

THAILAND SEED DEVELOPMENT PROJECT

โครงการขยายพันธุ์พืชแห่งประเทศไทย

Second Year Evaluation

การประเมินผลปีที่สอง

Conducted During

ปฏิบัติงานระหว่าง

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Joint THAI - US Evaluation Team

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Thailand Seed Development Project

Second Year Evaluation

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ABBREVIATIONS AND ACRONYMS

- BAAC** - Bank for Agriculture and Agricultural Cooperatives
- Changwat** - Province
- DA** - Department of Agriculture (a Department of the MOAC)
- DOAE** - Department of Agricultural Extension (a Department of the MOAC)
- DTEC** - Department of Technical and Economic Cooperation (the RTG Agency generally responsible for coordination of foreign technical and economic assistance programs)
- MOAC** - Ministry of Agriculture and Cooperatives
- MOF** - Marketing Organization for Farmers (a State Enterprise under the MOAC)
- NCSRC** - National Corn and Sorghum Research Center (a Research Center under the Kasetsart University)
- PP** - Project Paper
- RTG** - Royal Thai Government
- SDP** - Seed Development Project
- USAID** - United States Agency for International Development
- USG** - United States Government

THAILAND SEED DEVELOPMENT PROJECT

Second Year Evaluation

Summary

The evaluation of the second year's operations of the Thailand Seed Development Project was conducted during the period of September 5, 1978 through October 10, 1978. The Evaluation Team found that the overall achievement of the Project so far has not been up to expectation. The progress to date fell short of the planned implementation target in most aspects of the Project. The actual outputs of the Project in terms of the amount of seed produced, processed, and distributed as well as the training of the Project personnel and farmers were below planned targets. The construction and procurement aspects of the Project were one to two years behind schedule. It was also doubtful that the existing seed distribution procedures could benefit the majority poor farmers on a continuing basis.

The Evaluation Team found that the achievement of the Project was hindered by three main obstacles: the government bureaucratic red tape; the lack of a good coordination system among the implementing agencies; and the lack of experience in the seed business on the part of the Project personnel. Recommendations of the Team to help improve the performance of the Project focus on the areas of forward planning of production, decentralization of decision making, and adoption of business-like procedures. In view of the dedicated and hard working personnel at the implementation level together with their gradually built up experience, the Evaluation Team

believes that a lot of improvement is feasible especially if recommendations by the Team are seriously considered and efforts are made to carry them out. However, in order to enable the continued development of the use of good seed to bear effects on the increase in agricultural productivity, private investment in the seed development project of similar nature should be promoted.

THAILAND SEED DEVELOPMENT PROJECT
SECOND YEAR EVALUATION

I. Introduction

This report represents the findings of a joint team^{1/} of personnel contracted for the evaluation of the second year's operations of the Thailand Seed Development Project (SDP). The evaluation was made during the period of September 5, 1978 through October 10, 1978. The objective of the evaluation was to make a comprehensive assessment of the accomplishments of the Project against purpose output and input schedules set in the Project Paper (PP).

The Thailand Seed Development Project is a cooperative project of the Royal Thai Government (RTG), represented by the Ministry of Agriculture and Cooperatives (MOAC) and the United States Government (USG), represented by the United States Agency for International Development (USAID). The MOAC interests are divided, based on their nature, among three sections of the Ministry. The Department of Agricultural Extension (DOAE) has primary responsibility for the Project. The Department of Agriculture (DA) and the Marketing Organization for Farmers (MOF) play important supportive roles. Policy determinations regarding the SDP are made by the Seed Executive Committee^{2/} chaired by the Under-Secretary of State for Agriculture.

1/ See Attachment A for List of Evaluation Team Members.

2/ See Attachment B for List of Seed Executive Committee Members.

A Seed Implementation Committee^{3/}, chaired by the Director-General of the DOAE, who is also Project Director, has responsibility for coordinating Project activities.

The purpose of the Project is to get Thai farmers to use good seed of improved varieties which will result in increased yields which in turn will increase farmers' income.

The three implementing agencies of the MOAC are assigned the task of carrying out the Project operations centered around five major activities. These are foundation seed production, seed multiplication, seed processing, inoculum production and seed and inoculum distribution.

Under the Project foundation seed is produced by the DA and sold to DOAE on credit. The DOAE has responsibility for multiplying the seed by contract growers who are under DOAE supervision. Multiplied seed, if it meets the established standards, is purchased from the contract grower and delivered to a Seed Processing Center^{4/} by the DOAE. After the seed is processed and tested it is the responsibility of the MOF to sell and distribute the seed to farmers.

3/ See Attachment C for List of Seed Implementation Committee Members.

4/ One Seed Center already in existence at Phitsanulok is completed except for some drying facilities. A Second Seed Center has been constructed at Korat and equipment will be installed and ready for operation by January 1, 1979. Land for two more Centers at Lampang and Chai Nat has been obtained and contracts for construction are expected to be signed by the end of September 1978. Construction is anticipated to be completed by July or August of 1979.

Inoculant is produced by the DA. Distribution and sale is made through MOF except for contract growers which is handled by DOAE. Sales of seed and inoculant to farmers are made on either a credit or cash basis.

Project financing is from two sources. The RTG, through its regular budget, supplies local personnel for the Project, land for seed processing centers, necessary buildings, vehicles, etc. USG participation is through a low interest loan (AID Loan 493-T-017) which is used for technical assistance costs, for procurement of equipment for seed processing and inoculum production, and for the establishment of a working capital account to purchase foundation seed, inoculant and production supplies and to pay farmers for seed grown under the contract.

In conducting the evaluation, the Team interviewed RTG personnel responsible for or associated with all aspects of the Project and two specialists under the technical assistance contract.^{5/} The time constraint made it possible for the Team to interview only two farmers. Hence, their opinions cannot represent the view of all farmers involved with the Project. The information obtained from the interviews with RTG personnel were used in this evaluation. The five major Project activities listed above were used partly as the

5/ See Attachment D for list of those interviewed.

Don't understand why, at least, that members couldn't have done better than this number.

organization for this report.

The scope of work for the team covered such areas and concerns as (a) a comparison of the planned implementation schedule with progress to date and prospects for meeting the next year's goals; (b) examination of farmer training program to see if it is proceeding as planned, and is effective; (c) indications that staffing, organization and coordination of the project is such that it will be able to achieve the goal of reaching the small farmers; (d) progress being made in procurement and construction aspects of the project; (e) assessment of change in the project setting, particularly validity of price assumptions in the feasibility study; (f) capability and performance of MOF in seed and inoculum distribution; and (g) determination if the recommendations of the first evaluation were valid and what steps had been taken to carry them out.

