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FARMING SYSTEMS STUDIES IN SPRING AND SUMMER CROPS, '85

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FARMING SYSTEMS STUDIES IN SPRING AND SUMMER CROPS FOR 1985

By Farming Systems Staff

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FARMING SYSTEMS STUDIES IN SPRING AND SUMMER CROPS FOR 1985[1/]

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I. INTRODUCTION

The Cropping Systems Program (CSP) was initiated in 1977 as a part of the Integrated Cereals Project (ICP) which formally terminated on May 31, 1985. The basis for on-farm research, however, that has been established by the CSP is solid and has resulted in a more defined awareness of the value and need to work closely with farmers to identify relevant problems and for both scientists and farmers to work together to develop solutions. The basis has led to the establishment of the Farming Systems Research and Development (FSR/D) Division which is continuing the efforts started by the CSP and gradually extending the activities to encompass a broader range of socio and agroclimatic conditions in Nepal and other farm enterprises in addition to the crop production aspect. The work of FSR/D Division is guided by a Farming Systems Coordinating Committee under the Department of Agriculture (DOA) and composed of representatives of the major agriculture, livestock and forestry research programs. This division is being assisted by the Agricultural Research and Production Project (ARPP).

The goal of ARPP is to increase sustainable whole farm production, including livestock, agro-forestry, and the important food crops of Nepali small farmers by strengthening HMG/N institutional capabilities to develop appropriate technologies, developing methodologies for conducting comprehensive production programs in the hills and improving hill farmers' access to improved seed.

1/ - Report prepared for the 13th Summer Crops Workshop held at Parwanipur Agriculture Station from February 5-8, 1986.

2/ - Farming Systems Staff; HMG/N and WI/ARP Project.

This is the first report prepared under the auspices of the FSR/D Division and the ARPP. It summarizes the research results involving the performance of the cropping pattern trials conducted over the past year and the component technology trials for Spring and Summer Seasons at six Farming Systems sites throughout the country (See Table 1 for a brief description of each site).

Through the cropping pattern trials and component technology studies that have been carried out in each site, over 392 farm families have participated with FSP scientists in evaluating new technologies in their fields (see Table A for site-wise breakdown). Continued monitoring of farmers local practices in each site has been conducted to develop the needed reference base to evaluate the improved technologies. A more indepth study of various farm enterprises and their interlinkages has been carried out at Pumdi Bhumdi to develop better understanding of existing farming systems which will help to develop suitable on-farm crop-livestock interactive research methodology. This report, however, will focus on Spring and Summer Crops results for 1985.

II. RESEARCH METHODOLOGY

The basic concept of Cropping Systems Research is to look at farm production as the function of Environment and Management. Management for the Cropping Systems Research includes the arrangement of crops in time and space and their associated cultural techniques. The cultural techniques of the cropping pattern cover the choice of crop variety, times and methods of its establishment, fertilization, water management, crop protection and harvest.

Environment is composed of such land and climate-related variables as rainfall, the soil's textural profile, ground water level, topographic position of the field and use or no use of bundings, day length, solar radiation, and temperature, and cost and availability of such resources as power, labor, cash, and markets as well as the customs associated with their use. The economic performance of the cropping syetems depends on the economic environment-costs of inputs and prices for outputs. In a given environment the production is dependent on management. Hence, the objectives of the Cropping/Farming Systems

researcher are to (i) find out the best management for different environments, (ii) develop methodologies to diffuse those management practices into "similar conditions" as such or with modifications, and (iii) work as feed-back mechanism between on-station researchers and farmers in order to help the development of appropriate technology for different environments and management levels. To meet these objectives, the following research activities are carried out: (a) Cropping Pattern Trials, (b) Component Technology Trials, (c) Pre-Production Tests, (d) Pilot and Large Scale Production Programs and (e) Research Report Presentation at Seminars and Workshops.

A. Cropping Pattern Trials:

The cropping pattern trials test both improved versions of existing cropping patterns that farmers are currently using and introduced, alternative cropping patterns that are usually made more intensive by adding additional crops to existing patterns and/or substituting new crops not currently being grown by farmers.

The cropping pattern trials usually involve 1,000 m² plots and are conducted with at least five farmers in each land type. The crops involved in each cropping pattern are grown in sequence in the same parcel during the year by the guidance of the site staff and using the technologies (variety, fertilizer rate, seed rate, pest control etc.) being tested. The results from these trials are compared against the yields obtained from local crops cuttings taken from field where farmers are following their own practices to verify the feasibility of the improved practices being used in the cropping pattern trials. A short interview is taken with the farmers from whose fields the local crop cuttings are harvested to find out more about their practices (variety, fertilizer etc. used). This also allows an estimate of the adoption of improved practices that farmers incorporate into their own practices from year to year. The cropping pattern being tested, then, can be compared on an economic basis with the local farming practices using several economic indications. All of these indicators provide additional information for making relevant comparisons between the yields obtained by the technologies being tested in the cropping pattern trials and current yield situation that

farmers obtain with their local practices.

B. Component Technology Trials:

The component technology trials investigate specific production practices (such as varieties, fertilizer rates, pesticide use, etc.) for crops involved or to be involved in the cropping pattern trials. They are usually replicated, either within a farmer's field and/or across several farms. Their design is similar to research trials established in experiment stations and are more fully under the supervision of the site staff. Occasionally, when there is only one or two alternate production factor(s) that merit testing, these can be superimposed within the cropping pattern trial. The component technology trials provide the avenue for continued testing of new technologies and refining existing technologies within the sites to continue to improve the recommendations being tested in the cropping pattern trials.

C. Pre-Production Verification Trials (PVT):

In order to extend the improved technology identified for a particular agroclimatic and socioeconomic condition at a FS Site, into "similar environments" further verification of the recommended packages in the new area is essential before going for a pilot and then large scale production programs. The verification trials conducted before the initiation of a Production Program is called PVT and follow a fixed methodology.

III. RESEARCH RESULTS

The research results in this report are divided into two parts. First, there is a presentation of the results of the cropping pattern trials conducted at each site for the past year. Two tables pertaining to the cropping pattern performances are presented at the end of the report. The first table for each site includes the individual crop performances for each improved cropping pattern being tested in each land type and for each local farmer practice pattern being monitored. Also the total annual yields and Returns Above Variable Costs for each pattern are given. The second table presents the economic analysis for each improved pattern and for the local farmer practice pattern in each land type. It includes the Gross Returns, Material Costs, Labor and Power Costs, Total Variable Costs, Returns Above

Variable Costs, Marginal Benefit Cost Ratio, Returns to Material Costs and Returns to Labor and Power Costs. Together these two tables provide a detailed summary of the strengths and weaknesses of the improved technologies as compared to local farmer practices for each Cropping Systems Research Site.

The second part of the report presents a brief discussions of the results of the component technology trials conducted for Spring and Summer Crops during 1985 at each site. Wherever possible these results have been subjected to statistical analysis and, where relevant, to economic analysis.

A. Cropping Pattern Trials:

1. Ratna Nagar

Tables 2 and 3 present the cropping pattern performances and economic analysis, respectively, of the 9 improved cropping patterns and corresponding local farmer practice for the Ratna-Nagar site. These patterns have been tested in three land types differentiated on the basis of irrigation water availability.

In Irrigated Lowlands High Production Potential, 3 improved patterns have been tested : Rice-Wheat-Mungbean, Rice-Wheat-Dhaincha and Rice-Wheat-Fallow. The performances of these patterns are compared with the Rice-Wheat-Fallow which is the predominant pattern in this land type. Changes in rice varieties and addition of Spring crops such as Mungbean and Dhaincha resulted in significant total annual yield increments and returns above variable costs (RAVC) for these improved patterns. They produced 30-45% higher yield than local farmer practice in the same land type.

In the Partially Irrigated Lowlands, Rice-Mustard-Maize, Rice-Wheat-Dhaincha and Rice-Wheat-Fallow were tested against local practice pattern Rice-Mustard-Maize. The results indicate that an excellent opportunity exists for improving Rice-Mustard-Maize (in the trial improved Rice-Mustard-Maize pattern yielded 39% higher than the same pattern under local farmer practice). However, not very good scope is seen for Rice-Wheat-Dhaincha and Rice-Wheat-Fallow in this land type.

In Rainfed Lowlands Limited Production Potential 3 improved patterns have been tested against local farmer practice of Rice-Fallow-Fallow. All these improved patterns produced higher yields than local practice of growing only one rice crop in this land type.

The highest total annual yield producer pattern (among all tested during 1985) is Rice-Wheat-Dhaincha, 9.31 t/ha/year (excluding Dhaincha Green Manure Yield) in the Irrigated Lowlands. The highest RAVC is obtained in Rice-Mustard-Maize pattern (Rs.15,656/ha/year) in Partially Irrigated Lowlands and the highest Marginal Benefit Cost Ratio (MBCR) is recorded in Rice-Chickpea+Mustard-Fallow (3.96) in Rainfed Lowlands. The identified improved technologies for these three patterns; Rice-Wheat-Dhaincha, Rice-Mustard-Maize and Rice-Chickpea+Mustard, seem to be good enough for extending them into pilot production programs. Work with improved patterns such as Rice-Wheat-Fallow in Medium Production Potential Lowlands and Rice-Fallow-Dhaincha in Rainfed Lowlands should be minimized because of their comparatively poor performances. The basic reason of insignificant economic returns for these patterns as compared with farmer local practices is the significant improvement in farmer local practices overtime. There is need for more component technology studies for the identification of appropriate improved rice varieties. Some rice varieties like IR 8423, IR 7156 and MW-10 show promise but in general farmers demand for high yielding fine grain type varieties which are, at present, lacking.

2. Bahuwari Tube-Well Site

Table 3 presents the agronomic performances and Table 4 the economic analysis of the improved cropping patterns being investigated at Bahuwari Tube-Well Site along with the corresponding information for the local farmer practices being monitored. All these six improved patterns are being tested in tube-well irrigated lowlands.

The Spring Season of 1985 was very good for Spring crops. Mungbean, inspite of its total failure in 1984 due to the early

onset of monsoon performed exceptionally well in 1985. In Spring rice crop (1st crop) IR 9729 produced 5.55 T/ha and made Rice-Wheat-Rice pattern as the highest yielder (11.74 T/ha/year) among all the patterns tested. Spring maize, Rampur Composite, suffered over 15% yield loss because of hail damage. It still produced 3.46 t/ha. But Dhaincha green mass production was unsatisfactory and its incorporation into soil had insignificant effect on rice yields. The economic analysis of the results indicate that Rice-Chickpea+Mustard-Fallow pattern gave the highest RAVC followed by Rice-Maize-Mungbean and Rice-Rice-Wheat. The cropping pattern with chickpea included gave the highest MBCR (15.03) followed by Rice-Maize-Mungbean and Rice-Wheat-Rice.

The trials conducted in Bahuwari Tube-Well indicate that further research needed for such conditions include : (i) development of better medium duration rice varieties (good yield, acceptable grain type, resistance to diseases and pests, 125-135 days maturity) for use as a Summer crop in patterns such as Rice-Mustard-Maize, Rice-Maize-Mungbean and Rice-Chickpea+ Mustard-Fallow, (ii) identification of high yielding rice varieties that can be single-transplanted in the second rice crop in the Rice-Rice-Wheat pattern to replace the labor intensive double-transplanted Masuli.

3. Pumdi Bhumdi

Before going to the actual discussions of the Summer and Spring crops results it is useful to preface the discussions with a few comments regarding "Whole Farm Intervention Approach" implemented at Pumdi Bhumdi[3/]. This approach is based on the fact that a farmer combines several enterprises on his farm to earn livlihood. These enterprises have strong interactions among themselves and depend heavily on each other for their mutual existence. A farmer as an excellent manager of his farm understands these interactions better and adopts a reliable, viable and feasible technological option for increasing farm production.

3/ - The Reader is directed to various publications by Cropping Systems Program on Farming Systems Research Methodology and Crop-Livestock Interactive Research at Pumdi Bhumdi by C.S. Staff.

According to the Whole Farm Intervention Approach, twelve farms have been selected for indepth monitoring and observations of various activities. Out of these twelve farms six have been selected as "Intervention Group" and the other six as "Control Group" farms. Our cropping pattern and component technology trials are mostly being conducted with Intervention Group farms, however, Control Group farms can adopt any improved technology that they feel fits in their Farming Systems, coming out of Intervention Farms.

In the Spring and Summer Seasons of 1985, five cropping patterns were evaluated at Pumdi Bhumdi. The results of their agronomic performances are presented in Table 6 and the results of their economic performances are presented in Table 7. These patterns were tested in Rainfed Lowlands High Production Potential, Rainfed Lowlands Medium Production Potential and Rainfed Low Production Potential land categories.

Khumal-3 continues to perform excellent in comparison with other varieties. NR-10078-76-11 and NR-10068-60-3-2 didnot perform well this year. It appears that there is not any suitable rice variety other than Khumal-3 for Pumdi Bhumdi. In the Spring season Arun-4 maize performed exceptionally well in various patterns. Rice-Wheat-Maize pattern under improved management gave the highest annual grain production followed by Rice-Mustard-Maize. These two patterns also produced the highest RAVC. If we judge the economic performances of these patterns based on the MBCR, improved Rice-Wheat-Maize pattern is certainly outstanding (MBCR = 4.67) followed by Rice-Oats-Fallow in the low production potential lowlands (2.03)[4/]. It is clear that there is very little scope for Dhaincha as Spring green manure crop. Rice-Oat-Maize and Rice-Oat-Fallow patterns have been tested for 3 years and the developed technologies for these patterns are sound and need to be extended.

4. Khandbari

Table 8 and 9 present the results of the cropping pattern performances and economic analysis, respectively, for the ten improved cropping patterns and local farmer practices from

4/ - The economic analysis for Oats have been computed considering that 1 kg of oat fodder is equivalent of 0.1 Mana of pure milk. Pure milk price = Rs. 4.00/Mana.

four land types at Khandbari. In the Rainfed Uplands at Tumlingtar, Manakamana-1 produced the highest grain yield in the first maize crop in the Maize-Maize-Fallow pattern, however, the yield doesnot differ very much from the local crop cuttings yield data for the local maize in the same pattern. The white grain color of Manakamana-1 is the biggest plus of this variety, because in Khandbari farmers prefer white grain.

Khumal-3 performance was excellent in the Spring rice crop, however, as a normal season crop it didnot show much potential. It was inferior to IR 8423 and Malika (Terai varieties) in grain and straw yields. This opens a whole new area for testing improved rice varieties recommended for Terai and Terai Rice FFT sets in Khandbari. This year the mungbean crop was a good success. PS-7 variety produced 1.08 t/ha. This proves that mungbean can be successfully grown in Khandbari during the Spring season but its adoption will depend on several factors : labor, power, monsoon onset probability, PS-7 variety seed availability and other factors.

As a whole, Maize-Maize-Fallow pattern produced the highest grain yield (7.24 t/ha/year) followed by Rice-Wheat-Mungbean (6.89 t/ha/year) and Rice-Fallow-Maize (5.92 t/ha/year). The highest RAVC was obtained in Rice-Wheat-Mungbean pattern, Rs. 26,691/ha/year followed by Maize-Maize-Fallow, Rs. 19,794 ha/year. The MBCRs were obtained in the following order : Rice-Oat-Fallow - 8.14, Rice-Wheat-Fallow - 7.74, Rice-Wheat-Mungbean - 6,35 and Rice-Fallow-Mungbean - 5.19. Maize/Soybean-Fallow pattern in Tumlingtar produced a negative MBCR.

5. Chauri Jahari

Table 10 presents the agronomic performances and Table 11 the economic performances of the 3 improved cropping patterns being investigated at Chauri Jahari along with the corresponding information for the local farmer practices being monitored in the two land types under investigation.

