	(+) 57,350	(+) 69.0
Number sold – av/producer	Number	5,540	2,194	(-) 3,346	(-) 60.4
Other indicators					
Credit used	# of farmers	49	124	(+) 75	(+) 153.0
Credit used – total	\$ (US)	824,320.0	907,437.0	(+) 82,617.0	(+) 10.0
Credit used – av/farmer	\$ (US)	16,809.0	7,318.0	(-) 9,491.0	(-) 56.5
Farm buildings – area/farmer	sq. meters	2,437.7	2,491.0	(+) 56.3	(+) 2.3
New farm equipment acquired	% farmers	n/a	31.3	---	---
Organized markets used ³	% production	57.6	76.1	(+) 18.5	(+) 32.1
Written farm plans developed ⁴	% farmers	19.3	47.0	(+) 27.7	(+) 143.5
Project as an information source ⁵	% farmers	n/a	76.0	---	---
Information Support System used ⁶	% farmers	n/a	83.9	---	---
Knowledge of BMPs ⁷	% farmers	63.6	85.1	(+) 21.5	(+) 33.8
Use of BMPs ⁸	% farmers	42.1	74.5	(+) 32.4	(+) 77.0
Positive attitudes ⁹	% farmers	77.9	82.1	(+) 4.2	(+) 5.4

¹ Wheat, barley, buckwheat, rye, corn, sugar beet, potatoes, vegetables (carrots, cabbage, cucumbers, tomatoes, onions), fruits (apples, plums)

² Large difference between baseline and end-of-project figures due to (a) under-reporting in 2002, and (b) a number of farmers who took over the former collectives and had large herds were a part of the end-of-project survey.

³ Legitimate market outlets that allow sellers to enter a retail chain and obtain a tax receipt. Examples include Farmers market, Farm store, Bread Ukraine wholesale company, Retail buyers, Stock exchange, Processing company, Auction, Fair, Government agency

⁴ Production, business, marketing plans

⁵ Average of information source use in 13 subject-matter areas. Much smaller average percentages of farmers used other information sources: Ministry/Agro-industrial Complex (17.0%); College, University, Research Station (14.8%); Other Farmers (12.6%); Agribusiness (6.8%)

⁶ Help in solving problems in agricultural operations

⁷ Farmers who knew recommendations of crop BMPs (14) and livestock BMPs (13)

⁸ Farmers who "always" or "mostly" followed recommendations of crop BMPs (14) and livestock BMPs (13)

⁹ Farmers who "strongly agreed" or "agreed" with 13 positively-worded attitude statements

Farmers' Perceptions of Changes/Impacts From Participation In the Project

In the end-of-project evaluation survey, farmers were asked to respond to questions about the changes they perceived the project brought about in their agricultural situation, and the economic, social, and environmental impacts of the project in their communities. Responses are presented in Table 51.

Over 80% of the farmers indicated that their gross income and net profit from crop production increased over the period of the project, while over 60% of them said gross income/net profit from livestock production increased. In terms of per animal unit of livestock production, over one-half of the producers indicated improved performance in their dairy, beef, swine, and poultry operations

A majority of farmers felt the project had an economic impact on community life in terms of overall economic improvement, as well as specifically increasing agricultural incomes, savings, and purchases of consumer goods.

Specific examples of agricultural and economic improvements given by farmers were: farms became more productive/profitable (2 mentions); farmers increased crop yields, by as much as 50% in some cases (2 mentions); farmers learned how to plan for and grow appropriate crops (1 mention); farmers learned how to cultivate and market crop products (1 mention); farmers increased their knowledge of crop production technology (1 mention); farmers were helped in purchase of farm inputs and products marketing (1 mention). Reasons given by farmers who perceived the project did not have an economic impact on the community included the lack of stable and farmer-friendly government price policies (8 mentions), imbalance between production costs and market prices (2 mention), general deterioration of the rural economies (2 mentions), unsatisfactory/inadequate state support for farmers (1 mention), and unfavorable weather conditions (1 mention).

Social impacts of the project were seen by a majority of farmers in their increased participation in community groups and the benefits they personally received in agricultural operations from such participation. Nearly four-fifths (78.1%) said they had joined a village or raion group and cited the group's achievements as a result of the project's educational intervention. A list of these achievements for each of the three oblasts is shown in Table 52 along with the number of mentions.

Farmers also indicated significant personal and family involvement in community events and activities which were mutually beneficial to them and the community. Nearly two-thirds (64.5%) indicated they were invited to participate in meetings of administrative entities (village council, raion administration, Ministry of Agriculture). Results of such participation for each of the three oblasts are shown in Table 53 along with the number of mentions.

Four-fifths of farmers indicated that the environmental education programs of the project had influenced individual and community behaviors/actions to protect and preserve the environment. Examples of environmentally conscious behaviors/actions resulting from the project's educational intervention are shown for each oblast in Table 54 along with the number of mentions.

Table 51: Private farmers' perceptions of changes/impacts resulting from participation in the project, Cherkasy and Khmelnytsky oblasts, 2002-2004

Changes in Production Performance

Production performance indicator	Number of farmers reporting	Percent of farmers indicating change		
		Increase	No change	Decrease
Crop production				
Gross income	495	85.5	10.3	4.2
Net profit	490	82.7	13.3	4.0
Animal production				
Milk production (unit)	162	68.5	36.9	0.6
Beef cattle (unit)	111	49.6	48.6	1.8
Swine production (unit)	193	67.4	31.1	1.5
Poultry production (unit)	157	63.7	35.0	1.3
Gross income (overall)	235	76.2	23.0	0.8
Net profit (overall)	236	73.3	25.4	1.3

Economic Impact

Economic impact indicator	Number of farmers reporting	Percent of farmers		
		Yes	No	Not sure
Agricultural and economic situation improved	494	78.1	9.1	10.8
Agricultural income increased	467	83.5	5.1	11.4
More money saved for expenditure/investment	446	69.5	9.6	20.9
More consumer goods and services purchased	446	64.6	11.7	23.7
Project contributed to economic improvement	483	84.3	1.9	13.8

Social Impact

Social impact indicator	Number of farmers reporting	Percent of farmers	
		Yes	No
Joined a village or raion group ^a	485	78.1	21.9
Participated very actively or actively in the group	397	57.4	42.6
Group enlarged its activities	407	71.3	28.7
Group helped farm families:			
*Acquire farm inputs	414	67.9	32.1
*Acquire or enable use of farm machinery	413	67.1	32.9
*Market agricultural products	413	59.8	40.2
Farmer's family assisted/involved in community events:			
*Volunteered time and labor	429	45.9	54.1
*Provided/shared farm inputs	436	70.4	29.6
*Lent equipment to other farmers	435	71.5	28.5
*Participated in community events	432	68.1	31.9
*Donated money	431	38.7	61.3
Family received support from community	473	59.8	40.2
Project promoted family's participation in community	469	83.6	16.4
Local administrative bodies invite farmers to seminars/meetings to solicit their ideas	478	64.6	35.4

^a association, cooperative or social/civic group

Environmental Impact

Environmental impact indicator	Percent of farmers (N=495)		
	Yes	No	Not sure
Project influenced farmers'/community behavior/actions to protect and preserve the environment	80.4	5.7	14.9

Table 52: Examples of achievements of groups of which farmers became members as a result of the project educational intervention in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

Farmer responses regarding achievements of groups of which they became members	Number of mentions
Khmelnytsky Oblast	
Created a climate of mutual help and understanding among farmers/in community(Sharing agricultural machinery; Cooperative agricultural operations such as tilling and sowing crops, maintaining machines, a common threshing floor, harvesting, procuring inputs, security watch; Increased friendships; Doing things together; Uniting people; Helping war veterans)	25
Advisory Committee participation and work accomplishments (Accessed agricultural information; Purchased inputs; Marketing of products; Organized educational activities; Established mini-machinery park; Worked with veterans and organized young farmers groups; Created products marketing group; Brought people together; Elected farmers association council)	12
Sharing of farming experiences with other farmers	7
Potato production enhancements (Joined potato growers association; Spread high quality potato seed using a small grant; engaged new people in production activities)	3
Organized marketing of farm products	3
Milling grain for better profit	1
Won competitive contract to supply hospitals, kindergartens, sanitariums with vegetables/potatoes	1
Helped village community establish machinery production facility	1
Village women's group opened a kindergarten school in the village	1
United in an agricultural cooperative and started sausage production	1
Farmers, HPOs, and "Romashka" farm expanded field under herb production/increased profit	1
Cherkasy Oblast	
Spread mutual trust and understanding in community/Gained trust/Provided support/Worked together/Established friendships/Solved problems/Shared experiences/Enjoyed common interests	50
Promoted networking and communication among farmers for information sharing, learning, problem solving	15
Organized marketing for better grain/milk prices	8
Increase in cultivated land area from existing/new farm enterprises and asset shares of group members, including HPOs	6
Agricultural service cooperative formed/membership increased	6
Farmers Association created	6
Increased income from group activities	5
Improved ecological practices/conditions in villages	4
Farmers Association/Advisory Committees enjoy respect in raion	3
Asset share holders association created/income increased	2
Group members enjoy respect, support, and offers of cooperation	1
Group was authorized to present its interests in raion council/elected a deputy	1
Vegetable producers association increased output and provided services	1
A group of people with common interests was created	1
A local school was funded	1
Community pasture created and supply of vegetables organized	1
Farmers Association and Producers Council are respected organizations and a political force	1
Farming movement has become active and gained political momentum	1
Six farm enterprises work together in crop production, are active in village social life, support school financially	1
Thirteen people cultivate land together	1
Vinnytsia Oblast	
Farmers were united/assisted in solving problems and overcoming difficulties, organizing purchase of inputs, obtaining land shares, harvesting crops, spreading useful information, improving agricultural situation, organizing produce marketing, engaging each other	25
Promoted networking and communication among farmers for information sharing, learning, problem solving (started news column in local paper; machinery exchange)	5
Encouraged adoption of new technology	3
Organized farm service cooperative	2
Increased agricultural production/labor and farm productivity/income	2
Competed for/ received two small grants (vegetable production and mineral fertilizer purchase)	2
Established farmers credit union	1

Table 53: Examples of results of private farmers participating in local administrative entities (village council, raion administration, Ministry of Agriculture) as a result of the project's educational intervention, Cherkasy, Khmelnytsky, and Vinnytsya oblasts, 2002-2004

Farmer responses regarding results of participation in local administrative entities	Number of mentions
Cherkasy Oblast	
Information was shared with people (national/local government requirements; general and specific farming, fertilizers, fuel matters; stimulating business activities)	12
Support and sponsorship of new and positive ideas, activities to improve community life, protection of the interests of landowners, advocacy for farmers, influence of local authority	10
Securing financial support for farmers/community (village/raion events; farm roads repair; school; soil cultivation; fertilizer purchase; winter crop compensation; village council budget)	7
Learning (new ideas; legislation; markets; rational use of land and machinery; education programs of service cooperative "Ukraina")	7
Assistance (school; cultivating household plots; helping seniors in agricultural operations; securing bus transportation; repair of village club)	7
Cooperation (state-run institutions and farming enterprises; ecological issues; social programs; creating service cooperative)	5
Problem-solving (family, community, producers problems)	5
Four individuals served as deputies on village councils (helped form budgets for rural community; took active part in community issues/life)	4
Three individuals served as deputies on raion councils (took part in developing budgets; obtained financial support – 5,000 UAH – for agricultural development program)	3
Asset share holders association created and land titles issued	3
Promotion of farming/farm enterprises in community life and obtaining local government support	3
Village infrastructure development	2
Organizing and attending meetings; presenting information on various topics at seminars	2
Improved ecological situation	1
Khmelnytsky Oblast	
Learning new ideas/technology (attending seminars; conducting seminars; attending field days; procedures and documents to receive state subsidy for winter crops; obtained subsidy; agricultural technology/seeds/seed improvement)	16
Support and sponsorship (political issues, candidates, viewpoints, personal involvement in campaigns; agricultural issues and viewpoints; new ideas in science and agriculture, procurement of agricultural inputs)	12
Information exchange/dissemination (agricultural situation and activities in raion; agricultural products markets and marketing; agricultural prices; use of radio; crop growing technology)	9
Participation in and use of local meetings (observation; communication regarding agriculturists days; learn how to survive in difficult market/village conditions; promote agricultural products marketing; provide agricultural situation updates; receive land utilization reports; exchange farming experiences)	6
Farming subsidies obtained (for agricultural products/ crops produced on farm; 500 UAH for 5 tons of fertilizer)	3
Three individuals served as deputies on village councils (support HPOs' agricultural operations)	3
Two individuals served as deputies on raion council (advocate farmers' agricultural operations)	2
Help other farmers/establish closer relations with farmers	2
Vinnytsia Oblast	
Sharing of information and experiences through participation in village life/activities/meetings	16
Learning new ideas/technology	13
Developing/improving village infrastructure (gas pipeline constructed; village roads repaired)	3



Table 54: Examples of environmentally conscious behaviors/actions of private farmers in Cherkasy, Khmelnytsky, and Vinnytsia oblasts resulting from the Project's educational intervention (2002-2004)

Environmentally conscious behaviors/actions by farmers	Number of mentions
Cherkasy Oblast	
Used agricultural chemicals at recommended/lower rates (fertilizers, pesticides, weedicides, fungicides) to protect crops and promote optimum growth	38
Learned about environmental issues and protection in agricultural production/rural life, feel responsible for and take care of the environment	31
Followed biological methods of pest management/plant protection	24
Plant residues not burned but buried/tilled in soil or mulched into organic manure to increase soil fertility and reduce environmental contamination	19
Community awareness/activities/actions (reduced use of waterless ammonia and furadan treated seeds; Fish and lobsters reappeared in rivers; Black fallow controlled weeds and increased soil moisture; Alley of Glory planted near school and trees/bushes in park; Garbage dump built in village; Eight hectares of land from land reserve given for community pasture; Children taught to keep homesteads and streets clean/plant flowers and bushes/appreciate nature and protect environment ; Planted a windbreak; Planted flower bed near park; Funded a bio-laboratory; Provided money for planting a park in village; Purchased building materials for school; Built children's playground near kindergarten school)	13
Practiced no-till, minimum till	9
Controlled soil erosion (proper cultivation; planting pine trees on hills/slopes)	7
Used Trychogramma on corn, sugarbeet pests	6
Rational use of land (eg. nature protection zones near rented water receivers)	5
Followed safety measures of storage and disposal of farm chemicals	5
Used crop rotation	4
Khmelnytsky Oblast	
Plant residues not burned but buried/tilled in soil or mulched into organic manure to increase soil fertility and reduce environmental contamination	46
Used agricultural chemicals at recommended/lower rates (fertilizers, pesticides, weedicides, fungicides) to protect crops and promote optimum growth	32
Learned about environmental issues and protection in agricultural production/rural life and took appropriate actions (environmental days organized)	13
Trees planted	13
Community awareness/activities/actions (Cut brush in cemetery; Repaired/paved village roads; Formed/boarded village well; Planted orchards; Children cleaned litter from forest areas and roads; Community pasture developed; Village ponds cleaned; Village streets cleaned; Water well dug; Three stork nests built; Farm roads built; Sanitation days to clean village areas; Cut sidewalk weeds)	13
Followed proper storage and disposal of farm chemicals, chemical containers, pesticide wastes, fuels, lubricants	10
Controlled soil erosion (planted cover crops; not cultivating/terracing slopes)	5
Vinnytsia Oblast	
Learned about environmental issues and protection in agricultural production/rural life and took appropriate actions (Reduced trash; Washed pesticide application equipment in a special place with a drainage pit; Seeds treated with emulsified concentrate formulation; prepared fact sheets on environmental protection; Youth education programs conducted)	22
Used IPM approach in plant protection and ecologically safe/environmentally friendly agricultural production	16
Plant residues not burned but buried/tilled in soil or mulched into organic manure to increase soil fertility and reduce environmental contamination	15
Used agricultural chemicals at recommended/lower rates (fertilizers, pesticides, weedicides, fungicides) to protect crops and promote optimum growth	14
Community awareness/activities/actions (Developed forest belt; Observed environmental protection laws; Properly stored and used organic manure; Stopped livestock wastes on and removed construction materials from village streets)	5
Followed biological methods of pest management/plant protection	2

Appendix Table 1: Specialization of private farmers by highest education level completed in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Education Level/Specialization	Number and % of farmers by education level	
	Number	%
Candidate of Science		
Agronomy	1	50.0
Pedagogy	1	50.0
Total	2	100.0
Master of Science		
Agronomy	2	40.0
Agriculture	1	20.0
Economics	1	20.0
Pedagogy	1	20.0
Total	5	100.0
Specialist/Bachelor Degree		
Agriculture	110	34.0
Agronomy	74	22.8
Engineering (electrician, mechanic, technician, hydro, military, mining, power, radio, machine building)	54	16.7
Pedagogy	16	4.9
Agricultural Engineering	15	4.6
Economics	13	4.0
Biological Engineering/Zoo-technology	8	2.5
Law/Judicial Education	7	2.2
Accounting/Economics	7	2.2
Electronics/Electricity	5	1.5
Construction/Building Construction	4	1.2
Agricultural Economics	2	0.6
Veterinary Science/Veterinary Medicine	2	0.6
Forestry/Forest Engineering	2	0.6
Horticulture	1	0.3
Animal Science	1	0.3
Commerce	1	0.3
Food processing	1	0.3
Journalism	1	0.3
Total	324	100.0
Technical College		
Agriculture	68	36.6
Engineering/Mechanization ((electrician, mechanic, technician, power, machine building, construction, driving)	52	31.2
Agronomy	14	7.5
Pedagogy	9	4.8
Agricultural Engineering	8	2.7
Biological Engineering/Zoo-technology	6	3.2
Law/Legal Education	4	2.2
Medicine	4	2.2
Accounting	3	1.6
Agricultural Economics	3	1.6

