

**A PEACE CORPS VOLUNTEER'S EXPERIENCE
WITH THE
CROPPING SYSTEMS PRODUCTION PROGRAM
IN
CHITWAN DISTRICT, NEPAL.**

by

KEITH R. ROESLER, PCV

A CROPPING SYSTEMS REPORT

JULY 1984

HIS MAJESTY'S GOVERNMENT
MINISTRY OF AGRICULTURE
DEPARTMENT OF AGRICULTURE
INTEGRATED CEREALS PROJECT (USAID)

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TABLE OF CONTENTS

	<u>Page</u>
List of Abbreviations	i
I. INTRODUCTION	1
II. PRODUCTION PROGRAM ORGANIZATION AND SUPERVISION	2
A. Production Officers	2
B. JTs and JTAs	3
C. Production Leaders	4
D. Research-Production Communication	7
III. A BRIEF PRODUCTION PROGRAM HISTORY--BY CROP	8
A. Wheat	8
B. Rice	10
C. Dhaincha (<u>Sesbania aculeata</u>)	13
D. Mungbean	14
E. Rainfed Agriculture	16
F. Other	18
IV. EXTENSION ACTIVITIES	19
A. Crop Campaigns	19
B. Field Days	20
C. Minikits, PVTs and FFTs	21
D. Farmer Interviews vs Yield Sampling	23
E. Prizes and Contests	23
F. Seed Return and Redistribution	25
G. Other	25
V. THE ROLE OF A PEACE CORPS VOLUNTEER	26
VI. RECOMMENDATIONS	30
VII. SUMMARY AND CONCLUSIONS	33
VIII. APPENDIX	34
Tables 1 - 18	35-49

Abbreviations

ADB or ADB/N	-	Agricultural Development Bank of Nepal
ADO	-	District Agricultural Development Officer
AIC	-	Agricultural Inputs Corporation
BHC	-	Benzene Hexachloride
CS	-	Cropping Systems
CSP	-	Cropping Systems Program
DAP	-	Diammonium Phosphate
F	-	Fallow
FFT	-	Farmers' Field Trial
ha	-	Hectare(s)
ICP	-	Integrated Cereals Project
JT	-	Junior Technician
JTA	-	Junior Technical Assistant
P	-	Phosphorus
PCV	-	Peace Corps Volunteer
K	-	Potassium
kg	-	Kilograms
kg/ha	-	Kilograms per Hectare
N	-	Nitrogen
PL	-	Production Leader
PO	-	Production Officer
PVT	-	Pre-Production Verification Trial
R	-	Rice
SAJHA	-	Cooperative
SMS	-	Subject Matter Specialist
T and V	-	Training and Visit
t/ha	-	Metric Tons per Hectare
VIP	-	Very Important Person
VP	-	Village Panchayat
W	-	Wheat

11

I. INTRODUCTION

I have spent 2 years as a Peace Corps Volunteer helping to start and supervise the Cropping Systems Production Program in Chitwan District. I have observed, first hand, the successes and failures. Working in the field has allowed me to see practical problems and living in a village has allowed me to know farmers feelings and reactions to the program.

The main purpose of this report is to allow others to learn from my experiences in this program. A second reason for the report is to record the names of the farmers who have received minikits or FFTs. This will be helpful if there is ever a follow-up study on the impact of the program. Lastly, since there will be a lot of PCVs in the project following ICP, I would like to share my experiences as a PCV and my ideas on the role a PCV can play in a project like this.

I have learned a tremendous amount during my two years in Chitwan. It is a pleasure to pass some of it along.

II. PRODUCTION PROGRAM ORGANIZATION AND SUPERVISION

Briefly, the Chitwan Production Program evolved into a system where, for the 1983-84 wheat crop, the production officer, Mr. Khan, was responsible for 1700 ha. Under him were several JTs each responsible for 300-400 ha each. Local farmer production leaders were responsible for each area, or "block" of about 100 ha each. As a PCV, I assisted Mr. Khan wherever I could.

In general, this system was sound. It was an effective way to extend technology to the farmers. By the time I left the program I was satisfied with the performance of both the production officers and the production leaders.

A. Production Officers

I watched the program change from a situation where there were 2 production officers, Mr. Khan and Mr. Paudel, for 200 ha, to where there was just Mr. Khan for 1700 ha. Having just one PO was more effective. While both officers were capable; being posted so near to each other created problems of rivalry and jealousy. Communication between the two was not good, despite being nearby.

After the first wheat crop, Mr. Paudel was transferred to another project, and Mr. Khan's effectiveness was increased by the transfer. Having sole responsibility for the program, and not having to share the credit for successes, are powerful incentives to do a good job.

A major factor improving Mr. Khan's effectiveness was the fact that he stayed in the same area the entire 2 years. With each succeeding crop, his knowledge of the agriculture and farmers of eastern Chitwan, and his confidence, increased. As he became more confident in the program technology, he was better able to convince farmers to adopt it.

Having a motorcycle greatly increased Mr. Khan's effectiveness. It especially helped to improve communication with the ADO Office and, as the program grew larger, it made supervision easier.

B. JTs and JTAs

While I was satisfied with the performance of the production officer and production leaders, I was not satisfied with that of the JTs. The greatest weakness in the supervision of the production program was the lack of motivation and, in general, the lack of willingness of the JTs to work. They were reluctant to go to the field. Some were reluctant to live in the block areas where they were assigned, preferring instead Parsa or Bharatpur.

One reason for this problem is the lack of supervision and discipline given from the ADO office. This has continued for several years, to the point where some JTs in the district travel to their own homes, returning to Chitwan once a month to get their salaries. It's not surprising that some JTs were reluctant to be assigned to the production program, because if they were they would be supervised and watched more closely and expected to work more than if they stayed with the T & V system. Also, if working for the general T and V program, JTs receive a field bonus, which they don't receive while working in the production program. In effect, for the production program, a JT would be expected to work more for less pay. This contributed to a very high turnover rate of JTs in the production program.

I emphasize that the production officer has no real power over the JTs. For example, for the 1983-84 wheat crop, Mr. Khan planned a daily work schedule with each production program JT. This schedule determined which blocks were to be visited on which days by each JT. It was generally disregarded and ignored by the JTs. The production officer can assign work to the JTs but only the ADO has the authority to enforce the instructions.

One other observation about JTs in general; they tend to go by the book, regardless of what they see in the field, or what common sense would dictate. For example, even if land preparation is poor and there are a lot of clods present they are reluctant to increase the seed rate of wheat. If the book says line sowing is best, that's the way they'll sow a trial, even if farmers don't like it. If there is just a slight insect problem, they're inclined to advise spraying because it's the easiest answer. A strong decisive PO can help to correct this type of thinking.

On a more positive note, some of the most rewarding work I've done in Nepal is that which I did with Ganesh Raj Panta, the JTA whom I worked with during my first year. He made it clear to me how effective an enthusiastic and highly motivated JTA can be in Nepal. If all Nepalese extension people were like him, agricultural development work would be much easier here.

C.1 Production Leaders

Good production leaders are essential for a successful production program. I found that as the production program grew, Mr. Khan and I relied on our production leaders more and more. In a large program, it is not possible for a production officer to contact every farmer individually. Through the production leaders, though, we stayed aware of farmers' feelings and reactions and potential problems. The main value of a production leader is simply that he knows the local people. He can anticipate problems with acceptance of technology, he knows the best times for meetings, and he can help to persuade farmers to adopt the recommended technology. One of his main functions is to serve as someone through which to funnel technology, such as minikits to the farmers of his block.

As we expanded into new areas for the 1983-84 wheat crop, we developed an excellent method for production leader selection. At the first informational meeting in a new area, we asked the farmers to

nominate 4 or 5 candidates for production leader for that block. Much debate and arguing followed, but eventually the names of some good people arose. Those people were then interviewed, by a committee consisting of the production officer, the Sajha Manager, and the Pradhan Panch, and the best man given the job. This selection method actively involved farmers in the program on the very first day, and resulted in leaders whom the farmers had confidence in.