In Upland Rice+Maize-Wheat+Mustard-Fallow pattern, the rice variety Se322B-19 performed well (4.29 t/ha) in comparison with Bindeshwari and NR6-7-83. In maize, Manakamana-2 produced a higher yield than Arun-4. In irrigated lowlands in Rice-

Wheat-Dhaincha pattern, Sabitri produced the highest yield in the field where Dhaincha was incorporated as green manure and 60 kg N and 30 kg P/ha were applied (6.62 t/ha). In Rice-Wheat-Fallow pattern Bindeshwari yielded 6.53 t/ha.

The highest grain producer pattern is identified as Upland Rice+Maize-Wheat+Mustard-Fallow (10.15 t/ha/year) followed by Rice-Wheat-Dhaincha (9.97 t/ha/year) and Rice-Wheat-Fallow (9.86 t/ha/year). The highest RAVC is obtained for Rice-Wheat-Dhaincha (31,421 Rs/ha/year) followed by Rice-Wheat-Fallow (31,214 Rs/ha/year) and Upland Rice+Maize-Wheat+Mustard-Fallow (25,738 Rs/ha/year). The MBCR's for different Improved patterns are as follow: Rice-Wheat-Fallow, 16.22; Rice-Wheat-Dhaincha, 12.80 and Upland Rice+Maize-Wheat+Mustard-Fallow, 9.00. The MBCR's for different improved patterns indicate that there should not be any problem in adoption of these improved pattern technologies by farmers.

B. Component Technology Trials:

1. Ratna Nagar, Chitwan

Tables 12 through 22 present the results of the various component technology studies conducted at Ratna Nagar during the Spring and Summer Seasons of 1985.

Rice variety FFT results are presented in tables 12, 13, 14 and 15. Two normal season irrigated rice variety FFTs were planted in Rice-Mustard-Fallow and Rice-Mustard-Maize+Dhaincha patterns (Table 12). Varieties included in this set were of early to late maturity which caused some management problems in the field. BR 51-3-23 and ITA-121 grain and straw yield performances are excellent, however, farmers rejected these varieties because of their coarse grain type, threshing problem and late maturity. No significant differences between varieties were observed.

Table 13 presents the results of two normal season rainfed rice variety FFTs conducted in Rice-Mustard-Maize and Rice-Fallow-Fallow cropping patterns. In each set there were six varieties. UPLRI-5 continues to perform well. However, differences between varieties were not significant. Taking the farmers' grain type preference into consideration, Masuli is considered by

farmers as the preferred variety.

Early maturity rice variety FFTs were conducted (Table 4) in Rice-Rice-Fallow and Rice-Lentil-Mung patterns. In this FFT set, six varieties were included with Laxmi as the Local Check. We added one more variety JT-1 (Jethe Tauli) which was brought out from the FS Site, Khandbari. All varieties matured earlier than Laxmi and produced higher grain yields. IR 8608-82-1-3-1-3, especially, is liked by farmers and it deserves further testing. JT-1 was planted at only one location. Therefore, it is invalid to make any conclusion regarding its performance, However, average days to maturity and average moisture percent at harvest indicate that this is the earliest maturity variety in this set. It has very fine and aromatic grain - good market.

Five upland varieties, including local, were planted at Ratna-Nagar (Table 15). There were significant yield differences between varieties. MW-10 and Bindeshwari produced the highest grain yield. This is the second year of testing and these varieties continue performing well. In the coming Summer season MW 10 will be tested in the cropping pattern trials and at the same time in Pilot Production demonstrations.

Table 16 presents the results of different green manure crops incorpiration before rice on rice yields at Ratna Nagar in different cropping patterns and land types.

Green manure crops were planted during Spring season. Dhaincha (Sesbania aculeata) produced 12.8 t/ha, Sanai (Crotolaria juncea), 15.9 t/ha, Cowpea (Vigna unguiculata), 18.7 t/ha and Mungbean, 16.9 t/ha of green manure. The variation in green manure production did not significantly influence the rice yields. This trial gives an indication that Sanai, Cowpea and Mungbean can be as good as Dhaincha for green manure purposes for rice. This trial will be repeated next year including a control plot where green manure will not be grown.

A maize variety trial was conducted in the rainfed upalnds in the Maize-Mustard-Fallow pattern (Table 17). Rampur-2 continues to yield the best, however, it doesnot differ

significantly from Manakamana-1. Manakamana-1 is liked by farmers because of its white grain color and grain type. It is somewhat more tolerant to lodging (due to bacterial stalk rot) than other varieties.

The uplands at Ratna Nagar have a soil pH of 5.0-5.5. Under such low pH there may be a response to lime applications. To answer this question a fertilizer cum lime trial was designed to measure the maize response in uplands. The costs and returns from this trial are presented in Table 18. In general, the response to lime application (1.5 t/ha) has not been observed. There is response to the highest doses of nitrogen.

Tables 19 through 21 present the results of the cowpea variety trials conducted in Maize-Mustard-Fallow pattern in uplands and Rice-Wheat-Mungbean pattern in irrigated lowlands. In general, all these varieties were harvested from 64 to 78 days after seeding. IT82D-889, IT82E-18, IT82D-812 and IR82D-752 are identified as the best dual purpose varieties. They produced upto 5.38 t/ha of green pods and on an average 9.83 t/ha of bio-mass. Our previous experimentations with cowpea along with this year's trials have confirmed that cowpea cultivation is agronomically feasible at Ratna Nagar. However, the biggest problem still remains to protect this crop, especially in the lowlands, against stray cattle and by passers who tend to introduce some unplanned variations in the yield performances. Until and unless these difficult problems are solved there may not be very good scope for this crop in lowlands and we might be forced to limit our trials to kitchen gardens.

Soybean variety FFTs were planted in Upalnds as relay crop in standing maize. The results are given in Table 22. The local variety produced the highest yield, 1.92 t/ha. But significant differences between varieties were not observed.

2. Bahuwari Tube-Well, Parsa

Tables 23 through 25 present the results of the component

technology studies conducted at Bahuwari Tube-Well.

A Normal Season Irrigated Rice Variety FFT was conducted at four locations in Rice-Wheat-Fallow pattern. The results are presented in Table 23. Out of six varieties under test OR 63-252 is identified as the highest yielder. Other varieties which performed comparatively well are BR 51-323 and ITA-121. However, significant variety differences were not observed.

Table 24 presents Early Maturity Rice Variety FFT results for Bahuwari. Significant variety differences were not observed. IR 25890-82-4-3 produced 4.62 t/ha and Laxmi 3.68 t/ha mean grain yield. The yields of other varieties were in between these two varieties.

The effect of Dhaincha incorporation before rice and subsequent N application to rice on rice yields are presented in Table 25. Significant treatment differences were not observed. We think the reasons could be (i) insufficient water availability to well decompose the bio-mass, (ii) insufficient total bio-mass production, (iii) nutrient deficiency other than N and (iv) some other factors may have caused the insignificant treatment differences. This trial will be repeated in the coming season.

3. Pumdi Bhumdi, Kaski

Tables 26 through 34 present the results of the component technology trials conducted at Pumdi Bhumdi during the Spring and Summer Seasons 1985.

Three different sets of rice variety FFT's were conducted at Pumdi Bhumdi. In the first set, tested at two locations and called early maturing hill rice FFT, six varieties were included along with Khumal-3 as the Local Check (Table 26). Statistically significant differences between varieties were not observed. The farmers didnot like any of the varieties in this FFT set. Table 27 presents results of the early maturity rice variety observation trial. In this set also six varieties were included with Khumal-3 as the Local Check. At location 2, most of these varieties failed except Khumal-3

because of early cut off of water supply. However, at location 1, Malika, IR8423 and JT-1 performed better than Khumal-3. All varieties except Khumal-3 were heavily infested with Neck Rot, Sheath Blight and Bacterial Leaf Blight.

At Pumdi Bhumdi, farmers grow several local rice varieties in different land types and cropping patterns. At least there are three different types of varieties based on their maturity - late, medium and early. We have been testing only the early variety FFT set to-date. Limited testing of medium and late maturing varieties is attributed to unavailability of late and medium duration improved varieties, especially for the hills. Keeping in view the importance of testing such varieties this year, we made one FFT set consisting of four varieties, and tested at two locations. The testing was more of an observation trial. In selecting the varieties for the test, emphasis was given to grain as well as straw yields. All these varieties were late and except for Sabitri all were local. The performance of these varieties was unsatisfactory. However, we think such types of varietal trials (late and medium duration) must be conducted at Pumdi Bhumdi in order to find technology for broader range of rice farming areas.

A maize variety trial was conducted in the rainfed uplands in the Maize/Finger Millet-Wheat pattern (Table 29). Arun-4 and Manakamana-2 were the highest yielders. Last year, also, these two varieties produced the highest yields. The local variety, in both years, produced the lowest yield but was the earliest maturing variety.

Table 30 presents the results of maize minikits distributed for planting in the uplands. The minikit contained only seed. It is evident from the Table that all improved varieties -- Manakamana-1, Manakamana-2 and Arun-4, produced significantly higher yields than local under farmers' managements. None of the minikit cooperator farmers applied chemical fertilizer.

Table 31 presents the results of one finger millet variety FFT planted in the rainfed uplands in the Maize/Finger Millet pattern. Unfortunately, none of these improved varieties

produced higher yields than the Local Check.

Table 32 presents the results of the effect of maize variety on relayed local finger millet yields. Significant differences were not noticed. However, the farmers observation indicate that Khumal Yellow, Manakamana-1 and Manakamana-2 have negative effect on the relayed finger millet yield. We will repeat this trial in the coming season.

In Tables 33 and 34 the variety trial results of cowpea have been presented[5/]. The results are very encouraging. IT 82E-16 and IT82E-13 are identified as the highest yielders and have excellent potential for cultivation in the lowlands. Further studies on cowpea bio-mass incorporation (after picking the pods) on rice yields and cowpea bio-mass feeding to milking buffaloes are in order. They will be carried out in the coming Spring season. Cowpea will be further tested during the Spring season in the lowlands and during the Summer season in the kitchen gardens.

4. Chauri Jahari, Rukum

Tables 35 through 42 includes the results of the component technology studies conducted at Chauri Jahari.

Early maturing rice variety FFT results are presented in Table 35. All the six varieties yielded over 5 t/ha. IR8608-82-1-3-1-3 was the highest yielder and matured in 135 days. However, significant variety differences were not observed.

Normal Season Rainfed Variety FFT was planted in Rice-Wheat-Fallow pattern. Table 36 presents the results. All improved varieties yielded significantly higher than the Local Check. The best yield performances were given by IR 10781 followed by IR-46 and BG-400-1.

Table 38 presents the results of Normal Season Irrigated Rice variety FFT. Varieties included in this FFT set didnot produce less than 4.85 t/ha of grain. The highest yielders were

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5/ - For more information on cowpea the reader is referred to a report entitled "Cowpea Cultivation: Some Unanswered Questions" by N.B. Chhetri & B.K. Singh, FSR/D Division, 1986.

B 3894-246, BR 51-323 and ITA-121. Their grain yield performances were significantly different from OR 63-252 and Janaki at the 10 percent level.

Table 39 presents the results of Upland Rice Variety Testings at Chauri Jahari. Bindeshwari out yielded all other varieties included in this FFT set. The Local Check produced the lowest yield (2.74 t/ha). MW-10 is performing quite good since last year. Its performance this year was also very satisfactory.

Table 40 presents the effect of maize population on rice and maize yields in mixed cropping trials. This trial was conducted in Rainfed Uplands in the cropping pattern Upland Rice+Maize-Wheat+Mustard-Fallow. The treatment F-test indicated that maize population did not have a significant effect on total yields. However, the treatment 150 X 40 cm (spacing of the maize crop) produced the highest total yield followed by 150 X 20, 100 X 50 and 100 X 25 cm.

Tables 41 and 42 present the analysis of costs and returns to the fertilizer treatments applied to rice and maize crops. In Table 41 fertilizer treatments were applied to the Sabitri rice variety. It is clear from the Table that there is not very much difference in yield when the same dose of fertilizer was applied by different methods. But there is a clear response to the high rate of nitrogen application. The same conclusion is obtained from Table 42. The treatment yields are significantly different at different levels of nitrogen. But for the methods of application the differences are insignificant.

5. Khandbari, Sankhuwasabha

Tables 43-54 present the results of the various component technology trials conducted at Khandbari during the Spring and Summer Seasons of 1985.

Table 43 presents the results of an early maturing hill set rice variety FFT conducted at Khandbari. All improved varieties out yielded the Local Check. Among the improved entries NR 10042-67-3-2 gave the highest grain yield (2.86 t/ha).

An early maturity Terai set rice variety FFT was conducted at Khandbari. Results are given in Table 44. Mean yield of 2 locations for all varieties are very low. All entries were inferior to Local Check and took 123-132 days to mature. Significant differences between varieties were not observed.

Table 45 presents the results of a comparative study of three rice varieties conducted at five locations in a Rice-Rice-Wheat pattern. These varieties were planted during the first rice crop. NR-10067-8-2-2 produced the highest grain yield followed by the Local Check. Khumal-3 produced the lowest grain yield. Another similar trial was conducted in Rice-Fallow-Mungbean pattern where three varieties -- Khumal-3, Malika and IR 8423 were tested at five locations. The results from Table 46 indicate that IR 8423 was the highest yielder (3.6 t/ha) followed by Malika. Khumal-3 gave the lowest yield. These yield differences are significant at the 5% level.

Table 47 presents the results of costs and returns for fertilizer treatments applied to Khumal-3 rice in Rice-Fallow-Maize pattern. The trial was repeated at four locations. The yield results indicate that there was a response to N and P_2O_5. 40 kg N/ha produced 2.52 t/ha grain against 2.10 kg/ha grain with 0:0:0 N:P_2O_5:K_2O kg/ha. An addition of 20 kg/ha of P_2O_5 to 40 kg/ha of N produced 3.08 t/ha of rice grain. An economic analysis of the results indicates that MBCR for investment in Phosphorous is 11.42 and for Potash 5.44 at 40 kg N level/ha. A similar trial was conducted with Khumal-3 rice in Rice-Wheat-Mungbean pattern but the treatments were only two --- 60:30:0 and 60:0:0 N:P_2O_5:K_2O:kg/ha. The objective of this trial was to monitor the response to Phosphorous at the 60 kg N/ha level. This trial was repeated at 5 locations. It also confirmed the above finding with regard to a response to Phosphorous. MBCR for this trial was 4.91 for the investment in Phosphorous. Another trial of the same kind was conducted with Khumal-3 rice in the first crop of Rice-Rice-Fallow pattern. The results are presented in Table 49. In this trial we did not notice the response to Phosphorous and a higher dose of nitrogen

(above 40 kg N/ha). The varied responses to nitrogen and Phosphorous in different land types and cropping patterns might be associated with the production potential of these soils. Hence, a single blanket recommendation can never serve for all these conditions.

Table 50 presents the results of the green manure trials conducted with Khumal-3 rice in the Rice-Wheat- Dhaincha pattern. It is clear from the Table that Dhaincha made a significant N contribution to Khumal-3. A rough estimation of the amount of N given by Dhaincha to the rice crop was 40 kg N/ha. The mean grain yields of the various treatments differed significantly at the 5% level.

A maize variety trial was conducted in rainfed uplands at Tumlingtar in the Maize-Maize-Fallow pattern. The trial was planted during the first maize crop (Table 51). A severe drought during the tasseling stage of maize reduced the plant population and increased the number of barren plants resulting in a drastic yield reduction. Significant differences between varieties were not observed. However, Manakamana-1 produced the highest yield and is liked by farmers because of its grain type in general and grain color in praticular (Last year's maize FFT results indicated the same thing).