Construction/Building Construction	3	1.6
Economics/Trade	3	1.6
Food Processing	2	1.0
Veterinary Medicine	1	0.5
Aircraft technician	1	0.5
Commodity Research	1	0.5
Forestry	1	0.5
Military	1	0.5
Transportation	1	0.5
Total	186	100.0
Vocational School		
Agriculture	25	44.6
Engineering/Mechanization/Polytechnic	13	23.2
Military	3	5.4
Tractor Operation	3	5.4
Agronomy	2	3.6
Music	2	3.6
Carpentry	1	1.8
Construction	1	1.8
Culture	1	1.8
Driving	1	1.8
Welding	1	1.8
Economics	1	1.8
Forestry	1	1.8
Seamstress/Sewing	1	1.8
Total	56	100.0
High School		
Agriculture	5	27.7
Engineering	5	27.7
Driving	4	22.2
Tractor Driving	1	5.6
Economics	1	5.6
Teaching	1	5.6
Veterinary Technician	1	5.6
Total	18	100.0
8 years of school		
Agriculture	1	50.0
Machine building	1	50.0
Total	2	100.0

Attachment#2

Final Evaluation Report (HPO Outreach)

**Final Evaluation Report of
Home Plot Owners Outreach Education**

June 2005

Submitted by

International Programs
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In Partnership with

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International Center for Scientific Culture
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USAID Project: Improving Income of Private Ukrainian Agricultural Producers through Agricultural Extension, 2002-2005

**Final Evaluation Report of Home Plot Owners Outreach Education
Summary**

Project Background

A three-year extension education project intended to improve agricultural production of small private farmers and home plot owners (HPOs) in three oblasts – Cherkasy, Khmelnytsky, and Vinnytsya - in Ukraine began on March 1, 2002 and ended on February 28, 2005. Funded by the US Agency for International Development (USAID), the Louisiana State University Agricultural Center (LSU AgCenter), as Project contractor, partnered with the World Laboratory, Ukraine Branch, Kyiv and state agricultural universities/academies in the three oblasts to organize, plan, conduct, and evaluate education programs targeting private farmers and HPOs.

Organized through a state agricultural university/academy in each oblast, the project covered 67 raions (counties) and involved approximately 3,500 private farmers and 10,000 HPOs. Selected university/academy faculty possessing advanced degrees in different agricultural disciplines and raion specialists (county agents) with a basic agricultural degree were recruited and trained in extension program development and adult education methods. Subsequently, for a period of 2-3 years, educational seminars, workshops, demonstrations, and personal consultations were planned and conducted by the faculty and raion specialists in a number of crop and livestock production, management, and marketing subjects to enable farmers and HPOs to learn and apply research-based technology in their agricultural operations. The programs in each oblast were managed and supervised by an Oblast Center Coordinator with university faculty assisting in the management operations.

This report covers that portion of the project's work which was focused on outreach education of HPOs. A separate report addresses the outreach education work with small private farmers (LSU Agricultural Center, Final Evaluation Report of Private Farmers Outreach Education, June 2005).

Evaluation Methodology

Evaluations of HPO outreach education included gathering baseline information (September 2003) and end-of-project information (September 2004). It was anticipated that focused education programs conducted on a variety of subjects over two crop growing seasons would enable HPOs to learn and apply recommended technology in their agricultural operations, resulting in gains in agricultural performance and overall productivity.

In the baseline evaluation approximately 100 HPOs in each of the three oblasts, and in the end-of-project evaluation 250 HPOs each in Cherkasy Oblast and Khmelnytsky Oblast and 150 HPOs in Vinnytsya Oblast, were randomly selected for personal interviews by the raion specialists. Lists of HPOs participating in the project's education programs were maintained in each oblast. Samples were drawn from these lists using a computerized random numbers table. Primary and alternate lists of sample respondents were prepared. If an HPO on the primary list refused to be interviewed or could not be found after two attempts by the raion specialist the next name on the alternate list was chosen.

Raion specialists took part in a one-day training session to learn personal interview techniques, become familiar with the survey instruments, and practice interviewing. In the practice session, each raion specialist interviewed a fellow raion specialist to get the experience of a real-life encounter.

Information gathered in the surveys covered personal attributes of HPOs, their agricultural operations, including production, management, and marketing of cereal and horticultural crops and livestock products, farm assets, their knowledge and adoption of agricultural best management practices, and their attitudes and aspirations.

Evaluation Findings

Evaluation findings are presented in two sections. Section 1 describes personal attributes, agricultural operations, and educational behavior of HPOs as determined by the end-of-project survey (2004). Section 2 documents the influence of the education programs conducted on overall project performance and HPO agricultural production performance by comparing baseline and end-of-project information. HPOs' perceptions of changes resulting from the project are also included in this section.

Personal Attributes, Agricultural Operations, and Educational Behavior of HPOs

Personal Attributes

HPOs were relatively young (mean age 46.8 years), predominantly male (81.3%), received their education largely at a technical college (33.4%) or a university (31.1%), lived in the same household with a spouse (87.3%), children (78.9%) and/or a parent (34.6%), a majority of them (53.5%) deriving less than 50% of family income from the sale of agricultural products produced on home plots, a minority of them (30.1%) employing from 1-26 seasonally hired workers, with about one-fourth of HPOs belonging to a local/oblast farmers' associations (25.6%) or a civic/social group (21.2%). They perceived many benefits from these organizational affiliations, such as information sharing and farm operations assistance, and recognized the importance of participation in these organizations in buying inputs and selling their produce.

Agricultural Operations

Nearly four-fifths of HPOs began producing and selling agricultural products from their home plots in the last ten years (79.8%). Ten percent began between 1991 and 1995, and the remaining 10.2% before 1991. Some of them had been selling agricultural products as far back as 1950.

The average of cultivated land per HPO in home plots was 4.9 hectares, with a range of less than 1 hectare to 20 hectares.

A majority of home plots were single parcels of land (62.6%). As many as 24.7% of the home plots were in two land parcels, and the remaining 10.7% of home plots had 3, 4 or 5 land parcels. It is expected that HPOs with more land may have multiple land parcels. This could make it difficult for them to effectively manage their agricultural operations

A majority of home plots (59.2%) had been acquired by a title from the village council. However, family land shares (29.9%) and leasing land (14.4%) were also significant. Total area of land in home plots was 3,207 hectares.

HPOs had a variety of farm buildings and structures on their home plots, such as animal sheds, underground vegetable/fruit storage, and garages. About one-sixth of them had covered grain storage facilities and machinery/tool sheds. The average area of all farm buildings and structures on home plots was 514.8 sq meters.

HPOs owned or mutually exchanged with other HPOs the farm machinery and equipment they needed for their agricultural operations.

Barley and wheat were the principal cereal crops grown by 64.5% and 60.4% of HPOs, respectively. Other significant row crops grown were corn (23.1% HPOs), sugar beet (21.1%), green forage, hay and silage (20.0%), feeding beet (19.8%), and buckwheat (17.6%). Potatoes was a significant crop raised by 38.9% of HPOs. Vegetables were also of significance, with 43.9% of HPOs raising carrots, cabbage, cucumbers, tomatoes, and/or onions. A few HPOs (7.2%) raised apples. Total harvested area under row and horticultural crops was 3,494.3 hectares and the total crop produced was 199,299.6 centners. Most of the production was sold (80.7%), the balance used in the home or kept for seed.

Livestock products produced in 2004 totaled 18,027 centners of milk, 3,133.2 centners of beef and pork, and 97.8 centners of sheep/goat meat. The production of bird products was significant – 20,014 kg of chicken broilers, 13,313 kg of geese, and 7,353 kg of duck. As many as 10.2% of HPOs raised rabbits and sold 1,220 kg. Major portions of livestock products were sold, with some quantities kept for home consumption. Egg production totaled 615,710. Unlike the other livestock products, most of which was consumed in the home, more than one-half (57.4%) of the eggs produced was sold.

The majority of HPOs (51.0%) sold their farm produce through organized outlets such as farmers markets. But many of them also used processors (31.9%) or agribusiness companies (16.8%). One-fourth of HPOs (25.2%) sold their agricultural produce by themselves.

For HPOs reporting input use/cost, the largest cost was salaries/wages (average of \$551.60). Livestock feed, labor, fuel, and seeds were the next largest costs, the average ranging from \$481.10 to \$403.00. Other input costs included crop protection chemicals (\$310.70), chemical fertilizers (\$295.30) and organic fertilizers (\$170.20).

It is interesting that nearly one-third of HPOs paid salaries/wages to employees (32.5%) and hired paid labor (31.0%) to supplement family labor. This indicates a trend toward cash transactions, which might signify a growth in business entrepreneurship. This is a healthy and positive sign for a privatized, market-based economic system.

The project was most frequently mentioned (401 times) as a source of assistance, either in receiving actual inputs, and/or information regarding input use. Agribusiness companies were next with 40 mentions. Less frequently mentioned were other farmers (36 times) agricultural boards/departments (12 times), and farmers associations (6 times).

Significant proportions of HPOs followed eight recommended farm management practices. They ranged from 51.7% who used consulting assistance to 18.9% who planned and recorded the use of hired labor in a written format.

Only 7.6% of HPOs took agricultural credit in 2003/2004. A majority said they did not take credit because of the debt/risk (59.8%), and high interest rate (53.9%). Complex loan procedures (48.6%) and large repayment amount (42.5%) were other significant reasons. Many of them did not need a loan (40.2%) or did not have the required collateral/security (37.2%). Others said that only short-term loans were available (37.3%) or that the minimum loan amount was too high (31.2%).

For those HPOs who took agricultural credit, the average loan was \$936.40, the average interest rate was 20.8%, and the average length of all loans was 11.4%.

The most common source of agricultural credit was an agribusiness company (51.1% of HPOs who took loans). Friends/family members were next (37.2%). Banks (11.1%) and credit unions (7.0%) were the least used credit sources.

Educational Behavior

Level of HPO participation in education programs was highest in reading project publications (78.9%), reading the farmers library series produced by the project for use by local newspapers (65.5%), and attending raion education programs in their raions (57.8%). Lower levels of participation were found in listening to radio programs (31.9%), watching television programs (22.9%), and attending education programs at the university (15.1%) or in other raions (10.7%).

Visits by HPOs to specialists were about as frequent as visits by specialists to HPOs. Overall, two-thirds of HPOs reported that visits occurred once a month or once in 2-3 months.

HPOs were more satisfied with information received in education programs involving some form of personal contact with an extension professional such as workshops/seminars, field days, demonstrations, and visits compared to impersonal contact methods such as radio and television. The highest level of satisfaction was with newsletters and technical pamphlets issued by the project due to their utility and quality, and retention/reference value.

Practically all participants (98.5%) who received information in different education programs found it useful.

From a choice of five information sources for 13 subject-matter topics, the project was the most used source for all topics, with 68.4% of HPOs indicating it as their overall choice. The Ministry of Agriculture Policy/Agro-Industrial Complex was the second choice (12.6%), followed by other HPOs (10.5%), the college/university/research station (9.5%), and agribusiness (4.8%).

Choice trends for the several topics are interesting. For example, the Ministry/Agro-Industrial Complex was seen as a useful source for land titles, tax laws, legal issues, and rules and regulations; the college/university/research station for crop/livestock production technologies, and agribusiness companies for farm machinery, equipment, supplies, plant protection technology, and agricultural marketing and markets.

Nearly four-fifths of HPOs (72.1%) indicated that raion specialists had helped them in solving problems using the ISS, a computerized agricultural information database developed and distributed to all raion specialists by the World Laboratory, Ukraine Branch, Kyiv. Only 9.0% said they had not been helped, and 18.8% were uncertain. Numerous examples of topics/problems in several information categories where HPOs were helped are included in the technical report. The wide range of topics/problems shows the diversity of help received, the versatility of the ISS information database, and the ability of raion specialists to use ISS in assisting farmers.

Crop, livestock, and environmental best management practices (BMPs) were taught to HPOs in education programs so they could learn and adopt these practices in their agricultural operations.

With regard to learning BMP recommendations, 90.8% of HPOs gained knowledge of 14 crop production BMP recommendations, 74.7% knew 13 livestock production BMP recommendations, and 89.0% learned about 6 environmental BMP recommendations. The range of HPOs having knowledge of specific crop BMP recommendations was 98.6% to 72.3%, 90.7% to 54.3% for livestock BMP recommendations, and 97.2% to 76.4% for environmental BMP recommendations.

With regard to adopting BMP recommendations, HPOs were grouped into three categories – full adopters (always or mostly following recommendations), partial adopters (sometimes or rarely following recommendations) or non-adopters (not following recommendations). Overall, 68.1% of HPOs fully adopted

recommendations for 14 crop BMPs. The range of full adoption of these recommendations was 95.7% to 11.1%. With regard to livestock BMPs, overall, 64.2% of HPOs fully adopted the 13 practices included in this group, with a range of 89.2% to 27.1%. The overall full adoption percentage of 6 environmental BMPs (69.5%) was slightly more than BMP adoption in the other two groups. The adoption percentage range for environmental BMPs was 88.1% to 42.7%.

That a significant percentage of HPOs were in the partial and non-adopter categories for several specific BMPs in all three groups (crop, livestock, and environmental) is a concern for extension educators. It would be important for them to focus programming efforts to increase the adoption level of those practices. Specifically, 4 crop BMPs require to be stressed, i.e. no-till planting, soil testing every three years, using lime as recommended, and irrigating as needed. Three livestock BMPs, namely raising improved pastures, practicing rotational grazing, and proper milking equipment/maintenance, and one environmental BMP, biological plant protection, should receive the same educational emphasis.

The move toward a market-driven economy and the spread of democracy and political freedom over the last 15 years of Ukraine's independence have created an environment in which people can see positive changes in their lives and can increase their desire and hope for a better future for themselves, their families, and their communities. To determine how attitudes and aspirations of people might have changed due to the more open and free socio-political environment in which the project functioned, 13 attitude/aspiration statements were posed to HPOs and they were asked to indicate if they agreed, did not have an opinion, or disagreed with the statements. Their responses are summarized as percentages of HPOs who fell into these response categories for each statement and overall for all statements. Mean A/A scores for each practice and all practices were also determined.

On both measures – percentages and means – HPOs were very positive. Overall, for the set of 13 statements the high mean score of 2.63 on a score range of 0-3 (negative to positive) suggests a high positive regard for various aspects of their personal, family, community, and societal lives. Two positive statements – “HPOs should rely on their own resources rather than the government”, and “I trust the government” – elicited a lukewarm to negative response. This can be interpreted as a carryover of public thought from the communist era when people depended on the social security net of government and, at the same time, distrusted it for intruding into their private lives.

Project and HPO Performance and HPOs' Perceptions

Comparisons between baseline and end-of-project information provided evidence of (a) project performance, and (b) HPOs' agricultural production performance. The end-of-project survey provided information on HPOs' perceptions of changes/impacts resulting from the project's educational intervention.

Project Performance

Five indicators - educational participation, technology use (adoption), input use (cost), crop yield, and productivity (average gross income) - were selected to assess the project's performance or success in reaching the goal of improving income of HPOs. The rationale was that participation in education programs over a period of time leads to increased use of agricultural technology and production inputs, resulting in increased crop yields and overall productivity (defined as gross income).

All indicators showed positive changes over the three years of the project. Educational participation, measured as number of individuals served by the project's extension staff, increased from 858 at the beginning of the project to 6,773 at the end of the project (689.4% increase). New agricultural technology learned in the education programs influenced adoption of recommended technology, which increased by 50.0% over the life of the project. Increased technology adoption resulted in greater input use and cost

(131.5%). This contributed to higher overall crop yield (79.8%), and an increase of 154.8% in agricultural productivity (average gross income). Thus, the project was successful in changing the educational behavior of HPOs which enabled them to improve crop yields and income.

HPOs' Perceptions of Changes/Impacts Resulting from the Project

Responses of HPOs to end-of-project survey questions provided their perceptions of changes in their agricultural situation, and economic, social, and environmental impacts in their communities resulting from the project's educational intervention. Specific changes from 2002/2003 at project start to 2004 at project end in the parameters studied are indicated.