II. Foundation Seed Program

Problem Identification

Foundation seed production is the first stage of the seed development process and this is very crucial since poor quality of seed can result in damage at the later stages in terms of both financial loss including opportunity cost and bad image for the Seed Development Program. The Evaluation Team visited with research personnel involved in the foundation seed production. It was found

that DA has the capability to produce adequate foundation seed to meet requirements for the crops^{6/} included in the Project.

Normally, DA produces foundation seed in excess of the amount requested by DOAE. The extra foundation seed was sold directly to farmers or retained for internal uses. The foundation seed production is carried out on the Department's experiment stations and through contract growers. The experience learned from the past helped personnel of DA to deal effectively with contract growers. It seems that the main obstacle of the foundation seed production is the vagary of weather which is an uncontrollable factor. For example, the drought was the major cause of the insufficient amount of foundation seed of soybeans and peanuts produced in the crop year 1977/1978. The foundation seed of all the Project crops with the exception of rice, soybeans and peanuts received by DOAE was above the Project needs in the crop year 1977/1978.^{7/}

Though there exists no serious problem with regard to the capability of DA in the production of foundation seed, some problems do arise in the placement of order and the delivery of the foundation seed. The problems deserve to be mentioned include:

6/ Crops included in the Project are rice, corn, sorghum, soybeans, mungbeans, and peanuts.

7/ See Attachment E for amount projected and actual foundation seed received by DOAE.

(1) DOAE did not place orders far enough in advance and sometimes did not take full amount ordered. This practice would certainly affect the operation of DA and the actual production of foundation seed may fall short of the Project requirements.

(2) At times DOAE failed to pick up seed when ready for delivery. In the worst case, delay was as long as three months and finally resulted in the deterioration of the seed. This led to complaints about seed quality by DOAE's contract growers under the seed multiplication program. The delay in the delivery was attributable to the breakdown in the communication between DA and DOAE and the failure of DOAE to speedily and timely transport seed from the DA facilities to the contract farmers.

(3) As far as corn and sorghum are concerned, DOAE prefers to place the order for foundation seed of these two crops with the National Corn and Sorghum Research Center (NCSRC) and would turn to DA as an alternative source only when the order placed with NCSRC cannot be fulfilled. This practice is regarded as discriminatory by personnel in the Corn and Sorghum Project of DA and may give rise to some coordination problems.

Recommendations

To alleviate problems mentioned above the Evaluation Team makes the following recommendations.

(1) DOAE should formulate a workable plan with regard to the amount of foundation seed needed for each month of the year and place order accordingly with the DA well in advance, preferably one year before planting time.

(2) Unless there is concrete evidence to show that DA is not capable of producing foundation seed of any crops in accordance with the Project requirements, DOAE should place order of foundation seed of all Project crops with DA. This is to insure the close coordination of development efforts of the two implementing agencies of the SDP.

(3) DOAE personnel in charge of acquiring foundation seed from DA should be given authority to hire and approve transportation in case their own trucks are neither adequate nor available. This can insure prompt and timely delivery of the foundation seed to DOAE's contract growers.

(4) The prompt delivery of foundation seed to the contract farmers should be supported by the increase in the DOAE staff to supervise the multiplication of the seed. This would make it possible for seed multiplication to be carried out at different locations at the same time.

(5) In case the foundation seed cannot be delivered to the contract growers, arrangements should be made by DOAE to store it

at proper storage to protect against deterioration of the seed quality.

(6) DOAE should take delivery of all the seed they ordered and find a way to dispose of surplus or make arrangement agreeable to DA about reducing the order.

(7) All foundation seed should meet the standards needed for a "certified" seed program.

III. Seed Multiplication Program

Problem Identification

Based on the procedures outlined in the PP, the foundation seed obtained from the DA is provided by DOAE to contract growers for multiplication. The DOAE selects the growers, contracts with them to multiply the seed, buy the production for 10 to 15 percent above local market price, and trains the grower in seed multiplication. The seed is purchased and collected by DOAE and transported to a Seed Center for processing.

The Evaluation Team, after the interviews with DOAE personnel involved in the seed multiplication program, found that major problems encountered during the course of implementation are the following.

(1) The understaff of personnel at the Seed Center coupled with their inexperience in working with farmers made it difficult for them to supervise effectively the contract growers for seed multiplication as called for by the PP. Hence, the seed multiplication program had to be carried out by relying heavily on the Changwat extension staff, particularly in the Changwats far away from the Seed Center. Unfortunately, the Changwat extension staffs were handicapped by the lack of time and knowledge about

seed multiplication. This was one of the factors which accounted for the substandard performance of the seed multiplication activities.

(2) The purchase of multiplied seed from the contract growers posed a serious problem. According to the original plan of the PP, MOF was supposed to assume the purchase function in order to expedite timely pick-up of seed and to by-pass RTG cumbersome regulations governing all purchase operations. However, for the reason of quality control, the purchase function has been entirely carried out by DOAE at the implementation level. Purchase operations are, therefore, restricted by the government regulations which inevitably gave rise to delay in approval to purchase seed at time of collection and hence preclude timely delivery of multiplied seed from the farm to the processing plant.

(3) The purchase of multiplied seed under the existing RTG regulations proved to be all but impossible for on-the-spot payment to farmers at the time of collection as called for by the PP. However, it was recommended in the First Year Evaluation that the slow payment could be overcome by the establishment of a fully functioning accounting system and using money from the Capital Account of the Project. It is of interest to note that the procedures to speed up the payment to contract growers were set up recently and have not yet been made known to DOAE personnel involved in the purchase operations.

(4) Based on the present purchase procedure, the price offered to the contract farmers for multiplied seed is set by the Seed Purchasing Committee and cannot be adjusted freely and timely in accordance with the market situations. If the market price becomes higher whereas the price offered by DOAE remains rigid, contract growers are apt to sell their seed to private merchants for a better price.

(5) Though DOAE pays contract growers a premium price of 10 to 15 percent higher than local market price, this may not be adequate incentive for farmers because sorting of the seed is required and only good quality seed is accepted. The strict quality control at the time of purchase discouraged contract growers from selling their seed to DOAE and turned to private merchants as their market outlet.