Tables 52 through 54 present the results of cowpea variety FFT conducted during the Spring and Summer Seasons. The yields of these trials are not very encouraging and a lot of variation has been observed from location to location. In general, varieties tested in Maize-Maize-Fallow pattern at Tumlingtar show some promise. They all are of IT - series. The comments from the site coordinator indicate that cowpeas, at Khandbari and Tumlingtar, have a great deal of potential, agronomically. However, the biggest obstacle remains the stealing of the green pods by passerbys, herders and others. Under these conditions it makes it extremely difficult to evaluate the real potential of cowpeas and to encourage the farmers to cultivate cowpeas in the khets and baris.

6. Lele, Lalitpur

Tables 55 through 57 presents the results of the component technology trials conducted at Lele during the Spring and Summer seasons of 1985. In these three Tables rice variety FFT and maize variety FFT results are presented.

Table 55 presents the results of hill rice variety FFT. Highly significant differences between varieties were observed. Khumal-3 produced the highest grain yield, 5.80 t/ha, followed by NR10042-67-3-2 and NR10078-100-3-3. Taichung-176 (Local Check) produced 4.80 t/ha. All the tested varieties were earlier than Taichung-176 (166 days).

Three rice varieties were tested in irrigated lowlands in Rice-Wheat-Fallow pattern (Table 56). Significant differences between varieties were not observed. However, NR10041-66-3-1 produced the highest grain yield 6.72 t/ha followed by Taichung-176 (5.67 t/ha) and NR10078-76-1-1 (4.80 t/ha).

A maize variety FFT was conducted in the Maize+Soybean-Mustard-Fallow pattern in the Rainfed Uplands. Results are presented in Table 57. Highly significant differences between varieties were observed. Manakamana-2 produced the highest yield, 6.43 t/ha, followed by Manakamana-1, 6.00 t/ha and Arun-4, 5.95 t/ha. The Local Check produced only 4.17 t/ha. Manakamana-1 is liked by the farmers.

Table No. A: NUMBER OF FARMS INVOLVED IN CROPPING PATTERN TESTINGS AND COMPONENT TECHNOLOGY EVALUATIONS AT VARIOUS FARMING SYSTEMS SITES DURING THE SPRING & SUMMER SEASONS OF '85

F.S. Site	Number of Farms		Total
	Cropping Pattern Testing 1/	Component Technology Evaluation 2/	
Ratna Nagar	60	39	99
Bahuwari	40	8	48
Pumdi Bhumdi 3/	10	59	69
Khandbari	75	46	121
Chauri Jahari	25	14	39
Lele	-	16	16
Total :	210	182	392

1/ - In cropping pattern testings, local farmer practices monitored farms are also included

2/ - In component technology evaluation, minikits and observation trial conducted farms are also counted.

3/ - In Pumdi Bhumdi, most of the cropping pattern evaluation trials were conducted with six farmers in the "Intervention Group" farms.

WI/BKS: ds
January 26, 1986

Table No. 1:

DESCRIPTION OF FARMING SYSTEMS SITES IN NEPAL

Sites	Elevation m.a.s.l.	Rainfall (mm)	Rainfall Distribution*		Major Soil Orders	Major Land Types	MCI**	LUI***	Average Farm Size ha/farm
			Month Wet	Month Dry					
Pumdi Bhumdi	750-1270	4000	6	5	Inceptisol	Upland, Rainfed Lowland, Rainfed	168	56	0.87
Parsa(Irrigated)	150	1500	4	8	"	Lowland, Irrigated	185	65	0.85
Chauri Jahari	700	1100	3	8	Alfisol	Upland, Rainfed Upland, Rainfed in Summer, Irrigated in Winter Lowland Irrigated	179	61	0.91
Lele	1300-1500	1800	4	6	Inceptisol	Upland, Rainfed Lowland, Rainfed Lowland Irrigated	186	71	0.63
Khandbari	460-1100	1200	2	6	Inceptisol Ultisol	Upland, Rainfed Lowland, Rainfed Lowland, Irrigated	139	48	1.10
Ratna Nagar	305	1000	4	8	Inceptisol	Upland, Rainfed Lowland, Rainfed Lowland, Irrigated	179	60	0.68

* - Months wet refers to those months receiving more than 200 mm rainfall. Months dry means those receiving less than 100 mm rainfall.

** - MCI = Multiple Cropping Index : The sum of the areas planted to different crops harvested during the year divided by the total cultivated area times 100.

*** - LUI = Land Utilization Index : The number of days during the year which crops occupy the land during the land during a year, divided by 365 and times 100.

Table No. 2: CROPPING PATTERN PERFORMANCES AT RATNA NAGAR IN CHITWAN DISTRICT FOR SUMMER CROPS 1985, WINTER CROPS 1984/'85 AND SPRING CROPS 198. 1/

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
I. IRRIGATED LOWLANDS HIGH PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Wheat-Mungbean	IR 8423	60:0:0 a/	4.09	UP 262	80:40:0	2.78	PS-7	20:20:0	0.89	7.76	10,055
	Laxmi	"	3.68	-	-	-	-	-	-	-	-
2. Rice-Wheat-Dhaincha 3/	B44B	60:0:0 b/	4.42	UP 262	80:40:0	3.71	Local	0	25.66 2/	-	-
	Sabitri	"	5.60	"	"	3.71	"	0	25.66 2/	9.31	11,208
3. Rice-Wheat-Fallow 3/	B44-B	"	3.70	"	"	3.71	-	-	-	-	-
	Sabitri	"	4.77	"	"	3.71	-	-	-	8.48	10,569
B. Farmer Practice											
1. Rice-Wheat-Fallow	Masuli	60:0:0 + Compost	4.22	Improved	26:16:0	2.24	-	-	-	6.46	8.598
II. PARTIALLY IRRIGATED LOWLANDS MEDIUM PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Mustard-Maize	Janaki	60:0:0 a/	2.96	Local	40:20:20	0.49	Rampur C.	60:30:0	3.68	-	-
	IR 7151	60:0:0 a/	3.88	"	"	0.49	"	"	4.33	8.70	15,656
	Janaki	60:0:0 + ZnS04	3.30	"	"	0.49	"	"	3.68	-	-
2. Rice-Wheat-Dhaincha 3/	Janaki	60:0:0 a/	4.30	NL 297	80:40:0	1.98	Local	0	18.14 2/	6.28	4,628
	Janaki	0:0:0	3.11	-	-	-	"	0	18.14 2/	-	-
	IR 7156	60:0:0 a/	4.19	-	-	-	"	0	18.14 2/	-	-

Contd..../...

Table 2 (Continued):

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
3. Rice-Wheat-Fallow 2/	Janaki	60:0:0 a/	3.90	NL 297	80:40:0	1.78	-	-	-	5.68	8,299
	Janaki	0:0:0	2.76	-	-	-	-	-	-	-	-
B. Farmer Practice											
1. Rice-Mustard-Maize	Masuli	13:0:0	2.85	Local	28:19:0	0.46	Local	0	2.86	6.17	10,777
III. RAINFED LOWLANDS LIMITED PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Chickpea+ Mustard-Fallow	IR-8423	60:0:0 a/	4.48	GO 332+ Local	20:40:20	0.67 + 0.58	-	-	-	5.73	13,447
2. Rice-Fallow-Dhaincha 3/	BG400-1	60:0:0 b/	4.68	-	-	-	Local	0	14.33 3/	4.68	6,258
	IET-7251	"	3.72	-	-	-	"	0	14.33 2/	-	-
3. Rice-Fallow-Fallow 3/	BG400-1	"	4.64	-	-	-	-	-	-	4.64	7,686
	IET-7251	"	3.78	-	-	-	-	-	-	-	-
B. Farmer Practice											
1. Rice-Fallow-Fallow	Masuli	Compost	3.10	-	-	-	-	-	-	3.10	6,502

* - R.A.V.C. = Return Above Variable Costs

1/ - Fertilizer rates in the table are expressed as kg/ha N, P_2O_5 and K_2O

2/ - Applied in two split doses : ½ N basal and ½ N in one Top-Dress.

3/ - Applied in three split doses : ⅓ N basal, ⅓ N 1st Top-Dress and ⅓ N 2nd Top-Dress.

a/ - Fresh weight plowed down for green manure. Not included in total annual yield

b/ - Results from 2 and 3 (Irrigated Lowlands), 2 and 3 (Partially Irrigated Lowlands) and 2 and 3 (Rainfed Lowlands) were obtained from the same fields. One half of each field was planted to Dhaincha for green manure in Spring and one half was left fallow. This allows a more direct comparison of the effect of Dhaincha green manure on succeeding crops.

Table No. 3 : ECONOMIC PERFORMANCES OF CROPPING PATTERNS DESCRIBED IN TABLE NUMBER 2 FOR RATNA NAGAR IN CHITWAN DISTRICT

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Mat'l. Costs (Rs/ha)	Labor & Power Costs (Rs/ha)	Total V'able Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
I. IRRIGATED LOWLANDS HIGH PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Wheat-Mungbean	7.76	22,496	3,743	8,698	12,441	10,055	1.27	3.69	2.16
2. Rice-Wheat-Dhaincha	9.31	20,860	2,928	6,724	9,652	11,208	1.98	4.83	2.67
3. Rice-Wheat-Fallow	8.48	18,868	2,678	5,621	8,299	10,569	2.53	4.95	2.88
B. Farmer Practice									
1. Rice-Wheat-Fallow	6.46	15,608	1,900	5,110	7,010	8,598	1/	8.21	2.68
II. PARTIALLY IRRIGATED LOWLANDS MEDIUM PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Mustard-Maize	8.70	22,701	2,557	4,488	7,045	15,656	2.42	7.12	4.43
2. Rice-Wheat-Dhaincha	6.28	14,280	2,928	6,724	9,652	4,628	Neg.	2.58	1.69
3. Rice-Wheat-Fallow	5.68	12,920	2,678	5,621	8,299	4,621	Neg.	2.73	1.82
B. Farmer Practice									
1. Rice-Mustard-Maize	6.17	16,495	1,230	4,488	5,718	10,777	- 1/	9.76	3.40

Contd.../...

Table 3 (Continued):

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Mat'l. Costs (Rs/ha)	Labor & Power Costs (Rs/ha)	Total V'able Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
III. RAINFED LOWLAND LIMITED PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Chickpea+ Mustard-Fallow	5.73	19,167	1,734	3,986	5,720	13,447	3.36	8.75	4.37
2. Rice-Fallow-Dhaincha	4.68	11,136	1,064	3,814	4,878	6,258	1.11	6.88	2.62
3. Rice-Fallow-Fallow	4.64	11,080	814	2,580	3,394	7,686	3.20	10.44	3.97
B. Farmer Practice									
1. Rice-Fallow-Fallow	3.10	9,300	384	2,414	2,798	6,502	- 1/	17.93	3.69

1/ - This local farmer practice was used to calculate the MBCR of the improved patterns in the same land type.

Table No. 4 : CROPPING PATTERN PERFORMANCES AT BAHUWARI TUBE-WELL IN PARSA DISTRICT FOR SUMMER CROPS 1985, WINTER CROPS 1984/85 AND SPRING CROPS 1985 1/

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
I. IRRIGATED LOWLANDS HIGH PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Wheat-Rice 4/	BG-400-1	60:0:0	3.95	UP 262	80:40:0	2.28	IR 9729	60:0:0	5.55	11.74	9,792
	Masuli	"	2.66	"	"	2.[illegible]3	"	60:30:0	5.08	-	-
	Sabitri	"	3.07	"	"	2.[illegible]3	"	60:30:30	5.40	-	-
2. Rice-Maize-Mungbean	Laxmi	"	2.96	Rampur C.	95:45:30	5.11	PS-7	20 20:0	1.31	-	-
	Laxmi	60:0:0+ ZnSO4	3.50	"	"	5.11	"	"	1.31	9.92	12,184
3. Rice-Mustard-Maize	IR 7156	60:0:0	4.27	Local	40:20:20	0.85	Rampur C.	80:40:0	3.46 a/	8.58	7,736
	IR 7151	60:0:0	4.08	"	"	0.85	"	"	3.46 a/	-	-
4. Rice-Chickpea+ Mustard-Fallow	IR 8423	60:0:0	2.95	GO 332+ Local	1.5+0.61	-	-	-	-	-	-
	IR 8423	60:0:0+ ZnSO4	3.12	"	"	-	-	-	-	5.23	13,670
5. Rice-Wheat-Dhaincha 3/	B44B	60:0:0	3.19	NA	NA	NA	Local	0	8.98 2/	-	-
	BG400-1	60:0:0	3.69	NA	NA	NA	"	0	8.98 2/	3.69	-
6. Rice-Wheat-Fallow 3/	B44B	60:0:0	3.44	NA	NA	NA	-	-	-	-	-
	BG400-1	60:0:0	3.87	NA	NA	NA	-	-	-	3.87	-
B. Framper Practice											
1. Rice-Wheat-Fallow	Local	47:0:0+ Compost	3.10	UP-262	41:14:0	2.14	-	-	-	5.24	4,079
2. Rice-Wheat-Rice	Masuli	32:0:0	3.36	"	38:8:0	1.78	Local	43:0:0+ Compost	3.30	8.44	7,451

* - R.A.V.C. = Returns Above Variable Costs

1/ - Fertilizer rates in the table are expressed as kg/ha N, P_2O_5 and K_2O; 2/ - Fresh Weight plowed down for green manure. Not included in total annual yield; 3/ - Results for cropping patterns 5 and 6 were obtained from the same fields. One half of each field was planted to Dhaincha and one half was left fallow. This allows a more direct comparison of the effect of Dhaincha green manure on succeeding crops; NA = Not Available. This pattern is initiated from Spring Crop; a/ - 15% yield loss due to hail stone on 25th march and 20th May; 4/ - Summer rice varieties seedlings were 72 days old when transplanted. - 60 kg/N/ha was applied in three split applications 30 kg N/ha as a basal, 20 kg N/ha as a first top-dress and 10 kg N/ha as a second top-dress.

Table No. 5 : ECONOMIC PERFORMANCES OF CROPPING PATTERNS DESCRIBED IN TABLE NUMBER 4 FOR BAHUWARI TUBE-WELL IN PARSA DISTRICT

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Material Costs (Rs/ha)	Labor and Power Costs (Rs/ha)	Total Variable Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
I. IRRIGATED LOWLANDS HIGH PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Wheat-Rice	11.74	21,356	3,517	8,047	11,564	9,792	2.40	3.78	2.22
2. Rice-Maize-Mungbean	9.92	24,375	3,437	8,790	12,227	12,148	3.01	4.53	2.38
3. Rice-Mustard-Maize	8.58	19,166	2,855	8,575	1 ,430	7,736	1.18	3.71	1.90
4. Rice-Chickpea+Mustard-F	5.23	19,879	1,680	4,529	6,290	13,670	15.03	9.14	4.02
5. Rice-Wheat-Dhaincha	3.69 3/	-	-	-	-	-	-	-	-
6. Rice-Wheat-Fallow	3.87 3/	-	-	-	-	-	-	-	-
B. Farmer Practice									
1. Rice-Wheat-Fallow	5.24	9,691	1,608	4,004	5,612	4,079	- 1/	3.54	2.01
2. Rice-Wheat-Rice	8.44	17,342	2,576	7,315	9,891	7,451	- 2/	3.89	2.02

1/ - This local farmer practice was used to calculate the MBCR for only the improved pattern Rice-Chickpea+Mustard-Fallow.

2/ - This local farmer practice was used calculate the MBCR for all improved patterns except pattern number 4.

3/ - None of these improved patterns have a full year's information available. Therefore, it is not possible to evaluate their economic performances versus the local farmer practices.