- Harvested area of all crops raised by HPOs on the average increased from 8.7 hectares to 13.2 hectares (34.1% change). Average yield of all grain/horticulture crops increased. The increase was from a minimum of 4.2 centners/hectare for tomatoes to 33.8 centners/hectare for rye.
- With regard to cash return from crop products, 90.4% of HPOs said their gross income had increased, and 87.6% indicated an increase in net profit.
- The quantities of livestock products produced in 2004 compared to 2002/2003 increased. The range of increase was from 3.7% for beef to 27.1% for broilers.
- A majority of HPOs reported increased per animal unit production in all species. From 56.1% to 71.9% of HPOs reported increases. Most of the others maintained production at the same level.
- With regard to cash return from livestock products, over 80.0% said both gross income and net profit increased.
- The proportion of crop products sold through organized markets increased by 14.9%, and the proportion of livestock products sold in this manner increased by 12.5%.
- HPOs are becoming better managers of home plot operations. Over 9 of 10 HPOs indicated that their knowledge and use of crop and livestock management methods was much more or more by the end of the project as compared to when the project started (96.4% for knowledge, 95.4% for use).
- A majority of HPOs felt the project had an economic impact on community life in terms of overall economic improvement, as well as specifically increasing agricultural incomes, savings, and purchases of consumer goods.
- Social impacts of the project were seen by a majority of HPOs in their participation in community groups and the benefits they personally received in agricultural operations from such participation. Over one-half (52.4%) said they had joined a village or raion group and 92.1% of these respondents indicated they had actively participated in the group's activities. They also cited the group's achievements in acquiring farm inputs (61.7%), enabling use of farm machinery (68.7%), and marketing agricultural products (61.7%).
- There was significant personal and family involvement of HPOs in community events and activities which proved to be mutually beneficial to them and the community. Nearly one-half (49.7%) indicated they were invited to participate in meetings of administrative entities (village council, raion administration, Ministry of Agriculture).

- Three-fourths of HPOs indicated that the project's environmental education programs had influenced individual and community behaviors/actions to protect and preserve the environment.

USAID Project: Improving Income of Private Ukrainian Agricultural Producers through Agricultural Extension, 2002-2005

**Final Evaluation Report, Home Plot Owners Outreach Education
Technical Report**

Project Background

A three-year extension education program to improve the agricultural production performance of agricultural producers (small private farmers and home plot owners) in three oblasts – Cherkasy, Khmelnytsky, and Vinnytsia - of Ukraine was begun in March 2002 under the joint auspices of the Louisiana State University Agricultural Center (LSU AgCenter) and the Government of Ukraine with funding from the US Agency for Agricultural Development (USAID). Earlier, from October 1998 to September 2001, a similar education program for small private farmers in Vinnytsia Oblast, also funded by USAID, was successfully completed. An evaluation of that program was helpful in determining the program's impact and providing useful programming lessons for the new project.

Organized through a state agricultural university/academy in each oblast, the new education program covered 67 raions (counties) and involved approximately 3,500 private farmers and 10,000 home plot owners. Selected university/academy faculty possessing advanced degrees in different agricultural disciplines and raion specialists (county agents) with a basic agricultural degree were recruited and trained in extension program development and adult education methods. Subsequently, for a period of two years, educational seminars, workshops, demonstrations, and personal consultations were planned and conducted by the faculty and raion specialists in a number of crop and livestock production, management, and marketing subjects to enable farmers to learn and apply research-based technology in their agricultural operations. The programs in each oblast were managed and supervised by an Oblast Center Coordinator with university faculty assisting in the management operations.

A report of the project's outreach education program for small private farmers has been prepared and is available (LSU Agricultural Center, Final Evaluation Report of Private Farmers Outreach Education, June 2005). This report focuses on the project's work with home plot owners. Home plot owners are described as individuals who have one or more parcels of land associated with the home in which they live and who cultivate this land to produce agricultural products for home consumption and/or for sale to the public. It is estimated that there are about 12 million home plot owners in Ukraine who contribute 60% of the locally available agricultural product. They are, therefore, an important segment of the rural population. Their collective contribution can be increased and their individual agricultural performance improved if they receive technical and educational assistance. The goal of this project was to improve the agricultural income of home plot owners through an organized education program in the three selected oblasts.

Project Evaluation

At the outset, an evaluation plan to assess the effectiveness of the education program with home plot owners was developed and followed. The plan included a benchmark of the agricultural situation of home plot owners based on data published by the State Statistics Committee of Ukraine, 2002 and an internal intermediate evaluation of the project in 2003, and an end-of-project evaluation of the project's impact in 2004. Surveys of home plot owners in the three oblasts in the intermediate and end-of-project evaluations and the published information of the State Statistics Committee provided the data for this final evaluation report. Selected benchmark data are compared with the end-of-project data to draw inferences about the project's impact on home plot owners. The rationale underlying project impact was that a period of two crop growing seasons and focused education programs conducted on a variety of subjects would enable home

- plot owners to learn and apply recommended technology in their agricultural operations, resulting in gains in agricultural performance and overall productivity.

Baseline (benchmark) information regarding home plot owners in the three oblasts was extracted from the publication "Agricultural Activity of Households in Ukraine, Statistical Yearbook, 2002". The intermediate evaluation focused on (a) learning and use of recommended agricultural technology by HPOs, and (b) their crop and livestock production and marketing operations. One hundred HPOs in each of the three oblasts participated in interviews by raion specialists. Respondents were randomly selected from lists of HPOs who had participated in education programs in 2002-2003.

For the end-of-project evaluation, 250 HPOs each in Cherkasy and Khmelnytsky oblasts and 150 HPOs in Vinnytsia were randomly selected for personal interviews by the raion specialists. Lists of the HPOs who had attended education programs in the three-year period as maintained by the oblast centers were used to draw the samples. A computerized random numbers table was used to prepare primary and alternate lists of sample respondents. If an HPO on the primary list refused to be interviewed or could not be found after two attempts by the raion specialist the next name on the alternate list was chosen. Information was gathered on personal attributes of HPOs, their agricultural operations, including production, management, and marketing of cereal and horticultural crops and livestock products, farm assets, their knowledge and adoption of agricultural best management practices, and their attitudes and aspirations.

Raion specialists underwent a one-day training session in which they were trained in the personal interview technique, gained familiarity with the survey instrument, and practiced interviewing. In the practice session, each raion specialist interviewed a fellow raion specialist to get the experience of a real-life encounter.

Data gathered in the different evaluations were analyzed for frequencies and means and appropriate comparisons are made in this report to show the project's impact. The report has two sections. Section 1 describes personal attributes, agricultural operations, and educational behavior of HPOs as determined by the end-of-project survey (2004). Section 2 documents the influence of the project's education programs on the agricultural production performance of HPOs by comparing baseline and end-of-project information on selected performance indicators and HPOs' perceptions of changes.

Section 1: Personal Attributes, Agricultural Operations, and Educational Behavior of Home Plot Owners in Cherkasy, Khmelnytsky, and Vinnytsya Oblasts (2004)

Personal Attributes of Home Plot Owners

Age. The mean age of HPOs in the sample was 46.8 years, with slightly more than two-thirds of them under 50 years of age (Table 1). This suggests that HPOs are a relatively young group in the population studied. The largest number of HPOs (214, 32.7%) was 41-50 years old.

Table 1: Age of HPOs in Cherkasy, Khmelnytsky, and Vinnytsya oblasts, 2004

Age (years)	Number of HPOs	% of HPOs
30 or under	37	5.7
31-40	146	22.4
41-50	214	32.7
51-60	194	29.8
Over 60	61	9.4
Total	652	100.0

Mean age = 46.8 years; Age range = 20-78 years

Gender. Over 80% of HPOs in the sample were male, and 18.7% were female (Table 2).

Table 2: Gender of HPOs in Cherkasy, Khmelnytsky, and Vinnytsya oblasts, 2004

Gender	Number of HPOs	% of HPOs
Male	530	81.3
Female	122	18.7
Total	652	100.0

Highest Level of Education and Specialization. HPOs in the sample were fairly well-educated, with 33.4% indicating they had completed a technical college program, and 31.1% reporting that they had a university degree (Table 3). As many as 17.0% had a high school diploma and 15.2% completed a vocational school program.

Table 3: Highest level of education of HPOs in Cherkasy, Khmelnytsky, and Vinnytsya oblasts, 2004

Highest level of education	Number of HPOs	% of HPOs
8 years school	15	2.3
High School	111	17.0
Vocational school	99	15.2
Technical college	218	33.4
University degree	203	31.1
Master's degree	3	0.5
Candidate of Science	3	0.5
Total	652	100.0

Table 4 gives the areas of educational specialization of HPOs. The most common area of specialization (200 HPOs) was basic agriculture. This specialization area is represented at all educational levels. However, it is most significant at the post-baccalaureate levels (PhD, Masters, and Bachelors) and the

technical college level. The second-most represented area was engineering specializations, with 101 HPOs reporting agricultural, civil or zoo-biological specializations. The next significant area was Agronomy (46 HPOs) spanning three levels of education (Masters, Bachelors and Technical College). Specializations such as telephone communication, social work, forestry, and welding had less than 1% and are not shown in the table.

Table 4. Area of specialization by highest level of education for HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Specialization	Level of Education					
	PhD	Master	Bachelor Degree	Technical College	Vocational Education	High School
	n/%	n/%	n/%	n/%	n/%	n/%
Agriculture	1/100.0	2/ 66.7	78/ 44.7	94/ 51.5	34/ 54.9	1/14.2
Agronomy	---	1/33.3	36/20.7	9/ 4.9	---	---
Degree in Pedagogy	---	---	18/10.3	6/3.3	2/3.2	---
Ag Engineering/ Driver	---	---	12 /6.9	32/17.5	20/32.3	5/71.6
Civil engineering	---	---	9/5.1	7/3.8	4/ 6.4	---
Zooengineer/ technician	---	---	8/4.6	3/1.6	---	1/14.2
Economist	---	---	5/2.9	6/ 3.2	---	---
Veterinarian	---	---	4/2.3	5/2.7	---	---
Lawyer	---	---	4/2.3	2/1.1	---	---
Construction specialist	---	---	2/1.0	7/3.8	2/3.2	---
Retired military officer	---	---	2/1.0	---	---	---
Medical Doctor	---	---	2/1.0	4/2.2	---	---
Commodity research	---	---	1/0.6	2/1.1	---	---
Accountant	---	---	1/0.6	6/3.3	---	---
Total	1/100.0	3/100.0	174/100.0	183/100.0	62/100.0	7/100.0

Composition of Household. Parents, spouses, and children were the main relatives living in the HPO's household (Table 5). Spouses and children inhabited over 80% of the households; parents were reported in 24.6% of the households. As might be expected, all relatives helped with the farming operations.

Table 5 : Relatives living in HPO households, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Relative living in household	Number and percent of households		Average age of relative years	Number of relatives helping with farming operation	
	N	%		N	%
Parent	161	24.6	62.4	129	81.6
Spouse	572	87.3	44.8	543	95.8
Child	517	78.9	19.9	399	77.9
Other	125	19.2	3.4	109	87.2

Agricultural Income. Table 6 shows that HPOs were well distributed among the four categories of percentage of family income derived from the sale of agricultural products produced on their home plots. Over one-half of HPOs said that 50% or less of their family income came from the sale of agricultural products (54.5%). Slightly less than one-half indicated that more than 50% of family income was agricultural income (46.5%).

Table 6: Percent of HPOs' family income from sale of agricultural products produced on home plots, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Agricultural Income from home plot as % of family income	Number of HPOs	% of HPOs
0-25%	157	24.2
26-50%	190	29.3
51-75%	195	30.1
76-100%	106	16.4
Total	648	100.0

Hired labor. Nearly one-third (198 or 30.9%) of HPOs indicated hiring seasonal and/or full-time labor to help with cultivation of their home plots. The number of workers hired in 2004 ranged from 1-26. A breakdown is shown in Table 7. A majority of HPOs (80.3%) hired from 1-4 workers.

Table 7. Number of workers hired by HPOs, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Number of hired workers	Number of HPOs	% of HPOs
One	51	25.8
Two	59	29.8
Three	29	14.6
Four	20	10.1
Five to twenty-six	39	19.7
Total	198	100.0

Organizational Affiliation and Benefits. One fourth of HPOs belonged to a farmers' association (Table 8). Affiliation with a civic/social group was also significant (21.2% of HPOs). Very few HPOs belonged to an agricultural cooperative (3.4%) or a women's association (2.0%).

Benefits of belonging to a group or organization indicated by over one-third of HPOs were information sharing (40.0% of HPOs), farm operations assistance (35.0%), and selling agricultural produce (34.2%) or buying agricultural inputs (32.5%) (Table 8). Only a small proportion of HPOs felt there was a political benefit in belonging, reflecting a technical view, and an as-yet unrealized appreciation of the potential strength of organizational affiliation.

Table 8. Organizational affiliation and perceived benefits of belonging to groups and organizations, HPOs, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Variable	Number of HPOs	% of HPOs
Groups and organizations belonged to:		
Farmers association	168	25.6
Civic/social group	126	21.2
Agricultural cooperative	20	3.4
Women's association	13	2.0
Benefits perceived by belonging to groups and organizations:		
Information sharing	262	40.0
Farm operations assistance	229	35.0
Selling agricultural produce	224	34.2
Buying agricultural inputs	213	32.5
Support for political issues	71	10.8

a Other groups belonged to and number of mentions: Rural Council (3); Association of Vegetable Producers (2); Cooperative of Land Share Holders (1); Fishermen's Club (1).

Agricultural Operations of Home Plot Owners

Length of Time Producing and Selling Agricultural Products from Home Plots. Table 9 shows when HPOs started producing and selling agricultural products for sale from their home plots. .

A small proportion of HPOs (10.2%) started producing and selling agricultural products prior to 1991. Ten percent started production and sale between 1991 and 1995. The majority of HPOs began producing in the last ten years – 46.6% in the time period 1996-2000, and 33.2% since 2001.

Table 9. When HPOs started producing and selling agricultural products from home plots, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Time period	Started producing agricultural products from home plots for sale	
	Number	%
1955-1980	36	5.8
1981-1990	28	4.4
1991-1995	64	10.0
1996-2000	299	46.6
2001-2004	212	33.2
Total	639	100.0

Cultivated Land Possessed by HPOs. The average size of cultivated land in home plots was 4.9 hectares, with a range of 0.2 to 19.7 hectares (Table 10). A majority of HPOs (342, 58.1%) indicated home plot sizes between 1 and 4.9 hectares. The next largest group (132, 22.4%) had between 5 and 9.9 hectares of cultivated land.

Table 10. Number of hectares of cultivated land possessed by HPOs, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Land in hectares	Number and percent of HPOs	
	Number	%
Less than 1	28	4.8
1.0-4.9	342	58.1
5.0-9.9	132	22.4
10.0-14.9	62	10.5
15-20.0	25	4.2
Total	589	100.0

Particulars of Home Plots. HPOs were asked to indicate particulars – area, distance from home, and how acquired - of each of their home plots or land parcels. Two-thirds of HPOs had one parcel (64.6%) and one-fourth had two parcels (24.7%). The number of additional home plot parcels ranged from 3-5. The proportions of HPOs who had one or more parcels of land in their home plots are shown in Table 11.

Table 11.- Number of parcels of home plot land possessed by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Number of parcels of home plot land	Number of HPOs	% of HPOs
1	419	64.6
2	160	24.7
3	53	8.2
4	11	1.7
5	5	0.8
All plots	654	100.0

The average size of a parcel of home plot land ranged from 1.3 to 2.6 hectares. On the average, land parcels were about 3 km distant from the HPO's home.

Table 12 gives the methods by which HPOs had acquired their home plots. A total of 949 plots were owned by the 655 home plot owners in the sample. Over one-half of the plots were held under a land title (501 or 52.8%), 137 plots (14.4%) were on lease, 284 plots (29.9%) had been acquired as land shares, and 27 (2.9%) were purchased.

Table 12. Method of acquisition of home plots, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Method of acquisition of home plots	Number of plots	% of plots
Title	501	52.8
Land shares	284	29.9
Lease	137	14.4
Purchased	27	2.9
All methods	949	100.0

Use of Cultivated Land and Quality of Soil. The use of cultivated land by HPOs is shown in Table 13. Nearly all HPOs indicated using their home plots for raising crops/livestock (98.0%); 16.9% raised a fruit garden, 20.5% produced hay/pasture, and 11.7% had a greenhouse

Table 13. Use of home plot land, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Use of land	Number of HPOs	% of HPOs
Raising crops/livestock	645	98.0
Fruit garden	111	16.9
Hay/pasture	135	20.5
Greenhouse	77	11.7

Practically all HPOs said the quality of soil of their home plots was good (48.3%) or average (48.9). Only 2.8% of HPOs reported poor quality soil.

Other Farm Assets. Besides land, other farm assets owned or used by HPOs are farm buildings and structures and farm equipment and machinery.

Various buildings and structures owned by HPOs are shown in Table 14. The average age and average area of each building/structure are also indicated. Considering all buildings/structures, the average area

owned by each HPO was 514.8 sq meters. Sixty-one HPOs (9.3%) built additional buildings/structures in 2003-2004 to meet agricultural needs.

Table 15 presents the proportions of HPOs who used, owned, leased/borrowed, and loaned/shared various items of farm machinery and equipment during 2004. Table 16 shows the number of units of the same items of farm machinery and equipment owned, leased/borrowed, and loaned/shared in 2004. It appears that HPOs own or exchange the farm machinery and equipment that they need for their farm operations.