The problems outlined in (1) to (5) above were major factors accounting for the failure to produce multiplied seed as planned in the Project. The production of multiplied seed of all crops with the exception of rice was much below target amount in the crop year 1977-1978.^{8/}

Recommendations

To improve the performance of the seed multiplication program, the Evaluation Team recommends:

^{8/} See Attachment F for comparison of projected and actual production of multiplied seed.

(1) DOAE should increase their staff in order to make plan with regard to number of acres to be contracted for multiplication and area distribution, determine needs for foundation seed, select growers and train them and make all necessary field inspections to control the quality of the seed from the outset. Burden should be shifted from the Changwat extension staffs to the Seed Center personnel as soon as possible. Emphasis should be placed upon selecting and training good farmers for seed multiplication in order to insure a constant supply of good seed for processing.

(2) The revision of the present purchasing procedure should be made if it does not violate the government regulations. It is desirable that chief of the Seed Center should be authorized to take full responsibility regarding all aspects of purchase operations-inspection and acceptance of seed, price setting and adjustment. If the purchase through Committee has to be retained, members of the Committee should be appointed from personnel at the Seed Center. This will help overcome delay in the purchase operations.

(3) The recently established revolving fund which makes it possible to pay cash to farmers at the time of seed collection, should be made known to all personnel involved in the seed purchase and put into use immediately.

(4) If supervision of contract growers is well undertaken by staff of the Seed Center, DOAE should accept all the seed harvested by the

contract growers regardless of the quality of the seed. Prices paid to farmers will vary with the seed quality. This measure will induce contract farmers to sell their seed to DOAE. However, DOAE must be given authority to dispose of the seed which is not suitable for processing.

(5) The management of seed multiplication program should be supported by a more detailed information system about contract growers.^{9/} The recorded information will be of great use for monitoring the program and making adjustment for better performance.

IV. Seed Processing Program

Problem Identification

As far as Seed Processing Program is concerned, the Evaluation Team observed the following major problems.

(1) Based on the PP, four Seed Centers under the supervision of DOAE have to be established to carry out the seed processing function. The first plant at Phitsanulok was in existence before the commencement of the Project. The second plant at Korat was planned to be completed in the second Project year (1977) whereas the third and fourth plants at Lampang and Chai Nat were expected to be in operation by the third Project year (1978). Nevertheless, the establishment of the Seed Centers is one to one and a

^{9/} Suggested form for seed multiplication record is shown in Attachment G.

half years behind schedule, but is moving ahead. The delay was due mainly to two counts. One is the cumbersome approval procedures in both the appropriation of funds by the Budget Bureau and acceptance of plans and plant designs by the Department of Public Works. The other is the inexperience on the part of DOAE personnel about the procedures for international purchasing as well as the customs clearance of the imported equipment.

(2) The delay of the construction of the Seed Center at Korat adversely affected the operation of the plant at Phitsanulok. Peanut and sorghum seed which were planned to be produced at the Korat Seed Center had to be processed at the Phitsanulok Plant instead. The load was so heavy that the multiplied seed could not be processed to meet farmers' needs at the beginning of growing season. Part of the multiplied seed after collection from contract growers had to be distributed to farmers without being properly processed and tested. If the seed happened to be of low standard quality, it would jeopardize the reputation of the SDP.

(3) There was a large amount of waste material and cleanout stored in the warehouses of the Seed Center. There was also a large quantity of seed that has gone out of condition for which no plan for disposal was evident. The disposal of these undesirable materials is governed by RTG rigid and clumsy regulations. The procedures sometimes took months before the disposal was undertaken.

(4) Since the seed processing plant is operated within the government bureaucratic structure, the flexibility of operation cannot be secured. During the peak load of the processing plant where greater number of laborers are required, employees of the Seed Center working at other sections can by no means be transferred swiftly to work in the plant.

(5) The Seed Centers are understaffed and lack personnel with proficiency in management and supervision of plant equipment and facilities. A good controlling system of the processing and storage operations has not been established.

Recommendations

To help alleviate problems aforementioned the Evaluation Team makes recommendations as follows.

(1) Based on the lessons learned from the case of Korat Seed Center, the concerned personnel of DOAE should make plan well in advance regarding the construction and purchase and installation of equipment for Seed Centers at Lampang and Chai Nat. The effective use of AID Loan Funds should be mastered. The Project Director should exert his power to cut short the red tape incurred in the process of budget appropriation and acceptance of plans and designs. It should be borne in mind by all concerned that any further delay in the establishment of the third and fourth processing plants will severely hinder the progress of the Project as a whole.

(2) Chiefs of the Seed Centers should be given authority to dispose of the low quality seed including the deteriorated seed and other waste material as deemed appropriate. Criteria for disposal should be set in order to insure a uniform practice among Seed Centers. Rapid and efficient disposal of waste and deteriorated seed is an indication of good management of the Seed Center.

(3) A plant engineer should be employed for each Seed Center to supervise the processing operations and take care of maintenance, repair, and replacement of plant facilities. These upkeep functions are vital when the plant becomes old or needs repair. It would be wise to recruit plant engineers now and place them on the job for training by the two Senior Seed Industry and Processing Specialists working for the Project at present.

(4) The processing plant should keep daily record of seed processed and storage inventory and keep daily balance by using rolling year system (year - to - date) in order to avoid confusion concerning crop year, fiscal year and calendar year.^{10/} The account update for physical check at any time should also be kept.

(5) The Seed Center should report weekly to DOAE office in Bangkok the amount of seed processed and amount of waste and low quality seed disposed of. The provided information should be utilized by the SDP management for more efficient and effective implementation of the Project design.

(6) All seed for sale should be accurately and adequately labeled.

10/ See suggested format for daily record of seed processed in Attachment H.

v Seed Certification

The PP calls for the establishment of a Seed Certification Program to be handled by the DA.

At the time of the 1978 evaluation it did not seem necessary to implement this part of the program immediately. However, after careful consideration it seems wise to get the certification program drafted and authorized. It would then seem advisable to apply the rules to the foundation seed program to see how it might work. After a year's trial run, it should then be extended to the production processing centers. Finally it would be made available to the private sector.

It also seems to the Evaluation Team to be wise to establish a set of seed laws and delegate responsibility to the DA for the enforcement of the laws.

The regulatory system and the seed certification program could be handled by the same personnel, thus keeping the cost of the two at a minimum.

Justification for the two programs is to assure the consumer of seed that the seed he buys is true to variety and does meet minimum quality standards. Should an error be made or seed prove to be mislabeled, the purchaser would have a legal recourse to collect damages.