Table No. 6: CROPPING PATTERN PERFORMANCES AT PUMDI BHUMDI IN KASKI DISTRICT FOR SUMMER CROPS 1985, WINTER CROPS 1984/'85 AND SPRING CROPS 1985 1/

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
I. RAINFED LOWLANDS HIGH PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Wheat-Maize	Khumal-3	60:0:0	3.65	RR-21	60:30:0+ Lime	1.43	Arun-4	40:20:0	3.39	8.47	19,987
	NR-10078-76-11	"	2.91 2/	-	-	-	-	-	-	-	-
	NR 10068-60-3-2	"	2.74	-	-	-	-	-	-	-	-
B. Farmer Practice											
1. Rice-Wheat-Maize	Khumal 3	13:0:0	3.85	RR-21	Compost	1.36	Local	0:0:0+ Compost	1.50	6.71	8,223
	Local	0:0:0	1.92	Local	"	0.81	-	-	-	-	-
II. RAINFED LOWLANDS MEDIUM PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Oat-Maize	Khumal 3	60:0:0	3.24	Kent	40:20:0	6.10 3/	Arun-4	40:20:0	2.50	5.74	14,231
2. Rice-Mustard-Maize	"	"	4.04	Chitwan Local	20:20:0	0.24	Arun-4	40:20:0	3.50	7.78	19,707
B. Farmer Practice											
1. Rice-Fallow-Maize	Local	0:0:0	2.60	-	-	-	Local	0:0:0+ Compost (11.0t/ha)	3.34	6.94	16,106

Contd..../...

Table No. 6(Continued):

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
III. RAINFED LOWLANDS LOW PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Fallow-Dhaincha	Local	0	2.10	-	-	-	Local	0	0.59 4/	2.10	2,429
2. Rice-Oat-Fallow	Khumal 3	60:0:0	3.01 5/	Kent	40:20:0	7.9 3/	-	-	-	3.01	7,304
B. Farmer Practice											
1. Rice-Fallow-Fallow	Gurdi	0:0:0	2.00	-	-	-	-	-	-	2.00	3,228

* - R.A.V.C. = Returns Above Variable Costs

1/ - Fertilizer rates in the table are expressed as kg/ha N, P_2O_5 and K_2O

2/ - Average yield of two locations

3/ - Fresh Fodder Weight used to feed milking buffaloes

4/ - Plowed down for green manure. It appears there is little slope for Dhaincha cultivation as a green manure crop.

5/ - Average of two locations. In other three locations farmers preferred to plant local rice varieties.

Table No. 7: ECONOMIC PERFORMANCES OF CROPPING PATTERNS DESCRIBED IN TABLE NUMBER 6 FOR PUMDI BHUMDI IN KASKI DISTRICT

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Material Costs (Rs/ha)	Labor and Power Costs (Rs/ha)	Total Viable Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
I. RAINFED LOWLANDS HIGH PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Wheat-Maize	8.47	34,962	3,452	11,523	14,975	19,987	4.67	8.63	4.19
B. Farmer Practice									
1. Rice-Wheat-Maize	6.71	20,001	1,370	10,408	11,778	8,223	- 1/	7.00	1.79
II. RAINFED LOWLANDS MEDIUM PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Oat-Maize	5.74	25,928	2,445	9,252	11,697	14,231	0.33	6.82	2.54
2. Rice-Mustard-Maize	7.78	32,968	2,153	11,108	13,261	19,707	1.82	10.15	2.77
B. Farmer Practice									
1. Rice-Fallow-Maize	6.94	24,984	467	8,411	8,878	16,106	1/	35.49	2.91
III. RAINFED LOWLAND LOW PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Fallow-Dhaincha	2.10	7,770	1,064	4,277	5,341	2,429	0.31	3.28	2.91
2. Rice-Oat-Fallow	3.01	14,297	1,380	6,179	7,559	6,738	2.03	5.88	2.09
B. Farmer Practice									
1. Rice-Fallow-Fallow	2.00	7,400	284	3,888	4,172	3,228	- 1/	13.61	1.84

1/ - This local farmer practice was used to calculate the MBCR of the other patterns within the same land type.

Table No. 8 : CROPPING PATTERN PERFORMANCES AT KHANDBARI IN SANKHUWASABHA DISTRICT FOR SUMMER CROPS 1985, WINTER CROPS 1984/85 AND SPRING CROPS 1985 [1/]

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
I. RAINFED UPLANDS (TUMLINGTAR)											
A. Improved Patterns											
1. Maize-Maize-F. [2/]	M-Na-1	60:30:0	1.92	Arun-1	40:20:0	5.32	-	-	-	7.24	19,794
	M-Na-2	"	1.72	-	-	-	-	-	-		
	Arun-4	"	1.74	-	-	-	-	-	-		
	Kh.Yellow	"	1.83	-	-	-	-	-	-		
	Local	"	1.36	-	-	-	-	-	-		
2. Maize/Soybean-Fallow [2/]	M-Na-1	60:30:0	1.88+	-	-	-	-	-	-	2.97	8,671
	Hardee	-	1.09								
B. Farmer Practice											
1. Maize-Maize-F.	Local	Compost (6 t/ha)	2.54	Local	Compost (3 t/ha)	2.59	-	-	-	5.13	14,285
II. IRRIGATED LOWLANDS HIGH PRODUCTION POTENTIAL											
A. Improved Pattern											
1. Rice-Wheat-Rice	NR10067-8-2-2	60:0:0	2.98	NA [5/]	NA	NA	Khumal-3	46:20:0	3.63	-	-
	Khumal-3	"	2.10	-	-	-	-	-	-	-	-
	Local	"	2.87	-	-	-	-	-	-	-	-
B. Farmer Practice											
1. Rice-Fallow-Rice	Local	0:0:0	2.55	-	-	-	Local	0:0:0	2.40	4.95	11,679

Contd.../...

Table No. 8 (Continued):

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
III. PARTIALLY IRRIGATED LOWLANDS MEDIUM PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Wheat-Mung-bean	Khumal-3	60:30:0	3.37	NL 304	60:30:0	2.44	PS-7	20:20:0	1.08	6.89	26,691
		60:0:0	2.99	-	-	-	-	-	-	-	
2. Rice-Mustard-Maize	**	**	**	Chainpur - Local	20:20:20	0 3/	Arun-4	60:30:0	4.03	-	-
B. Farmer Practice											
1. Rice-Fallow-Maize	Local	0	1.53	-	-	-	Local	Compost	4.01	5.54	-
2. Rice-Wheat-Fallow	Local	0	1.53	Improved	51:22:0+ Compost	3.23	-	-	-	4.76	14,519
IV. RAINFED LOWLANDS LOW PRODUCTION POTENTIAL											
A. Improved Patterns											
1. Rice-Wheat-F.	Khumal-3	60:0:0	1.79	HS-94	60:30:0	3.32	-	-	-	5.11	14,772
2. Rice-F-Maize	Khumal-3	46:0:0	2.30	-	-	-	Arun-4	60:30:0	3.62	5.92	14,506
3. Rice-F-Mungbean	IR 8423	46:0:0	3.67	-	-	-	PS-7	20:20:0	0.92	4.59	14,295
	Malika	"	3.07	-	-	-	"	20:20:0+ Innoculum	1.07		
	Khumal-3	"	2.70								
4. Rice-Oat-Fallow	Khumal-3	"	3.05	Kent	60:30:0	11.98 4/	-	-	-	3.05	8,787
5. Rice-Wheat-Dhaincha	Khumal-3	"	2.17	HS-94	"	3.32	Local	0	9.90 6/	5.49	16,042

Contd..../....

Table No. 8 (Continued).

Cropping Patterns	Summer Crops			Winter Crops			Spring Crops			Total Annual Yield (T/ha)	R.A.V.C.* (Rs/ha)
	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)	Variety	Fert. Rate	Yield (T/ha)		
B. Farmer Practice											
1. Rice-Fallow-F.	Local	0	1.52	-	-	-	-	-	-	1.52	3,005

* - R.A.V.C. = Returns Above Variable Costs

** - This pattern is dropped

1/ - Fertilizer rates in the table are expressed as kg/ha N, P_2O_5 and K_2O

2/ - Severe drought during the tasseling stage of Summer Maize reduced the plant population by 25.30%. Over 10% of the survived plants were barren.

3/ - Totally failed

4/ - Green fodder yield used for feeding milking buffaloes

5/ - Data not available- These are new patterns initiated in the Spring Season 19[illegible]

6/ - Fresh weight plowed under for green manure for succeeding crops.

Table No. 9: ECONOMIC PERFORMANCES OF CROPPING PATTERNS DESCRIBED IN TABLE NUMBER 8 FOR KHANDBARI IN SANKHUWASABHA DISTRICT

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Material Costs (Rs/ha)	Labor and Power Costs (Rs/ha)	Total Viable Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
I. RAINFED UPLANDS (TUMLINGTAR)									
A. Improved Patterns									
1. Maize-Maize-Fallow	7.24	25,557	1,984	3,779	5,763	19,794	3.84	10.98	6.24
2. Maize/Soybean-Fallow	2.97	12,086	1,065	2,350	3,415	8,671	Neg.	9.14	5.14
B. Farmer Practice									
1. Maize-Maize-Fallow	5.13	18,109	388	3,436	3,824	14,285	- 1/	37.82	5.16
II. IRRIGATED LOWLANDS HIGH PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Wheat-Rice 2/	-	-	-	-	-	-	-	-	-
B. Farmer Practice									
1. Rice-Fallow-Rice	4.95	19,800	566	7,555	8,121	11,679	-	21.63	2.55
III. PARTIALLY IRRIGATED LOWLANDS MEDIUM PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Wheat-Mungbean	6.89	35,784	3,503	5,554	9,057	26,691	6.35	8.62	5.81
2. Rice-Mustard-Maize 3/	-	-	-	-	-	-	-	-	-
B. Farmer Practice									
1. Rice-Wheat-Fallow	4.76	21,301	1,733	5,049	6,782	14,519	- 1/	9.38	3.88
2. Rice-Fallow-Maize 4/	-	-	-	-	-	-	-	-	-

Contd.../...

Table No. 9 (Continued):

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Material Costs (Rs/ha)	Labor and Power Costs (Rs/ha)	Total Viable Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
IV. RAINFED LOWLANDS LOW PRODUCTION POTENTIAL									
A. Improved Patterns									
1. Rice-Wheat-Fallow	5.11	22,764	2,438	5,554	7,992	14,772	7.74	7.06	3.66
2. Rice-Fallow-Maize	5.92	21,978	1,805	5,667	7,472	14,506	3.62	9.04	3.56
3. Rice-Fallow-Mungbean	4.59	22,040	1,878	5,867	7,745	14,295	5.19	8.61	3.44
4. Rice-Oat-Fallow	3.05	12,672	813	3,072	3,885	8,787	8.14	11.81	3.86
5. Rice-Wheat-Dhaincha	5.49	24,284	2,688	5,554	8,242	16,042	3.52	6.97	3.89
B. Farmer Practice									
1. Rice-Fallow-Fallow	1.52	6,080	282	2,793	3,075	3,005	- 1/	11.66	2.08

1/ - This local farmer practice was used to calculate the MBCR of the improved patterns in the same land type

2/ - This pattern is incomplete. It was started from Spring Crop, 1985

3/ - Economic Analysis was not conducted because this pattern is rejected after the mustard crop failure

4/ - Local crop cutting data for rice crop is not obtained.

Table No. 10: CROPPING PATTERN PERFORMANCES AT CHAURIJAHARI IN RUKUM DISTRICT FOR SUMMER CROPS 1985, WINTER CROPS 1984/1985 AND SPRING CROPS 1985 1/

Cropping Patterns	Summer Crops					Winter Crops					Spring Crops			Total Annual Yield (T/ha)	R.A.V.C. (Rs/ha)
	Variety		Fert.	Yield(T/ha)		Variety		Fert.	Yield(T/ha)		Variety	Fert. Rate	Yield (T/ha)		
	Rice	Maize	Rate	Rice	Maize	Wheat	Must.	Rate	Wheat	Must.					
I. UPLAND RAINFED IN SPRING AND SUMMER, IRRIGATED IN WINTER															
A. Improved Patterns															
1. Upland Rice+Maize-Wheat+Mustard-Fallow 2/	Se-322B-19	Arun4	60:30:0	4.29	2.35	UP262	Local	60:30:0	3.13	0.38	-	-	-	10.15	25,738
	Bin.x	"	"	3.06	2.53	"	"	"	3.13	0.38	-	-	-	-	-
		M-Na-2	"	-	2.69	"	"	"	3.13	0.38	-	-	-	-	-
	NR6-7-83x	Arun4	"	2.49	2.53	"	"	"	3.13	0.38	-	-	-	-	-
B. Farmer Practice															
I. Upland Rice+Maize Wheat+Mustard-F.	Local	Local+ Imp.	28:17:0+ Compost	3.51	2.22	Improved	Local	Compost	1.89	0.10	-	-	-	8.62	10,888
II. IRRIGATED LOWLANDS															
A. Improved Patterns															
I. Rice-Wheat-Dhaincha	Sabitri	-	60:30:0	6.62	-	UP262	-	60:30:0	3.35	-	Local	0	?	9.97	31,431
	"	-	"	5.44	-	-	-	-	-	-	-	-	-	-	
	IR-9828	-	"	6.44	-	-	-	-	-	-	Local	0	?	-	
2. Rice-Wheat-F.	Bin.	-	"	6.53	-	UP262	-	60:30:0	3.33	-	-	-	-	9.86	31,214
	IR-8423	-	"	5.47	-	-	-	-	-	-	-	-	-	-	
B. Farmer Practice															
I. Rice-Wheat-F.	Local		11:7:0+ Compost	4.43	-	Improved	-	Compost	2.28	-	-	-	-	6.71	20,389

* - R.A.V.C. = Returns Above Variable Costs

x - Bin. = Bindeshwari - Poor stand because of poor germination and drought (Both Bindeshwari and NR-6-7-83)

1/ - Fertilizer rates in the table are expressed as kg/ha N, P_2O_5 and K_2O

2/ - This pattern trial was conducted at two locations

? - Not yet received.

Table N 11: ECONOMIC PERFORMANCES OF CROPPING PATTERNS DESCRIBED IN TABLE NUMBER 10 FOR CHAURI JAHARI IN RUKUM DISTRICT

Cropping Patterns	Total Annual Yield (T/ha)	Gross Returns (Rs/ha)	Material Costs (Rs/ha)	Labor and Power Costs (Rs/ha)	Total Viable Costs (Rs/ha)	Returns Above Variable Costs (Rs/ha)	Marginal Benefit Cost Ratio	Returns to Material Costs (Rs/ha)	Returns to Labor and Power Costs (Rs/ha)
I. UPLAND RAINFED IN SPRING AND SUMMER, IRRIGATED IN WINTER									
A. Improved Pattern									
1. Upland Rice+Maize-Wheat+ Mustard-Fallow	10.15	36,771	3,040	7,993	11,033	25,738	9.00	9.47	4.22
B. Farmer Practice									
1. Upland Rice+Maize-Wheat+ Mustard-Fallow	8.62	20,057	1,911	7,266	9,177	10,888	- 1/	6.69	2.50
II. IRRIGATED LOWLANDS									
A. Improved Patterns									
1. Rice-Wheat-Dhaincha	9.97	40,953	2,948	6,574	9,522	31,431	12.80	11.66	5.78
2. Rice-Wheat-Fallow	9.86	40,486	2,698	6,574	9,272	31,214	16.22	12.57	5.75
B. Farmer Practice									
1. Rice-Wheat-Fallow	6.71	27,540	1,175	5,976	7,151	20,389	- 1/	18.36	4.41

1/ - This local farmer practice was used to calculate the MBCR of the improved patterns in the same land type.