Table 14: Farm buildings and structures owned by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Farm building/structure a	Number and percent of HPOs		Average age of structure (years)	Average area/HPO (sq. meters)
	N	%		
Cattle barn/shed	538	82.1	33.9	59.2
Underground vegetable/fruit storage	459	70.1	18.3	27.8
Garage	380	58.0	42.3	31.9
Covered grain storage	103	15.9	16.7	113.9
Machinery/tools shed	96	14.7	9.2	61.1
Workshop (metal, carpentry)	65	9.9	12.8	29.4
Hangar	47	7.2	12.7	132.5
Bunker	6	0.9	14.5	59.0
All buildings/structures	---	---	---	514.8

a Other structures owned: Hay storage/hayloft – 171 sq meters; Winter hut for bees/Bee pavilion – 160 sq. meters; Carriage (train car) – 25 sq. meters; Shed for airing herbs – 80 sq. meters.

Table 15: Machinery and equipment used on farm by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Item	Number and percent of farmers by type of use							
	Used in farm operation (N=655)		Owned		Leased/borrowed		Loaned/shared	
	n	%	N	% ^a	n	% ^a	n	% ^a
Truck	393	60.0	124	31.5	229	58.3	66	16.8
Car	382	58.3	346	90.6	30	7.9	35	9.2
Horse cart	162	24.7	119	73.5	39	24.1	21	13.0
Tractor	603	92.1	297	49.3	272	45.1	83	13.8
Trailer	447	68.2	249	55.7	174	38.9	64	14.3
Cultivator	567	86.6	253	44.6	252	44.4	98	17.3
Planter	69	10.5	36	52.2	34	49.3	6	8.7
Combine	479	73.1	72	15.0	364	76.0	67	14.0
Sprayer	294	44.9	81	27.6	175	59.5	54	18.4
Seeder	126	19.2	37	29.4	76	60.3	13	10.3
Milking machine	396	60.5	136	34.3	197	49.8	86	21.7
Feed mill	45	6.9	40	88.9	3	6.7	2	4.4
Power tiller (hand)	98	15.0	82	83.7	12	12.2	2	2.0
Power mower	49	7.5	31	63.3	5	10.2	4	8.1
Mini tractor	93	14.2	56	60.2	30	32.2	14	15.1

^a % of HPOs who used different items: for example, 393 HPOs used trucks; 124 of these 393 HPOs (31.5%) owned their own truck; 229 of these 393 HPOs (58.3%) leased/borrowed a truck; 66 of these 393 HPOs (16.8%) loaned/shared a truck.

Table 16: Number of units of machinery and equipment owned, leased/borrowed, loaned/shared by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Item	Units owned	Units leased/borrowed	Units loaned/shared	Total units
Truck	128	238	69	435
Car	351	30	36	417
Horse cart	122	42	22	186
Tractor	328	283	92	703
Trailer	262	174	67	503
Cultivator	271	256	104	631
Planter	44	34	6	84
Combine	76	374	70	520
Sprayer	81	175	54	310
Seeder	40	76	14	130
Milking machine	142	211	91	444
Feed mill	91	3	2	96
Power tiller (hand)	91	12	2	105
Power mower	31	15	4	50
Mini tractor	56	30	14	100

Crop Production and Disposal in 2004. Table 17 shows the different row (cereals/grains) crops cultivated by HPOs in the 2004 crop season. Information for each crop includes number and percent of farmers growing the crop, area harvested (total and average per farmer), amounts of the crop produced (total production and average yield per hectare), and the amounts of the crop sold, used in the home, and kept for seed (totals and averages per HPO).

Wheat and barley were the principal cereal crops grown by 60.4% and 64.5% of HPOs, respectively. Other significant row crops grown were corn (23.1% of HPOs), sugar beet (21.1% of HPOs), feeding beet (19.8% of HPOs), and buckwheat (17.6% of HPOs). Total harvested area under row crops was 3,289.2 hectares. The total amount of crops produced was 168,612 centners, of which 129,273.1 centners was sold (76.6%), 12,786.7 centners was used in the home (7.6%), and 21,893.6 centners (12.9%) was kept for seed. Green forage, silage, and hay were raised by 20.0% of HPOs.

Table 17: Row crop production and disposal in 2004, HPOs, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Crop	Unit of measure	Quantity
Wheat		
Number of wheat producers	Number	352
% of all producers	%	60.4
Area harvested (hectares)	Total	1054.7
	Average	3.0
Amount produced (centners)	Total	35809.3
	Yield/ha	34.0
Amount sold (centners)	Total	23424.8
	Average	81.0
Amount used in home (centners)	Total	5679.1
	Average	19.9
Amount kept for seed (centners)	Total	5325.4
	Average	19.6
Rye		

Number of rye producers	Number	8
% of all producers	%	1.8
Area harvested (hectares)	Total	14.6
	Average	1.8
Amount produced (centners)	Total	331.6
	Yield/ha	24.2
Amount sold (centners)	Total	170.0
	Average	42.5
Amount used in home (centners)	Total	20.6
	Average	4.120
Amount kept for seed (centners)	Total	56.2
	Average	11.2
Barley		
Number of barley producers	Number	384
% of all producers	%	64.5
Area harvested (hectares)	Total	1217.0
	Average	3.2
Amount produced (centners)	Total	36594.4
	Yield/ha	30.1
Amount sold (centners)	Total	23275.3
	Average	84.3
Amount used in home (centners)	Total	4237.5
	Average	29.0
Amount kept for seed (centners)	Total	9548.3
	Average	35.9
Buckwheat		
Number of buckwheat producers	Number	87
% of all producers	%	17.6
Area harvested (hectares)	Total	208.3
	Average	2.4
Amount produced (centners)	Total	2294.9
	Yield/ha	11.8
Amount sold (centners)	Total	1727.2
	Average	25.7
Amount used in home (centners)	Total	431.9
	Average	9.6
Amount kept for seed (centners)	Total	1320.2
	Average	28.1
Corn		
Number of corn producers	Number	151
% of all producers	%	23.1
Area harvested (hectares)	Total	238.0
	Average	1.6
Amount produced (centners)	Total	8751.7
	Yield/ha	45.3
Amount sold (centners)	Total	5665.1
	Average	79.8
Amount used in home (centners)	Total	727.5
	Average	18.2
Amount kept for seed (centners)	Total	52.8
	Average	2.9
Sugarbeet		
Number of producers	Number	138
% of all producers	%	21.1
Area harvested (hectares)	Total	229.1

Amount produced (centners)	Average	1.6	
	Total	56825.5	
	Yield/ha	289.8	
Amount sold (centners)	Total	55795.5	
	Average	442.8	
	Feeding Beet		
Number of producers	Number	130	
% of all producers	%	19.8	
Area harvested (hectares)	Total	53.3	
	Average	0.4	
	Total	15891.8	
Amount produced (centners)	Yield/ha	313.4	
	Total	3151.5	
	Average	150.1	
Sunflower			
Number of producers	Number	58	
% of all producers	%	8.9	
Area harvested (hectares)	Total	157.1	
	Average	2.7	
	Total	2423.7	
Amount produced (centners)	Yield/ha	15.3	
	Total	2224.4	
	Average	46.3	
Amount sold (centners)	Total	105.7	
	Average	4.2	
	Total	1.2	
Amount used in home (centners)	Average	0.1	
	Green forage, silage, hay		
	Number of forage/silage/hay producers	Number	131
% of all HPOs	%	20.0	
Area harvested (hectares)	Total	117.7	
	Average	0.8	
	Total	9690.0	
Amount produced (centners)	Yield/ha	109.4	
	Total	2357.0	
	Average	107.1	
Amount sold (centners)	Total	1585.0	
	Average	39.6	
	Total	5499.5	
Amount used in home (centners)	Average	79.7	

Total = Total amount for all producers in the sample who reported harvesting and disposing the crop in different ways – sale, use in home, seed..

Average = Average amount per producer in the sample who reported harvesting and disposing the crop in different ways – sale, use in home, seed..

Horticultural Production and Disposal in 2004. Table 18 shows the different horticultural crops cultivated by HPOs in the 2004 crop season.

Potatoes were grown by 38.9% of the HPOs, vegetables (carrots, cabbage, cucumbers, tomatoes, and/onions) by 43.9%, and fruits (apples and/or strawberries) by 8.2%. Total harvested area under horticultural crops was 205.1 hectares. The total amount of horticultural crops produced was 27,275.5 centners, of which 18,179.5 centners was sold (65.1%), 4358.8 centners was consumed in the home (16.0%), and 5431.5 centners were kept for seed (18.9%).

Twelve other crops were raised on a total of 97.6 hectares (Table 19). The main crops were oats (30.0 ha), spring rape (20.0 ha), and millet (16.5 ha).

Table 18: Horticultural production and disposal in 2004, HPOs, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Crop	Unit of measure	Quantity^a
Potatoes		
Number of potato producers	Number	254
% of all HPOs	%	38.0
Area harvested (hectares)	Total	130.9
	Average	0.5
Amount produced (centners)	Total	21636.8
	Yield/ha	172.7
Amount sold (centners)	Total	13870.1
	Average	73.7
Amount used in home (centners)	Total	3920.9
	Average	17.6
Amount kept for seed (centners)	Total	5431.5
	Average	28.6
Carrots		
Number of carrot producers	Number	55
% of all HPOs	%	8.4
Area harvested (hectares)	Total	15.3
	Average	0.2
Amount produced (centners)	Total	2561.4
	Yield/ha	158.7
Amount sold (centners)	Total	2124.0
	Average	57.4
Amount used in home (centners)	Total	136.4
	Average	3.4
Cabbage		
Number of cabbage producers	Number	80
% of all HPOs	%	12.2
Area harvested (hectares)	Total	37.4
	Average	0.4
Amount produced (centners)	Total	3591.2
	Yield/ha	173.2
Amount sold (centners)	Total	2596.6
	Average	45.5
Amount used in home (centners)	Total	251.5
	Average	4.5
Amount kept for seed (centners)	Total	5.0
	Average	5.0
Cucumbers		
Number of cucumber producers	Number	51
% of all HPOs	%	7.8
Area harvested (hectares)	Total	7.8
	Average	0.1
Amount produced (centners)	Total	632.0
	Yield/ha	111.9
Amount sold (centners)	Total	547.9
	Average	14.8
Amount used in home (centners)	Total	63.9
	Average	2.1
Tomatoes		

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Number of tomato producers	Number	60
% of all HPOs	%	9.2
Area harvested (hectares)	Total	25.1
	Average	0.4
Amount produced (centners)	Total	1854.8
	Yield/ha	87.6
Amount sold (centners)	Total	1708.8
	Average	41.6
Amount used in home (centners)	Total	128.0
	Average	3.2
Onions		
Number of onion producers	Number	41
% of all HPOs	%	6.3
Area harvested (hectares)	Total	10.7
	Average	0.2
Amount produced (centners)	Total	411.4
	Yield/ha	69.7
Amount sold (centners)	Total	337.9
	Average	14.0
Amount used in home (centners)	Total	68.9
	Average	2.5
Apples		
Number of apple producers	Number	47
% of all HPOs	%	7.2
Area harvested (hectares)	Total	13.4
	Average	0.2
Amount produced (centners)	Total	161.0
	Yield/ha	16.0
Amount sold (centners)	Total	114.7
	Average	3.9
Amount used in home (centners)	Total	38.7
	Average	1.174
Strawberries		
Numbers of strawberries producers	Number	9
% of all HPOs	%	1.4
Area harvested (hectares)	Total	1.81
	Average	0.2
Amount produced (centners)	Total	18.1
	Yield/ha	13.0
Amount sold (centners)	Total	16.1
	Average	2.0
Amount used in home (centners)	Total	2.5
	Average	0.4

3 HPOs reported growing plums on 0.1 hectare of land producing 1.1 centners ; 2 HPOs reported growing young trees (average: 1 hectare of land, 80 trees)

53 HPOs (8.1%) said they had a green house for vegetables and fruits.

Total = Total amount for all producers in the sample who harvested and disposed of the crop in different ways – sale, use in home, seed.

Average = Average amount per producer in the sample who harvested and disposed of the crop in different ways – sale, use in home, seed.

Table 19: Number of hectares of other crops raised in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Other crop	Number of hectares
------------	--------------------

Oats	33.0
Spring rape	20.0
Millet	16.5
Mustard	9.6
Peas	6.0
Kidney beans	4.5
Pumpkins	3.0
Medicinal herbs	2.0
Flowers	1.5
Vetch	0.5
Watermelon	0.4
Eggplant	0.1
Total	97.1

Livestock Production and Disposal in 2004. Table 20 indicates the different livestock raised by farmers in 2004. The information presented shows the number and percent of producers raising animals of different species, total and average number of animals of each species owned by these producers, total amounts of animal products produced and the quantities per animal, and the amounts of animal products sold and used in the home (totals and averages per farmer). The number of head of other livestock species raised in 2004 and the quantities of products produced are shown in Table 21.

Livestock products produced in 2004 totaled 1,802.7 centners of milk, 3,143 centners of beef, pork, goat/lamb meat and poultry (Table 20). In addition, 73.5 centners of duck and 133.2 centners of geese meat, and 615,710 eggs were produced. The bulk of these products, except for 60% of the eggs which were consumed in the home, was sold to consumers.

Table 20: Livestock production and disposal in 2004, HPOs, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Livestock or livestock product	Unit of measure	Quantity ^a
Horse		
Number of HPOs having horses	Number	94
% of all HPOs	%	14.4
Number of horses	Total	132.0
	Average	1.3
Dairy		
Number of dairy producers	Number	318
% of all HPOs	%	48.5
Number of milking cows	Total	509.0
	Average	1.6
Milk produced (tons)	Total	1802.7
	Per cow	3.7
Milk sold (tons)	Total	1387.8
	Average	4.6
Milk used in home (tons)	Total	396.4
	Average	1.3
Beef		
Number of beef producers	Number	194
% of all HPOs	%	29.6
Number of beef cattle	Total	354.0
	Average	1.8
Beef produced (centners)	Total	1146.7

	Per head	3.4
Beef sold (centners)	Total	1114.8
	Average	6.2
Beef used in home (centners)	Total	30.4
	Average	1.9
Sheep/Goats		
Number of sheep/goat producers	Number	14
% of all HPOs	%	2.1
Number of producers	Total	33.0
	Average	2.3
Produced (kg)	Total	978.0
	Per head	35.9
Sold (kg)	Total	423.0
	Average	84.6
Used in home (kg)	Total	555.0
	Average	61.6
Breeding sows		
Number of breeders	Number	40
% of all HPOs	%	6.1
Number of breeding sows	Total	102.0
	Average	2.5
Number produced	Total	118.20
	Average	4.2
Number sold	Total	79.0
	Average	4.3
Number used in home	Total	19.2
	Average	1.4
Swine		
Number of swine producers	Number	448
% of all HPOs	%	68.4
Number of swine	Total	1793.5
	Average	4.0
Pork produced (centners)	Total	1986.5
	Per head	1.5
Pork sold (centners)	Total	1541.6
	Average	5.1
Pork used in home (centners)	Total	473.5
	Average	1.9
Chicken (Broilers)		
Number of broiler producers	Number	324
% of all HPOs	%	49.5
Number of broilers	Total	9164.0
	Average	28.5
Broilers produced (kgs)	Total	20014.0
	Per bird	2.3
Broilers sold (kgs)	Total	2166.0
	Average	36.7
Broilers used in home (kgs)	Total	18047.0
	Average	61.5
Ducks		
Number of duck producers	Number	164
% of all HPOs	%	25.0
Number of ducks	Total	3384.0
	Average	20.6
Ducks produced (kgs)	Total	7353.0
	Per bird	2.6

Ducks sold (kgs)	Total	730.0
	Average	38.421
Ducks used in home (kgs)	Total	6812.0
	Average	46.0
Geese		
Number of geese producers	Number	169
% of all HPOs	%	25.8
Number of geese	Total	3807.0
	Average	22.5
Geese produced (kgs)	Total	13317.0
	Per bird	3.7
Geese sold (kgs)	Total	3955.0
	Average	96.4
Geese used in home (kgs)	Total	9268.0
	Average	58.6
Eggs		
Number of egg producers	Number	235
% of all HPOs	%	35.9
Number of eggs produced	Total	615710.0
	Average	2863.7
Number of eggs sold	Total	263800.0
	Average	1998.4
Number of eggs used in home	Total	353315.0
	Average	1628.1
Rabbits		
Number of rabbits producers	Number	67
% of all HPOs	%	10.2
Rabbits produced (kgs)	Total	1494.0
	Average per animal	2.9374
Rabbits sold (kgs)	Total	1220.5
	Average	55.4
Rabbits used in home (kgs)	Total	2566.0
	Average	44.2

Total = Total amount for all producers in the sample who raised the animal in 2004.
Average = Average amount per producer in the sample who raised the animal in 2004.