VI. Seed Distribution

Problem Identification

The PP states that the processed seed of high quality is to be distributed to farmers through MOF. The MOF will sell seed to farmers' associations, agricultural cooperatives, RTG agencies, and individual farmers. However, other farmers who are living in the vicinity of a processing plant will be able to buy up to ten percent of the Project seed production at the plant. The seed distribution is to be complemented with an extensive farmer education and seed appreciation program carried out by DOAE. Focus is to be placed upon the provision of seed to poor, small farmers.

Through the investigation, the Evaluation Team found that seed distribution is the weakest component of the whole Project as far as the performance is concerned. Major problems of the seed distribution are the following.

(1) MOF has only one distribution center located at the head office in Bangkok, while the PP calls for the establishment of distribution centers in each province with adequate sales staff. At present there is no indication that MOF will be in a position to build up a distribution network as planned.

(2) MOF has virtually no marketing plan, its present seed distribution for the whole country is handled by only four staff personnel

and none of them performs the sale function directly. They usually await order for seed from buyers and will request DOAE for seed upon the receipt of order from customers. The procedure coupled with the lack of proper storage and transportation facilities resulted in delays in delivery of seed and farmers sometimes were forced to use seed from other sources in order to plant on time.

(3) The actual production of processed seed was far below the Project target.^{11/} This was due to both the low production of multiplied seed and the delay in the establishment of the second plant at Korat. Not all of the processed seed produced by DOAE was handled to MOF for distribution.^{12/} A large portion of the processed seed was retained by DOAE for internal uses in its demonstration plots and reserved for free distribution to farmers in the case of calamity such as flood and drought. Some portion was sold directly to individual farmers and RTG agencies dealing with poor farmers such as the Department of Public Welfare, Department of Cooperative Promotion, Accelerated Rural Development Office, to name just a few.

(4) Since the access to MOF was difficult, quite a large number of farmers who were aware of the good quality of the processed seed came to

11/ See Attachment I for comparison of projected and actual production of processed seed.

12/ See details about seed distribution in Attachment J.

purchase seed at the plant directly. This created an unexpected burden to the Seed Center because there was no MOF personnel stationed there. The personnel of the Seed Center had to take care of the seed distribution in lieu of MOF and could not concentrate fully on the seed multiplication and processing as outlined in the PP.

(5) The actual amount of processed seed received by the four groups of recipients was much below the projected target. Nor did the distribution system conform with the plan of the Project.^{13/} It was estimated that seventy percent of the seed handled by MOF went to RTG agencies and only ten percent to farmers' associations and agricultural cooperatives. This was a reversal of the planned distribution system, reflecting the failure of MOF in the seed marketing.

(6) There is no doubt that the existing distribution system, deliberately or indeliberately, benefits the large or high income group farmers more than small and poor ones. Farmers of relatively large scale, operations or belonging to high income groups, can afford to travel a long way to purchase seed at either the processing plant or the MOF head office in Bangkok. It seems that small poor farmers also reaped benefit from the SDP as they did receive the good quality seed through DOAE's demonstration plots

13/ See Attachment K for details about recipients of processed seed.

program and other RTG agencies. However, the distribution of seed to small and poor farmers through these organizations is temporary in nature and is likely to shift from one group or one area to another. Without a good network of seed distribution at the village level, small and poor farmers can hardly be continuously accessible to seed produced under the SDP. It was reported that most of the farmers in the provinces proposed for the establishment of Seed Centers and adjacent locations still use seed produced in their own farms and know very little about commercial processed seed.^{14/}

(7) The poor performance of seed distribution by MOF is also due to the lack of experience in the seed business on the part of its personnel. As a matter of fact, MOF is a new organization with a loose structure. In the past the key personnel of MOF were not enthusiastic about the SDP and paid little attention to the role of MOF as stipulated in the PP. The reason for this may be due to the low margin obtained from handling the seed.

Recommendations

To help overcome the problems outlined above and hence improve

14/ See details in Report of Base Line Data Analysis of the Seed Development Project in the Provinces Proposed for Establishment of Seed Centers, 1976 - 1977. Prepared by Projects Division, Office of the Under-Secretary of State, MOAC, 1977.

the performance of seed distribution the Evaluation Team recommends:

(1) Despite its poor performance, MOF should be given a chance to participate in the SDP. However, the key personnel should study the PP and comprehend clearly the role of MOF in the Project. The Director of MOF should rank the seed distribution business at high priority among its various activities, or some other mechanism for distribution must be devised. For example, DOAE might take responsibility for marketing and distribution, if adequately staffed.

(2) MOF should do all in its power to increase staff members particularly sales force in its Seed Section and establish distribution centers outside of Bangkok. There should be sales forces located at the Seed Centers so that shipment of easily deteriorated seed such as soybeans can be made directly from cold storage at the Center to purchasers. An efficient seed distribution program should be developed in such a manner that seed is made available to farmers at the village level. The money to be used for the program can be acquired from the Capital Account of the Project or from the Farmers' Compensation Fund.

(3) There should be a recording and reporting system concerning seed distribution by each plant and by MOF so that the SDP management can trace to the ultimate recipients of the processed seed. Survey of farmers in the target areas should be carried out occasionally, preferably once a year. The survey should be completed and analyzed prior to each evaluation. The information from the record and survey can be used to determine whether the Project helps increase the farm production and benefits small and poor farmers.

VII. Inoculum Production and Distribution

Problem Identification

The DA is responsible for the production of inoculum. Distribution is carried out by DOAE in the case of contract growers and by MOF in all others. Major concerns regarding inoculum production and distribution include:

(1) The production and distribution of inoculant fell short of the projected target.^{15/} Since the inoculant is perishable and needs to be kept in proper storage facilities, it must be rapidly distributed to farmers for use right after the production. It is evident that the use of inoculum has increasingly become more popular among farmers. However, MOF failed to get the inoculum to farmers conveniently because of the lack of proper storage facilities and fast distribution network. At present, MOF will place order for inoculum with DA only when it receives orders from farmers. This procedure precludes DA from producing inoculum to meet the farmer requirements in terms of adequate supply and timelines for use.

(2) The establishment of inoculum production plant is behind schedule. At present the construction of the building is awaiting approval of additional funds from the Budget Bureau to cover the inflation factor

^{15/} See Attachment L for the comparison of projected and actual production and distribution of inoculant.

