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Prioritizing Rice Research in Bangladesh: Results of an Ex-ante Analysis

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ABSTRACT

The study analyzes the ex-ante returns to rice research to be conducted in Bangladesh during the period of 1996-2000. It is based on the scientists' interview and farm survey data of 1993-96. Using ex-ante economic surplus technique, it prioritizes the rice researches among different rice eco-system. To prioritize rice research among different research disciplines of the Bangladesh Rice Research Institute (BRRl), it used scoring approach. The study suggests that development of disease and insect resistant transplanted am an rice varieties suitable for cultivation under rainfed condition should get the highest priority followed by Boro, transplanted Aus, and deepwater aman.

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Socio-economic Factors, Problems and Solutions for Training Needs for Rice Production under National and Communal Irrigation Systems in Nueva Ecija, Philippines

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ABSTRACT

The study was conducted to determine the socio-economic factors for the training needs in rice production and other related areas of the rice farmers as well as to identify the problems of the communal irrigation system (ClS) and national irrigation system (NIS) of Munoz and Guimba, Nueva Ecija, Philippines. The study indicated that about 34% and 35% of the respondents from CIS and NIS, respectively, attended training in rice production, and 83% of the respondents in both irrigation systems were members of farmer's organizations. The technicians visited about 50% and 78% of the CIS and NIS farmers, respectively. Those who visited model farms were 32.36% under CIS and 40.20% under NIS respondents. The study also indicted that 31-37% farmers were busy in farm work at the time of training program and 24.42% farmers reported that the venues of the program were very far from their houses and over 28% farmers were not able to attend the training due to financial problems. About 29% and 28% CIS farmers suggested conducting the training at the village level and without fee, respectively; whereas 10.78% NIS farmers advised to bear the training expenses by the government. Thus, the rice farmers of both the systems should be trained at the grass root level in their own language without fee and with daily allowance so that they can attend the training program eagerly to increase the rice production for the self sufficiency of the country.

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Macronutrient Absorption Pattern of Rice and Their Distribution under Two Levels of Fertility

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ABSTRACT

An experiment was conducted at BRR! experimental field to study the macronutrient absorption pattern of rice and their distribution to various plant parts at different growth stages under two levels of soil fertility. At all growth stages under both levels of fertility macronutrients absorption followed the order of K>N>Mg>P>S>Ca. although the magnitude of absorption was almost two times higher with high level of soil fertility than with low level of soil fertility. Maximum nutrient absorption occurred at maximum tillering to panicle initiation stages. At early growth stages. most of the absorbed nutrients accumulated in culms, but at maturity their accumulation was the highest in panicle except K. which was the highest in the culms. Nitrogen. K. S and Ca absorption ceased at flowering stage and P and Mg absorption continued till maturity.

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High Density Grain Panicles of BR3 in Dry Season Based on Thousand Grain Weight under Different Plant Densities and Nitrogen Levels

A L Shah, M S Rahman and M Ishaque '

ABSTRACT

Two experiments were conducted at BRRI Regional Station. Habiganj during dry season in 1996 under different plant densities and N levels to identify high-density grains panicle based on whole panicle grain weight. Filled grains weight increased with increasing specific gravity of the sodium chloride solution. Filled grains of BR3 heavier than specific gravity of 1.18 (lOOO-grain weight >26.9 g) considered as high density grain. The panicle produced within second week at 20 x 20 cm or only first week at close spacing considered as high density grain panicles. High-density grain panicles extended one week more in seedling number experiment than spacing experiment viewing same plant densities. Application of N extended high-density grain panicles production one week than no N but the response pattern was similar as spacing or seedling number per hill. Placing more number of hills per unit area rather than placing more seedlings per hill was effective in increasing grain yield.

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Salinity Level and Nutrient Status of BRRI Sonagazi Farm Soil

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ABSTRACT

The study was performed to determine soil salinity level year round and to have a benchmark result on soil nutrient status of BRRI Sonagazi farm soil. Salinity level of surface soil (0-15 cm) increased gradually during November to March and remained peak from March to May. At the on set of monsoon, salinity level begins to decrease gradually to a minimum level «4 *dS/m)* in June and remained static up to November. In dry season, salinity of surface soil was higher (5-15 *dS/m)* compared to sub-surface (2-5 *dS/m).* In wet season (':Iune-November), salinity level did not vary considerably with soil depth. The texture of Sonagazi farm soil is clay in nature and pH ranges from 6.6 to 7.7. The surface soil has low organic matter (1.64%), total N (0.13%) and available P (8 ppm). Exchangeable Na and Mg are high compare to exchangeable K and Ca, respectively. DTPA Fe and Mn content of the surface soils are much above the critical level.