For the first wheat crop in 1982-83, the 2 production officers had picked the production leaders themselves, and that did not work as well. The officers tended to pick at least one leader located near them to act as an "office peon", certainly not the purpose of a PL. The PLs also tended to be younger and less responsible than those whom farmers would have selected themselves.

I noticed consistently that production leaders are at their best, most enthusiastic and helpful, during their first year. After that, their enthusiasm wanes.

It is very difficult to terminate the services of a production leader without having hard feelings. After the production officer becomes a good friend of the PL, and even though the PL may gradually lose enthusiasm and effectiveness, it is difficult to make a change.

We found that female production leaders were less effective than male leaders. They seemed to command less respect than male leaders, especially in the field. However, they did show potential in explaining the technology in meetings for the village women.

It is important not to give production leaders too much to do. As with JTs, the PLs were given a daily work plan which assigned them a different area of their block each day. Even the best PLs did not follow this, and I now think it was asking too much of them. A better approach was to have the PL work closely with the first 5

farmers to plant the crop in his block - to make sure they did land preparation, fertilizer application and planting correctly. Not only was that effective, it was also achievable.

PLs should not be asked to attend training meetings more than once a month. We experimented with weekly and bi-weekly meetings, which were just too often. Sometimes PLs would come from the farthest areas of the program to the ag subcentre in Parsa for training only to find that the meeting was cancelled, because the SMS couldn't come from Bharatpur, because a VIP had come from Kathmandu, etc. Less frequent meetings, but reliable, certain meetings would be better. The most effective training of all is in the field, in the production leaders own block, and this should also be done at least twice each crop season by the PO.

In Chitwan, we had a special problem not present in the other districts. For the first year PLs were given inputs for 10 kathas, plus a salary of 50 rupees per month. This was later changed to only 50 rupees per month, resulting in much complaining by PLs. This was exacerbated by the fact that the panchayat level ag assistants for the T & V program receive 150 rupees per month, and are usually no more active than the PLs in the production program.

In theory, giving inputs to the PLs is a good idea. In practice, it didn't work well. The inputs tended to become available too late and, in general, a straight salary was much simpler. I think money is at least as good an incentive as seed and fertilizer is, although the inputs had demonstration value also.

If PLs are not given too much work, and are given first choice at minikits and FFTs, a small salary is enough. Since there was sometimes confusion about just what the PLs' responsibilities were and because I sometimes observed them being misused by the production officers for personal errands, I think their duties should be written down and given to the PLs as soon as they are selected.

In general, I was pleased with the performance of the production leaders. All too often I found myself by-passing the JTs to work directly with the PLs, who were more eager and cooperative. That is not altogether bad, since the PLs are local farmers who will always be there and training them is a permanent improvement to the village.

D. Research-Production Communication

For the research and production programs to be most effective, the personnel of each must take an active interest in the other program. The production officer can see which new crops or varieties look good in research trials and plan them as minikits in his production program. The site coordinator can learn from the practical problems which arise in a production program and use this knowledge to help keep his research relevant and meaningful. A good example of this is that the site coordinator in Chitwan dropped trials with Janaki rice variety after seeing how susceptible to stem borers it was in the production program areas. This problem was not evident in the trials because insecticides were used, while in the production program farmers could not afford to buy the insecticide.

I think communication could have been better in Chitwan. Perhaps one day every 2 weeks could be set aside for the production officer and site coordinator to visit a part of the production program and research trials together.

If the site coordinator made frequent visits to the production program, however, there is the danger that the production officer would resent this. The production officer should have the freedom to run the program himself, without feeling constantly watched.

III. A BRIEF PRODUCTION PROGRAM HISTORY; BY CROP

Even before the production program was started in Chitwan, the Sajhas in Khairahani, Birendranagar and Bhandara VPs were working well. The Chitwan farmers are progressive, and were already using moderate amounts of chemical fertilizers and achieving fairly good yields. The Chitwan soils are naturally fertile. The active Sajhas and good transportation made this a good area to organize and start a production program, but dramatic increases in rice and wheat yields were less likely here than in the other districts.

A. Wheat

The production program was started on 200 ha in Khairahani and Birendranagar panchayats in the fall of 1982. This was a time of learning. Starting small helped to ensure a successful program, and the extension staff gained confidence in themselves and the program. Good teamwork and cooperation were developed among the ADB, Sajhas and AIC. The fertilizer and seed supply were adequate and the weather was good. Yields were good averaging 3.5 t/ha and, in some blocks, over 4 t/ha were achieved. Farmers gained confidence in the program.

Except for a few hectares of UP-262, the entire program was planted to RR21. Minikits of 2 varieties, Vaskar and HD2204, were tried (Table 2), but RR21 performed better.

Minor problems included wireworms, poor land preparation, broadcasting mistakes and weeds. None of these were serious. A 2,4-D demonstration was done in Premपुरi and Khurkhure, Birendranagar VP, and in Sultana, Khairahani VP. Good weed control was achieved, but spraying by hand took a lot of time and water.

The wheat PVT (Table 1) showed that broadcast seeded wheat actually outyielded that which was seeded behind the plow. This

appeared to be because the local plows go too deep and emergence is not good when seeded behind the plow.

For the 1983-84 wheat crop, the production program covered 1700 ha in Khairahani, Birendranagar, Khattar, and Bhandara panchayats. The informational campaign, collection of seed and fertilizer demands, and loan processing all went much more smoothly than during the previous year. Our experience and confidence showed. Then a shortage of phosphorous fertilizer created serious problems. Some farmers planted with only N applied basally, and the others waited for the P fertilizers and planted late, in December. This was a difficult time for us, because we had stressed the importance of early planting in our trainings.

Despite the late planting and fertilizer shortage, yields were still over 3 t/ha. After harvest a second big problem arose - low prices. Because of a windstorm that caused lodging, the AIC didn't even buy the wheat in the seed multiplication program, so all the farmers faced low prices. There was a lot of complaining about this.

FFTs, including RR21 and 5 new varieties were planted (Table 3), some line-sowed, some broadcast. Again, RR21 outperformed all other varieties, and matured earlier. Although rust was visible on RR21 in both years, it didn't cause much damage.

I believe the program technology for wheat is sound. One top-dressing, as the program recommends, works best. One farmer tried 2 topdressings, but at the time of the second topdressing the soil below the surface 2 inches was not dry enough to warrant irrigating again; so the urea was applied later and gave less benefit. I believe that, if carefully done, broadcasting is a good method of sowing wheat.

The farmers had confidence in our recommendations for wheat. Some even bought complexal on the black market just so they could

repeat the exact fertilizer rates we had used the year before, which worked so well. When the DAP finally came, farmers listened and followed our recommendations closely. This was because DAP was not familiar to them, as well as the fact that they had confidence in the advice. Also, many farmers planted wheat rather than mustard in 1983-84 because of the successful wheat crop the year before.

B. Rice

The predominant main season rice variety in Chitwan is Masuli. It requires 165 days to mature, making it almost impossible to plant spring maize in a rice-wheat-maize pattern. It is also a tall variety which lodges under high N rates. These facts, plus the fact that the Chitwan soil is fertile, and that farmers were already topdressing, using some urea on rice, mean that the best way for us to improve the system is to work with other varieties. Farmers are reluctant to switch varieties, however, because Masuli has a high market price, good eating quality and a good straw yield. So I found myself working to improve a crop that couldn't be improved much; and I found that frustrating. It must be emphasized that the present system is not bad; Masuli yields of 3.5 t/ha are common in Chitwan.

1. Main Rice Season, 1983

The program area was 437 hectares and, except for a small amount of IR20 in Prempuri, Birendranagar VP, the program was entirely with Masuli.