Table No. 12:

NORMAL SEASON IRRIGATED RICE VARIETY FFT RESULTS

FOR RATNANAGAR DURING SUMMER SEASON 1985 1/

Cropping Pattern: Farmer 1 - Rice-Mustard-Fallow
Farmer 2 - Rice-Mustard-Corn+Dhaincha

Land Type : Irrigated Lowland, High Production Potential

Fertilizer Rate : 60:0:0 ($N-P_2O_5-K_2O$) kg/ha

Insecticide : Furadan 10 kg/ha

Variety	Ave. Days to Maturity	Ave. Moisture % at Harvest	Yield (t/ha)			Sun-Dried Straw Yield (t/ha)
			Farmer 1	Farmer 2	Mean	
OR 63-252	119.0	13.25	3.19	3.36	3.58	5.15
C1322-23	126.5	15.35	5.97	3.64	4.81	6.67
BR51-3-23	153.0	16.20	4.96	4.40	4.68	10.05
ITA-121	153.0	15.55	4.37	4.17	4.27	10.75
B3894-246 2/	135.0	11.95	5.06	4.06	4.56	7.65
Janaki	139.9	14.45	5.02	2.36	3.69	8.50

Date seeded	18/5/85	28/5/85
Seedling Age (Days)	36	32

Variety F-test - NS CV = 17.27%

1/ - Due to coarse grain type and threshing problems this FFT set is not liked by farmers.

2/ - Excellent plant vigour, long panicle, good yield but very difficult to thresh.

Table No. 13:

NORMAL SEASON RAINFED RICE VARIETY FFT RESULTS FOR RATNANAGAR DURING SUMMER SEASON, 1985 1/

Cropping Parrern : Farmer 1- Rice-Mustard-Maize
Farmer 2- Rice-Fallow-Fallow

Land Type : Rainfed Lowland, Medium Production Potential - Farmer 1

Rainfed lowland - Limited production potential. Low placement in the Land scape - Farmer 2

Fertilizer Rate and Method of Application : 60:0:0 (N-P O -K O) kg/ha. 30:0:0 basal, 15:0:0 1st top-dress and 15:0:0 2nd top-dress

Insecticide : (a) Furadan - 10 kg/ha
(b) BHC dust - 25 kg/ha

Variety	Ave. Days to Maturity	Ave. Moisture % at at Harvest	Yield (t/ha)			Sun-Dried Straw Yield (t/ha)
			Farmer 1	Farmer 2	Mean	
IR 10787	130.0	14.25	3.97	4.71	4.34	7.85
UPLRI-5	123.0	17.50	6.43	2.97	4.70	10.35
IR 46	130.0	13.60	4.21	4.43	4.32	7.65
BG 400-1	143.0	16.20	3.87	4.79	4.33	8.68
BR 51-228	143.0	15.45	3.71	4.88	4.29	6.90
Sabitri	143.0	13.70	3.73	4.30	4.01	6.67
Date seeded			12/6/85	30/5/85		
Seedling Age (Days)			38	32		

Variety F-test - NS

CV = 28.38%

1/ None of these varieties is liked by farmers. All entries in this set are coarse grain type.

Table No. 14

EARLY MATURITY RICE VARIETY FFT RESULTS FOR RATNANAGAR DURING SUMMER SEASON, 1985 1/

Cropping Pattern : Rice/Lentil-Fallow at location 1, Rice-Lentil-Mung at location 2 and Rice-Rice-Fallow at location 3.

Land Type : Lowland Rainfed, Low production potential at location 1, Lowland, High production potential at location 2 and 3.

Fertilizer Rate : 60:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Moisture % at Harvest	Yield (t/ha)				Sun-Dried 3/ Straw Yield (t/ha)
			Farmer 1	Farmer 2	Farmer 3	Mean	
Laxmi	123.5	24.05	2.13	3.22	5.29	3.54	12.62
IR28128-45-2	119.5	18.65	3.38	3.15	6.64	4.39	12.00
IR8608-82-1-3-3 2/	121.0	19.05	2.51	4.31	5.05	3.95	9.50
IR25890-85-5-3	119.5	17.50	1.96	3.59	4.89	3.48	11.82
IR29692-65-2-3	119.0	24.95	2.56	3.40	4.64	3.53	10.30
IR25588-7-3-1	114.5	17.65	1.97	3.46	4.91	3.44	10.50
JT-1 4/	114.0	16.30	-	-	4.11 5/	-	-
Date seeded			27/5/85	20/5/85	11/3/85		
Seedling Age (Days)			39	35	29		

Variety F-test - NS CV = 14.2%

1/ This trial was planted in different cropping patterns and land types to observe the wide adaptability of varieties included in this FFT set.

2/ Farmer liked this variety because of less infestation against stemborers, long panicles and reasorable yield.

3/ We estimate further reduction of 15-25% to get the straw yield presented here well sundried.

4/ JT-1 (Jethe Tauli) - a local variety from Khandbari. It is early, tall and very fine. Observation trials planted during 1985 in Ratna Nagar, Sukichaina and Pumdi Bhumdi show incouraging results.

5/ It is excluded from the Analysis of varience.

WI:BKS/hks

Table No. 15:

UPLAND RICE VARIETY FFT RESULTS FOR RATHANAGAR

DURING SUMMER SEASON 1985

Cropping Pattern : Upland Rice-Mustard-Fallow

Land Type : Rainfed Uplands

Fertilizer Rate and Method of Application : 60:30:0 (N- P_2O_5-K_2O) kg/ha.0:30:0 basal, 30:0:0 1st top-dress 30:0:0 2nd top-dress

Variety	Ave.Days to Maturity	Ave.Mois. % at Harvest	Average Straw Yield (t/ha)	Grain Yield (t/ha) 3/					
				Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5	Mean
NW-10 2/	115.4	20.7	10.80	5.89	4.33	4.85	4.27	4.20	4.71[b]
Bindeshwari	115.4	21.2	13.53	5.18	4.91	4.74	5.89	4.09	4.96[b]
NR 6-7-83	110.0	18.5	10.30	4.27	2.95	4.28	3.71	4.32	3.91[a]
SE 332 B-19 1/	-	21.3	-	-	2.82	-	-	-	-
Local	110.0	21.7	15.59	4.29	3.17	3.86	3.87	4.19	3.88[a]
Date seeded				7/5/85	7/5/85	11/5/85	13/5/85	12/5/85	

Treatment F-test - Sat 0.05

LSD (0.05) = 0.74 (t/ha)

CV = 12.33%

1/ Excluded for the AOV.

2/ Liked by farmers

3/ Means followed by the same letter donot differ significantly at 5% level.

Table No.16: EFFECT OF INCORPORATION OF DIFFERENT GREEN MANURE CROPS BEFORE RICE ON RICE YIELDS AT RATNA NAGAR DURING THE SUMMER SEASON '85 1/

Cropping Patterns : Farmer 1 - Rice - Fallow - Fallow
Farmer 2 - Rice - Wheat - Fallow
Farmer 3 - Rice - Mustard - Fallow

Land Type : Farmer 1 - Rainfed Lowland
Farmer 2 - Partially Irrigated Lowland
Farmer 3 - Irrigated Lowland

Rice Variety : Masuli

Fertilizer Rate : 0

Green Manure Crops (Spring Season)	Green Manure Production (T/ha)				Rice Yield (T/ha)			
	F 1*	F 2	F 3	Mean	F 1	F 2	F 3	Mean
Dhaincha	11.18 2/	21.33	6.14 3/	12.88	3.74	4.13	3.01	3.62
Sanai	12.40	26.25	9.00	15.88	3.67	3.81	3.76	3.74
Cowpea	18.20	22.10	15.90	18.73	3.09	2.73	4.69	3.50
Mungbean	18.73	19.35	12.70	16.92	3.92	3.92	3.90	3.92

Variety F-test for Green Manure - NS
CV = 21.38 %
Variety F - test Rice Yields - NS
CV = 18.14 %

* F = Farmer

1/ - The main objective to conduct this trial was to explore the possibility to find out alternatives to Dhaincha as a green manure crop in different land types. There is no doubt about the nitrogen contribution from Dhaincha to the succeeding crops (previous reports). However, the main obstacle remains the availability of Dhaincha seed itself in large quantity.

- In the absence of a local check plot (w/o - G.M.) it is difficult to quantify the approximate contribution from different green manure crops to rice but one can easily observe from the table that mungbean and Sanai could be as good as Dhaincha for green manure.

2/ - The crop was damaged by rabbits at early growth stage. The recovery was satisfactory.

3/ - Partially damaged by stray cattles.

Table No.17: MAIZE VARIETY TRIAL RESULTS FOR RATNA NAGAR DURING SUMMER SEASON '85

Cropping Pattern : Maize-Mustard-Fallow
Land Type : Rainfed Upland
Fertilizer Rate : 40:20:0 ($N-P_2O_5-K_2O$) kg/ha
Compost : 5 - 7 (t/ha)2/

Variety	Average Moisture % at Harvest	Yield (t/ha)					
		F 1*	F 2	F 3	F 4	F 5	Mean
Rampur Comp.	31.08	3.94	3.54	4.16	3.55	4.13	3.86
Rampur-2	27.59	4.26	3.90	4.29	4.42	4.62	4.30
Mana-1 3/	30.88	3.49	4.29	4.80	3.83	4.00	4.08
Local 1/	28.09	3.92	3.97	4.51	2.95	4.52	3.97
Date Seeded		1/5/85	2/5/85	2/5/85	5/5/85	2/5/85	
Days to Harvest 4/		102	103	98	96	100	

Variety F-test - NS
CV - 9.26 %

* F = Farmer

1/ - Local Check was Rampur Composite at 4 locations and Khumal Yellow at one.

2/ - The rate of Compost application was not fixed. It depends on the availability.

3/ - Manakamana (Mana)-1 is liked by farmers because of its white grain color. This variety is also tolerant to lodging.

4/ - All varieties at each location were harvested at same date.

Table No. 18: ANALYSIS OF COSTS AND RETURNS FOR FERTILIZER-LIME TREATMENTS APPLIED TO RAMPUR COMPOSITE MAIZE AT RATNA NAGAR DURING THE SUMMER SEASON 1985

Cropping Pattern : Maize - Mustard - Fallow
Land Type : Rainfed Upland
Soil pH : 5.32 ± 0.35

Treatment	Mean Yield 1/ (T/ha)	Gross Returns (Rs/ha)	Fertilizer-Lime Costs (Rs/ha)	Comparisons		
				Treatments	Change 2/ in Net Profits (Rs/ha)	MBCR 3/
LIME-1.5 T/HA						
1. 60:30:0	4.43[b]	10,632	1,773	1 vs. 4	Neg.	0.10
2. 40:20:0	4.19[ab]	10,056	1,540	2 vs. 5	Neg.	0.60
3. 0: 0:0	3.84[a]	9,216	1,075	3 vs. 6	Neg.	?
LIME-0						
4. 60:30:0	4.38[ab]	10,512	698	1 vs. 3	Neg.	0.82
5. 40:20:0	3.94[ab]	9,456	465	4 vs. 6	574	2.22
6. 0: 0:0	3.85[a]	9,240	0	4 vs. 5	823	4.53
				5 vs. 6	Neg.	0.46

Treatment F-test - S at 0.10
LSD (0.10) = 0.55 t/ha
CV = 16.53 %

1/ - Average of five locations. Means followed by the same letter donoy differ significantly at the 10% level.

2/ - Change in gross returns minus change in fertilizer costs. Differences in labor costs are ignored

3/ - Marginal Benefit Cost Ratio - Calculated as change in gross returns divided by change in fertilizer costs.

Table No.19 : EARLY MATURITY COWPEA VARIETY TRIAL RESULTS FOR RATNA NAGAR DURING SUMMER SEASON, 1985

Cropping Pattern : Maize - Cowpea - Mustard
Land Type : Upland Rainfed
Fertilizer Rate : 20:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Bio-Mass Yield (T/ha)	Green Pods Yield (T/ha)			
		Farmer 1	Farmer 2	Mean	Sd
IT 84 E-124	7.30	2.3	2.4	2.35	0.07
IT 82 D-752	9.20	5.0	1.7	3.35	2.33
IT 82 D-1228-16	11.20	*	3.3	1.65	2.33
IT 82 D-889	11.6	2.8	3.3	3.05	0.35
Date Seeded :		6/9/85	3/9/85	-	-
Days to Harvest 1/		72	75		

* - Poor Germination

1/- All varieties at each location were harvested at same date.

Table No. 20 COWPEA VARIETY TRIAL RESULTS FOR RATNA NAGAR DURING SPRING SEASON 1985

Cropping Pattern : Rice - Wheat - Mung
Land Type : Lowland Irrigated
Fertilizer Rate : 20:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Bio-Mass Yield (T/ha)	Green Pods Yield (T/ha)			
		Farmer 1**	Farmer 2	Farmer 3	Mean 1/
CES 41-6	8.5	0.16	3.98	1.76	2.87 bc
All Season	9.76	-	2.65	1.55	2.1 b
IT 82 D-889	9.40	0.15	4.56	4.56	5.38 d
IT 82 E-18	10.38	0.13	2.74	2.74	3.38 c
IT 82 E-16	16.50	-	0.84	0.38	0.61 a
*TVX-289-4G	17.10	-	-	-	-
Date Seeded:	-	11/4/85	14/4/85	14/4/85	-
Days to Harvest 2/	-	64	77	73	-

* - No pod formation
** - Not included in the AOV

Variety F - test - HS at 0.01
CV = 15.97 %
LSD (0.01) = 0.968 t/ha.

1/ - Means followed by the same letter do not differ significantly at the 1% level.

2/ - All varieties at each location were harvested at same date.

Table No. 21: COWPEA VARIETY TRIAL RESULTS FOR RATNA NAGAR DURING SUMMER SEASON, 1985

Cropping Pattern : Maize - Cowpea - Mustard
Land Type : Upland Rainfed
Fertilizer Rate : 20:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Bio-Mass Yield (T/ha)	Green Pods Yield (T/ha)						
		Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5	Mean	Sd
IT 82 D-812	6.96	3.30	5.90	3.40	2.80	3.00	3.68	1.26
IT 82 D-889	5.40	3.00	5.10	3.00	@	3.00	2.82	1.82
IT 82 D-9	2.95	1.70	3.40	@	1.4	2.90	1.88	1.30
IT 82 E-18	5.86	5.50	4.90	2.20	5.0	4.30	4.38	1.29
IT 82 D-380-5	2.87	*	4.70	@@	4.70	3.40	2.56	2.40
IT 82 E-16	5.76	3.00	3.2	@@	2.10	5.30	2.72	1.92
Date Seeded :	-	29/8/85	28/8/85	29/8/85	28/8/85	1/9/85		
Days to Harvest 1/		78	76	78	75	69		

* - Poor germination

1/ - All varieties at each location were harvested at same date.

@ - Picked up by farmer before sampling

@@ - Damaged by stray animals.

Table No.22: SOYBEAN VARIETAL TRIAL RESULTS CONDUCTED AT RATNA NAGAR DURING SUMMER SEASON 1985[1/]

Cropping Pattern : Maize/Soybean-Mustard
Land Type : Upland, Rainfed
Maize Variety : Rampur Composite
Fertilizer Used in Maize Crop : N, P_2O_5, K_2O (kg/ha) - 60:30:0
Compost (T/ha) - 3.30 (Median)

Variety	Average Moisture % at Harvest	Yield (T/ha)				
		F 1*	F 2	F 3	F 4	Mean
Hardee	18.30	0.24	2.74	3.00	1.30	1.82
Ransom	16.23	0.78	1.60	2.20	1.80	1.59
Local	17.50	0.96	3.40	2.00	1.30	1.92
Date Seeded		3/7/85	21/6/85	2/7/85	2/7/85	-
Days to Harvest 2/		103	102	96	99	

Variety F - test - NS
CV = 37.97%

* - F = Farmer

1/ - The trial was planted at five locations. The 5th location soybean crop was totally grazed.