^{ORIGINAL}
since the ~~original~~ approval. Fear of further delays due to inexperience in international purchase, USAID has been authorized by DA to handle purchase of plant equipment. Equipment bids will be opened November 27, 1978 with delivery in 240 days. The plant which was originally scheduled to open in 1977, is expected to be in operation no sooner than late 1979. If the requirement for inoculum reaches over twenty tons, the delay in the establishment of the inoculum production plant will be a critical problem because the requirement is beyond the maximum capacity of the DA's existing facilities and improvisations.

(3) DOAE did not notify DA well in advance of the amount of inoculum required for use by contract growers. Consequently, the inoculum could not be supplied at the time of planting and quite an amount of seed was used without being inoculated. This would certainly affect the yield of the contract growers.

Recommendations

The problems mentioned above have dragged on since the First Year Evaluation and most of them have still remained unsolved. Therefore, the Evaluation Team, repeats, more or less, the same recommendations, as follows.

(1) DOAE should notify DA well in advance of the amount of inoculum required for use by contract growers. This can be easily carried out if the seed multiplication program is well planned.

(2) MOF should have a marketing system which can supply inoculum to farmers with adequate amount and timely delivery. Inoculum should be made available together with the seed. MOF should also make plans with respect to the amount of inoculum needed for sale to farmers' associations, cooperatives, and individual farmers and place orders well in advance in accordance with the plan.

(3) Quality standards for inoculum should be established. All inoculum for sale should be accurately and adequately labeled, including the warning "PERISHABLE - Must be kept out of direct sun!"

(4) Inoculant must be kept in refrigerated storage until distributed to the farmers.

(5) DA should train the personnel of DOAE and MOF in proper methods for distribution and use of inoculum so that they can successively pass on the knowledge to farmers.

VIII. Technical Assistance

Problem Identification

To assist the RTG with implementation of the various project activities, seven man years of technical assistance is planned, four man years for a Senior Seed Specialist with marketing experience, and two man years for a Processing and Production Specialist. In addition, twelve man months of short term assistance is planned in various fields; i.e. seed plant engineering, seed regulations and certification, seed marketing, and seed quality control. Currently, one Senior Seed Industry Specialist and one Seed Processing Specialist are on the job. The problems with respect to technical assistance conceived by the Evaluation Team include:

(1) The delay in the establishment of the Seed Center at Korat lessened the opportunity of the two Specialists to render full services to the Project as planned during the contracted year.

(2) It is doubtful that knowledge and expertise of the two Specialists can be effectively and fully transferred to DOAE personnel. The reason for this is that DOAE key personnel with absorptive capacity are occupied with too much work and can hardly find time to learn from the Specialists. Personnel of low profile are usually hindered by the language barrier.

(3) DOAE which has the responsibility for contracting for technical assistance experienced great difficulty in contract approval. Contract signing could not be carried out in a timely manner because of delay in contract approval. The delay was due to uncertainty regarding delegation of authority to approve contracts and a lack of knowledge of contracting procedures.

Recommendations

To help solve problems concerning technical assistance aspect of the Project, the Evaluation Team makes the following recommendations.

(1) DOAE should assign personnel of high potential and absorptive capacity to work closely with any Specialists on the project, currently the two Specialists in particular and learn from them as much as possible. DOAE own personnel should be able to take over duties

performed by the specialists after the termination of their contracts. This will be of importance in making future Project implementation move ahead with little need of further technical assistance.

(2) The Seed Executive Committee should be delegated authority to approve contracts. The MOAC should also establish or utilize a presently existing office for all contracting. This would free Project personnel from the complicated procedures to devote themselves to Project implementation.

IX. Training

Problem Identification

Extensive training of Thai personnel both in country and abroad is planned in the PP. Twenty-six in country short courses as well as eighteen study tours outside Thailand are planned for RTG personnel. In-country management training will also be provided to assist the MOF in establishing and maintaining a modern accounting system. Six M.S. programs in required disciplines are also planned. Over 25,000 farmer users will receive a 1-2 day training program on improved seed and its accompanying technology. Finally over 2,000 contract farmer seed growers will receive seed production training.

The Evaluation Team found that progress of the training is slow in reaching its purpose. The strong recommendations from the First Evaluation have not been implemented. Main problems encountered are:

(1) As for training abroad, of the 24 slots planned with 21 of them to have received training or be in training by 1978, only one has been trained and none are in training at present. Any changes in training needs should be identified and changes requested as soon as possible. It is planned to screen candidates for training in October 1978. However, the number that will finally receive training may fall short of the planned slots because some nominees may fail to qualify. Training is funded by an AID Grant which must be committed by April 30, 1980. Thus, timing is now extremely critical especially for those who will receive advanced academic training. The delay stemmed from the fact that SDP personnel did not grasp the time constraint imposed on the funding and at the same time overlooked the importance and contribution of training to the success of the Project.

(2) As for in-country training, not much progress was achieved during the first two years of the Project. The instillment of knowledge and appreciation of good seed has not yet reached farmers in large numbers as planned. The SDP personnel who are too few, faced many unexpected burdens and did not have enough time to concentrate on the training aspect.

Recommendations

Regarding the training aspect of the Project, the Evaluation Team would like the SDP personnel to consider the following recommendations.

(1) The Seed Implementation Committee should step up the nomination of candidates of different levels of training for each agency involved in the Project. Relevant documentation should be well prepared

as well. Language training, if required, should be coordinated with the Department of Technical and Economic Cooperation (DTEC).

(2) As far as the in-country training is concerned, more effort should be given to instill a knowledge and appreciation of good seed to farmers through cooperation with RTG agencies dealing with poor farmers, agricultural cooperative managers, Bank for Agriculture and Agricultural Cooperatives (BAAC) credit supervisors, seed and grain dealers, and salesmen for other production inputs.

X. Project Coordination

Problem Identification

Since three agencies of RTG, namely DOAE, DA, and MOF are directly involved in the implementation of different activities, a good coordination mechanism is of utmost importance to the success of the Project. Based on the present procedure, coordination of the various aspects of the SDP is the responsibility of the Project Director, the Seed Implementation Committee and the Seed Executive Committee. Most of the activities entrusted with DOAE are carried out in the recently established Seed Division. Thus, the Chief of this Division plays an important role in the coordination effort of the Project.

The Evaluation Team brought together personnel from the agencies involved to discuss the problems noted by the Team. This was the first

time they had had this opportunity. The Evaluation Team found that one of the main reasons accounted for various problems discussed in the previous sections was the lack of an efficient coordination mechanism. Specifically, problems deserve attention include:

(1) The Project implementation has to be carried out within the government bureaucratic structure. Operations of all aspects are subject to many regulations. Many decisions must be made by both Committees. However, needed decisions are often not made timely because Committee meetings, particularly the Seed Executive Committee, are rarely held. Even when the meeting was held, needed decisions are frequently left undecided and problems unsolved because key Committee members were not in attendance.