In general, farmers response to our recommendations was not as good as for wheat. We convinced some farmers to apply half of the urea basally, but in all areas less than 50% did this. In general, rates were less than the program recommendation of 60 kg/ha of N. We also convinced some farmers who had applied P to the preceding wheat crop to apply only urea to rice, rather

than complexal and urea both. I sometimes wondered about the wisdom of this, especially since a complexal application ensures that some N gets applied basally. In a country like Nepal, however, I still think it's best to go with only N, when consistent P responses are not found in research.

There was a severe stem borer problem. Furadan was too expensive to buy, and the borers damaged a lot of rice. Several farmers planted Janaki rice for an AIC seed multiplication program, and a PVT was also planted with Janaki (Table 1). The variety was extremely susceptible to stem borers, and none of the farmers who planted it wanted to plant it again. Masuli seemed more resistant than Janaki, IR20 or Bindeswari. Perhaps this is because it has more days to make new tillers and recover.

Gundhi bugs are present every year, but cause less damage than do borers. Since they are easily seen and BHC and Metacid are affordable, farmers use these insecticides to successfully control Gundhi bugs. I noticed a lot of carelessness and unconcern for safety with the use of these insecticides. It made me hesitant to recommend them.

Bindeswari rice minikits were distributed in areas with less than full irrigation, mostly in the Prempuri-Sirkot area of Birendranagar VP (Table 4). The farmers liked the fact that it matures so much more quickly than IR 20 or Masuli, that it yielded as much, or more in some cases, that it has a high percentage rice recovery, and that it has better eating quality than other quick-maturing varieties like Laxmi or Janaki. The ultimate criterion for success of a minikit is not how good the yield is, or how good the socio-economic analysis looks, but simply if the farmers like it well enough to plant it again the following year. By this standard the Bindeswari was successful, since 11 of 14 farmers intended to plant it again (Table 4). Five kg of seed

were distributed per minikit in most cases, with the stipulation that 5 kg be returned by the farmers after harvest. This worked well. I stored the seed in my room for several months, and then we used it again as minikits in the early rice crop in Bhandara VP in the spring of 1984.

2. Early Rice, 1984

There is a much better potential to improve upon CH45 in the early rice crop than to improve upon Masuli in the main season crop. This is because the yield and grain quality of CH 45 are not as good as those of other existing varieties. The most important characteristic needed for early rice is quick maturity.

Bhandara VP has a lot of fully irrigated land with a rice (CH45) - rice (Masuli) - wheat pattern. Since the expansion and impact would be large if there was a better variety found, it seemed a good place to try some minikits of other varieties. The existing CH45 yields are over 3 t/ha.

The Bindeswari seed mentioned previously, and some Malika rice which Dr. Ken Sayre brought from Parwanipur, were distributed as minikits, mostly in Bhandara VP (Tables 5, 7). In addition, 3 early rice FFTs were planted (Table 6).

My final observation of the Malika and Bindeswari minikits and the FFTs was on June 14 and 15. The Malika looked good and I think it could replace CH 45 in larger areas next year. In the field it looked like it would yield substantially better than CH45, and it is just as tall so will yield just as much straw. Another thing in its favor is that it is not much different than CH45 in maturity. I rated the rice subjectively (Table 5).

The Bindeswari was just starting to head and was therefore more difficult to judge in the field than Malika. Farmers did not like the fact that it was 10-12 days longer in maturity than CH45, and that it was shorter in height. It appeared to me that it would yield less than Malika, and no better than the best CH45. There was also leaf roller damage. Perhaps farmers will like it better after harvest, when the better grain quality and rice recovery % are known.

The FFTs arrived late, were planted late, and hadn't started heading at the time I left Chitwan.

3. Main Rice Season, 1984

I left Chitwan before rice planting, but I'm confident that the correct approach is being taken to improve rice production. We distributed a lot of minikits of new varieties throughout the program area. They mature more quickly than Masuli, and some of them have good grain quality, so I have high hopes. (See tables 8-14 for variety names, locations, and farmers' names.)

Mr. Khan and I put a lot of faith in our production leaders for minikit distribution. We decided how many minikits of a certain variety to distribute in a block and then let the production leaders decide to whom they should be given. We also used our knowledge of which varieties had already been introduced in some areas in past years, such as Janaki, Laxmi and Durga, and designed the FFTs to avoid duplication.

C. Dhaincha (Sesbania aculeata)

In the spring of 1983, 15 hectares of Dhaincha were grown for green manure in the Sultana Block, Khairahani VP. Although Dhaincha has been around for a long time, it had never been grown on such a large scale. The crop looked beautiful, it was easy for the farmers

to grow, and they liked it. A field day was held for farmers in Ratnanagar VP and in western Chitwan. They were impressed with such a good crop on such a large area.

We conducted fertilizer trials on the Masuli rice following Dhaincha, but there was so much variability in results that the trials were inconclusive. From what I saw and what farmers said, however, it is not necessary to apply any N fertilizer at all to the Masuli rice following Dhaincha.

Farmers like Dhaincha so well that a large demand for seed was created for the spring of 1984. I don't have a record of farmers name and areas, but about 56 quintals of seed were sold in our program areas, mostly in Khairahani and Khattar VPs; 7 quintals in the Ratna Nagar VP area; and 20 quintals in the Patiani area of western Chitwan. If that was all planted at 45 kg/ha, it would amount to about 185 hectares. A private seed company, Nepal Seed Co., brought the seed from India. It seems that there will now be a permanent demand for Dhaincha seed in Chitwan. Mr. Khan did the work of contacting and communicating with the seed company.

Since Nepal must import 100% of its chemical fertilizers, the significance of the successful Dhaincha crop in Chitwan is obvious. Dhaincha also fits well into a cropping pattern which includes Masuli rice.

D. Mungbean

Mungbean was another new spring crop which was introduced through the production program. In 1983, 1 to 2 kg of PS 7 variety mung seed per farmer were distributed to 16 farmers in Prempuri and Sirkot villages of Birendranagar VP (Table 16). Most of this mung was successful, but the farmers did not like the high labor required in picking it (3 to 4 times). We collected some mung seed from the

farmers who grew it successfully and redistributed it. In addition, the Birendranagar Sajha purchased 80 kg of mung from the farmers and stored it for one year in a seed drum provided by the Cropping Systems Site Coordinator, Mr. Shrestha.

JTA Mr. Panta and I did a mungbean seed storage training; using plastic bags, BHC and ash. This method usually worked fine, but a few farmers tended to seal the seed in plastic before it was well dried, and some didn't use enough BHC, so that damage resulted. I think that the local method of frequent drying and storing in ash, as is done with black gram seed, is just as good.

In the spring of 1984, the Birendranagar Sajha sold 12 of the 80 kg to a farmer in Ratnanagar panchayat, and the rest went to farmers in our Gaida-Sundi and Bargaun blocks of Khattar VP. I saw some of the Khattar mung at the time of first picking, and it looked fair. Mr. Khan did a good extension job in helping to sell the Sajha mung.

Some of the Prempuri farmers saved seed from the 1983 crop and planted it again in 1984 (Table 16). In addition, we distributed some mung minikits to production leaders in Bhandara and Khattar VPs (Table 15).

Although we have successfully started mung in Chitwan, it did not spread as quickly as I had hoped. Not all of the Prempuri farmers who grew it successfully in 1983 planted it again, and those that did, only planted small areas again. Among the farmers who grew it for the first time in 1984, the most positive response was that they would save "a little" seed for next year. I believe we have established mung as a spring crop in Chitwan, but I don't think it will ever cover large areas, like Dhaincha will. The labor requirement is just too great for one family to plant more than 1 or 2 Kathas.