2/ - All varieties at each location were harvested at same date.

Table No. 23:

NORMAL SEASON IRRIGATED RICE VARIETY FFT RESULTS

FOR BAHUWARI TUBE-WELL DURING SUMMER SEASON, 1985

Cropping Pattern: Rice-Wheat-Fallow

Land Type: Irrigated Lowland

Fertilizer Rate: 60:0:0 (N-P_2O_5-K_2O) Kg/ha

30:0:0 basal, 15:0:0 1st top-dress and

15:0:0 2nd top-dress

Insecticide: BHC Dust - 25 kg/ha

Variety	Ave. Days to Maturity	Ave. grain Moisture % at Harvest	Ave. plant Population (1000/ha)	Yield (t/ha)				
				F1*	F2	F3	F4	Mean
B 3894-246	152.0	19.20	2802	3.76	2.60	1.32	2.81	2.62
BR 51-323	152.0	20.95	2762	5.38	1.66	1.61	3.20	3.01
FIA 121	150.7	21.20	2280	5.76	3.28	1.81	1.80	3.16
OR 63-252	118.7	19.15	2735	3.66	2.94	4.98	2.40	3.49
C 1322-23	134.2	21.55	2752	0.91	1.45	3.96	2.78	2.28
Janaki	139.0	22.40	2962	**	3.46	4.12	3.57	2.79
Date Seeded				21/5/85	21/5/85	8/5/85	5/6/85	
Seedling Age (Days)				31	30	29	40	

* - F = Farmer

** - 100 % Sterile

Variety F - test - NS

CV = 57.00%

Table No.24:

EARLY RICE VARIETY FFT RESULTS FOR BAHUWARI TUBE-WELL DURING SUMMER SEASON, 1985[1/]

Cropping Pattern: Rice-Rice-Wheat

Land Type: Irrigated Lowland

Fertilizer Rate: 60:0:0(N-P_2O_5-K_2O) kg/ha

Insecticide: BHC Dust - 25 kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Yield (t/ha)				
			F1*	F2	F3	F4	Mean
IR8608-82-1-3-1-3	123.0	20.76	5.81	4.66	2.83	3.03	3.93
IR 25588-7	110.0	22.20	5.34	3.22	4.62	3.26	4.11
IR 25890-82-5-3	119.7	20.60	5.36	4.98	4.95	3.22	4.62
IR 28128-45-2	119.0	20.00	5.55	4.95	4.51	3.01	4.51
IR 29692-65-2-3	114.7	23.20	5.71	4.98	4.28	2.39	4.34
Laxmi	127.7	20.90	5.52	4.16	3.53	2.30	3.88
Muturi(Local)[2/]	113.0	18.50	3.13	-	-	-	-
Date seeded			10/4/85	11/5/85	28/4/85	11/5/85	
Seedling Age(Days)			32	27	34	28	

Variety F-test - NS

* F = Farmer CV = 13.40%

1/ Planted during first rice crop in Rice-Rice-Wheat cropping pattern

2/ Not included in the Analysis of Variance.

Table No.25: EFFECT OF INCORPORATION OF DHIANCHA (SESBANIA SPS.) AS GREEN MANURE BEFORE RICE AND SUBSEQUENT N APPLICATION ON RICE YIELDS IN IRRIGATED LOWLANDS FOR BAHUWARI DURING SUMMER SEASON, 1985.

Cropping Pattern : Rice - Wheat - Dhaincha
Land Type : Irrigated Lowlands
Rice Variety : B-44B and BG 400-1

Treatment 1/			Yield (T/ha)					
Before Rice	N (kg/ha) to rice	Rice Variety	F 1*	F 2	F 3	F 4	F 5	Mean 2/
Dhaincha	60	B-44B	2.68	2.86	2.45	4.09	3.81	3.18
Dhaincha	60	BG400-1	3.20	2.97	2.66	3.99	3.90	3.34
Fallow	60	B-44B	4.25	2.69	2.47	3.90	3.90	3.94
Fallow	60	BG-400-1	3.40	3.67	3.39	4.77	4.13	3.87
Date Seeded (Dhaincha)			7/5/85	8/5/85	8/5/85	10/5/85	9/5/85	-
Dhaincha Age During Incorporation (Days)			38	37	37	43	37	
Fresh wt. of Dhaincha plowed down			16.00	6.0	7.1	5.0	5.8	
Rice Seedling Age (Days)			29	31	30	38	30	

Treatment F-test - NS
CV = 10.67 %

* - F = Farmer

1/ - All treatments were in the same field of each farmer to facilitate direct comparisons.

2/ - We suspect (1) insufficient water availability to well decompose the green mass, (2) total green mass production itself, (3) nutrients defficiency other than N and (4) some other factors may have caused negative effect/no effect of Dhaincha on rice yields. This trial will be repeated next year.

Table No.26:

EARLY MATURITY RICE VARIETY FFT RESULTS FOR PUMDIBHUMDI DURING SUMMER SEASON, 1985[1/]

Cropping Pattern: Rice-Wheat-Maize(F1) and Rice-Oat-Maize(F2)

Land Type : Rainfed Lowland, High Production Potential

Fertilizer Rate : 60:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Fresh Straw Yield (t/ha)	Yield (t/ha)		
				Farmer 1	Farmer 2	Mean
NR10042-67-3-2	135.0	23.55	7.98	3.17	3.03	3.10
NR10067-8-2-2	137.0	23.70	8.25	3.31	2.35	2.83
NR10068-60-3-2	133.5	23.25	9.75	3.11	2.26	2.68
NR10078-76-1-1	133.5	23.75	10.25	3.29	1.38	2.33
NR10078-100-3-3	133.5	24.55	6.35	3.21	2.53	2.87
Khumal-3	116.0	20.05	7.50	3.02	3.36	3.29
Date seeded				23/6/85	24/6/85	
Seedling Age (Days)				28	33	

Variety F-test - NS

CV = 20.44%

* F = Farmer

1/ Maize before rice in both Cropping patterns received compost however the amount applied differed very much. At F1 compost t/ha = 12.0 and at F2 = 2.7 t/ha.

Table No.27:

EARLY MATURITY RICE VARIETY OBSERVATION TRIAL

RESULTS FOR PUMDIBHUMDI DURING SUMMER SEASON, 1985 1/

Cropping Pattern: Rice-Wheat-Dhaincha(F1)
Rice-Wheat-Maize(F2)

Land Type : Lowland Rainfed, High Production Potential

Fertilizer Rate : 30:0:0 ($N-P_2O_5-K_2O$) kg/ha
15:0:0 basal and 15:0:0 top-dress

Plot Size : $10M^2$

Variety	Ave. Days to Maturity	Ave.Grain Moisture % at Harvest	Fresh Straw Yield (t/ha)	Yield (t/ha)		
				F1*	F2	Mean
Mallika	129.0	20.00	8.05	3.39	0.35	1.37± 2.15
IR 8423	129.0	18.30	9.30	3.94	**	1.97± 2.79
Gaddar	111.0	15.40	8.50	2.05	1.57	1.81± 0.34
Maturi	111.0	16.45	8.25	1.83	1.90	1.87± 0.05
JT-1 3/	118.0	14.50	5.50	3.55	2.07	2.81± 1.04
Khumal-3	118.0	16.75	8.50	3.01	3.34	3.18± 0.24
Date seeded				6/6/85	4/6/85	
Seedling Age (Days)				34	19	

* F = Farmer

** Severe sterlity problem

1/ The objective of this trial was to observe how early maturing rice varieties from different cropping systems sites perform at Pumdi Bhumdi.

2/ Mallika, IR8423 and Khumal-3 are improved varieties while Gaddar, Mutari and JT-1 (Jethe Tauli) are local.

- All varieties except Khumal-3 were heavily infested with different diseases.

(i) IR8423 and Mallika - Neck Rot
(ii) Gaddar and Muturi - Sheath Blight
(iii) JT-1 - Bacterial Leaf Blight

3/ This variety may be further tested in the comming summer season because it has very fine grain type - high market demand.

Table No. 28

LATE MATURITY RICE VARIETY OBSERVATION TRIAL

RESULTS CONDUCTED AT PUMDIBHUMDI DURING SUMMER SEASON, 1985 1/

Cropping Pattern: Rice-Fallow-Fallow

Land Type : Rainfed Lowland, Low Production Potential

Fertilizer Rate : 30:0:0 ($N-P_2O_5-K_2O$) Kg/ha

Plot Size : 10M²

Variety	Ave. Days to Maturity	Sun-dried Straw Yield (t/ha)			Grain Yield (t/ha)		
		F1*	F2	Mean	F1	F2	Mean
Sabitri 4/	172.0	10.50	6.00	8.25	0	2.24	1.12± 1.58
Handiful	NA 3/	NA	NA	NA	NA	NA	NA
Badagaule 4/	158.0	18.00	11.00	14.50	0	1.35	0.68± 0.95
Local (Gurdi)	174.0	11.00	8.00	9.50	2.32	1.88	2.04± 0.35

Date seeded	13/5/85	13/5/85
Seedling Age (Days)	41	41

* - Farmer

1/ - The objective of this trial was to test two local rice varieties Handiful (Sukchaina) and Badagaule (Chaurijhari) and one improved - Sabritri for their straw as well as grain production potential at Pumdi Bhumdi.

2/ - Only 15:0:0 ($N-P_2O_5-K_2O$) kg/ha was applied as basal. No need for top-dressing was felt looking at the plant vigorus growth.

3/ - No heading until November.

4/ - At location F1 they failed because of early cut off of water supply.

Table No.29: MAIZE VARIETY FFT RESULTS FOR PUMDI BHUMDI DURING SUMMER SEASON '85 1/

Cropping Pattern : Maize/Finger Millet-Wheat
Land Type : Rainfed Upland
Fertilizer Rate : 40:20:0 (N-P_2O_5-K_2O) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Ave. Plant Population at Harvest	Yield (t/ha)						
				F 1*	F 2	F 3	F 4	F 5	F 6	Mean
Khumal Yellow	124.5	29.40	30.4±3.7	5.36	4.06	3.06	4.21	3.66	4.55	4.15
Manakamana-1 2/	132.2	28.10	32.8±5.1	4.84	4.12	3.98	4.99	3.21	3.69	4.14
Manakamana-2 2/	127.7	26.50	33.0±6.9	5.25	3.02	3.44	5.11	4.72	4.92	4.41
Arun-4	119.1	27.58	37.0±4.8	4.45	4.20	4.79	4.67	4.09	4.59	4.47
Local	114.3	28.87	39.6±11.9	3.75	2.82	4.15	3.90	2.39	4.73	3.62
Date Seeded				9/4/ 1985	12/4/ 1985	11/4 1985	10/4 1985	7/4 1985	10/4 1985	
Compost (t/ha)				12.0	12.0	18.0	21.0	12.0	15.0	

Variety F-test - NS
CV = 14.9 %

* F = Farmer

1/ - This is the second year of this trial. Last year, Manakamana-1, Manakamana-2 and Arun-4 performed very well in Rainfed Uplands. Therefore, along with the varietal testing some minikits were distributed in the summer season of 1985. For results refer to Table No.6.

2/ - Manakamana 1 and Manakamana 2 store better and taste better than Khumal Yellow.

Table No. 30: MAIZE MINIKIT RESULTS FOR PUMDI BHUMDI DURING SUMMER SEASON, '85[1/]

Cropping Pattern : 1) Maize/Finger Millet-Wheat
2) Maize/Finger Millet-Mustard
3) Maize/Finger Millet-Fallow

Land Type : Rainfed Upland, High to Medium Production Potential.

Chemical Fertilizer Application Rate : 0 : 0 : 0

Variety	No. of Samples	Compost (t/ha)	Days to Maturity	Grain Yield (t/ha) at SMC
Manakamana-1	7	12.5±4.4	132.1±5.3	4.0±1.1
Manakamana-2	7	12.1±6.9	125.8±4.9	3.6±0.8
Arun-4	5	10.5±1.6	117.2±7.9	3.1±0.5
Local [2/]	10	11.0±3.2	115.6±5.3	2.5±0.8

1/ - Only seed for one Ropani (0.05 ha) was provided. Farmers followed local cultural practices.

2/ - Local maize was not distributed as minikit, however, we monitored few parcels with local maize to know the input applications and crop yields.

Table No. 31 : FINGER MILLET VARIETY FFT RESULTS FOR PUMDI BHUMDI DURING SUMMER SEASON 1985 1/

Cropping Pattern : Maize / Finger Millet - Wheat
Land Type : Rainfed Upland
Fertilizer Rate : 0

Variety	Average Days to Maturity	Fresh Straw Yield (T/ha)	Yield (T/ha) 3/				
			Farmer 1	Farmer 2	Farmer 3	Farmer 4	Mean
NE3801-22/	158.8	6.62	1.10	1.75	0.82	1.76	1.36
NE6401-262/	158.0	6.39	1.[illegible]5	2.18	1.28	1.64	1.54
Okhale	156.7	6.75	1.53	1.75	0.82	1.46	1.39
Local (Khalse and Dalley)	162.0	6.87	1.65	2.83	1.80	1.48	1.94
Date Seeded:			4/6/85	19/6/85	12/5/85	12/5/85	
Seedling Age (Days):			43	37	39	39	
Compost Application to Maize Crop (T/ha)			5.0	8.5	4.0	6.0	

Veriety F -test - NS
CV = 20.4%

1/ - This trial was planted as relay crop with local maize

2/ - Very unsynchronized heading

3/ - Sun-Dried.

Table No. 32. RESULTS OF MAIZE VARIETY EFFECT ON RELAYED LOCAL FINGER MILLET YIELD AT PUMDI BHUMDI DURING SUMMER SEASON, 1 9 8 5

Cropping Pattern : Maize/Finger Millet-Wheat

Land Type : Rainfed Upland

Fertilizer Rate : Maize - 40:20:0 (N, P_2O_5-K_2O) kg/ha

Finger Millet - 0 : 0 : 0

Maize Variety	Finger Millet Yield (t/ha) (Sun-Dried)						
	F 1*	F 2	F 3	F 4	F 5	F 6	Mean
Arun-4	1.12	0.68	1.49	1.31	1.65	1.49	1.29
Khumal Yellow	1.32	0.85	1.43	2.05	2.65	1.10	1 56
Manakamana-1	1.33	1.02	1.49	2.30	2.10	2.03	1.71
Manakamana-2	1.21	0.95	1.55	2.00	1.48	1.29	1.41
Local	1.00	0.78	1.75	2.30	2.24	1.35	1.57
Date Seeded (Maize)	9/4/85	10/4/85	12/4/85	10/4/85	11/4/85	7/4/85	
Date Seeded (FM.)	13/5/85	4/6/85	23/5/85	11/5/85	30/4/85	2/6/85	
Seedling Age (Days)	25	29	33	37	48	37	
Compost (t/ha)(Maize)	12.0	15.0	12.0	21.0	18.0	12.0	

Treatment F-test - NS

CV = 18.20 %

* F = Farmer.

Table No. 33: RESULTS OF EARLY MATURITY COWPEA VARIETY TRIAL CONDUCTED AT PUMDI BHUMDI DURING SPRING SEASON, 1985

Cropping Pattern : Rice - Mustard - Maize

Land Type : Rainfed Lowland, Medium Production Potential

Fertilizer Rate : 40:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Average Bio-Mass Yield(T/ha)	Green Pods Yield (T/ha)					
		Farmer 1	Farmer 2	Farmer 3	Farmer 4	Mean	Sd
IT 82 E-16 1/	7.50	7.00	12.00	5.00	6.00	7.50	3.10
IT 82 E-41 2/	9.40 4/	NA	NA	1.50	NA	-	-
IT 82 E-13 1/	6.50	6.00	10.00	8.20	7.00	7.80	1.70
IT 82 D-889	4.40 4/	3.00	NA	3.50	2.00	2.10	1.50
Days Seeded:	-	27/3/85	28/3/85	25/3/85	24/3/85	-	-
Days to Harvest 3/		113	95	100	106		

1/ - Excellent pod and bio-mass production

2/ - Excellent bio-mass producer

3/ - All varieties in each trial were harvested at same date

4/ - Average of only three locations. At location 2 (F2) the seed germination was very poor.