Table 21: Number of head of other livestock raised by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Other livestock	Number
Fish fingerlings (number)	100,000
Bee hives (number of families)	613
Quail (# of swarms)	2000
Turkeys (# of swarms)	87
Pigeons (# of swarms)	42

Sale of Crop, Horticultural, and Livestock Products. Table 22 shows the percentages of HPOs using various sales methods/outlets. A majority of HPOs used organized markets (51.0%). About one-third of the HPOs favored processors (31.9%). Personal sale was the next largest market outlet (25.2%), followed by agribusiness companies (16.8%), and former collective farms (15.4%). Wholesale dealers (9.5%), government organizations/enterprises (5.0%), and agricultural products stock exchanges (2.9%) were the least preferred methods.

Table 22: Methods/outlets used by HPOs to sell agricultural products, Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Sales method/outlet	Number and % of HPOs using sales method/outlet (N=655)	
	Number	%
Organized markets (farmers, etc.)	334	51.0
Processor	209	31.9
Personal sale	165	25.2
Agribusiness company	110	16.8
Former collective farm	101	15.4
Wholesale dealer	62	9.5
Government organization/enterprise	33	5.0
Agricultural products stock exchange	19	2.9

Cost of Inputs and Sources of Assistance. The cost of various production inputs purchased by HPOs is indicated in Table 23. For HPOs reporting input use/cost, the largest average cost per HPO was for salaries and wages (\$551.60). Livestock feed, labor, fuel, and seeds were the next largest costs, the averages ranging from \$481.10 to \$403.00. The cost of crop protection chemicals (\$310.70) and chemical fertilizers (\$295.30) were at an intermediate level. Organic fertilizers had the lowest average cost (\$107.20)

It is interesting that 31.0% of HPOs gave out salaries/wages to employees and 30.9% hired paid labor to supplement family labor. This indicates a trend toward cash transactions, which might signify a growth in business entrepreneurship. This is a healthy and positive sign for a privatized, market-based economic system.

Other inputs used and their costs are indicated in Table 24. Fingerlings and leased machinery costs were the highest among other inputs reported.

Information assistance was received by 445 HPOs (67.9%) about agricultural input suppliers and by 388 HPOs (59.2%) regarding the use and application of agricultural inputs. Nearly 30% of HPOs received actual inputs. Most HPOs (approximately 68.0%) were assisted with information or the actual inputs by input suppliers and dealers.

The project was most frequently mentioned (401 times) as a source of assistance (Table 25). Agribusiness companies were next with 40 mentions. Other sources included other farmers (36 mentions), agricultural boards/departments (12 mentions), and farmers associations (6 mentions).

Table 23: Cost of inputs used by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Input	Number and percent of HPOs		Reported cost (US \$)	
	Number	%	Total	Average
Salaries/wages	209	31.0	115,291.20	551.60
Livestock feed	345	57.2	160,220.00	481.10
Labor	213	32.5	47,008.30	427.30
Fuel	588	89.8	238,649.60	415.70
Seeds	596	91.0	242,662.40	403.00
Crop protection chemicals	379	57.9	121,505.30	310.70
Chemical fertilizers	495	75.6	147,079.10	295.30
Organic fertilizers	266	40.6	26,267.70	107.20

Table 24 Cost of other inputs used by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Input	Reported cost (US \$)
Young fish (fingerlings)	990.10
Machinery lease	915.10
Beekeeping tools	188.60
Medicine and sugar for bees	94.34

Table 25: Sources of input assistance to HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2004

Source of input assistance	Number of mentions
Center/Oblast advisory service	401
Agribusiness companies	40
Other farmers	36
Agricultural board/department	12
Farmers Association	6
Collective enterprise	1

Farm Management Practices. Table 26 shows the extent to which HPOs followed recommended farm management practices which they learned in seminars and other education programs. These practices included use of consulting assistance to improve management and production, use of written formats for various production and marketing aspects, and use of trade contracts with suppliers and consumers.

Over one-half of the HPOs used consulting assistance to improve agricultural production and management (51.7%). Significant numbers of HPOs used written formats to calculate profitability/income (49.4%), analyze agricultural production (45.0%), keep production and marketing records (37.0%), and plan production and marketing (36.1%). Only about one-fourth of the HPOs developed consumer contracts (27.2%) and suppliers' contracts (22.0%) for their agricultural operations. The use of written formats for managing hired labor was quite low (18.9% of HPOs). It is encouraging that significant proportions of HPOs are using several of the recommended management practices.

Table 26- Farm management practices followed by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2004

Management practice	Number and percent of HPOs following practice					
	Yes		No		Total	
	n	%	n	%	n	%
Use consulting assistance to improve production/management	322	51.7	301	48.3	623	100.0
Calculate profitability/gross income (written form)	307	49.4	315	50.6	622	100.0
Analyze agricultural production (written form)	278	45.0	340	55.0	618	100.0
Keep production and marketing records (written form)	230	37.0	392	67.0	622	100.0
Plan agricultural production and marketing (written form)	225	36.1	398	63.9	623	100.0
Develop consumer contracts before harvesting/selling products	167	27.2	446	72.8	613	100.0
Develop contracts with input suppliers	133	22.0	472	78.0	605	100.0
Plan and record use of hired labor (written form)	116	18.9	499	81.1	615	100.0

Agricultural Credit. The next four tables (27-30) deal with agricultural credit used by HPOs.

Only 7.6% of HPOs took agricultural credit in 2003/2004 (Table 27). A variety of reasons was given by the remaining HPOs (92.4%) as to why they did not take credit (Table 28). A majority said they did not want to go into debt or take the risk (59.8%) and the high interest rate (53.9%). Complex loan procedures was the reason given by 48.6% of HPOs and the large repayment amount by 42.5%. Many of them did not need a loan (40.2%) or did not have the required collateral/security (37.2%). Nearly one-third said that only short term loans were available (37.3%) or that the minimum loan was too high (31.2%) as reasons. For 24.8% of the HPOs, credit was not available when they needed it

For those HPOs who took agricultural credit, the average loan was \$936.40, the average interest rate was 20.8%, and the average length of loans was 11.4 months (Table 29).

The most common source of agricultural credit was an agribusiness company (51.1% of respondents who took loans) (Table 30). Friends/family members were next (37.2%), followed by banks (25.0%). Credit unions were cited by only 7.0% of the respondents.

Table 27: Agricultural credit taken by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2003/2004

Credit taken	Number and percent of HPOs	
	n	%
Yes	49	7.6
No	597	92.4
Total	646	100

Table 28: Reasons given by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts for not taking agricultural credit in 2003/2004

Reason	Number of respondents	% of respondents
	(n = 597)	(n = 597)
Did not want to go into debt/take risk	357	59.8
Interest rate was too high	322	53.9
Loan procedures were too complex	290	48.6
Repayment amount was too large	254	42.5
Did not need	240	40.2
Did not have collateral/security	222	37.2
Only short-term loan was available	205	34.3
Minimum loan was too high	186	31.2
Loan not available when needed	148	24.8

Table 29: Particulars of agricultural credit taken by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2003/2004

Particulars of credit	Number of respondents	Quantity	
		Total	Average
Value of all loans in 2003/2004 (\$)	46	43,076.8	936.4
Interest rate of all loans (%/yr)	29	---	20.8
Length of all loans (months)	42	---	11.4

Table 30: Source of agricultural credit taken by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts in 2003/2004

Credit source	Number of respondents	% of respondents
	(n=49)	(n=49)
Agribusiness company	23	51.1
Friend/family member	16	37.2
Bank	11	25.0
Credit union	3	7.0

Educational Behavior of Home Plot Owners

First Contact with Project. Table 31 indicates that most HPOs (50.5%) learned about the project during the period 2003 – 2004, and 32.5% of HPOs in 2002. Those HPOs (17.0%) who indicated first learning about the project from 1998 to 2000 were from Vinnytsia, where the first project was conducted.

Most HPOs (77.6%) first learned about the project from raion specialists or university specialists (Table 32). Other sources indicated by smaller numbers of HPOs were friends (8.2%), media (6.5%), farmers associations (3.9%), government officials (3.1%), and agribusiness dealers/enterprises (0.8%).

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Table 31: Year HPOs first learned about the project, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Year first learned about project	Number of HPOs	% of HPOs
1998-2001	107	17.0
2002	204	32.5
2003-2004	316	50.5
Total	627	100.0

^a Includes basically Vinnytsya HPOs from the earlier project (1998-2001)

Table 32: How HPOs first learned about the project, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Source first learned about project	Number of HPOs	% of HPOs
Raion specialist/university specialist	502	77.6
Friend (farmer, social circle)	53	8.2
Media (newspaper, radio, TV, flyer)	42	6.5
Farmers Association	25	3.9
Government official (village, raion, oblast)	20	3.1
Agribusiness dealer/enterprise	5	.8
Total	647	100.0

Level of Educational Participation. Table 33 shows how often HPOs participated in different education programs of the project. HPOs indicated participating very often or often in reading project publications (78.9%), reading the farmers library column produced by the project for publication in local newspapers (65.5%), and attending raion education programs (57.8%). Smaller numbers of HPOs said they listened to radio programs (31.9%), watched television programs (22.9%), and attended education programs at the university (15.1%) or in other raions (10.7%).

The frequency of visits between HPOs and raion/university specialists in terms of specialists making visits to HPOs' plots and HPOs coming to the offices of specialists is shown in Table 34. The distributions for these types of visits was practically similar. Overall, two-thirds of the HPOs reported that visits occurred once a month or once in 2-3 months.

Table 33: How often HPOs participated in education programs of the project in a three-year period, 2002-2004, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Type of education program participation	Number of respondents	How often attended education program (% respondents)		
		Very often/often	Sometimes	Seldom/never
Read publications	620	78.9	12.2	3.5
Read farmers library	613	65.5	21.2	6.9
Attended raion education programs	633	57.8	34.6	7.6
Listened to radio programs	566	31.9	30.2	24.3
Watched television programs	553	22.9	34.0	27.5
Attended university education programs	583	15.1	24.0	60.8
Attended other raion programs	583	10.7	29.6	48.7

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Table 34: Frequency of visits between HPOs and raion/university specialists for receiving information and advice in a three-year period, 2002-2004, Cherkasy, Khmelnytsky, and Vinnytsia oblasts

Frequency of visits	Number and percent of farmers indicating type of visit			
	Specialists visited HPOs on their plots		HPO visited specialists in their offices	
	n	%	n	%
Once a week	41	6.3	62	9.6
Once in two weeks	79	12.2	43	6.7
Once a month	216	33.4	245	37.9
Once in 2-3 months	249	38.5	184	28.5
Once in 4-6 months	46	7.1	66	10.2
Once a year	15	2.3	37	5.7
Never	1	0.2	9	1.4

Reactions on Educational Participation. The extent to which HPOs were very satisfied or fairly satisfied with the information received in education programs was greater for programs which involved some form of personal contact with an extension professional such as workshops/seminars, field days, demonstrations, and visits compared to impersonal contact methods such as radio and television (Table 35). It is interesting to note the high level of satisfaction with newsletters and technical pamphlets issued by the project, perhaps due to the utility and quality of their content, and retention/reference value.

Practically all HPOs (99.5%) who received information through the different education programs found the information to be very useful, fairly useful, or useful (Table 36).

Table 35: How satisfied were HPOs with the agricultural, environmental, credit, legal and other information received in education programs in which they participated

Education program	Number of respondents	How satisfied with education programs (% respondents)			
		Very satisfied	Fairly satisfied	Somewhat satisfied	Dissatisfied
Workshops/seminars	616	24.4	65.7	5.0	3.9
Field days	584	24.0	60.3	8.6	5.8
Demonstrations	563	24.3	57.7	9.8	5.9
Specialists' plot visits	593	25.1	55.3	9.1	8.8
HPOs' office visits	613	29.2	62.3	5.2	2.0
Consultations	615	32.2	61.8	3.4	2.1
Radio programs	528	5.7	44.7	26.7	18.9
TV programs	517	5.0	36.0	31.7	21.3
Newsletters	610	27.2	64.3	5.7	1.8
Technical pamphlets	606	37.5	55.1	4.8	1.2

Table 36: How useful was the agricultural, environmental, credit, legal and other information received in education programs in which HPOs participated

Usefulness of information	Number of HPOs	% of HPOs
Very useful	187	29.3
Fairly useful	265	41.5
Useful	183	28.7
Not useful	3	.5
Total	638	100.0

Use of Information Sources. HPOs were offered five information sources and asked to indicate for each of 13 subject-matter topics which sources they used. The responses in Table 37 indicate that the most used source for all topics was the project, with 68.4% of HPOs indicating it as their overall choice. The Ministry of Agriculture Policy/Agro-Industrial Complex was the second choice (12.6%), followed by other HPOs (10.5%), college/university research station (9.5%), and agribusiness (4.8%).

It is interesting to observe the choice trends of other-than-project sources for different topics. For example, the Ministry/Agro Industrial Complex was seen as a useful source for land titles, legal issues in farming, and tax laws, rules and regulations, the college/university station for crop/livestock/horticulture technology, and agribusiness companies for farm machinery, equipment, and supplies, plant protection technology, and agricultural marketing and markets.

Table 37: Sources of information on various subject matter topics used by HPOs over a three-year period, 2002-2004

Subject-matter topic	Percent HPOs using different information sources (N=655)				
	Project	Ministry/ agro-industrial complex	Other HPOs	College/ University Research Station	Agri- business
Legal issues in farming	71.3	20.6	10.4	6.6	0.8
Tax laws, rules, regulations	61.5	26.6	5.8	7.8	0.9
Obtaining land titles	69.3	32.2	12.8	4.1	0.3
Farm business planning/management	60.0	12.4	7.2	8.9	1.7
Obtaining farm credit	60.0	14.2	12.5	3.2	5.5
Crop production technology	86.9	9.3	12.1	18.3	3.7
Livestock production technology	67.0	5.2	8.2	13.3	1.2
Vegetable production technology	70.8	5.8	9.6	14.2	2.0
Fruit production technology	61.4	4.0	6.7	13.1	1.4
Farm machinery, equipment, supplies	61.7	10.7	13.7	8.2	15.3
Forming/managing ag cooperatives	60.3	6.6	4.4	6.4	2.0
Plant protection technology	82.3	10.4	12.8	13.7	14.7
Agricultural marketing and markets	76.9	6.1	20.6	5.8	12.8
Overall	68.4	12.6	10.5	9.5	4.8

Information Support System (ISS) Help to HPOs. Nearly three-fourths of HPOs (72.2%) indicated that raion specialists had helped them in solving problems using the ISS, a computerized agricultural information database developed and distributed by the World Laboratory, Ukraine Branch, Kyiv, as a partner in the project. Only 9.0% said they had not been helped, and 18.8% were uncertain (Table 38).

Table 38: Help given by raion specialists to HPOs in solving problems using the Information Support System (ISS), Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

Raion specialists helped HPOs	Number of HPOs	% of HPOs
Yes	468	72.2
No	58	9.0
Don't know	121	18.8
Total	642	100.0

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HPOs who received help from raion specialists using ISS gave a number of general and specific examples of topics/problems of such help/problem solving. These are listed in Table 39 grouped under six information categories showing the number of mentions of each topic/problem. The wide range of topics/problems mentioned in these categories shows the diversity of help received, the versatility of the ISS information database, and the ability of raion specialists to use ISS in assisting farmers.

A few HPOs did not receive help from ISS/raion specialists. Their reasons are listed in Table 40.

Overall, the ISS-raion specialists system was regarded by HPOs as a valuable source of information and help in solving problems.