(2) Most of the members of the Seed Executive Committee hold top positions in the MOAC and are busily involved in other activities. They do not have enough time to observe and follow up the Project operations.

(3) The Director-General of DOAE who is the Project Director has a busy schedule and cannot supervise the day-to-day operations. This has resulted in delays and loss of time in implementing the Project.

(4) The coordination problem also arises from a lack of knowledge about the SDP particularly the inter-relationships of its various elements by the Project implementers.

Recommendations

To help improve the project coordination at all levels, the Evaluation Team makes the following recommendations.

(1) The Implementation and Executive Committees functions should be more clearly defined and their authority increased in order to facilitate the Project operations. It is desirable that Committees are given authority to allow the Project implementation to be carried out in a more business-like manner. These Committees should establish policy and delegate authority for day-to-day decisions to others.

(2) Committee meetings should be held more frequently on a regularly scheduled basis, preferably monthly, with special meetings being called if necessary. Persons attending Committee meetings as representatives of regular Committee members must have authority to make decisions and take necessary actions.

(3) All SDP personnel and Committee members should be thoroughly familiar with the Project and its implementation plans. More attention should also be given to the Project operations. DOAE should arrange a one or two-day conference to familiarize above personnel with problems and plans for Project each year.

(4) DOAE should coordinate all aspects of the Project, that is, foundation seed production, multiplied seed production and processing inoculum production, and marketing of seed and inoculum. Project plans should be reviewed and adjusted from time to time. One person should be assigned full-time with authority and responsibility to implement overall plans and policies needed to get high quality seed of improved varieties to the farmer.

(5) The key personnel in DOAE responsible for day-to-day implementation, such as Chief of the Seed Division, and Chiefs of Seed Centers should be delegated authority from the Project Director to make decisions and take necessary action. This can help day-to-day operations go more smoothly as all decisions are not to be made by Project Director alone.

XI. Other Aspects of Interest

This section deals with some important issues concerning the Project which have not been brought to attention clearly in the above discussion. The Evaluation Team feels that important issues worth being raised for consideration are the following.

Project Setting and Validity of Assumptions

The SDP is extremely an important stepping-stone contributing to the increase in agricultural productivity in the country. The Project is a valid one and will succeed. But the success can neither be as much as planned nor be achieved within the time frame set in the Project. Since the Project has to be implemented within the government bureaucratic structure, delays from red tape have hindered rapid achievement of goals. Unless various Project operations can be governed by more flexible RTG regulations, the chance of achieving success is slim.

Most of the assumptions are sound. However, the assumption that the MOF will be ready to assume the role of producer, processor, and distributor of good seed of improved varieties by the end of the sixth year or any year in the near future is highly improbable. During the course of implementation, seed purchase from contract growers was undertaken by DOAE instead of by MOF as originally planned. The role of MOF has been limited to distribution only. The design to shift the production and processing from DOAE to MOF will be difficult because: (a) the DOAE

staff may not want to shift to MOF as their status will be altered from the government official to the employee of a State Enterprise; (b) if they cannot be transferred, then a whole new set of production and processing persons will need to be trained and this may not be feasible under the present circumstance; (c) money limitations of MOF at present with no immediate solution will hinder such a transfer.

Impact on Poor Farmers and Agricultural Development

The present distribution procedures preclude small and poor farmers getting the seed conveniently. In addition, the process of selecting contract growers is discriminatory against small and poor farmers. The objective of the Project to benefit the poorest majority has not been satisfactorily achieved.

The amount of improved seed produced under the Project can satisfy only a small fraction of the national requirements. In order to achieve a real positive impact on the agricultural productivity, there should be widespread use of good quality seed by a large percentage of farmers. In this connection, private investment on seed production should be promoted. The investment on seed production will become viable if prices of seed charged are higher than that assumed in the Project feasibility study. In view of the fact that (a) the utilization of improved seed will result in less amount of seed used and increase in yield, and (b) the cost of seed usually constitutes an insignificant percentage of the total cost of production; the improved seed

can be priced higher without burdening farmers. If the private seed production comes into existence, the present DOAE's seed processing plants, aside from producing seed for its own use and for other RTG agencies, can be used to produce foundation seed to be transferred to the private sector for further multiplication under a seed certification program. It should also be noted that the promotion of the use of improved seed will help increase farmers' production and income on an equitable basis only when it is carried out vis-a-vis other government measures such as agricultural credit and price support programs. To protect both farmers and good seed producers (private and non-private) a law providing for a "certification" program, proper labeling, and quality standards for both seed and inoculum is required, along with just and adequate enforcement.

Implementation of Recommendations

Recommendations for improved organization and operations of the Project made earlier are in many cases the same as those made in last year's evaluation report. This does not, however, imply that a small measure of change has not taken place nor that attempts were not made to make changes. As a matter of fact, corrective actions have been taken to follow recommendations. But change must go through channels to be decided at a high level and the process does take time indeed. For example, the effort to solve the problems on slow payment to contract growers and disposal of deteriorated seed took several months before a remedial measure was finally adopted. In some cases, the SDP personnel show strong desire to follow the recommendation, but their ability to do so is not as strong as their desire.

Evaluation Arrangement

USAID/RTG can improve their method of evaluation by having preliminary work such as statistics, surveys, etc. completed and assembled prior to the evaluation. This is feasible if DOAE has an accounting system for inventory control and an up-to-date complete record of information concerning every phase of the Project.

Contracts with representatives of both countries to conduct the evaluation should coincide. Materials collected in above recommendation should be in the hands of the evaluators well in advance of the evaluation. The evaluators should not be expected to do all the necessary preliminary work of familiarizing themselves with the project and examining of the records, surveys, etc. on their own time but should be given time to discuss these prior to starting the actual evaluation.

XII. Conclusions

The Evaluation Team found that the SDP has failed to achieve the purpose output and input schedules outlined in the PP. The progress to date fell short of the planned implementation target in most aspects of the Project. Delays were due mainly to the bureaucratic red tape and the inexperience of the SDP personnel. Though the slow progress of the SDP may be acceptable based on the government standard, it is far from being totally satisfactory when viewed from the commercial perspective.