E. Rainfed Agriculture

In my 2 years in the Cropping Systems Program, I have often heard complaints or criticisms that our production programs are concentrating in the irrigated areas and ignoring the rainfed areas, that there are more rainfed than irrigated areas in Nepal, and that we should be doing production programs now in these areas. I think this shows a lack of understanding of the present situation. From what I've seen in Chitwan, I would not want to be held accountable for a production program in a completely rainfed area with the technology presently available.

Over half of Birendranagar VP is completely rainfed. The predominant upland rainfed pattern is maize-mustard, and the predominant lowland rainfed pattern is rice, followed by lentil, linseed, lathyrus or fallow. I was curious about the potential for improving rainfed maize, so I did a small survey in ward #4 of Birendranagar VP in the winter of 1982. I interviewed 10 farmers whom I did not previously know, and their answers were remarkably similar. On average, they used 25 kg of seed/ha, and thinned. Five farmers used Rampur yellow and 5 farmers used Khumal yellow variety. They applied an average of 320 dokos of compost/ha and none used any chemical fertilizer. They all hand weeded once and weeded with a plow once. The average yield was 1.4 t/ha. This mini-survey, by showing the lack of chemical fertilizer use and the low yields, indicated to me that there was a big potential for improvement in rainfed maize.

I thus eagerly looked forward to conducting a rainfed maize PVT in 1983. Five replications were used (Table 1), with a seed rate of 30 kg of Rampur Composite/ha with 30 kg each of N and P₂O₅ applied basally and 30 kg of N topdressed at the knee high stage. The farmers did not like to topdress, but there were no other problems or complaints early in the season. Then it got hot and dry, and the maize burned up. In 4 of the 5 replications, the farmers harvested

before maturity for fodder, because there was no grain produced on the tiny ears. The 5th rep looked just like the local maize surrounding it - it was all poor, and water was the limiting factor. I was really glad that this was only a trial and not a full production program. The crop failed, but the PVT did not - it demonstrated that we are not yet ready for a rainfed maize production program. I did not repeat this trial in 1984, because I could not stay throughout the season, but it rained a lot and perhaps the maize would have done well with our technology. Rainfed agriculture is unpredictable, and I think it's a very great risk to arrange loans for seed and fertilizer for upland maize based patterns in rainfed areas.

On a lot of the rainfed rice in Birendranagar VP chemical fertilizer is not used. Farmers are not very particular about grain quality or plant height, either, and would probably be willing to try any variety that gives a fair yield in dry conditions. I would have no more confidence in a rainfed rice production program than I would in one for upland rainfed maize, however. I think trials should be done in rainfed rice, but I know we are not at the production program stage now.

The closest thing to a rainfed area in our production program is the Premपुरi block of Birendranagar VP. This area has partial irrigation, with farmers taking turns for the water. For example, farmers can irrigate at some time from 15 to 40 days after planting wheat. This is a completely different situation and both rice and wheat yields are good there.

One other thing I tried in rainfed areas was the Hardee soybean variety. However, by the time I got the seed distributed and the farmers got it planted, it was late July. Thus the plants flowered while still small and being a determinate variety, they stopped growing vegetatively and the yield was poor. One farmer, Dhan Bahadur Pur, of 2 group in Birendranagar, planted 3 kg on July 10, immediately

after I brought the seed. This crop did well, both as an intercrop with maize and as a sole crop. It outyielded the local variety and matured earlier, in mid-October, thus allowing mustard planting. He intends to plant a larger area next year, because he said this crop gave more profit than his rainfed Chandina rice. This did show the potential for this variety of soybean, if planted early enough.

F. Other

I planted or distributed 153 Leucaena leucocephala (ipil ipil) seedlings, obtained from the Forestry Offices in Khairahani. I encouraged 1 meter spacing in a line around buildings or along fences. I distributed small numbers to each farmer, because they required hand watering the first few days. Five of the farmers I distributed seedlings to were production leaders of our program (Table 17).

Also, I tried an experiment with azospirillum on CH 45 rice, but found no difference between the treated and untreated rice.

IV. EXTENSION ACTIVITIES

A. Crop Campaigns

Before each rice or wheat crop, we held a meeting in every block to explain the production program technology for that crop and to gather loan demands for seed and fertilizer. As our program grew, I had the satisfaction of observing each crop campaign go more smoothly than the one before it, despite larger areas. In addition to our increasing confidence in the technology, there were two other reasons for this. First, our posters and visuals improved with each campaign, enabling us to give more interesting and effective trainings. The best trainings we gave were for the 1983/84 wheat crop, because we had been given 5 sets of already-made posters to use. We modified the posters and brightened them up, but they still worked better than any visuals we had made entirely by ourselves in previous seasons. Since Mr. Khan has good ability in making posters and in presenting trainings, I believe that the ready-made posters would be even more helpful in other districts than they were for us. Secondly, a Sajha representative actually accompanied us to the meetings, and took loan demands directly from the farmers and made it official at that time. In our very first crop campaign, we had tried to work with the production leaders to get a list of demands by visiting door-to-door. That was difficult for a small area, and it would be almost impossible for a large area.

Problems included "burnout" from giving so many meetings in such a short period, usually 2 weeks or less. Giving the JTs some of the work helped, but I observed that it is better for the program officer to at least be present at each meeting. Also, in areas where the production program had already been present for a full year, farmers attendance and enthusiasm tended to be less. Farmers seemed to think they had already seen a training for that crop and didn't need to see it again. A strong production leader had a big influence on

attendance in these areas. We also noticed that, being an American, my presence at meetings seemed to help attendance and enthusiasm even when I didn't do much of the actual training. In the first crop campaign, we had tried raffling small prizes to help attendance. I didn't like that, because it seemed to distract from the training message, and any farmers who came mainly for the raffle weren't serious about learning, anyway.

In conducting trainings, we found that it helped to simplify our recommendations as much as possible. For example, for Masuli rice, we recommended 45 kg urea/bigha basal and the same amount topdressed 45 days after transplanting. The 45-45-45 was easy to remember, and we felt it was worthwhile to recommend this, even though topdressing was a little before panicle initiation and the N rate worked out to 62 kg/ha rather than 60. There was also a conflict between doing the campaign early enough so that the Sajhas had a lot of time to process loans, and doing it so early that farmers forgot the training by planting time. We usually followed the Sajhas advice on when to conduct the meetings.

B. Field Days

In the spring of 1983, we held a field day for the Dhaincha in Sultana and one for the mung in Prempuri. We brought farmers from other parts of Chitwan to see these crops. Farmers had never seen Dhaincha on such a large area, or mungbean at all. The demand for Dhaincha in Ratnanagar VP in 1984 was a result of the Dhaincha field day. Communicating and coordinating vehicles were difficult, and farmers were often asked to stretch their patience, but these field days overall were effective and successful.

In the fall of 1982, some Chitwan farmers were taken to Parsa district to see Janaki rice. The farmers' reaction to this were mixed. They enjoyed seeing a different variety, but there was only a little

time in the field, and a lot of time travelling to Parsa and back. This field day was less effective than those held for Dhaincha and mung.

There were also many visits by groups of government officials from Kathmandu to view the production program. I observed that these were motivating and inspiring for the production officer and JTs.

C. Minikits, PVTs and FFTs

Minikits and PVTs both serve the same purpose - they test new technology on a small scale preceding a production program which uses that technology. PVTs should be used to test cropping patterns that are different from those present in the production program, or test technology under different conditions, such as rainfed, than those present in the production program. To test new varieties of existing crops, within production program areas, minikits are more appropriate.

I worked with 2 different PVTs in Chitwan (Table 1). One was a maize-mustard pattern under rainfed conditions, and the other was a rice-wheat pattern under "semi-irrigated" conditions. As I stated in the section on rainfed agriculture, the maize trial was effective and appropriate. It tested a new pattern not in the production program, and we learned from it. The rice-wheat trial was less effective, partly because the pattern tested was the existing one in the production program and as the production program area expanded, it eventually included the trial sites. The intent had been to test the technology in "semi-irrigated" conditions, rather than the fully irrigated areas of the production program. As the program expanded into the partially irrigated Prempuri areas, however, and as more pumping sets and new wells increased the fully irrigated area around the trials, they lost their value. I believe that the most worthwhile PVTs to conduct in Chitwan now are rice and maize based patterns under completely rainfed conditions.