Table 39: Examples of help received from raion specialists using ISS information to solve problems of HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

Topic/Problem (general and specific)	Number of mentions
Information Category: Crop Production Cultural Practices	
Wheat	
Using regionally recommended and locally adapted winter wheat varieties	15
Protecting winter wheat from diseases and insects	12
Wheat production technology	7
Controlling weeds on winter wheat	3
Procuring spring wheat seeds	2
Fertilization of winter wheat	1
Barley	
Choosing spring/winter barley/early maturing vegetative period varieties	15
New seeds of brewing barley purchased/used	1
Herbicides for spring barley applied	1
Barley for hop production	1
Buckwheat	
Choosing recommended buckwheat varieties	3
Applying pest management measures to buckwheat	1
Grading (sorting) buckwheat	1
Soybean	
Choosing and buying recommended soybean varieties	1
Understanding and applying new soybean production technology	1
Sugar beet	
Selecting better varieties and hybrids of sugar beet	5
Understanding and controlling for insects and diseases of sugar beet	5
Understanding and applying sugar beet production technology	3
Sugar beet fertilization and protection system applied	1
Identifying weeds in sugar beet fields	1
Corn	
Choosing better and higher-yielding corn varieties/hybrids	4
Applying herbicides and chemical protection measures for corn	2
Sunflower	
High quality sunflower seeds/hybrids/French selection purchased ("Raiz" farm)	4
Herbicides for sunflower applied	3
Diseases in sunflower fields identified and remedies applied	2
Information Category: Horticultural Production Cultural Practices	
Potatoes	
Better potato varieties selected and purchased at economical prices	34
Potato diseases/insects controlled	21

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Recommended potato production technology followed	4
Assistance in sorting (grading) of potatoes	1
Early potato growing technology used	1
Potato "atlas" used	1
Other Vegetables (Tomatoes, Onions, Cucumbers, Carrots, Peas, Beans)	
Improved/recommended vegetable varieties selected/technology used	18
Insects and diseases of vegetables identified and controlled	15
Horticulture/vegetable "atlas" used	9
Medicinal plants cultivated	2
Technology of onion/garlic production followed	1
Herbicides on vegetables applied	1
Fruits	
Fruit varieties selection, production technology understood and used	5
Intensive (Dutch) orchard technology learned and practiced	1
Varieties, technology, and diseases of currants/black currants learned and practiced	1
Cockchafer in new orchards controlled	1
Productive varieties of apple trees selected for planting in orchard	1
Causes and control of apple tree diseases determined and followed	1
Fruit trees planting area determined	1
Information Category: Livestock Husbandry Practices	
Beef/dairy cattle/ swine breeds procurement and raising information received and used	22
Bee-keeping advice received and bee-garden management practiced	17
Forage, feed rations, feeding recommendations followed	16
Beef cattle and swine diseases prevented/treated/controlled	7
Assistance in identifying and treating poultry diseases	3
Pasture management/hay marketing	2
Fish fingerlings procured/fish production technology	1
Information Category: Plant Health/Protection	
Plant protection technology (General)	35
Weed control methods and optimum use of herbicides	23
Plant protection chemicals and their purchase/appropriate use	14
Crop IPM (wheat, barley, corn, sugar beet, potato, general)	10
Understanding and using pest control methods/measures	10
Following pesticide recommendations and pesticide applications	6
Information Category: Farm Planning and Management	
Production Planning and Management Decisions	
Selection, source, purchase, and economical use of production inputs (seeds, fertilizers, pesticides, weedicides, equipment and machinery, fuel)	44
Use of crop atlases	5
Cover crops in a crop rotation	1
Business and Financial Planning and Management Decisions	
Legal and managerial issues (obtaining land title/share certificate; preparing documents to establish a farm enterprise, register farm; develop bylaws for the farm)	15
Farm bookkeeping and accounting	6
Business planning and business plan development (to obtain agricultural credit)	3
Setting up an agricultural service cooperative	3
Using a financial reporting system	1
Understanding and preparing crop budgets (sheets, elements)	1
Information Category: Marketing Agricultural Products	
Understanding optimum marketing of farm produce (principles; methods/channels, outlets, prices)	20
Following grain markets and prices	7
Barley and spring wheat marketing	6

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Table 40: Reasons given by HPOs why the ISS/raion specialists could not help solve their problems, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

Reason	Number of mentions
Could not get information on bell pepper and egg plant production/grain varieties	1
Pest control information outdated	1
Livestock production program leaves much to be desired	1
Could not get information on leasing a tractor	1
Did not get information on strawberry fertilization; as a result lost 100 strawberry shrubs	1
Timely help not received in getting land	1
Could not get information on quail production	1

HPOs' Knowledge of Agricultural Best Management Practices (BMPs). The next three tables present percentages of HPOs who indicated knowing or not knowing the recommendations associated with crop, livestock, and environmental best management practices.

Overall, 90.8% of HPOs had knowledge of recommendations for crop production BMPs, 74.7% knew livestock production BMP recommendations, and 89.0% had knowledge of environmental BMP recommendations.

The range of HPOs having knowledge of specific crop BMP recommendations was 98.6% to 72.3% (Table 41), 90.7% to 54.3% for livestock BMP recommendations (Table 42), and 97.2% to 76.4% for environmental BMP recommendations (Table 43).

The information on percentages of HPOs who did not know specific recommendations in the three areas is useful to program educators for targeting weaker knowledge areas in future education programs.

Table 41: HPOs' knowledge of crop best management practices (BMPs)

Best management practice	Number of respondents	Percent of respondents who knew/ did not know recommendation		
		Knew	Did not know	Total
Controlling insects	498	96.4	3.6	100.0
Controlling weeds	496	98.6	1.4	100.0
Planting recommended varieties	496	97.2	2.8	100.0
Planting at right time	496	98.0	2.0	100.0
Using correct row spacing	495	96.8	3.2	100.0
Using recommended fertilizers	495	95.8	4.2	100.0
Using recommended seeding rate	493	97.2	2.8	100.0
Harvesting properly	491	97.6	2.4	100.0
Following recommended crop rotation	490	93.9	6.1	100.0
Soil testing every three years	489	83.4	16.6	100.0
No-till planting	489	77.5	22.5	100.0
Maintaining farm records	486	88.9	11.1	100.0
Using lime as recommended	481	78.8	21.2	100.0
Irrigating as needed	480	72.3	27.7	100.0
Overall		90.8	9.2	100.0

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Table 42: HPOs' knowledge of livestock best management practices (BMPs)

Best management practice	Number of respondents	Percent of respondents who knew/ did not know recommendation		
		Knew	Did not know	Total
Selecting or buying superior stock	413	85.7	14.3	100.0
Sanitary housing facility	410	90.7	9.3	100.0
Regular health check by veterinarian	409	89.2	10.8	100.0
Feeding balanced concentrate mixture	409	84.8	15.2	100.0
Using artificial insemination	406	82.5	17.5	100.0
Culling unproductive animals	403	80.6	19.4	100.0
Up-to-date on required immunizations	403	84.6	15.4	100.0
Sanitary milking operations	400	70.8	29.3	100.0
Proper milking equipment/maintenance	400	54.3	45.8	100.0
Proper record-keeping	397	71.0	29.0	100.0
Controlling internal/external parasites	397	63.2	36.8	100.0
Raising improved pastures	396	59.3	40.7	100.0
Practicing rotational grazing	396	54.0	46.0	100.0
Overall	---	74.7	25.3	100.0

Table 43: HPOs' knowledge of environmental best management practices (BMPs)

Best management practice	Number of respondents	Percent of respondents who knew/ did not know recommendation		
		Knew	Did not know	Total
Plant protection – chemical	494	97.2	2.8	100.0
Plant protection – cultural	493	96.6	3.4	100.0
Not burning post-harvest stubble	489	95.1	4.9	100.0
Handling animal sludge liquor	486	90.9	9.1	100.0
Plant protection – cultural, chemical, biological	487	78.0	22.0	100.0
Plant protection – biological	484	76.4	23.6	100.0
Overall	---	89.0	11.0	100.0

Adoption of Agricultural Best Management Practices (BMPs) by HPOs. The next three tables (44, 45, 46) present information on the adoption of recommendations associated with crop, livestock, and environmental best management practices. HPOs who had knowledge of specific practices were asked to indicate the extent to which they followed the recommendations for those practices. A 5-point response scale was provided with ratings of 4 for always following recommendations, 3 for mostly following, 2 for sometimes following, 1 for rarely following, and 0 for not following. HPOs were placed into three categories according to their responses – full adopters if always or mostly following; partial adopters if sometimes following, and non-adopters if rarely following or not following. Percentages of HPOs falling into these three categories were determined. In addition, the mean adoption score for each practice was calculated by

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summarizing and averaging scaled responses. Overall adoption percentages and the overall adoption means shown in the tables are for all practices in each of the three BMP groups, i.e., crop, livestock, and environmental.

Overall, 66.1% of HPOs fully adopted recommendations for 14 crop BMPs. The range of adoption for this category of home plot owners was 95.7% to 11.1% (Table 44). With regard to livestock BMPs, overall, 64.2% of HPOs fully adopted the 13 practices included in this group. The range of full adoption was from 89.2% to 27.1% (Table 45). The overall full adoption percentage of 6 environmental BMPs (69.5%) was slightly more than for BMPs in the other two groups. The adoption percentage range for environmental BMPs was 88.1% to 42.7% (Table 46).

The fact that significant percentages of HPOs were in the partial and non-adopter categories for several specific BMPs in all three groups (crop, livestock, and environmental) should concern extension educators. It would be important for them to focus programming efforts to increase the adoption level of those practices.

Mean adoption scores are an alternative and convenient way of analyzing and interpreting data. They provide essentially the same information as percentages on an adoption continuum. Mean scores from 2.5-4.0 can be interpreted as full adoption; scores from 1.5-2.49 indicate partial adoption, and scores below 1.5 suggest non-adoption. According to this interpretive scale, four crop BMPs require program educators' attention, i.e, no-till planting, soil testing every three years, using lime as recommended, and irrigating as needed. Three livestock BMPs, namely raising improved pastures, practicing rotational grazing, and proper milking equipment/maintenance, and one environmental BMP, biological plant protection, should receive the same educational focus.

Table 44: Adoption of crop production best management practices (BMPs) among HPOs

Best management practice	Number of HPOs ^a	Adoption score ^b	Adoption category ^c (% HPOs)			Total
			Full adopters	Partial adopters	Non adopters	
Using recommended seeding rate	483	3.45	95.7	2.7	1.6	100.0
Planting at right time	488	3.45	94.3	4.5	1.2	100.0
Harvesting properly	483	3.41	93.6	3.1	3.3	100.0
Using correct row spacing	490	3.34	93.1	4.1	2.8	100.0
Planting recommended varieties	484	3.14	87.4	8.9	3.7	100.0
Properly controlling weeds	493	3.17	86.0	10.5	3.5	100.0
Maintaining farm records	450	2.79	70.2	10.4	19.3	100.0
Properly controlling insects	487	3.08	81.3	11.5	7.2	100.0
Using recommended fertilizers	481	2.81	70.3	22.9	6.8	100.0
Following recommended crop rotation	470	2.74	68.5	20.4	11.1	100.0
No-till planting	417	1.63	38.2	15.6	46.2	100.0
Soil testing every three years	436	1.20	22.5	16.1	61.4	100.0
Using lime as recommended	411	.77	13.1	12.2	74.7	100.0
Irrigating as needed	407	.61	11.1	6.6	82.3	100.0
All BMPs (average)		2.5	66.1	10.7	23.2	100.0

^a HPOs who said they knew different BMPs.

^b Mean based on a 5-point rating scale with HPOs indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).

^c Full adopters – always or mostly followed practices; Partial adopters – sometimes followed practices; Non adopters – rarely followed or did not follow practices.

Table 45: Adoption of livestock production best management practices (BMPs) among HPOs

Best management practice	Number of HPOs ^a	Adoption score ^b	Adoption category ^c (% HPOs)			Total
			Full adopters	Partial adopters	Non adopters	
Sanitary housing facilities	389	3.28	89.2	2.6	8.2	100.0
Regular health check by veterinarian	382	3.03	80.4	9.2	10.4	100.0
Feeding balanced concentrate mixture	376	2.82	75.8	11.2	13.0	100.0
Sanitary milking operations	314	2.77	76.8	2.2	21.0	100.0
Selecting/buying superior stock	369	2.77	77.0	8.9	14.1	100.0
Up-to-date on required immunizations	363	3.05	78.2	10.5	11.3	100.0
Using artificial insemination	361	2.48	63.7	9.4	26.9	100.0
Culling unproductive animals	348	2.71	70.4	12.4	17.2	100.0
Proper record-keeping	323	2.37	62.2	10.2	27.6	100.0
Controlling internal/external parasites	306	2.32	60.5	11.1	28.4	100.0
Raising improved pastures	305	1.26	29.8	10.8	59.4	100.0
Practicing rotational grazing	292	1.15	27.1	11.0	61.9	100.0
Proper milking equipment/maintenance	287	1.69	44.3	5.2	50.5	100.0
All BMPs (average)	---	2.4	64.2	8.8	27.0	100.0

^a HPOs who said they knew different BMPs.

^b Mean based on a 5-point rating scale with HPOs indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).

^c Full adopters – always or mostly followed practices; Partial adopters – sometimes followed practices; Non adopters – rarely followed or did not follow practices.

Table 46: Adoption of environmental best management practices (BMPs) among HPOs

Best management practice	Number of HPOs ^a	Adoption score ^b	Adoption category ^c (% HPOs)			Total
			Full adopters	Partial adopters	Non adopters	
Plant protection – cultural	480	3.24	88.1	9.8	2.1	100.0
Plant protection – chemical	489	3.10	84.5	11.5	4.0	100.0
Not burning post-harvest stubble	472	2.90	70.3	14.4	15.3	100.0
Handling animal sludge liquor	455	2.92	77.6	8.6	13.8	100.0
Plant protection – cultural, chemical, biological	432	2.17	53.5	16.2	30.3	100.0
Plant protection – biological	424	1.75	42.7	13.9	43.4	100.0
All BMPs (average)	---	2.68	69.5	12.4	18.1	100.0

^a HPOs who said they knew different BMPs.

^b Mean based on a 5-point rating scale with HPOs indicating at what level they followed BMPs: always (4); mostly (3); sometimes (2); rarely (1); not at all (0).

^c Full adopters – always or mostly followed practices; Partial adopters – sometimes followed practices; Non adopters – rarely followed or did not follow practices.

Attitudes and Aspirations of HPOs. The move toward a market-driven economy and the spread of democracy and political freedom over the last 15 years of Ukraine's independence have created an environment in which people can see positive changes in their lives and can raise their desires and hopes for a better future for themselves, their families, and their communities. It is important, therefore, to

determine how attitudes and aspirations of people might have changed not only due to the more favorable societal environment but also how the project might have contributed to these changes.

Following this line of thinking, 14 attitude/aspiration (A/A) statements (13 positive and 1 negative) were posed to HPOs and they were asked to indicate if they agreed, did not have an opinion, or disagreed with the statements. Their responses are summarized as percentages of HPOs who fell into these response categories for each statement and overall for all statements. Mean AA scores for each practice and all practices were also determined. One negative statement was reverse scored for frame of reference consistency. The results of this analysis are presented in Table 47.

Both measures – percentages and means – show that HPOs are very positive. Overall, for the set of 13 statements the high mean score of 2.62 on a score range of 0-3 (negative to positive) suggests a high positive regard for various aspects of their personal, family, community, and societal lives. Two positive statements – Farmers should rely on their own resources rather than the government, and I trust the government – elicited a lukewarm to negative response. This can be interpreted as an extension of public thought from the communist era when people depended on the social security net of government and at the same time distrusted it for intruding into their private lives.

Table 47: Attitudes and aspirations of HPOs

Attitude/Aspiration (AA) statement	Number of HPOs	Mean AA score ^a	Extent of agreement with AA statement (% HPOs)			
			Agree	No opinion	Disagree	Total
I trust the government	494	2.97	98.2	1.0	.8	100.0
Farmers must use science-based crop and livestock information to be successful	499	2.95	96.0	2.8	1.2	100.0
I like to take responsibility for my actions	491	2.92	93.5	4.7	1.8	100.0
I look forward to a better life for my family	485	2.89	93.0	3.3	3.7	100.0
I want to be a successful farmer making a good income by following scientific methods	499	2.89	92.0	5.0	3.0	100.0
My outlook on life and the world is positive	495	2.86	88.7	8.5	2.8	100.0
If farmers join together they can be stronger and more successful than as individuals	498	2.83	84.9	13.1	2.0	100.0
I trust people with whom I have agricultural transactions	493	2.81	84.6	11.6	3.9	100.0
Government should give farmers money when they have financial difficulties	495	2.77	83.2	10.5	6.3	100.0
The next generation of Ukrainians will be much better off than our generation	496	2.76	80.8	14.5	4.6	100.0
I am confident that our oblast has a bright future	494	2.58	67.2	23.5	9.3	100.0
I feel we were better off in collective farms than in the new private farming system ^b	490	2.40	17.1	22.0	60.8	100.0
Farmers should rely on their own resources rather than the government	494	2.13	48.8	15.0	36.2	100.0
Village councils should treat all people equally	495	1.88	31.9	23.8	44.2	100.0
Overall (average)	494	2.69	75.8	11.3	12.9	100.0

a Based on a 3-point response scale: 3=agree; 2=no opinion; 1=disagree.

b Negative statement: mean calculated by reverse scoring responses (1=agree; 2=no opinion; 3=disagree)

Section 2. Project Performance and Perceptions of Home Plot Owners on Changes Resulting from the Project

This section assesses overall project performance with regard to HPO outreach as judged on five core indicators, and selected perceptions of HPOs on changes resulting from the project. Project performance is assessed by comparing information from the baseline (2003) and end-of-project (2004) surveys. Information on changes in the agricultural production performance of HPOs and the economic, social and environmental impacts of the project is based on HPO responses to questions in the end-of-project survey (2004) on the changes they perceived to have taken place from the start of their association with the project (2002/2003) to the time the project ended (2004).

Project Performance

Five indicators - educational participation, technology use (adoption), input use/cost, crop yield, and productivity (average gross income) - were specified in the project proposal to assess its success in reaching the goal of improving income of HPOs. The program logic of these indicators is that participation in education programs over a period of time leads to increased use of agricultural technology and production inputs, resulting in increased crop yields and overall productivity (defined as gross income).

Table 48 compares baseline and end-of-project information for these indicators. For each indicator, the measurement unit, baseline and end-of-project quantities, and changes in these quantities (absolute and percentage values) as a result of the project's educational intervention are presented.