The Team believes that the SDP personnel at the implementation level are dedicated, conscientious persons who are desirous of making the Project a successful one. The progress can be sped up if the Seed Executive Committee and the Seed Implementation Committee address themselves to the more serious problems as the Team views them. Of all the recommendations the Evaluation Team is of the opinion that the following items must be given immediate attention:

(1) Delegation of authority to key personnel responsible for day-to-day operations to make decisions and see that they are carried out.

(2) Insist on regular Executive Committee and Implementation Committee meetings, at least on a monthly basis, to find solutions to problems.

(3) MOF should be given help in terms of both trained staff members and money in developing and carrying out a sound seed sales program which can get the seed to farmers effectively.

(4) Selection of candidates for training abroad, especially for those who will receive degree training, must be done as funds provided by the AID Grant must be committed within less than 18 months from now.

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8. Mr. Prasit Utchin, Economist, Office of Fiscal Policy,
Ministry of Finance (Observer)
9. Mr. Det Trisahd, Assistant Project Officer, Office of
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Seed Executive Committee

1. Under-Secretary of State
for Agriculture and Cooperatives
Mr. Prida Karnasut Chairman
2. Deputy Under-Secretary of State
for Agriculture and Cooperatives
Dr. Thalerng Thamrong Nawasawat Vice Chairman
3. Director-General
Department of Agricultural Extension
Mr. Yookti Sarikaphuti Member
4. Director-General
Department of Agriculture
Dr. Prakob Kanjanasoon Member
5. Director-General or Representative
Comptroller Generals Department
Mr. Wisut Montriwat Member
6. Director-General or Representative
Bureau of the Budget
Mrs. Prachitt Kambhu Member
7. Director
Marketing Organization for Farmers
Mr. Choke Srisithigum Member
8. Deputy Director-General
Department of Agricultural Extension
Mr. Pisit Sasiphalin Member
and
Secretary
9. Director, Projects Division
Office of the Under-Secretary of State
for Agriculture and Cooperative^a
Mr. Thana Thongton Member
and
Asst. Secretary

Seed Implementation Committee

1. Director-General
Department of Agricultural Extension
Mr. Yookti Sarikaphuti Chairman
2. Deputy Director-General
Department of Agricultural Extension
Mr. Pisit Sasiphalin Vice Chairman
3. Director
Marketing Organization for Farmers
Mr. Choke Srisithigum Vice Chairman
4. Rice Division
Department of Agriculture
Mr. Pornchai Pookamarn Member
5. Corn and Sorghum Project
Agronomy Division
Department of Agriculture
Mr. Ampol Senanarong Member
6. Representative
Marketing Organization for Farmers
Mr. Parinya Sippanandana Member
7. Oil Crops Project
Agronomy Division
Department of Agriculture
Dr. Arwooth Nalampang Member
8. Soil Microbiology and Bacteriology Branch
Division of Plant Pathology
Department of Agriculture
Mrs. Yenchai Vasuvat Member
9. Representative
Department of Technical and
Economic Cooperation
Mr. Sombhong Pattamavichaiporn Member
10. Representative
Bureau of the Budget
Ms. Chertchoo Bandhurat Member

Attachment C

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|--|----------------------------------|
| 11. Representative
National Economic and Social
Development Board
Dr. Rungruang Isarangura | Member |
| 12. Representative
Office of Fiscal Policy
Ministry of Finance
Mr. Prasit Utchin | Member |
| 13. Representative
Bank for Agriculture and
Agricultural Cooperatives
Mr. Suwan Traipol | Member |
| 14. Director
Division of Agricultural Economics
Dr. Somnuk Sriplung | Member |
| 15. Representative
Division of Plant Pathology
Department of Agriculture
Ms. Dara Puangsuwan | Member |
| 16. Director
Crop Promotion Division
Department of Agricultural Extension
Mr. Chaisop Sopsarr | Member
and
Secretary |
| 17. Chief, Seed Division
Department of Agricultural Extension
Mr. Petcharat Wannapee | Member
and
Asst. Secretary |

Interviews and Visits

1. Mr. Petcharat Wannapee
Chief, Seed Division
Department of Agricultural Extension
2. Mr. Pipat Kaewplung
Seed Division
Department of Agricultural Extension
3. Mr. Charan Wansanit
Seed Division
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4. Mr. Panoo Satayavibul
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9. Dr. Chinda Chan-orn
Chief, Corn and Sorghum Project
Department of Agriculture
10. Mr. Narongsak Senanarong
Corn and Sorghum Project
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11. Mr. Pornchai Pookamarn
Director, Rice Division
Department of Agriculture

12. Col. Larp Dejdarn
Deputy Director
Marketing Organization for Farmers
13. Mr. Prasert Vipamas
Planning Officer
Marketing Organization for Farmers
14. Mr. Pirom Jitjumnonk
Acting Chief, Seed Sales Section
Marketing Organization for Farmers
15. Mr. Thawisak Narakol
Provincial Agricultural Extension Officer
Khon Kaen
16. Mr. Ekachai Ocharern
Chief, Irrigated Agriculture Project
Khon Kaen
17. Mr. Somnuk Tadee
Assistant Provincial Agricultural Extension Officer
Nakhon Ratchasima
18. Mr. Samarn Suksanguan
Subject Matter Specialist
Provincial Agricultural Extension Office
Nakhon Ratchasima
19. Mr. Thirapong Tangchai
Chief, Irrigated Agriculture Project
Nakhon Ratchasima
20. Mr. Sutat Ratanamuang
Superintendent
Phimai Settlement
Nakhon Ratchasima
21. Corn Farmers at Wang Thong District
Phitsanulok
22. Peanut Farmers at Phimai Settlement
Nakhon Ratchasima
23. Mr. Thomas L. Cooper
Project Officer
Office of Rural Development
USAID

24. Dr. Bill R. Gregg
Senior Seed Industry Specialist
Mississippi State University Contract

25. Mr. George M. Dougherty
Seed Processing Specialist
Mississippi State University Contract

Comparison of Projected Production and
Actual Receipt of Foundation Seed

Crops	1976/1977 Crop Year			1977/1978 Crop Year		
	(1) Projected Production (MT)	(2) Actual Receipt (MT)	(3) Percentage of (2) to (1)	(1) Projected Production (MT)	(2) Actual Receipt (MT)	(3) Percentage of (2) to (1)
Soybeans	16.7	34.1	204.2	27.9	23.2	83.1
Corn	2.5	4.0	60	6.3	6.5	103.2
Rice	-	-	-	8.7	8.2	94.2
Peanuts	-	8.4	-	29.2	24.7	84.6
Mungbeans	-	-	-	1.1	2.0	181.8
Sorghum	-	-	-	0.8	1.0	125
Total	19.2	46.5	242.2	74.0	65.6	88.6