The extension staff of the production program tended to think of PVTs as unimportant. They seemed to feel that their responsibilities were with the production program and that the PVTs were definitely a 2nd priority. One other observation is that it took a long time and was a hassle for the Sajha to get reimbursed for PVT materials.

PVTs have an exact methodology, and that can be both an advantage and a disadvantage. It allows Nepalese extension workers to be trained to conduct trials, but it also decreases the flexibility of the trials. I liked the freedom and flexibility of minikits. For example, one farmer divided his 5 kg Bindeswari rice minikit, with my approval, and gave half to another farmer. With the mung minikits, some farmers tried part of their seed intercropped with maize, as well as sole crop; some tried planting it on rice bunds, and one even chose to try planting it in the fall. Minikits get the decision making into the farmers' hands quickly, and I have a lot of faith in the farmers of Chitwan.

After experimenting with different sizes of minikits, I believe that the best size is enough seed to plant 1 to 1½ kathas. The 3 kathas area or 1/10 ha suggested for PVTs is larger than necessary for a minikit. If a variety failed, I felt better if it was only on 1 katha, and if it was successful, that seemed to be enough to show the potential. Smaller minikits also allow seed to be distributed to more farmers.

I found it very helpful when FFTs included the main existing variety, such as RR 21 for wheat, or CH 45 for early rice, for comparison purposes. This is especially helpful if the FFTs arrived late and were planted later than the surrounding area.

One of the best uses of money for demonstration materials is signboards giving the names of varieties in trials. They should be written in Nepali, of course.

I strongly feel that when selected wisely, PVTs, minikits and FFTs can all be very productive and useful.

D. Farmer Interviews vs Yield Sampling

Correct sampling is the most accurate way to determine yield. For research trial evaluation, there really is no other choice. For evaluation of production programs, however, I strongly feel that yield sampling should not be used. First of all, it is not possible to obtain an adequate number of samples. To evaluate 1700 ha properly, a tremendous number of samples would be necessary. Too few samples are worse than none at all, because they can be misleading. Secondly, I've had a first-hand look at all the ways mistakes can be made with samples, and I think that a lot of sample data that is obtained here is unreliable. In Chitwan, there was a reluctance to take a random sample if it didn't look good in the field. The threshing, weighing, recording and returning of samples were done late. Storing samples in the office so long led to damage by mice and lost or mixed labels. The threshing and weighing of wheat samples interfered with the informational campaign for the following rice crop.

For the same amount of work, many more farmer interviews can be taken than samples. I think that the results of a well-trained interviewing team are at least as reliable as yield sample data. Random selection is much more likely with interviews, and farmers seem to have a good idea of how much production they obtained on their land. The error in a farmer's estimate of his yield is less than the errors made in the sampling process. American farmers don't take yield samples of their crops and yet have a fairly good idea what yields they achieve. The Nepalese farmer with his small landholding and much smaller production, has at least as good an idea of his own yield.

E. Prizes and Contests

Awarding prizes to the "best farmers" in the production program

sounds like a good idea, but in practice does not work well. Based on his experience in Chaurijahari, I think that Mark Jenner agrees with me.

In Chitwan, we conducted a "best farmer" contest for the 1982-83 wheat crop. We decided that selection of winners by yield-sampling would take too much time and labor. Instead, we formed a judging committee consisting of the ADO, ADB, AIC and Sajha personnel, as well as the Pradhan Pancha of the involved panchayats. Since the judging was subjective, non-winners complained of unfairness. Since it has a hot time of the year, the judging committee didn't do a conscientious job and tried to finish quickly. Since the prizes were awarded long after harvest, even the winners complained. In short, I think the contest upset more people than it pleased.

I believe that prizes give no incentive at all to follow the recommendations. If the technology is good, farmers will follow it, whether there is a prize possible or not.

If a contest must be held, I think it is better to give several equal prizes to several winners, rather than to rank them from 1st to 10th. Prizes should never be very valuable.

I'm not opposed to contests for educational purposes, or to make a point. I liked the "biggest maize ear" contest at Pundi Bhumdi. It was easy to judge, created a lot of enthusiasm, and demonstrated that Khumal yellow produces larger ears than local varieties. Another possibility is to have a contest to guess the yields of a plot with local practices and a nearby plot with the recommended technology being used. Prizes could be given for the closest estimate of the yield of each. Just two yield samples would not be difficult, and the results would demonstrate the value of the technology.

In general, contests should be designed carefully and if potential problems are likely it is better to avoid them entirely.

F. Seed Return and Redistribution

The Bindeswari rice and mung minikits were distributed with the stipulation that an equal amount of seed be returned by the farmers after harvest. We then redistributed this seed to others in different areas.

This prevented the minikit from being a "handout", and prevented the mentality that can result after years of being given something free. It also allowed us to spread the seed more quickly over larger areas. The rice seed I stored for several months before redistributing it, while the mung I redistributed immediately after harvest for the following year. The quick redistribution of mung was a mistake because we could have stored it with less damage than the farmers, and because we could have had the option to start it in new areas that the program expanded into the following year. In general, this worked well and we obtained a high return of seed.

G. Other

A major mistake was made in collecting seed demand for Arun maize in the spring of 1983. There was a large demand, and when no seed became available, farmers were angry with us. It damaged our credibility.

Dave Mergen, Mr. Panta and I discovered an effective way to determine potential expansion areas of the production program. In just a couple of days, travelling by bicycle and asking a few simple questions to farmers concerning existing crops, practices and yields, we had a good feel for the agriculture in 5 panchayats of eastern Chitwan.

V. THE ROLE OF A PEACE CORPS VOLUNTEER

The most obvious contribution a PCV working in an agricultural development project can make is to provide technical knowledge. Although much of the technical knowledge he has acquired in the U.S. is inappropriate in Nepal, a PCV with a B.S. in Agronomy or a related field can still teach a lot to Nepalese extension people. This is especially true in the Terai; where agriculture is more similar to that in the U.S. than is agriculture in a remote hill area. PCVs can make technical contributions in the remote hills areas also, but their training period in Nepal should strongly emphasize hill agriculture, especially alternatives to chemical fertilizers, if they are to be posted in the hills.

The non-technical contributions a PCV can make, however, are at least as important as the technical ones. As members of a completely different culture, PCVs possess a lot of different characteristics than do the Nepalese, which can help a program to operate more smoothly and successfully. These "American characteristics" include a systematic way of planning, observing, and thinking; dynamism, foresight, hard work, enthusiasm, and "common sense". Some of these characteristics are unconsciously transferred to Nepalese co-workers over a 2-year period, and help to make them more effective extension workers. For instance, PCVs help to demonstrate, by their own example, that extension work is most effectively done in the field, rather than in an office. PCVs also can help extension people to anticipate problems and prepare for them before they arise. By working with the extension staff, a PCV not only helps to motivate them, but also increases their enjoyment of the work. Also, just the presence of an American seems to lend some legitimacy to the program.

The energy and enthusiasm of a PCV could perhaps best be used in the hills, where transportation is least developed. In the Terai, even JTs who are not highly motivated can still conduct program activities by using a bicycle or a motorcycle.