All indicators showed positive changes over the three years of the project. Educational participation of HPOs, as measured by number of individuals served by the project's extension staff, increased from 858 at the beginning of the project to 6,773 at the end of the project (689.4% increase). New agricultural technology learned in the education programs influenced adoption of recommended technology, which increased by 50.0% over the life of the project. Increased technology adoption resulted in greater input use and cost (131.5% increase). This contributed to a significantly higher overall crop yield (79.8% increase), and an increase of 154.8% in agricultural productivity (average gross income). Thus, the project was successful in changing the educational behavior of HPOs which enabled them to improve crop yields and income.

Table 48: Changes among home plot owners (HPOs) in Cherkasy, Khmelnytsky and Vinnytsia oblasts as a result of the project's educational intervention, 2002-2004.

Project performance indicator	Measure	Baseline 2002:2003	End-of-Project 2004	Change in 2004 over 2002	
				Quantity	Percent
Educational participation ^a	# of contacts	858	6,773	(+) 5,915	(+) 689.4
Technology adoption ^b	% HPOs	46.1	69.1	(+) 23.0	(+) 50.0
Input cost ^c	\$	463.0	1,072.0	(+) 609.0	(+) 131.5
Yield ^d	c/ha	35.6	64.0	(+) 28.4	(+) 79.8
Productivity ^e	\$	1,935.0	4,931.0	(+) 2,996.0	(+) 154.8

Note: Data are based on random samples of HPOs from the three oblasts. Total number of HPOs sampled: Baseline (Intermediate Evaluation, 2003) - 240; End-of-project - 655.

^a Number of different HPOs who participated in workshops, seminars, demonstrations, and office and farm visits organized by Center faculty/raion specialists

^b % HPOs who "always" or "mostly" adopted crop and livestock management practices (Baseline: ___ practices reported in the publication "Agricultural Activity of Households in Ukraine, Statistical Yearbook, 2002, State Statistics Committee of Ukraine, Kyiv, 2002; End-of-project: 27 practices).

^c Per HPO average cost of seeds, livestock feed, organic fertilizers, chemical fertilizers, crop protection chemicals, fuel. Baseline figure determined by multiplying the reported quantities of these inputs as reported in Intermediate Evaluation Report (2003) by the prevailing input prices averaged over a six-month period. End-of-project figure is actual reported cost.

^d Average aggregate yield of wheat, rye, barley, buckwheat, corn, sugar beet, potatoes, vegetables (carrots, cabbage, cucumbers, tomatoes, onions), fruits (apples, plums)

^e Defined as average gross income and calculated by (1) multiplying total production of crop and livestock commodities by prevailing commodity prices averaged for a six-month period, (2) subtracting total cost of production inputs, and (3) averaging the difference. Includes only HPOs who (1) harvested up to 20 hectares, and (2) had a calculated gross income in the range of (-) \$100 and (+) \$65,000.

HPOs' Perceptions of Changes/Impacts Resulting From Participation in the Project

In the end-of-project evaluation survey, farmers were asked to respond to questions about the changes they perceived the project brought about in their agricultural situation, and the economic, social, and environmental impacts of the project in their communities.

Changes in Agricultural Situation of HPOs

Crop Production Changes. HPO perceptions of changes in crop production are shown in Table 49. HPOs reported the amount of harvested land area and average yields of grain and horticulture crops obtained in the first year of their contact with the project (2002/2003) and the end year of the project (2004). Harvested area of all crops raised by HPOs on the average increased from 8.7 hectares to 13.2 hectares (34.1% change). Average yield of all grain/horticulture crops increased. The range of increase was from a minimum of 4.2% for tomatoes to a maximum of 35.1% for rye.

Table 49. Crop production reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts at the beginning year of their contact with the project and the end year of the project.

Production indicator	Measure Average/HPO	Beginning year of contact with the project	End-of-project 2004	Change in 2004 over beginning year of contact (work with project)	
				Quantity	Percent
Harvested land	hectares	8.7	13.2	(+) 4.5	(+) 34.1
Average yield of crops					
Wheat	centners/hectare	28.59	38.03	(+) 9.4	(+) 24.8
Rye	centners/hectare	19.46	29.42	(+) 9.9	(+) 33.8
Barley	centners/hectare	23.75	30.73	(+) 6.9	(+) 22.7
Buckwheat	centners/hectare	12.45	13.37	(+) 0.9	(+) 6.8
Corn	centners/hectare	41.99	49.50	(+) 7.5	(+) 15.2
Sugar beet	centners/hectare	208.09	260.00	(+) 51.9	(+) 19.9
Sunflower	centners/hectare	17.28	18.65	(+) 1.3	(+) 7.3
Silage	centners/hectare	125.69	163.74	(+) 38.0	(+) 23.2
Potato	centners/hectare	175.02	242.46	(+) 67.4	(+) 27.8
Carrot	centners/hectare	140.05	177.19	(+) 37.1	(+) 21.0
Cabbage	centners/hectare	217.83	267.88	(+) 50.0	(+) 18.9
Cucumbers	centners/hectare	97.61	113.36	(+) 15.8	(+) 13.9
Tomatoes	centners/hectare	126.70	132.30	(+) 5.6	(+) 4.2
Onion	centners/hectare	90.20	112.52	(+) 22.3	(+) 19.8
Apples	centners/hectare	65.79	101.42	(+) 35.6	(+) 35.1

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With regard to cash return from crop products, 90.4% of HPOs said their gross income increased, and 87.6% indicated an increase in net profit (Table 50). Ten percent or less said there had been no change in gross income or net profit. Practically none of them indicated a decline.

Table 50. Changes in gross income and net profit from crops reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts at the beginning year of their contact with the project and the end year of the project.

Change reported by HPOs from beginning to end of project	Gross income		Net profit	
	n	%	n	%
Increased	450	90.4	436	87.6
Same	45	9.0	58	11.6
Decreased	3	0.6	4	0.8
Total	498	100.0	498	100.0

Livestock Production Changes. HPO perceptions of changes in livestock production are shown in Tables 51-54.

Table 51 shows an increase in all livestock products produced by HPOs over the term of the project. All products showed an increase. Milk, pork, broilers, eggs and honey production increased by over 20% in each case. Beef showed only a slight increase (3.7%)

Table 51. Livestock production reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts at the beginning year of their contact with the project and the end year of the project.

Livestock product	Measure Average per HPO	Beginning year of contact with project	End-of- project 2004	Change in 2004 over beginning year of contact with project	
				Quantity	Percent
Milk	tons	4.64	6.02	(+) 1.3	(+) 22.9
Beef	centners	12.60	13.00	(+) 0.4	(+) 3.7
Pork	centners	7.88	10.45	(+) 2.5	(+) 24.6
Broilers	kg	93.90	128.82	(+) 34.9	(+) 27.1
Eggs	number	2603.59	3257.20	(+) 653.6	(+) 20.1
Honey	kg	520.10	711.80	(+) 191.7	(+) 26.9

Table 52 indicates that about one-third of HPOs increased their herds of milking cows and beef animals, and two-thirds increased swine herds and poultry flocks from the beginning year to the end year of the project. Nearly all the rest of the HPOs maintained level numbers of the different species over the duration of the project.

Table 52. Change in number of livestock reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts that were raised at the beginning at their contact with the project and the end year of the project

Livestock	Number of HPOs	% HPOs reporting change in number of livestock from beginning to end year			
		Increase	Same	Decrease	Total
Milking cows	275	31.3	66.9	1.8	100.0
Beef animals	194	39.2	58.2	2.6	100.0
Swine	343	60.7	36.7	2.6	100.0
Poultry	302	62.9	34.1	3.0	100.0

In tandem with the reported increase in animal numbers maintained over the duration of the project, a majority of HPOs indicated good animal production efficiencies in terms of per animal unit production (Table 53). From 56.1% to 71.9% of HPOs reported increased production. Most of the remaining HPOs maintained their production at the same level through the three-year period.

Table 53. Change in per animal unit production reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts at the beginning at their contact with the project and the end year of the project

Livestock	Number of HPOs	% HPOs reporting change in unit production from beginning to end year			
		Increase	Same	Decrease	Total
Milking cows	270	65.5	31.9	2.6	100.0
Beef animals	196	56.1	54.4	0.5	100.0
Swine	342	71.9	26.3	1.8	100.0
Poultry	302	70.8	27.5	1.7	100.0

With regard to cash return from livestock products, over 80% said both gross income and net profit increased (Table 54). Less than 20% said there had been no change in gross income or net profit. Practically none of them indicated a decline.

Table 54. Changes in gross income and net profit from livestock reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts at the beginning year of their contact with the project and the end year of the project.

Change reported by HPOs from beginning to end of project	Gross income		Net profit	
	n	%	n	%
Increased	322	82.2	333	82.8
Same	68	17.3	65	16.2
Decreased	2	0.5	4	1.0
Total	498	100.0	498	100.0

Change in Use of Organized Markets. Organized markets are legitimate market outlets that enable sellers to enter a retail chain and obtain a tax receipt. Use of such market outlets reflects a business orientation to marketing and the possibility of better cash returns for produce in contrast to the use of unorganized markets such as spontaneous and personal sales which may not provide as good return. Examples of

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legitimate market outlets include farmers markets, farm stores, Bread Ukraine wholesale company, retail buyers, stock exchanges, processing companies, auctions, fairs, and government agencies.

HPOs were asked to indicate the percentages of their crop and livestock products sold through organized markets at the beginning of their association with the project and at project end. Greater percentages of HPOs used organized markets for crop products (64.7% at end vs. 55.3% at beginning) as well as animal products (77.2% at end and 70.2% at beginning) (Table 55).

Table 55. Percentages of crop and livestock products sold by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts through organized markets at the beginning of their contact with the project and the end year of the project

Commodity	% of products sold through organized markets a	
	Beginning year (2002/2003)	End year (2004)
Crop products	55.3	70.2
Livestock products	64.7	77.2

Changes in Knowledge and Use of Management Methods. The positive impact of agricultural management education programs on HPOs can be seen in Table 56. Over 90% of HPOs said their knowledge and use of crop and livestock management methods was much more or more at the end of the project as compared to when they were first involved at the start of the project.

Table 56. Changes in knowledge and use of crop and livestock management methods reported by HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts through organized markets at the beginning of their contact with the project and the end year of the project

Change from beginning to end year of project	Knowledge of management methods		Use of management methods	
	Number of HPOs	% of HPOs	Number of HPOs	% of HPOs
Much more	45	9.0	117	23.5
More	430	86.4	353	70.9
About the same	23	4.6	28	5.6
Total	498	100.0	498	100.0

Economic, Social and Environmental Impacts of Project in HPO Communities

Table 57 summarizes information gathered in the end-of-project survey of the economic, social, and environmental impacts of the project on the lives of HPOs and their communities.

A majority of HPOs felt the project had an economic impact on community life in terms of overall economic improvement, as well as specifically increasing agricultural incomes, savings, and purchases of consumer goods.

Specific examples of agricultural and economic improvements given by HPOs were: general welfare of the community and individual incomes, living standards, and quality of life improved (9 mentions); useful and relevant technology was learned and applied in HPO agricultural operations such as pond fish culture, disease and insect control (8 mentions); better planning of home plot operations (1 mention). Reasons given by HPOs for the project's limited economic impact in the community included the lack of stable and

farmer-friendly government price policies (3 mentions); imbalance between production costs and market prices (2 mentions); and unfavorable weather conditions (1 mention).

Social impacts of the project were seen by a majority of HPOs in their increased participation in community groups and the benefits they personally received in agricultural operations from such participation. Over one-half (52.4%) said they had joined a village or raion group and cited the group's achievements as a result of the project's educational intervention. A list of these achievements for each of the three oblasts is shown in Table 58 along with the number of mentions.

HPOs also indicated significant personal and family involvement in community events and activities which were mutually beneficial to them and the community. Nearly one-half (49.5%) said they were invited to participate in meetings of administrative entities (village council, raion administration, Ministry of Agriculture). Results of such participation for each of the three oblasts are shown in Table 59 along with the number of mentions.

Three-fourths of HPOs (77.4%) indicated that the environmental education programs of the project had influenced individual and community behaviors/actions to protect and preserve the environment. Examples of environmentally conscious behaviors/actions resulting from the project's educational intervention are shown for each oblast in Table 60 along with the number of mentions.

Table 57. HPO perceptions of economic, social, and environmental impacts of the project

Economic impacts	Number of HPOs reporting	Percent of HPOs		
		Yes	No	Not sure
Agricultural and economic situation improved	499	88.8	1.4	9.8
Agricultural income increased	479	90.6	4.2	5.2
More money saved for expenditure/investment	453	68.9	17.4	13.7
More consumer goods and services purchased	454	72.9	18.7	13.4
Project contributed to economic improvement	489	90.8	0.2	9.0

Social impacts	Number of HPOs reporting	Percent of HPOs	
		Yes	No
Joined a village or raion group ^a	489	52.4	47.6
Participated very actively or actively in the group	256	92.1	7.9
Group enlarged its activities	305	73.8	26.2
Group helped HPO families			
*Acquire farm inputs	326	61.7	38.3
*Acquire or enable use of farm machinery	341	68.7	31.3
*Market agricultural products	326	61.7	38.3
HPO's family assisted/involved in community events			
*Volunteered time and labor	420	46.0	54.0
*Provided/shared farm inputs	434	65.4	34.6
*Lent equipment to other farmers	430	62.1	37.9
*Participated in community events	422	67.8	32.2
*Donated money	409	60.3	39.7
Family received support from community	475	69.7	30.3
Project promoted family's participation in community	476	78.6	21.4
Local administrative bodies invite farmers to seminars/meetings to solicit their ideas	487	49.5	50.5

^a association, cooperative or social/civic group

Environmental Impact	Percent of HPOs (N=496)		
	Yes	No	Not sure
Project influenced HPOs'/community behavior/actions to protect and preserve the environment	77.4	1.4	21.2

Table 58: Examples of achievements of groups of which HPOs became members as a result of the project's educational intervention in Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

HPO responses regarding achievements of groups of which they became members	Number of mentions
Khmelnytsky Oblast	
Helped one another in land preparation, sowing, harvesting of crops	10
Shared information and ideas on production and marketing of crop commodities	10
Helped one another with farm machinery hiring/use/maintenance	9
Increased own participation and encouraged others to participate in project's educational activities	9
Cooperated with other HPOs in marketing products through organized markets	6
Learned how to form, build, and sustain a good organization	5
Jointly purchased inputs at better prices (seeds, herbicides, etc.)	5
New beehive technology demonstrated in bee gardens/beekeepers trained	3
Raion beekeepers association formed	3
Successful farming experiences shared among HPOs	3
Availed small grant for potato growers association/planted new varieties/increased yield	2
Expanded land area under herbs	1
Formed gardeners association	1
Increased lease land	1
Interest in cattle breeding increased	1
Cherkasy Oblast	
Spread mutual trust and understanding in community/Gained trust/Provided support/Worked together/Established friendships/Solved problems/Shared experiences/Enjoyed common interests	23
Timely and better organized/coordinated land preparation, planting, and harvesting	13
Better organized marketing of home plot produce	7
Land shares acquired/land association formed/land titles prepared	6
Milk collection/distribution for sale organized	6
Agricultural equipment/machinery shared	6
Agricultural service cooperative organized	4
Potato planting, supply organized	3
Fuel procured jointly with other HPOs	2
Gas supply cooperative in village created	2
Village council and community work together on activities	2
Meat sold at farmers market to processing company	2
Group and its members have higher social position/respect in community	2
Land fill (garbage dump) built	1
Credit union started	1
Vinnytsia Oblast	
Information gained from project and successful personal home plot production experiences shared with others in group and disseminated to other HPOs	7
Joint/wholesale purchase of farm inputs (seeds, fertilizers, fuel)	6
Yield/production of grains and vegetables, livestock products, honey increased	4
Joint purchase/use/maintenance of equipment and machinery	2
Knowledge and skills of group members increased	2
Agricultural service cooperative was planned by group of HPOs	2
Cooperated in marketing home plot produce	1
Withdrew my land shares from former collective farm	1

Table 59: Examples of results of HPOs participating in local administrative entities (village council, raion administration, Ministry of Agriculture) as a result of the project's educational intervention, Cherkasy, Khmelnytsky, and Vinnytsia oblasts, 2002-2004

HPO responses regarding results of participation in local administrative entities	Number of mentions
Cherkasy Oblast	
Active participation in village/community meetings/events/activities/seminars where information was shared and HPOs benefited	27
Exchange, dissemination, and use of information (raion agricultural situation, raion markets, crop production, marketing, business planning)	9
Local authorities/village councils support HPOs in farming activities	7
Discussed problems/determined solutions at village council meetings (land rights, village club, leased land, etc.)	7
Organized/membership of/head of village gas supply cooperative	7
Support and sponsorship of ideas	7
Learning of new ideas and technology	6
Four individuals served as deputies on village councils	4
Have greater respect and social position in village/community	2
One individual became land manager in the village council	1
Organized and became member of service cooperative "Silhospservice"	1
Khmelnytsky Oblast	
Exchange and dissemination of information and experiences through participation in village and community meetings/activities/events exchange/dissemination	20
Learning new ideas/technology (attending seminars, conducting seminars, attending field days)	10
Politically involved/campaigns/discussions	6
Became members of school parents committee/supported school with money	2
Became deputy of village council	1
Became head of election headquarters of block "Narodik"	1
Served on selection board for president of village council	1
Vinnytsia Oblast	
Learning new ideas/technology	10
Active involvement in/responsibilities for community work/activities	8
Sharing of information and experiences through participation in village life/activities/meetings	4
Became head of administration commission	1
One individual became deputy of the village council	1
Produce marketing was improved	1