NA - Not Available.

Table No. 34: MEDIUM MATURITY COWPEA VARIETY TRIAL CONDUCTED AT PUMDI BHUMDI DURING SPRING SEASON, 1985

Cropping Pattern : Rice - Wheat - Maize

Land Type : Rainfed Lowland, High Production Potential

Fertilizer Rate : 20:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Average Bio-Mass Yield(t/ha)	Green Pods Yield (T/ha)				
		Farmer 1	Farmer 2	Farmer 3	Mean	Sd
TVX-4577-02D	8.08	0.30	0.21	0.12	0.21	0.09
TVX-3236-016	7.26	1.30	1.10	0.64	1.01	0.34
CP-4-2-3-1	3.16	NA	1.00	0.18	-	-
EG #-2	5.57	0.50	0.50	0.18	0.39	0.18
TVX-4677-088E	4.10	0.35	0.78	0.21	0.45	0.29
Date Seeded :		1/4/85	31/3/85	4/4/85	-	-
Days to Harvest 1/		107	112	95		

NA = Not Available

1/ - All varieties in each trial were harvested on same date.

Table No.35:

EARLY MATURITY RICE VARIETY FFT RESULTS

FOR CHAURIJHARI DURING SUMMER SEASON, 1985

Cropping Pattern : Rice-Wheat-Fallow

Land Type : Irrigated Lowland

Fertilizer Rate : 60:30:0 (N-P_2O_5-K_2O) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Yield (t/ha)		
			Farmer 1	Farmer 2	Mean
IR 25890-82-5-3	137.0	18.0	7.66	4.73	6.19
IR 8008-82-1-3-1-3	135.0	16.1	7.78	6.85	7.31
IR 26126-45-2	128.0	17.5	5.62	6.83	6.23
IR 25588-[illegible]-3-1	128.0	17.5	5.68	5.89	5.78
IR 2969-65-2-3	134.0	19.7	6.52	5.57	6.05
Laxmi	136.0	16.7	6.64	5.87	6.25
Date seeded			25/5/85	25/5/85	
Seedling Age (Days)			39	39	

Variety F-test - NS

CV = 15.52%

Table No. 36:

NORMAL SEASON RAINFED RICE VARIETY FFT RESULTS

FOR CHAURIDHARI DURING SUMMER SEASON, 1985

Cropping Pattern: Rice-Wheat-Fallow

Land Type : Lowland, Rainfed

Fertilizer Rate and Method of Application : 60:30:0 (N-P O -K O) kg/ha; 30:30:0 basal, 15:0:0 1st Top-Dress and 15:0:0 2nd Top-Dress.

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Yield (t/ha)		
			Farmer 1	Farmer 2	Mean 1/
BR 51-228	140.0	19.50	5.72	5.44	5.58[ab]
IR-46	149.0	23.40	7.48	5.68	6.58[b]
IR 10781	149.0	19.20	8.26	5.65	6.95[b]
Sabitri	140.0	19.30	5.26	4.86	5.06[ab]
BG 400-1	140.0	17.70	7.72	4.86	6.29[b]
UPLRI-5	149.0	21.10	5.55	3.71	4.63[ab]
Local	132.0	16.10	4.87	2.92	3.89[a]
Date seeded			28/5/85	15/5/85	
Seedling Age (Days)			30	29	

Variety F-test - Sat 0.05

LSD (0.05) = 1.72 t/ha

CV = 12.66%

1/ - Means followed by the same letter donot differ significantly at the 5% level.

Table No. 38:

NORMAL SEASON IRRIGATED RICE VARIETY FFT

RESULTS FOR CHAURIJHARI DURING SUMMER SEASON 1985

Cropping Pattern : Rice-Wheat-Fallow

Land Type : Irrigated Lowland

Fertilizer Rate : 60:30:0 ($N-P_2O_5-K_2O$) kg/ha

and

Method of Application: 30:30:0 basal, 15:0:0 1st top-dress and 15:0:0 2nd top-dress

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Yield (t/ha)		
			Farmer 1	Farmer 2	Mean 1/
BB394-246	135.0	16.29	7.81	7.66	7.73[b]
BR51-323	135.0	17.70	7.50	6.10	6.80[b]
I A-121	135.0	14.80	7.76	7.82	7.79[b]
OR63-252	123.0	16.40	3.91	5.80	4.85[a]
CI322-23	135.0	17.52	5.67	5.65	5.66[ab]
Janaki	135.0	17.50	5.86	6.36	6.11[a]
Date seeded			9/5/85	18/5/85	
Seedling Age (Days)			30	23	

Variety F-test - Sat 0.10

LSD (0.10) = 1.52 t/ha

CV = 11.61%

1/ - Means followed by the same letter donot differ significantly at the 10% level.

Table No. 39:

UPLAND RICE VARIETY FFT RESULTS

FOR CHAURIJHARI DURING SUMMER SEASON 1985

Cropping Pattern: Rice+Maize-Wheat+Mustard

Land Type : Rainfed Upland

Seed Rate : 100 kg/ha

Fertilizer Rate : 60:30:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Yield (t/ha)		
			Farmer 1	Farmer 2	Mean 1/
SC-322-19	122.0	18.3	3.95	3.66	3.81[b]
NR-6-7-83	107.0	17.2	4.00	2.03	3.02[ab]
MW-10	107.0	20.7	4.66	3.92	4.29[b]
Bindeshwari	111.0	18.8	4.94	3.72	4.34[b]
Local	112.0	21.3	3.60	1.87	2.74[a]
Date seeded			25/5/85	23/5/85	

Variety F-test - Sat 0.10

LSD (0.10) = 1.04 t/ha

CV = 13.45%

1/ - Means followed by the same letter donot differ significantly at 10% level.

Table No.40: EFFECT OF MAIZE POPULATION ON RICE AND MAIZE YIELDS IN MIXED CROPPING TRIALS AT CHAURI JAHARI DURING SUMMER SEASON, 1985

Cropping Pattern : Upland Rice+Maize-Wheat+Mustard
Land Type : Rainfed Upland
Fertilizer Rate : 60:30:0 (N-P_2O_5-K_2O) kg/ha
Rice Variety : Bindeshwari
Maize Variety : Arun - 4

Planting Scheme, cm (Maize)	Yield (ton/ha)								
	Farmer 1			Farmer 2			Mean		
	Maize	Rice	Total	Maize	Rice	Total	Maize	Rice	Total
150 x 40	2.70	3.38	6.08	2.32	3.26	5.58	2.51	3.32	5.83
150 x 20	2.63	3.68	6.31	2.20	2.01	4.21	2.42	2.85	5.27
100 x 50	1.97	4.20	6.17	2.14	2.09	4.23	2.06	3.15	5.21
100 x 25	1.95	3.05	5.00	2.17	2.39	4.56	2.06	2.72	4.78
Date Seeded	----- 24/5/1985 --------			--- 26/5/1985 ---					

Planting Scheme F-test - NS (for total yield)
CV = 12.02 %

Table No. 41: ANALYSIS OF COSTS AND RETURNS FOR FERTILIZER TREATMENTS APPLIED TO SABITRI RICE AT CHAURI JAHARI DURING THE SUMMER SEASON, 1985

Cropping Pattern : Rice - Wheat - Fallow
Land Type : Irrigated Lowland
Seeding Date : 13-15/5/1985

Sl. No.	Treatment (N, P_2O_5, K_2O) (kg/ha)	Mean Yield 1/ (T/ha)	Gross Returns (Rs/ha)	Fertilizer Cost (Rs/ha)	Comparisons: Treatments	Comparisons: Change in Net Profits 2/ (Rs/ha)	Comparisons: MBCR 3/
1.	60:30:0(B,2TD)	4.49	19,262	715	1 vs 3	Neg.	-
2.	60:30:0(1B, 1TD)	4.45	19,090	715	4 vs 6	158	1.69
3.	60: 0:0(B,2TD)	4.93	21,150	456	8 vs 7	Neg.	-
4.	60: 0:0(B,1TD)	5.00	21,450	456	8 vs 6	Neg.	-
5.	60: 0:0(2 TD)	5.12	21,965	456	5 vs 7	588	3.58
6.	30: 0:0(B,1TD)	4.91	21,064	228			
7.	30: 0:0(2TD)	4.93	21,149	228	1 vs 8	Neg.	
8.	30:15:0(B,2TD)	4.80	20,592	358			

B = Basal
TD= TopDress

Variety F - test - NS
CV = 9.65 %

1/ - Average yield from 2 locations

2/ - Change in gross returns minus change in fertilizer costs. Differences in labor costs are ignored.

3/ - Marginal Benefit Cost Ratio - Calculated at change in gross returns divided by change in fertilizer costs.

Table No. 42: ANALYSIS OF COSTS AND RETURNS FOR FERTILIZER TREATMENTS APPLIED TO BINDESHWARI RICE AND ARUN MAIZE AT CHAURI JAHARI DURING THE SUMMER SEASON, 1985

Cropping Pattern : Rice+Maize-Wheat+Mustard-Fallow
Land Type : Rainfed Upland
Planting Date : 24-27/5/1985
Variety : Arun-4

Sl. No.	Treatment N, P_2O_5, K_2O (kg/ha)	Mean Yield[1/] (t/ha) Rice	Maize	Total	Gross Returns (Rs/ha)	Fertilizer Costs (Rs/ha)	Comparisons Treatments	Change in Net Profit (Rs/ha)[2/]	MBCR[3/]
1	0:0:0	1.67	1.90	3.57^{d}	11,629	0	3 vs 8	2,675	11.33
2	60:30:0 (B, 1TD)	3.13	2.60	5.73^{bc}	19,557	715			
3	60:30:0 (B, 2TD)	3.75	2.64	6.39^{c}	22,291	715	3 vs 6	2586	11.87
4	60:30:0 (2TD)	2.95	2.64	5.59^{bc}	1[illegible],860	715	7 vs 9	327	3.15
5	40:20:0 (B, 1TD)	2.89	2.17	5.06^{b}	17,497	477	2 vs 5	1802	8.57
6	40:20:0 (B, 2TD)	3.13	2.57	5.70^{bc}	19467	477	4 vs 7	Neg.	-
7	60:0:0 (2TD)	3.13	2.63	5.76^{bc}	19608	456			
8	60:0:0 (B, 2TD)	3.11	2.56	5.67^{bc}	19,357	456			
9	40:0:0 (2TD)	3.10	2.48	5.58^{bc}	19,129	304			

B = Basal; TD = Top Dress

Treatment F - test - S at 0.05
LSD (0.05) = 1.02 t/ha
CV = 18.23 %

1/ - Average yield from 3 locations. Means followed by the same letter donot differ significantly from each other at 5 level.

2/ - Change in gross returns minus change in fertilizer costs. Differences in labor costs are ignored.

3/ - Marginal Benefit Cost Ratio - Calculated as change in gross returns divided by change in fertilizer costs.

Table No.43:

RICE VARIETY FFT RESULTS FOR KHANDBARI DURING SUMMER SEASON, 1985 (HILL SET)

Cropping Pattern: Rice-Wheat-Mungbean

Land type: Partially Irrigated Lowland

Fertilizer Rate: 60:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Sun-dried Straw yield t/ha	Grain Yield (t/ha)						
				F1*	F2	F3	F4	F5	F6	Mean1/
NR 10042-67-3-2	134.0	20.78	3.80	2.71	3.37	2.35	1.67	2.39	4.65	2.86[b]
NR 10078-100-3-3	134.0	21.42	3.09	2.48	3.72	2.49	1.49	2.35	3.37	2.71[b]
NR 10067-8-2-2	134.0	22.04	4.40	2.44	4.07	2.03	1.67	1.85	3.83	2.65[b]
NR 10068-60-3-2	139.0	23.04	4.86	2.38	3.48	1.76	0.82	1.76	4.12	2.39[a]
NR 10078-76-1-1	139.0	24.19	4.76	1.89	3.87	1.76	1.49	1.59	3.08	2.28[a]
Local	137.0	23.71	4.73	1.64	2.64	2.23	1.32	2.02	1.93	1.96[a]
Date seeded				14/7/85	4/7/85	16/7/85	17/7/85	8/7/85	4/7/85	
Seedling Age(Days)				29	29	20	37	27	24	

*F = Farmer

Variety F-test - Sat 0.05

LSD (0.05) = 0.52 t/ha

CV = 17.77%

1/ - Means followed by the same letter donot differ significantly at the 5% level.

Table No.44:

RICE VARIETY FFT RESULTS FOR KHANDBARI DURING SUMMER SEASON, 1985 (TERAI SET)

Cropping Pattern: Rice-Wheat-Mungbean

Land Type: Partially Irrigated Lowland

Fertilizer Rate: 60:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Ave.1/ Straw Yield t/ha	Grain Yield (t/ha)		
				Farmer 1	Farmer 2	Mean
IR 28128-45-2	132.5	23.18	2.25	2.11	1.72	1.92
Laxmi	123.5	21.57	3.30	3.10	1.32	2.21
IR25588-7-3-1	123.5	20.42	2.75	1.99	1.53	1.76
IR 8608-82-1-3-1-3	126.5	23.62	3.60	2.60	1.50	2.05
IR 29692-65-2-3	123.5	21.06	3.45	2.08	1.88	1.98
IR 25890-82-5-3	132.5	24.26	1.95	1.01	1.32	1.16
Local (Dhude)	132.5	24.26	3.25	3.25	1.58	2.41
Date seeded				15/7/85	9/7/85	
Seedling Age (Days)				27	23	

1/ Sun-dried

Variety F-test - NS

CV = 22.66%

Table No.45:

COMPARATIVE STUDY RESULTS OF DIFFERENT HILL RICE VARIETIES IN THE SECOND RICE CROP FOR KHANDBARI DURING SUMMER SEASON, 1985

Cropping Pattern: Rice-Rice-Wheat

Land Type : Irrigated Lowland Medium Production Potential

Fertilizer Rate : 46:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture Content at Harvest	Sun-dried Straw Yield (t/ha)	Grain Yield t/ha					
				F1*	F2	F3	F4	F5	Mean 1/
NR 10067-8-2-2	129.0	22.39	3.11	3.09	3.75	3.29	2.28	2.57	2.98[b]
Khumal-3	113.0	16.52	3.19	1.67	1.85	2.14	2.28	2.57	2.10[a]
Local	144.0	20.16	4.51	3.57	2.98	2.57	2.60	2.66	2.87[b]
Date seeded				9/7/85	9/7/85	8/7/85	2/7/85	4/7/85	
Seedling Age(Days)				24	24	23	30	23	

Variety F-test - Sat 0.10

LSD (0.10) = 0.61 t/ha

CV = 19.51%

* F = Farmer

1/ - Means followed by the same letter donot differ significantly at the 10% level.