For work that the Nepalese extension people are capable of doing themselves, it is important for the PCV to try to work with his counterparts, rather than to work in place of his counterparts. In a production program a PCV becomes well acquainted with the production officer and knows his strengths and weaknesses. He should help the officer to make use of his strengths, and try to supplement him in areas where he is not as strong. I feel that Mr. Khan and I complemented each other well and that I helped to make him more effective. Knowing that his persuasion and speaking abilities are good, I tried to encourage him to use them when needed. For example, the mung seed in the Birendra Nagar SAJHA in 1984 was not being sold until I stressed to Mr. Khan the importance of selling it. He then much more effectively convinced farmers to plant it than I could have done, and in just 2 days all the seed was sold. The two of us together were more effective than either of us could have been alone. As another example, Mr. Khan could present trainings to farmers in Nepali much more effectively than I could. I was still able to strengthen the trainings, however, by helping to plan with him what should be included on the posters, in which order they should be presented, and which points should be emphasized.

A PCV sometimes needs to conduct activities on his own for the sense of accomplishment and satisfaction they bring, and to reduce his own frustration. How much of this individual activity is necessary, each PCV must decide for himself. In general, though, the PCV should try to assist the Nepalese staff, rather than to do their work for them.

Towards the end of my Peace Corps term, I experienced the feeling that I was less essential for the success of the program than I had been earlier in my term. I found, for example, that I was able to take a less active role in the informational campaign for the 1984 rice season than ever before. The Nepalese staff seemed able to handle it themselves, and I found that extremely satisfying. Perhaps a PCV can be most useful in helping to start and supervise a program in its first 2 years.

One of the best contributions a PCV can make in an agriculture production program is to give feedback to the project staff in Kathmandu.

He is able to communicate with expatriates, who are working with the project, much more effectively than the Nepalese extension staff can. Living in a village and working in the field allows him to see things that other project personnel don't have an opportunity to see. This report is an example of that feedback. Throughout my 2 years, I have enjoyed discussing the program with ICP personnel, and I appreciate the fact that I have been sincerely listened to. In a remote hill site, project personnel are even less likely to see first-hand the situation in the field, and the feedback which a PCV can give is even more important.

A PCV can also help to increase communication and cooperation between production program and research personnel. A PCV perhaps has a better perspective of the cropping systems strategy as a whole, and the importance of both research and production, than do Nepalese working in one or the other.

It is not necessary for a PCV to be posted in a village to be effective. In my PC group, both David Lipinski and David Mergen worked effectively from Kathmandu. The cross-cultural aspect of Peace Corps is very important, however, and if a PCV strongly wants a village experience, I believe he should be given a field post. Living with a local family in Chitwan has been the best part of my Peace Corps experience.

A PCV should not handle a revolving fund account for a production program. If he does, he will find himself in a "policeman" role, and his working relationship with the production officers will be damaged. When the Chitwan production program became HMG's, and I was no longer involved with the revolving fund, I was greatly relieved. I enjoyed having the production officer, JTs, production leaders, and even the local villagers know that all of the program money was not coming from me.

In a cropping systems production program, there is a good system for extending technology through the production leaders to a lot of people in many different villages. I propose that PCVs use this system to promote

secondary projects not included in the cropping systems program, such as fodder and fruit trees, smokeless stoves, bee-keeping, vegetable seed production and so on. I used the system to spread Leucaena leucocephala (ipil ipil) trees throughout the program area, and if I had found a local potter willing to construct smokeless stoves, I would have tried to install a stove in every production leaders' home. I believe that even PCVs working on other assignments, but posted near a production program area, should make use of the program system. By working with the production officer, he could have a chance to work with some progressive and cooperative farmers, the production leaders, in villages where he might not have an opportunity to make contacts otherwise. This type of cropping systems program - Peace Corps cooperation could be very productive, with PC providing the secondary project support and CSP providing the extension system.

VI. RECOMMENDATIONS

1. Keep a production officer in the same area for at least 2 years, to increase his effectiveness and provide continuity.
2. Start a production program on a small scale to improve the confidence of the PO and JTs. Do not post 2 POs near to each other.
3. To select a new production leader, have the farmers of the block nominate 3 to 5 people. A committee consisting of the PO, a SAJHA representative, and the Pradhan Panch can then interview the candidates and select one.
4. Change the PL in a block once a year to help maintain PL enthusiasm, to avoid the unpleasant task of firing PLs, and to allow more people to be trained as PLs.
5. Give a cash salary and first choice of minikits or other trials to PLs. Do not give inputs for a certain amount of land.
6. When PLs are selected, give them a written list of their duties, so that no misunderstandings or misuse of PLs occurs.
7. Ideally, combine the Training and Visit (T and V) and Cropping Systems Production Programs into one program. At the least, make salaries for the JTs and PLs of both programs equal.
8. Do not require PLs to attend trainings more often than once a month. Conduct most of the PL training individually in the field, in the PLs own block.
9. For each crop season, have the PLs work with and follow up the first 5 farmers to plant the crop in their block.

10. Encourage good communication between the PO and the site coordinator. Field visits together to view the production program and the research trials twice per month may help.
11. For each crop campaign, give a ready-made set of posters to each PO as was done for the 1983-84 wheat crop. Ensure that each PO also has enough materials to construct his own visuals.
12. Have a SAJHA representative present at informational meetings for a coming crop season to collect loan demands in an official manner at that time.
13. Use interviewing, rather than yield samples, to evaluate a production program.
14. Do not award prizes to the "best farmers" in a production program.
15. Use field days to show off a successful new crop or variety. Within-district field days are more effective than those in which farmers are brought from long distances.
16. Do not collect seed demand from farmers, unless there is an assured supply.
17. Use PVTs to test cropping patterns which are different from those of the production program, or in completely rainfed areas.
18. Use minikits to test new varieties of existing crops within the production program.
19. For minikits, use enough seed to cover 1 to 1½ Kathas (330-500 m²).
20. In FFTs, include the most popular local variety as a check.

21. Use signs, written in Nepali, to give names of new varieties in trials.
22. Have farmers return an amount of seed equal in size to the minikit, after harvest.
23. For wheat in eastern Chitwan, continue with the present CS technology and continue to conduct varietal FFTs each year.
24. For rice in eastern Chitwan, de-emphasize the production program for Masuli variety. Concentrate on minikits and FFTs of shorter-season varieties for both main season and the early rice crop.
25. Provide minikits of Arun maize to the same farmers who were given quick-maturing main-season rice minikits in 1984; to plant on the same areas in the spring of 1985.
26. Try to minimize technology which relies on the use of insecticides.
27. Introduce chaincha in all Terai production program areas. At the least, provide chaincha minikits to the PLs.
28. Provide minikits of 1 kg of mung seed to each PL in Terai production program areas where it has not already been introduced.
29. For at least the immediate future, do not attempt a full production program in a completely rainfed area in Chitwan.
30. Continue to use PCVs in cropping systems production programs.
31. Encourage PCVs working in other programs, but posted near production program areas, to use the production program PL system for activities not included in the cropping systems production program.