Sources: (1) from the PP
(2) from DOAE records

**Comparison of Projected and
Actual Production of Multiplied Seed**

Crops	Crop Year 1976/1977			Crop Year 1977/1978		
	(1) Projected Production (MT)	(2) Actual Production (MT)	(3) Percentage of (2) to (1)	(1) Projected Production (MT)	(2) Actual Production (MT)	(3) Percentage of (2) to (1)
Soybeans	440	160.4	36.5	723	197.8	27.4
Corn	220	200	90.9	550	224.7	40.9
Rice	-	-	-	330	319.4	96.8
Peanuts	-	58	-	220	98.9	45.0
Mungbeans	-	-	-	28	17.3	61.8
Sorghum	-	-	-	55	26.5	48.2
Total	660	418.4	63.4	1,906	884.6	46.4

Sources: (1) from the PP

(2) from DOAE records

Suggested Recording Format for

Attachment G

Seed Multiplication

CROP _____

VARIETY _____

Name of Contract Grower	Location	Planted Area (Rai)	Foundation Seed Used (Kg)	Total Yield (Kg)	Amount Buy Back (Kg)	Bad Seed (Kg)	Sold to Other Party (Kg)	Remarks

Suggested Recording Format for
Processing and Storage Inventory

Attachment H

CROP _____

Year - to Date

VARIETY _____

(Daily Record and Balance)

Date	Amount Purchased (Kg)	Moisture Loss (Kg)	Loss During Processing (Kg)	Unproven Seed (Kg)	Clean out (dirt & bad seed) (Kg)	Processed Seed in Storage (Kg)	Amount Sold (Kg)	Balance in Storage (Kg)

Comparison of Projected and
Actual Production of Processed S

Crops	Crop Year 1976/1977			Crop Year 1977/1978		
	(1) Projected Production (MT)	(2) Actual Production (MT)	(3) Percentage of (2) to (1)	(1) Projected Production (MT)	(2) Actual Production (MT)	(3) Percentage of (2) to (1)
Soybeans	400	127.1	31.8	667	158.3	23.7
Corn	200	180.3	90.2	500	157.3	31.5
Rice	-	-	-	300	255.5	85.2
Peanuts	-	56.6	-	200	86.6	43.3
Mungbeans	-	-	-	25	15.5	62
Sorghum	-	-	-	50	21.2	42.4
Total	600	364	60.7	1,742	4.4	39.9

Sources: (1) from the PP

(2) from DOAE records

Distribution of Processed Seed

Crops	MOF		Farmers		DOAE		Total	
	(MT)	(%)	(MT)	(%)	(MT)	(%)	(MT)	(%)
<u>Crop Year 1976/1977</u>								
Soybeans	0.7	1.3	9.0	16.2	45.7	82.5	55.4	100
Corn	22.9	12.7	102.2	56.7	55.2	30.6	180.3	100
Rice	-	-	-	-	-	-	-	-
Peanuts	-	-	1.7	3.9	41.7	96.1	43.4	100
Mungbeans	-	-	-	-	-	-	-	-
Sorghum	-	-	-	-	-	-	-	-
Total	23.6	8.4	112.9	40.5	142.6	51.1	279.1	100
<u>Crop Year 1977/1978</u>								
Soybeans	44.4	31.4	25.3	18.0	71.5	50.6	141.2	100
Corn	95.0	60.4	31.3	19.9	30.9	19.7	157.2	100
Rice	107.6	51.0	103.3	49.0	-	-	210.9	100
Peanuts	15.0	17.3	29.0	33.5	42.6	49.2	86.6	100
Mungbeans	5.0	32.3	1.8	11.6	8.7	56.1	15.5	100
Sorghum	2.0	-	2.5	-	4.0	-	7.5	-
Total	269	43.5	192.2	31.1	157.7	25.4	618.9	100

Source: DOAE records

(B) Comparison of Projected and Actual Distribution System

Recipients	(1) Target Percentage	(2) Actual Percentage
Farmers' Association	60	4.1
Agricultural Cooperatives	20	1.7
RTG agencies for poor farmers	10	40.9
Individual farmers	10	53.3
Total	100	100

Sources: (1) from the PP

(2) from Attachment K, (A)

(A) Comparison of Projected and Actual Distribution of
Processed Seed to Recipients: Crop Year 1977/1978

Crops	Farmers' Association			Cooperative			"Poor Farmer" Agencies			Individual Farmers			Total		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Soybeans	400	3.1	0.8	133	1.3	1.0	67	31.1	46.4	67	34.1	50.9	667	69.6	10.4
Corn	300	6.7	2.2	100	2.9	2.9	50	66.5	133.0	50	50.3	100.6	500	126.4	25.3
Rice	180	7.5	4.2	60	3.2	5.3	30	75.3	251.0	30	124.8	416	300	210.8	96.2
Peanuts	120	1.1	0.9	40	0.5	1.3	20	10.4	52	20	32	160	200	44	22.5
Mungbeans	15	0.4	2.7	5	0.2	4	2.5	3.4	136	2.5	2.8	112	25	6.8	27.2
Sorghum	30	0.1	0.3	10	-	-	5	1.5	30	5	1.9	38	50	3.5	7.5
Total	1,045	18.9	1.8	348	8.1	2.3	174.5	188.2	107.9	174.5	245.9	140.9	1,742	461.1	26.5

Note: (1) refers to the Projected Amount in MT
(2) refers to the Actual Amount in MT
(3) percentage of (2) to (1)

Source: (1) from the PP

(2) from DOAE records and sales records of MOF with the assumption that the ratio of seed distribution among the farmers associations, agricultural cooperatives, "poor farmers" agencies and individual farmers is 7 : 3 : 70 : 20 respectively.

Comparison of Projected and Actual
Production and Distribution of Inoculant

	Crop Year 1976/1977	Crop Year 1977/1978
<u>Production</u>		
(1) Projected Amount (MT)	17	32
(2) Actual Amount (MT)	5	10
(3) Percentage of (2) to (1)	29.4	31.3
<u>Distribution by MOF</u>		
(1) Projected Amount (MT)	10	15
(2) Actual Amount (MT)	1.8	5.4
(3) Percentage of (2) to (1)	18	36

Sources: (1) from the PP

(2) from MOF records.