Table No.46:

COMPARATIVE STUDY RESULTS OF DIFFERENT RICE VARIETIES (HILL AND TERAI) FOR KHANDBARI DURING SUMMER SEASON, 1985

Cropping Pattern : Rice-Fallow-Mungbean

Land Type : Rainfed Lowland Low Production Potential

Fertilizer Rate : 46:0:0 (N-P_2O_5-K_2O) kg/ha

Variety	Ave.Days to Maturity	Ave. Grain Moisture % at Harvest	Sun-dried Ave.Straw Yield(t/ha)	Grain Yield(t/ha)					
				F1*	F2	F3	F4	F5	Mean 1/
IR 8423	129.4	23.98	5.26	3.10	3.43	3.60	3.63	3.96	3.67[b]
Malika	129.4	23.71	4.73	3.29	2.99	3.14	3.59	2.38	3.07[ab]
Khumal-3	114.2	24.26	3.69	2.81	2.11	2.55	2.55	3.52	2.70[a]
Date seeded				10/7/85	9/7/85	14/7/85	2/7/85	15/7/85	
Seedling Age (Days)				29	17	21	32	28	

Variety F-test - Sat 0.05

LSD (0.05) = 0.65 t/ha

CV = 14.24%

* F = Farmer

1/ - Means followed by the same letter donot differ significantly at the 5% level.

Table No. 47: ANALYSIS OF COSTS AND RETURNS FOR FERTILIZER TREATMENTS APPLIED TO KHUMAL-3 RICE IN NORMAL SEASON FOR KHANDBARI DURING SUMMER SEASON, 1985

Cropping Pattern : Rice - Fallow - Maize

Land Type : Partially Irrigated Lowland

Fertilizer Treatment (N, P_2O_5 & K_2O) kg/ha	Yield[1/] (T/ha)	Gross Returns (Rs/ha)	Fertilizer Cost (Rs/ha)	Comparisons		
				Treatments	Change in net Profit(Rs/ha)[2/]	MBCR[3/]
0:0:0	2.10	7,413	0			
40:0:0	2.52	8,896	304	60:0:0 vs. 40:0:0	Neg.	?
40:20:0	3.08	10,872	477	40:20:0 vs. 40:0:0	1,803	11.42
40:20:20	3.16	11,155	529	40:20:20 vs. 40:20:0	231	5.44
				40:20:20 vs. 40:0:0	2,034	10.04
60:0:0	2.55	9,002	456	60:0:0 vs. 40:20:0	Neg.	?
				60:0:0 vs. 40:20:20	Neg.	?
				60:0:0 vs. 0:0:0	1,133	3.48

Treatment F-test - NS

CV = 26.04 %

1/- Average Yield from four locations

2/- Change in gross returns minus change in fertilizer costs. Differences in labor costs are ignored.

3/- Marginal Benefit Cost Ratio : Calculated as change in gross returns divided by change in fertilizer costs.

Table No. 48: ANALYSIS OF COSTS AND RETURNS FOR PHOSPHOROUS APPLIED TO KHUMAL 3 RICE FOR KHANDBARI DURING SUMMER SEASON, 1985

Cropping Pattern : Rice-Wheat-Mungbean

Land Type : Partially Irrigated Lowland

Fertilizer Treatments (N, P_2O_5, K_2O) kg/ha	Yield 1/ (T/ha)	Gross Returns (Rs.ha)	Fertilizer Cost (Rs./ha)	Comparisons		
				Treatments	Change in net Profit(Rs/ha)2/	MBCR3/
60:30:0	3.35	11,825	715	60:30:0 vs.	1,012	4.91
60: 0:0	2.99	10,554	456	60: 0:0		

Treatment F-test - NS

CV = 47.7 %

1/ - Average of five locations

2/ - Change in gross returns minus change in fertilizer costs. Difference in labor costs are ignored.

3/ - Marginal Benefit Cost Ratio. Calculated as change in gross returns divided by change in fertilizer costs.

Table No. 49 : ANALYSIS OF COSTS AND RETURNS FOR FERTILIZER TREATMENTS APPLIED TO KHUMAL-3 RICE IN FIRST CROP AT KHANDBARI DURING SUMMER SEASON, '85

Cropping Pattern : Rice - Rice - Fallow

Land Type : Irrigated Lowland, Wet during winter season

Fertilizer Treatments N, P_2O_5 and K_2O (kg/ha)	Yield 1/ (T/ha)	Gross Returns (Rs/ha)	Fertilizer Cost (Rs./ha)	Comparisons: Fert. Treatment	Change in Net Profit (Rs/ha) 2/	MBCR 3/
0:0:0	2.14 a	7,554	0	60:30:0 vs. 40:20:0	Neg.	
40:0:0	2.92 b	10,307	304	40:20:0 vs. 40:0:0	Neg.	0.61
40:20:0	2.95 b	10,413	477	60:30:0 vs. 0:0:0	944	2.32
60:30:0	2.61 ab	9,213	715	60:30:0 vs. 40:0:0	Neg.	Neg.

Treatment F-test - S at 0.05

LSD (0.05) = 0.58 t/ha

CV = 13.76 %

1/ - Average of four locations. Average yield followed by the same letter donot differ significantly at the 5% level.

2/ - Change in gross returns minus change in fertilizer costs. Differences in labor costs are ignored.

3/ - MBCR = Marginal Benefit Cost Ratio. Calculated as change in gross returns divided by change in fertilizer costs.

Table No.50: EFFECT OF THE INCORPORATION OF DHAINCHA (SESBANIA ACULEATA) AS A GREEN MANURE VERSUS FALLOW BEFORE RICE ON THE SUCCEEDING RICE YIELDS AT KHANDBARI DURING THE SUMMER SEASON, 1 9 8 5

Cropping Pattern : i) Rice - Wheat - Dhaincha
ii) Rice - Wheat - Fallow

Land Type : Rainfed Lowland, Low Production Potential

Rice Variety : Khumal-3

Treatment		Grain Yield (t/ha)					
Fertilizer Rate on Rice	Before Rice	Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5	Mean 1/
0:0:0	Dhaincha	1.09	1.72	2.29	3.09	2.47	2.13[b]
46:0:0	"	1.09	2.73	2.38	2.29	2.29	2.16[b]
0:0:0	Fallow	0.44	2.06	1.85	1.63	1.43	1.48[a]
46:0:0	"	0.88	2.11	2.06	2.33	1.61	1.79[ab]
Dhaincha Green Manure Yield (T/ha) :		6.5	9.0	10.0	17.0	7.0	9.9

Treatment F -test - S at 0.05

LSD (0.05) = 0.45 t/ha

CV =17.40%

1/ - Means followed by the same letter donot differ significantly at the 5% level.

Table No .51: MAIZE VARIETY TRIAL RESULTS FOR KHANDBARI DURING THE SUMMER SEASON 1985 1/

Cropping Pattern : Maize-Maize-Fallow (Trial was planted during first maize crop)

Land Type : Rainfed Upland (Tumlingtar)

Fertilizer : 60:30:0 (N, P_2O_5, K_2O) kg/ha.

Variety	Ave. Moisture % at Harvest	Yield (t/ha)					
		F 1*	F 2	F 3	F 4	F 5	Mean
Manakamana 1	25.12	2.31	2.08	1.14	2.21	1.87	1.92
Khumal Yellow	20.56	1.82	3.05	0.72	2.22	1.33	1.83
Arun-4	18.23	2.60	2.22	0.97	1.55	1.35	1.74
Manakamana-2	21.50	2.66	2.01	1.26	1.15	1.60	1.74
Local	18.12	1.54	1.78	0.98	1.14	1.38	1.36
Date Seeded		24/4/ 1985	26/4/ 1985	28/4/ 1985	28/4/ 1985	28/4/ 1985	
Compost (t/ha)		5.0	5.0	4.2	4.6	5.0	
Days to Harvest 2/		112	111	108	110	113	

Variety F-test - NS

CV - 23.22%

* F = Farmer

1/ - Severe drought during tasseling stage.

2/ - Different varieties at each location were harvested at same date to facilitate the management for timely planting of the second maize crop. The average grain moisture percent at harvest for different varieties indicate that Manakamana-1 is the latest variety under the test.

Table No.52: COWPEA VARIETY TRIAL RESULTS FOR KHANDBARI DURING SPRING SEASON '85[1/]

Cropping Pattern : Rice -Wheat - Mungbean
Land Type : Rainfed Lowland, Medium Production Potential
Fertilizer Rate : (N, P_2O_5, K_2O) kg/ha 20:20:0

Variety	Green Pods Yield (T/ha)				
	Farmer 1	Farmer 2	Farmer 3	Mean	Sd
TVX-133-16-D2	0.15	MD[2/]	1.50	0.82	0.95
CP-2-3-1	NA	MD	0.48	0.24	0.34
TVX-1850-016	NA	MD	0.20	0.10	0.14
TVx-3629	0.09	MD	0.39	0.24	0.21
All Season	0.10	MD	1.09	0.60	0.70
Date Seeded :	12/5/85	29/4/85	29/4/85	-	-
Days to Harvest [3/]	64	-	65	-	-

1/ - Very poor performance
2/ - Monkey damaged the standing crop.
3/ - All varieties in each trial were harvested at same date.

Table No.53: COWPEA VARIETY TRIAL RESULTS FOR KHANDBARI DURING WINTER SEASON, 1985[1/]

Cropping Pattern : Maize - Maize - Fallow
Land Type : Rainfed Upland
Fertilizer Rate : 20:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Green Pods Yield (T/ha)[2/]				
	Farmer 1	Farmer 2	Farmer 3	Farmer 4	Mean[3/]
IT 82 E-16	0.12	1.50	2.00	2.50	1.53[bc]
IT 82 D-380-5	0.22	1.01	0.30	4.00	1.38[b]
IT 82 D-812	0.30	0.31	1.30	2.50	1.23[b]
IT 82 E-4	3.10	2.30	1.50	2.50	2.35[c]
IT 82 D-889	0.23	4.0	2.20	2.50	2.22[c]
IT 82 E-18	0.23	0.33	0.30	2.30	0.79[ab]
IT 84 E-124	2.00	1.00	1.00	2.10	1.52[bc]
All Season	0.25	0.40	0.30	0.40	0.34[a]
Date Seeded :	15/8/85	15/8/85	15/8/85	15/8/85	
Days to Harvest[4/]	90	80	81	78	

Variety F - test - S at 0.05
LSD (0.05) = 0.71 t/ha
CV = 22.61

1/ - Trial was planted during second maize crop
2/ - Partially stolen from each location
3/ - Means followed by the same letter do not differ significantly at the 5% level.
4/ - All varieties in each trial were harvested at same date.

Table No.54 : COWPEA VARIETY TRIAL RESULTS FOR KHANDBARI DURING SPRING SEASON 1985[1/]

Cropping Pattern : Rice -Wheat - Mungbean
Land Type : Rainfed Lowland Medium Production Potential
Fertilizer Rate : 20:20:0 (N, P_2O_5, K_2O) kg/ha

Variety	Green Pods Yield (T/ha)				
	Farmer 1	Farmer 2	Farmer 3	Mean	Sd
EG BS2 [3/]	1.05	*	0.50	0.52	0.52
BS 7	1.26	2.10	0.43	1.26	0.84
LBBS # 1	1.54	0.70	1.50	1.25	0.47
BS 1 [2/]	1.73	3.20	2.00	2.31	0.78
BS 3	0.30	2.20	2.10	1.53	1.07
B6	0.90	1.25	0.85	1.00	0.23
Date Seeded :	26/4/85	2/5/85	27/4/85		
Days to Harvest[4/]	65	66	66		

Variety F - Test - NS
CV = 55.80 %

* - Harvested for green fodder because it was getting late for rice transplanting

1/ - High yield variations from farmer to farmer is attributed to several factors. Due to pressing need for vegetables during spring season our trial plots attract not only farmer cooperators but also their neighbours to make few un-official pickings.

2/ - Early, impressive pod formation.

3/ - Late, excellent for bio-mass production.

4/ - All varieties at each location were harvested at same date.

Table No. 55:

HILL RICE VARIETY FFT RESULTS FOR LELE DURING SUMMER SEASON 1985

Cropping Pattern : Rice-Wheat-Fallow

Land Type : Irrigated Lowland, High Production Potential

Fertilizer Rate : 80:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Ave. Days to Maturity	Ave. Grain Moisture % at Harvest	Sun-dried Straw Yield (t/ha)	Grain Yield (t/ha)						
				F1*	F2	F3	F4	F5	F6	Mean[1]
Khumal-3	146.8	16.38	14.50	6.36	5.70	5.57	5.85	5.13	6.21	5.80[a]
NR10042-67-3-2	151.0	17.11	10.80	5.72	6.26	5.07	6.99	3.10	6.47	5.60[a]
NR10078-100-3-3	151.0	17.57	12.85	7.59	5.17	4.82	5.12	4.35	7.28	5.72[a]
NR10067-8-2-2	160.0	17.99	12.62	4.07	4.75	3.62	4.01	2.65	4.32	3.90[ab]
NR10078-76-1-1	158.0	17.45	10.50	4.29	5.07	5.29	4.04	3.35	5.71	4.63[a]
NR10068-60-3-2	160.0	17.82	9.95	3.42	3.33	4.31	4.55	2.97	2.49	3.36[b]
Taichung-176	166.0	18.02	10.53	4.42	3.85	5.42	5.88	3.70	5.52	4.80[a]
Date seeded				17/5/85	17/5/85	13/4/85	6/5/85	3/6/85	19/5/85	
Seedling Age (Days)				44	32	27	43	32	30	

Variety F-test - S at 0.01

LSD (0.01) = 1.280 t/ha

CV = 16.71%

* F = Farmer

1/ - Means followed by the same letter donot differ significantly at the 1% level.

Table No. 56:

RESULTS OF COMPARATIVE STUDY OF DIFFERENT RICE VARIETIES

IN RICE-WHEAT-FALLOW CROPPING PATTERN IN LELE DURING SUMMER SEASON 1985 1/

Land Type : Irrigated Lowland

Fert. Rate : 80:0:0 ($N-P_2O_5-K_2O$) kg/ha

Variety	Days to Harvest	Yield t/ha					
		F1*	F2	F3	F4	F5	Mean
NR10041-66-3-1	148.2	8.19	8.09	6.16	6.20	4.94	6.72
NR10078-76-1-1	170.0	6.28	5.56	3.77	6.96	6.20	4.80
Taichung-176	170.0	5.75	6.40	5.04	6.20	4.94	5.67
Date seeded		6/5/85	14/5/85	10/5/85	20/5/85	15/5/85	
Seedling Age (Days)		42	34	44	32	45	

Variety F-test - NS

CV = 16.04%

*F = Farmer

1/ Compost application ranged from 0.9 to 1.5 t/ha

Table No.57: HILL MAIZE VARIETY FFT RESULTS FOR LELE DURING SUMMER SEASON '85

Cropping Pattern : Maize+Soybean-Mustard

Land Type : Rainfed Upland

Fertilizer Rate : a) N, P_2O_5, K_2O (kg/ha) = 60:30:0

b) Compost (t/ha) = 9.21 ± 1.89

Variety	Ave. Grain Moisture % At Harvest	Ave. Plant Population 0.000/ha	Yield (t/ha)					
			F 1*	F 2	F 3	F 4	F 5	Mean 2/
Manakamana-1	32.09	52.0	7.72	5.19	5.92	5.10	6.07	6.00[b]
Arun-4	24.80	52.8	7.04	6.06	6.21	5.68	4.76	5.95[b]
Manakamana-2	28.50	49.2	8.00	7.19	6.46	5.38	5.10	6.43[b]
Local	25.16	37.8	4.62	4.53	3.76	4.49	3.47	4.17[a]
Date Seeded :			27/4/ 1985	7/5/ 1985	12/5/ 1985	3/5/ 1985	14/5/ 1985	
Days to Harvest 1/			140	138	131	135	137	

Variety F-test - S at 0.01

LSD (0.01) = 1.16 t/ha

CV = 11.37 %

* - F = Farmer

1/ - All varieties at each location were harvested at same date but the grain moisture % at harvest indicate that Arun-4 was the earliest and Manakamana-1 the latest under the test.

2/ - Means followed by the same letter donot differ significantly at the 1% level.

WI/BKS: ds