34-

APPENDIX

Table 1. PRE-PRODUCTION VERIFICATION TRIALS (PVTs)

PVT	Date	Farmer	Panchayat	Village
1. Rainfed maize	1983	Sri Prasad Pathak	Birendranagar	Khurkhure
		Bir Bahadur Pariyar	Birendranagar	Khurkhure
		Kabi Raj Thapa Magar	Birendranagar	Khurkhure
		Bishnu Prasad Khadel	Birendranagar	Khurkhure
		Mahabir Chaudhary	Birendranagar	Khurkhure
2. Semi-irrigated R-W-F (RR21 Wheat)	1982/83	Kriparam Chaudhary	Birendranagar	Khurkhure
		Krishna Prasad Timilsina	Birendranagar	Khurkhure
		Jaganath Ghimire	Birendranagar	Khurkhure
		Ram Bahadur Rana	Birendranagar	Prempuri
		Gobinda Prasad Khadel	Birendranagar	Prempuri
3. Janaki Rice	1983	Kriparam Chaudhary	Birendranagar	Khurkhure
		Krishna Prasad Timilsina	Birendranagar	Khurkhure
		Jaganath Ghimire	Birendranagar	Khurkhure
		Santee Thapa	Birendranagar	Prempuri
		Gobinda Prasad Khadel	Birendranagar	Prempuri

Table 2. WHEAT MINIKITS, 1982-83, Vaskar and HD 2204

Farmer's Name	Panchayat	Village
1. Prem Bahadur Tamang	Birendra Nagar	Prempuri
2. Shanta Thapa	Birendra Nagar	Prempuri
3. Tag Bahadur Thapa	Birendra Nagar	Prempuri
4. Bal Bhadra Thapa	Birendra Nagar	Prempuri
5. Tej Prasad Upreti	Birendra Nagar	Khurkhure-Bhairahani
6. Chatra Bahadur Bisowkarma	Birendra Nagar	Khurkhure
7. Bahira Mahato	Birendra Nagar	Khurkhure
8. Gopi Chaudhary	Birendra Nagar	Khurkhure
9. Ganga Lal Chaudhary	Birendra Nagar	Khurkhure
10. Chunu Chaudhary	Birendra Nagar	Khurkhure
11. Nak Ched Mahato	Birendra Nagar	Khurkhure

Table 3. WHEAT FFTs, 1983-84

Varieties: Vaskar, Vinayak, NL288, NL289, RR21, Siddhartha.

Farmer's Name	Panchayat	Village	Varieties
1. Small Farmer Development Group	Birendra Nagar	Birendra Nagar	Vaskar, Vinayak, NL288, NL289, RR21, Siddhartha
2. Ram Dash Chaudhary	Khairahani	Bhairahani.	Same
3. Kaji Chaudhary	Khairahani	Sultana	Same
4. Pradib Chaudhary	Khairahani	Majui	Same
5. Aht Maram Sedhai	Bhandara	Padariya	Same
6. Gobinda Ram Chaudhary	Bhandara	Hardi	Triveni, HUW 37, NL297, NL352, NL370, UP262

Table 4. BINDESWARI RICE MINIKITS, 1983, MAIN SEASON

Farmer	VP	Village	Quantity (kg)	Rating
1. Durga Narayan Bhusal	Birendra Nagar	Sirkot	5	++
2. Jaganath Khadel	Birendra Nagar	Sirkot	5	++
3. Dhan Bahadur Gurung	Birendra Nagar	Sirkot	5	+
4. Dhan Bahadur Gurung	Birendra Nagar	Sirkot	5	+
5. Nanda Lal Khadel	Birendra Nagar	Sirkot	2.5	+
6. Dhari Ram Acharya	Birendra Nagar	Prempuri	2.5	++
7. Santee Thapa	Birendra Nagar	Prempuri	5	++
8. Gobinda Khadel	Birendra Nagar	Prempuri	5	++
9. Bhuwan Singh Thapa	Birendra Nagar	Prempuri	5	-
10. Bal Bhadra Thapa	Birendra Nagar	Prempuri	5	++
11. Tagai Chaudhary	Khairahani	Pakhribas	5	++
12. Siduwa Mahato	Khairahani	Bhairahani	5	++
13. Ram Narayan Chaudhary	Khairahani	Magani	5	-
14. Shyam Narayan Chaudhary	Khairahani	Magani	5	-

++ = Farmer liked it well and will plant larger area next year.

+ = Farmer liked it well enough to plant small area next year, but not completely successful.

- = Farmer did not like it and will not plant it again. In all of these areas there was too much water and Masuli or IR 20 did better.

Table 5. MALIKA RICE, SPRING 1984 2.5 kg EACH

Farmer	Panchayat	Village	Rating
1. Jaugi Mahato	Bhandara	Beldia	++
2. Garbu Ram Chaudhary	Bhandara	Demaura	-
3. Bikuwa Chaudhary	Bhandara	Mahal	-
4. Krishna P. Silwall	Bhandara	Mahal	++
5. Chalaha Mahato	Bhandara	Fulyare	+
6. Bharat Kumar Chhetri	Bhandara	Padariya	++
7. Perma Sar Chaudhary	Bhandara	Padariya	++
8. Bishashur Chaudhary	Bhandara	Hardi	Main season
9. Syam Chaudhary	Birendranagar	Bhairahani	Not headed

++ = Very good

+ = Fair

- = No better than CH 45

Table 6. RICE FFTs, SPRING 1984

Varieties: IR 7151, IR 7156, IR 9729, IR 9761, IR 9828, CH 45

Farmer	Panchayat	Village
1. Bal Singh Chaudhary	Bhandara	Madavar
2. Chanu Chaudhary	Bhandara	Fulyare
3. Laxman Chaudhary	Khattar	Bargaun

Table 7. BINDESWARI RICE, SPRING 1984, 2.5 kg EACH

Farmer	Panchayat	Village
1. Bishashur Chaudhary	Bhandara	Hardi
2. Santa Kumar Chaudhary	Bhandara	Beldia
3. Sita Ram Chaudhary	Bhandara	Beldia
4. Man Dhoe Subeti	Bhandara	Demoura
5. Sukra Raj Chaudhary	Bhandara	Demoura
6. Devi Prasad Silwall	Bhandara	Mahal
7. Chahaha Mahato	Bhandara	Fulyare
8. Judha Bahadur Biswokarma	Bhandara	Madevar
9. Bharat Kumar Chhetri	Bhandara	Padariya
10. Gian Chaudhary	Bhandara	Padariya
11. Gajendra Chaudhary	Bhandara	Padariya
12. Bala Bahadra Pandey	Bhandara	Padariya
13. Tanka Prasad Pathak	Bhandara	Dilliparsa
14. Bodha Raj Oli	Bhandara	Paduwa
15. Mysore Patnak	Bhandara	Belowa
16. Tarak Raj Pathak	Bhandara	Gaida Rap
17. Chandrakant Mainali	Bhandara	Purbari Majuwa
18. Ram Lal Chaudhary	Khairahani	Sultana
19. Pradib Chaudhary *	Khairahani	Majui
20. Sita Ram Chaudhary	Khairahani	Jaubkouli
21. Promod Raj Upreti	Khairahani	Simaltari
22. Homlal Sharma	Birendranagar	Khurkhure

* Decided to plant in main season.

Table 8. SARJYU 49 RICE, SUMMER 1984, 1.5 kg EACH

Farmer	No. Minikits	Village	Panchayat
1. Dipak Sivakoti	1	Khattgauli	Khairahani
2. Syam Lal Shrestha	1	Parsa	Khairahani
3.	5	Magani	Khairahani
4.	3	Jaubkauli	Khairahani
5.	3	Parsa	Khairahani
6.	3	Bhairahani	Khairahani
7.	3	Majui	Khairahani
8. Purma L. Chaudhary	1	Majui	Khairahani
9. Hem P. Ghimire	1	Simattari	Khairahani
10.	4	Khurkhure	Birendranagar
11.	3	Prempuri	Birendranagar
12.	2	Khattar	Khattar
13.	3	Hardi	Bhandara
14.	4	Daduwa Beluma	Bhandara
15.	2	Kumroj	Kumroj
16.	3	Pipile	Pipile
17. Dhurwa Bdr. Kharka	1	Chainpur	Chainpur

If name not listed, then give to PL of that village for distribution.
In Kumroj and Pipile, the T & V PL was used.