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Table 60: - Examples of environmentally conscious behaviors/actions of HPOs in Cherkasy, Khmelnytsky, and Vinnytsia oblasts resulting from the project's educational intervention (2002-2004)

Environmentally conscious behaviors/actions by HPOs	Number of mentions
Cherkasy Oblast	
Learned about environmental issues and protection in agricultural production/rural life, feel responsible for and take care of the environment	35
Used agricultural chemicals at recommended/lower rates (fertilizers, pesticides, weedicides, fungicides) to protect crops and promote optimum growth	31
Community awareness/activities/actions (school students planted alley of glory; change in attitude toward land use; joint solutions found for problems; established/repaired dump sites for garbage and reduced garbage piles in village; planted apple orchard and lowers near school; improved quality of lake water; established cattle slaughter/storage facility; intensive orchard planted; river bank cleaned; trees planted near river/along roads/in country/around homes; established communal pasture at the correct slope; prohibited cutting of trees; weeds controlled along roads; community cleanup and ecology days; youth environmental education activities; park planted near village club)	24
Followed biological methods of pest management/plant protection	20
Plant residues not burned but buried/tilled in soil or mulched into organic manure to increase soil fertility and reduce environmental contamination	15
IPM	5
Controlled soil erosion (proper cultivation; planting pine trees on hills/slopes)	2
Khmelnytsky Oblast	
Plant residues not burned but buried/tilled in soil or mulched into organic manure to increase soil fertility and reduce environmental contamination	45
Used agricultural chemicals at recommended/lower rates (fertilizers, pesticides, weedicides, fungicides) to protect crops and promote optimum growth	23
Community awareness/activities/actions (common garbage dump built; public livestock pasture established; dead trees cut; garbage removed from field roads; created/protected forest belts; planted fruit trees; cleaned wells/river bed; repaired roads; organized environmental/sanitary/cleanup days)	21
Trees planted around homes, along roads. In field, ravines, slopes, common areas	11
Rivers and ponds cleaned	5
Followed proper storage and disposal of farm chemicals, chemical containers, pesticide wastes, fuels, lubricants	4
Controlled soil erosion (planted cover crops; not cultivating/terracing slopes)	2
Followed biological methods of pest management/plant protection	1
Vinnytsia Oblast	
Learned about environmental issues and protection in agricultural production/rural life (attitude change; greater awareness; knowledge gain; updated information; follow recommendations)	16
Plant residues not burned but buried/tilled in soil or mulched into organic manure to increase soil fertility and reduce environmental contamination	14
Used agricultural chemicals at recommended/lower rates (fertilizers, pesticides, weedicides, fungicides) to protect crops and promote optimum growth	13
Community awareness/activities/actions (Developed forest belt; Observed environmental protection laws; Properly stored and used organic manure; Stopped livestock wastes on and removed construction materials from village streets)	5
Used IPM approach in plant protection and ecologically safe/environmentally friendly agricultural production	3
Pollution of Rysvora river stopped	2
Controlled soil erosion near water reservoir	2

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INTERNATIONAL CENTER FOR

Attachment#3

List of Publications and Conference Presentations

List of Publications and Conference Presentations

1. Satish Verma (1999). *A Perspective of Extension Worldwide: Trends and Issues*. Paper Presentation, International Extension Conference, Kyiv, May 21-25, 1999.
2. Satish Verma, William Brown and Lakshman Velupillai (2001). *Linking Research, Teaching, and Extension in Ukraine*. In Brewer, Frank (Ed.), *Agricultural Extension Systems: An International Perspective*, Erudition Books, North Chelmsford, MA, pp 166-183.
3. Satish Verma, Larry Brock, Grigoriy Loyanich, Wanda Yamkovenko and Lakshman Velupillai (2002). *Using a Systems Analysis Framework to Improve Performance of the Ukrainian Center for Private Farmer Training and Outreach*. Proceedings of the 18th Annual Conference of the Association for International Agricultural and Extension Education, Durban, South Africa, May 2002, XVIII, 529-536.
4. Wanda Yamkovenko, Natasha Fishchuk, Julia Nesterchuk, Iryna Lozhinska and Satish Verma (2003). *Learning Transfer in an Extension Setting: An Example in Ukraine*. Paper Presentation, 16th European Seminar in Extension Education, Eger, Hungary, September 2-8, 2003.
5. Satish Verma, Lakshman Velupillai, Larry Brock, Michael Burnett and Viacheslav Sereda (2003). *Estimating Agricultural Productivity of Private Farmers in a Ukraine Extension Project*. Proceedings of the 19th Annual Conference of the Association for International Agricultural and Extension Education, Raleigh, North Carolina, April 2003.
6. Natasha Fishchuk and Wanda Yamkovenko (2004). *Extension Methods*. Paper Presentation, Proceedings of the International Conference on Extension, Kyiv, May 22-23, 2004.
7. Tetiana Butkaluk, Yuriy Vanzhula, Grygoriy Loyanych, Vasyl Mamalyga, Oleksander Muliar, Oleksander Nedbaluk, Natalya Fishchuk, Zoya Shchokina and Wanda Yamkovenko (2004). *Theory and Practice of Advisory Service: Planning and Implementation of Extension Programs*. Book in Ukrainian, edited by Vasyl Mamalyga. Consol, Vnnytsia, 2004, 231 pages.
8. Satish Verma, Larry Brock, Wanda Yamkovenko and Lakshman Velupillai (2005). *The Impact of an Extension Project on Private Farmers in Ukraine*. Paper Presentation, 17th European Seminar in Extension Education, Izmir, Turkey, Aug 29-Sep 3, 2005
9. Yuriy Chaplinskyy, Olena Subbotina (2002). *Advanced business advice for Ukrainian farmers*, International Conference "Farming with Nature", Carrefour Wageningen, Innovatiesteupunt Wageningen, 2002, 13-15 June
10. Yuriy Chaplinskyy (2003). *One Realization of Mobile Agrarian DSS for Outreach Agents in Ukraine*, International Congress on Information Technology in Agriculture, Food and Environment, Izmir, 2003, 7-10 October.
11. Olena Subbotina (2003). *System Approach for Realization Information Technologies of Integrated Pest Management*, International Congress on Information Technology in Agriculture, Food and Environment, Izmir, 2003, 7-10 October.

Attachment#4

#4 ISS Software and Databases Generated

Attachment #4.

Software and Databases Generated

Information in the ISS developed in the project included data on private farmers in Vinnytsia, Cherkasy, and Khmelnytsky oblasts; data on crop varieties, fertilizers, and protection chemicals registered in Ukraine; information on agricultural machinery; and a database on weeds, pests, and diseases. In addition, the database was used for computer-aided identification of weed plants, crop diseases, and insect pests. Information on livestock production/health systems was also incorporated in these databases. This decision making component was used in the project outreach effort to help farmers with building crop rotation schemes and flowcharts, computing fertilizer schemes, choosing herbicides against specific weed groups, economic analysis of farm operations, and computerized bookkeeping. The component was also used to provide research coordination assistance in the form of a database of resources and research programs. Finally, based upon the requirements of the Environmental Impact Assessment conducted by USAID, integrated pest management approaches were incorporated in all ISS subcomponent software and atlases.

The above have been incorporated in "Agro-IKS," designed at ICSC/World Laboratory, Ukraine Branch, and are offered in two versions – on CDs and on the web:

Compute-aided Atlases, directories and programs of the "Agro-IKS" Information Support System for distribution among farmers and extension specialists on CDs:

- A. Seven computer-aided Atlases in Crop Production, which enable display and printout of information on**
- Varieties, pest resistance, seed properties
 - Biological classification of pests – insect, diseases and weeds, and pest control practices.

for 731 crops and 6432 varieties.

Descriptive (attribute) Crop Production database contains

- 872 pesticides
- 654 crop diseases
- 720 pest insects
- 267 weed species
- 12,413 entries in the Pesticide Applicability Guide

Graphical Database includes 2,559 pictures

- B. Eleven Directories in Livestock Production, which cover a wide array of data on**
- Keeping, feeding, and reproductive management of livestock
 - Disease therapy and prevention
 - Description of species and breeds for
 - Cattle
 - Swine
 - Horses
 - Sheep
 - Rabbits

- - - Fur-animals
- Poultry
- Beekeeping and
- Fish farming

With attribute database covering 5,542 entries and graphical database including 461 pictures.

C. Computer Program "Farm Business Bookkeeping and Accounting" a computer program for Farm businesses allowing

- Input and correction of primary information without detailed specification of source of assets
- Filling up, visual display and printout of 7 mandatory financial accounting and statistical forms
- Computer-aided keeping of 9 analytical registers:
 - Form B-1: "Fixed Assets and Depreciation Costs"
 - Form B-2: "Stocks, Finished Products and Goods"
 - Form B-3: "Production Costs"
 - Form B-4: "Money and Financial Results"
 - Form B-5: "Payments and Other Transactions"
 - Form B-6: "Sale of Goods and Services"
 - Form B-7: "Settlements with Suppliers and Contractors"
 - Form B-8: "Salaries and Deductions"
 - Turnover & Balance Statement

D. Computer Program "Farm Business Planning," including 90 analytical forms, including the following

Basic --

- Farm Profile (3 forms)
- Market Analysis (2 forms)
- Production Plan (13 forms)
- Marketing Plan (4 forms)
- Organizational Plan (4 forms)
- Financial Plan (6 forms)
- Risks Estimate (3 forms)
- Prospective Financial Conditions (4 forms), and

Complementary --

- Retrospective Analysis of Financial Condition (4 forms)
- Solvability Assessment (3 forms)
- Forecast of Harvest Output (4 forms)

Internet Version on <http://www.agro-iks.org>

Wide access to Information Support Systems in Agriculture and Food Industry through the Internet site has been opened for the first time in Ukraine by efforts of the WLUB Team. The ISS "Agro-IKS" on the Web became an instrument, which led to changes in management methods and decision-making practices in these industries.

Projects success stories show a growing interest of stakeholders in Information Support Systems, which proves that website has become an easily accessible source of timely and useful information, facilitating the contacts of farmers and business with input suppliers, buyers and contractors, as well as leading to increased sales.

Each company highlighted on the web portal is being contacted directly by suppliers offering raw materials, equipment, feeds, vitamins and veterinary products and, thus, providing for lower transaction costs.

Components of the "Agro-IKS" on the Web –

- i. Information resources (databases)
- ii. Interactive services
- iii. Services of administration and update

Information resources (databases) available on the web provided a wide array of technological and market data in Agricultural Production, including

- Crop Production
- Animal Production
- Animal Disease
- Beekeeping
- Farm Research Database

and Processing Industry, including

- Meat Industry
- Poultry Production
- Seafood Production
- Cold Chain Technology
- HACCP Training and Implementation through International Institute of Food Safety and Quality

Interactive Services of the "Agro-IKS" website:

- Exchange by business information (Business Board)
- Questions and Answers Board
- News Board
- Guest Book
- Virtual Commodity Exchange

Administration and Update Instruments of the "Agro-IKS" website:

- Multi-Level Security System
- Statistics of Web-Resource Usage
- News Board Administration
- Questions and Answer Board Administration
- Business Board Administration
- Administration of Farm Research Database

Information Resources (Databases) on the Web Cover:

- A. Nine computer-aided Atlases with information on varieties, diseases and pests on 682 crops and 4,390 crop varieties, including:**

- Atlas of 1,299 varieties for 61 Vegetable Crops
- Atlas of 1,773 varieties for 67 Field and Technical crops
- Atlas of 426 varieties for 327 Feed crops
- Atlas of 289 varieties for 14 Fruit crops
- Atlas of 191 varieties for 14 Berry crops
- Atlas of 89 varieties for 29 Spice and Aromatic crops
- Atlas of 38 varieties for 70 Medicinal crops
- Atlas of 276 varieties for 79 Flower and Garden crops
- Atlas of 7 Subtropical crops

B. Computer-Aided Directories of

- 266 weed crops
- 390 plant diseases
- 707 pest insects

C. Databases and Program Package on Livestock Production, including

- 12 livestock species categorized by productivity groups with characterization of 60 breeds
- Stock-breeding work
- Feed production
- Livestock feeding schemes
- Livestock keeping practices

D. Databases and Program Package on Livestock Disease

- Full information on clinical symptoms, therapy and prevention for 1,337 diseases for 5 groups of livestock
- Glossary of Terms and Guide to temperature and lifetime norms for livestock and domestic animals
- Directory of 500 modern veterinary products for livestock

E. Databases and Program Package on Beekeeping

- Manual on Beekeeping, composed of 295 articles
- Questions and Answers Manual for Beginning Bee-keepers with 288 questions answered
- Month-by-Month Calendar of Beekeeping Works
- Glossary of Terms
- Addresses of Companies

The beekeeping manual provides generic information on bees and bee family composition and nest, functions of the bee-queen, reproduction and development of bees, seasonal changes, accumulation of the food stock, detailed technology of beekeeping and breeding, accident prevention, key factors of high productivity and vitality of bee families etc.

F. Research Development Database covers 277 entries in 24 sections, including

- Agrarian economics (86)
- Livestock production, products and protection of animals (68)
- Farming (39)
- Veterinary medicine (39)

- Agricultural mechanization (36), etc.

G. Computer Program "Automated Business Planning for Farm Enterprises"

- Credit payback calculator
- Analysis of farm business balance liquidity
- Financial indicators of farm business
- Assessment of farm business solvency

H. Website "Meat Industry" (pfid.ubwlab.org/meat/default.asp) with data on

- Profiles of 783 enterprises of the meat industry, including 358 stock-breeding farms
- Supply of equipment for meat processing industry with price, characteristics and contact information
- Mixed fodder, vitamins and food additive producers
- Sausage casing producers
- Meat industry standards

I. Website "Poultry Production" (pfid.ubwlab.org/poultry/default.asp)

- Profiles of 462 of Poultry industry operators
- Data on 130 poultry breeds and 37 crosses with pictures
- Data of 561 poultry diseases and 595 veterinary products
- List of standards and norms currently in force
- 47 most important regulatory documents and 25 scientific articles on poultry production practices

J. Website "Fish and Seafood" (pfid.ubwlab.org/fish/default.asp)

- Profiles of 542 fish industry operators, including 145 aquaculture enterprises
- Data on major commercial species harvested and cultured in Ukraine and non-traditional species
- Profile of 49 diseases in fish, including pathogens, symptoms and preventive measures
- List of industry standards currently in force
- 70 articles to help fish farmer businesses in ponds construction, aquaculture practices, veterinary and sanitary activities, evaluation of fish and seafood quality

Computer-Aided Atlases, Directories and Programs of the "Agro-IKS" Information Support System for Distribution among Farmers and Extension Specialists on CDs:

A. Seven Computer-Aided Atlases in Crop Production, which enable display and printout of information on:

- Varieties, pest resistance, seed properties
- Biological classification of pests — insect, diseases and weeds, and pest control practices

For 731 crops and 6,432 varieties.

Descriptive (attribute) Crop Production database contains

- 872 Pesticides

- 654-Crop Diseases
- 720 Pest Insects
- 267 Weed Species
- 12,413 Entries in the Pesticide Applicability Guide

Graphical Database includes 2,559 pictures.

B. Eleven Directories in Livestock Production, which covers a wide array of data on

- Keeping, feeding, and reproductive management of livestock
- Disease therapy and prevention
- Description of species and breeds for
 - Cattle
 - Swine
 - Horses
 - Sheep
 - Rabbits
 - Fur-animals
 - Poultry
 - Beekeeping, and
 - Fish farming

with attribute database covering 5,542 entries and graphical database including 461 pictures.

C. Computer Program "Farm Business Bookkeeping and Accounting" a computer program for Farm Businesses allowing

- Input and correction of primary information without detailed specification of source of assets
- Filling up, visual display and print out of 7 mandatory financial accounting and statistical forms
- Computer-aided record keeping for 9 analytical registers
 - Form B-1: "Fixed Assets and Depreciation Costs"
 - Form B-2: "Stocks, Finished Products and Goods"
 - Form B-3: "Production Costs"
 - Form B-4: "Money and Financial Results"
 - Form B-5: "Payments and Other Transactions"
 - Form B-6: "Sale of Goods and Services"
 - Form B-7: "Settlements with Suppliers and Contractors"
 - Form B-8: "Salaries and Deductions"
 - Turnover & Balance Statement

D. Computer Program "Farm Business Planning," including 90 analytical forms, such as the following:

Basic —

- Farm Profile (3 forms)
- Market Analysis (2 forms)
- Production Plan (13 forms)
- Marketing Plan (4 forms)
- Organizational Plan (4 forms)
- Financial Plan (6 forms)

- Risks Estimate (3 forms)
- Prospective Financial Conditions (4 forms), and

Complementary –

- Retrospective Analysis of Financial Condition (4 forms)
- Solvability Assessment (3 forms)
- Forecast of Harvest Output (4 forms)