Table 9. MALIKA RICE, SUMMER 1984, 2.25 kg EACH

Farmer	Panchayat	Village
1. Madan Kumar Chaudhary	Birendranagar	Khurkhure
2. Mahabir Chaudhary	Birendranagar	Khurkhure
3. Krishna Bahadur Rana	Birendranagar	Prempuri
4. Govinda Khadel	Birendranagar	Prempuri
5. Santee Thapa	Birendranagar	Prempuri
6. Phan Bahadur Gurung	Birendranagar	Sirkot
7. Durga Narayan Bhusal	Birendranagar	Sirkot
8. Siduwa Mahato	Khairahani	Bhairahani
9. Jai Ram Chaudhary	Birendranagar	Pakhribas

Table 10. IET 7251 RICE, SUMMER 1984, 1.5 kg EACH

Village	Panchayat	No. of Minikits
1. Sultana	Khairahani	4
2. Bhairahani	Khairahani	5
3. Parsa	Khairahani	5
4. Magani	Khairahani	4
5. Jaubkauli	Khairahani	5
6. Majui	Khairahani	4
7. Pasera	Khairahani	2
8. Khurkhure	Birendranagar	7
9. Prempuri	Birendranagar	1
10. Bargaun	Khattar	3
11. Khattar	Khattar	3
12. Gaida-Sundi	Khattar	2
13. Bhandara	Bhandara	3
14. Beldia	Bhandara	3
15. Padariya	Bhandara	4
16. Pipile	Pipile	5
17. Kumroj	Kumroj	17

Distributed through PLs.

For Pipile and Kumroj, T and V PL was used.

Table 11. RICE FFTs, SUMMER 1984

Farmer	Panchayat	Village	Varieties
1. Jagat B. Pandey	Khairahani	Parsa	Janaki, Bindeswari, Durga, Laxmi, Malika, IET 7251
2. Bihari Chaudhary	Khairahani	Parsa	BG 400-1, B44 B, IET 7251, Janaki, Durga
3. Lila Bdr. Upreti	Khairahani	Parsa	BG 400-1, B44 B, IET 7251
4. Shyam N. Chaudhary	Khairahani	Magani	BG 400-1, B44 B, IET 7251
5. Shen Chaudhary	Khairahani	Bhairahani	B44B, BG 400-1, IET 7251, Laxmi
6. Bishashur Chaudhary	Bhandara	Hardi	Janaki, Laxmi, Malika, IR36
7. Bhonat Dahal	Bhandara	Daduwa-Beluwa	BR 319-1, IR8423, B2714c, Masuli, BR 51-28252, IR 13540
8. Charpa Mahato (rainfed FFT)	Khairahani	Khattrauli	BR 51-282-8, Sabitri, Masuli, Bindeswari, IR 10781, UPL-R1-5, BG 400-1

Table 12. IR 7151, RICE, SUMMER 1984, 1.5 kg EACH

Farmer	Panchayat	Village
1. Santa Kumar Chaudhary	Bhandara	Beldia
2. Sita Ram Chaudhary	Bhandara	Beldia

Table 13. IR 50 RICE. SUMMER 1984. 2 kg EACH

Farmer	Panchayat	Village
1. Bishashur Chaudhary	Bhandara	Hardi
2. Sita Ram Chaudhary	Bhandara	Beldia
3. Bharat Kumar Chhetri	Bhandara	Padariya
4. Bechar Chaudhary	Khairahani	Jaubkauli
5. Laxman Chaudhary	Khattar	Bargaun

Table 14. IR 36 RICE. SUMMER 1984. 2 kg EACH

Farmer	Panchayat	Village
1. Aitaram Derai	Khattar	Gaida-Sundi
2. Krishna Bdr. Rana	Birendranagar	Prempuri
3. Deepak Sivakoti	Khairahani	Khattrauli
4. Prakash Hani	Pipile	Pipile

Table 15. MUNGBEAN. SPRING, 1984. 1 TO 1.5 kg EACH

Farmer	Panchayat	Village	Variety
1. Bishashur Chaudhary	Bhandara	Hardi	E6M6
2. Sita Ram Chaudhary	Bhandara	Beldia	PS7
3. Jaugi Mahato	Bhandara	Beldia	E6M6
4. Hari Prasad Gautam	Bhandara	Padariya	E6M6
5. Bal. Singh Chaudhary	Bhandara	Madaraj	M350
6. Aitaram Derai	Khattar	Gaida-Sundi	E6M6
7. Laxman Chaudhary	Khattar	Bargaun	E6M6

Table 16. MUNGBEAN. SPRING 1983. 1-2 kg EACH

Farmer	Panchayat	Village	Result	Comments
1. Durga Narayan Bhusal	Birendranagar	Sirkot	+	
2. Jaganath Khadel	Birendranagar	Sirkot	+	
3. Santee Thapa	Birendranagar	Prempuri	+	
4. Em Bahadur Thapa*	Birendranagar	Prempuri	+	
5. Jagbir Pun*	Birendranagar	Prempuri	+	
6. Govinda Khadel	Birendranagar	Prempuri	-	Plowed under; too grassy
7. Amar Jit Pun	Birendranagar	Prempuri	+	
8. Bal Bahadur Acharya	Birendranagar	Prempuri		Planted on bund
9. Jailal Sharma	Birendranagar	Prempuri	-	Lack of water
10. Biddhu Padhe*	Birendranagar	Prempuri	+	
11. Bhuwani P. Sapkota	Birendranagar	Prempuri	-	Lack of water
12. Yadav P. Thapalia	Birendranagar	Prempuri	+	
13. Mani Bahadra Gautam	Birendranagar	Prempuri	+	
14. Chandra Datta Gautam*	Birendranagar	Prempuri	+	
15. Purna Ram Poudel	Birendranagar	Prempuri	-	Lack of water
16. Khadga Bdr. Pun	Birendranagar	Prempuri		
17. Chaudra Bdr. Poudel	Birendranagar	Amilapani	-	Lack of water
18. Buddhana Mahato (Sole crop) (with maize)	Birendranagar	Khurkhure	+	

* Planted again in 1984.
Other nearby farmers also planted mung in 1984.

+ Success.

- Failure.

Table 17. LEUCAENA LEUCOCEPHALA, (IPIL IPIL), SPRING 1984

Farmer	Panchayat	Village	No. of Seedling
1. Madan Kumar Chaudhary	Birendranagar	Khurkhure	31
2. Kriparam Chaudhary	Birendranagar	Khurkhure	10
3. Budhana Chaudhary	Birendranagar	Khurkhure	10
4. Gokarna Sedhai*	Birendranagar	Khurkhure	10
5. Kaji Ghimire	Birendranagar	Khurkhure	5
6. Edu Ram Khadel	Birendranagar	Khurkhure	2
7. Hemlal Sharma	Birendranagar	Khurkhure	6
8. Siddhi Prasad Pandey	Birendranagar	Khurkhure	7
9. Krishna Bdr. Rana*	Birendranagar	Premपुरी	10
10. Jai Ram Chaudhary	Birendranagar	Pakhribas	3
11. Several students	Birendranagar	Birendranagar	10
12. Syen Chaudhary*	Khairahani	Khairahani	10
13. Bharat Pandey	Khairahani	Simaltari	3
14. Promot Raj Upreti	Khairahani	Simaltari	4
15. Bishshur Chaudhary*	Bhandara	Hardi	11
16. Sita Ram Chaudhary*	Bhandara	Beldia	10
17. Bharat Kumar Chhetri*	Bhandara	Padariya	11
Total			153

* Production leader.

Table 18. PRODUCTION LEADERS DURING 1983-84 WHEAT SEASON

Name	Village	Panchayat
1. Syen Chaudhary	Bhairanani	Khairahani
2. Kaji Chaudhary	Sultana	Khairahani
3. Bechan Chaudhary	Jaubkauli	Khairahani
4. Pradip Chaudhary	Majui	Khairahani
5. Chaudhary	Magani	Khairahani
6. Gokarna Jedhai	Khurkhure	Birendranagar
7. Krishna Bahadur Rana	Prempuri	Birendranagar
8. Bishashur Chaudhary	Hardi	Bhandara
9. Santa Kumar Chaudhary	Beldia	Bhandara
10. Bharat Kumar Chhetri	Padariya	Bhandara
11. Aitaram Derai	Baida-Sundi	Khattar
12. Laxman Chaudhary	Bargaun	Khattar