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Influence of Prilled Urea and Urea Super Granule on Grain Yield and N Use Efficiency of Some Modern and Hybrid Rice Varieties

M A M Miah, P K Saha and G M Panaulla ı

ABSTRACT

Four field experiments were conducted at Bangladesh Rice Research Institute (BRR1), Gazipur in Boro and T. Aman seasons to evaluate the performances of prilled urea (PU) and urea super granule (USG) on rice yield or modern varieties (MV) developed by BRRI and hybrid rice and N use-efficiency. Varying combinations of PU and USG along with and application methods were tested. USG was agronomically superior to PU as N source. In T. Aman, 50 kg N/ha as USG was enough for obtaining 3.5-4.0 t/ha yield. In Boro season it required 80 kg Nlha as USG to produce 6.0-6.5 t/ha irrespective of varieties. Prilled urea @ 125 kg N/ha was needed to achieve of similar yield. BRRI dhan3 lout yielded hybrid rice during wet season. In Boro, Alok and IR69690 I yielded similarly as of BRRI dhan29. The N use efficiency of both type of rice was greater with USG than that with PU.

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Influence of Leaf Clipping on Grain and Herbage Yield of Deepwater Rice *(Oryza sativa* L.)

M H Ali, M N I Miah, M I U Mollah and Nur-E-Elahi ı

ABSTRACT

The experiment on leaf clipping of deepwater (OW) rice was conducted during 1991 and 1992 in farmers' field at Subulla, Tangail, Bangladesh. The objectives were to determine forage yield, forage quality and grain yield of OW rice. Leaf clipping at 45 and 75 days after sowing and 60 days after flooding did not affect the grain yield of OW rice. Moreover, leaf clipping allowed additional rice herbage and crude protein yield over non-clipping treatment. Result also indicated a higher dry matter production and grain yield with higher harvest index. Leaf clipping at 60 days after flooding produced higher herbage, crude protein and grain yield of DW rice.

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Intercropping of Pigeonpea with Upland Rice at Different Row Ratios

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ABSTRACT

A field experiment on intercropping of pigeon pea with upland rice at different row ratios was conducted in the rice-based cropping pattern to asses the advantage of intercropping in terms of grain, biomass and economic return over rice monoculture. Both rice and pigeonpea yields reduced significantly by intercropping. However, the intercropping produced significantly higher rice equivalent yields as well as gross and net returns than sole cropping. The land equivalent ratio (LER) and the competitive ratio (Ck) values indicated the advantages of intercropping over sole crops and the mutual compatibility of the crops. Moreover, the intercropping systems added organic N to soil. Rice - pigeonpea intercropping at 4:1 row ratio was compatible and economically profitable than 7:1 and 10:1 row ratios.

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Sedimentation Enriches Flood Plain Soils

A L Shah, M S Rahman, M Ishque and G M Panullah ı

ABSTRACT

Every season BRRI Habiganj farm receives sediment around 2 t1ha due to flood which added a mean of total N. 20.14 kg; available P, 0.41 kg; exchangeable K. 1.89 kg; available S. 0.17 kg and available Zn, 0.05 kg/ha. respectively. Addition of such an amount of NPKSZn by deposition every season may contribute to fertility of the farm soil to sustain longer fertility maintenance. Rice grain yield of 4.8 t/ha in a long-term NPKSZn missing element experiment indicated higher fertility of the farm soil might be the outcome of every years deposition of sediment due to flood.

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Genetic Composition of BRRI Varieties: 11. BRRI dhan27-BRRI dhan41 and BRRI hybrid dhanl

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ABSTRACT

The study was conducted to trace the genetic composition of 16 modern rice varieties starting from BRRI dhan27 to BRRI dhan4l and one hybrid rice variety, BRRI hybrid dhanl developed by the Bangladesh Rice Research Institute (BRRI). Like earlier 25 varieties (BR I-BR26), most of the test varieties have the same maternal parent

'Cina' and carried the same semi-dwarf gene from Dee-geo-Woo-gen (DgWg). Instances were observed in utilizing local germplasm for development of BRR! dhan34, BRR! dhan37 and BRRI dhan38. Besides, wide adaptive varieties and location specific stress tolerant varieties like BRRl dhan35, BRRl dhan40, BRRl dhan41 and BRRI hybrid dhanl were also developed. Only 48 parents including five from Bangladeshi local cultivars and the rest 43 from exotic sources were used to breed these 15 varieties. During 1990 to 2000, BRRI breeders used 45% local germplasms and 2% wild rice in their hybridization programs. It indicates that breeders are trying to widen genetic background of their varieties. Use of widely adapted diverse germplasms in the development of future modern varieties are emphasized.

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Comparative Performances of Hybrid and Inbred Rice Varieties in Response to Nitrogen Fertilizer

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ABSTRACT

Four hybrid and two inbred rice varieties were tested in response to nitrogen (N) fertilizer to find out the performances of hybrid and inbred rice in Boro, 1999 at three locations in Bangladesh. Significant variations were observed in different plant characters among the varieties. IR69690H gave the highest grain yield compared to BRRI dhan29 and RRI dhan28 in all three locations. Increased tiller and panicle number was observed with increased N application. Grain yield also increased with greater N application. The highest grain yield was obtained from 200 kg N/ha at Gazipur. In Habiganj. there was no significant difference in grain yield due to added 80-200 kg N/ha. In Barisal, 120-200 kg N/ha gave statistically the similar grain yield irrespective of rice varieties.

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Performances of Late Transplanted Aman Rice at Different Population Densities in Medium Highland

M H Rashid, Nur-E-Elahi, A H Khan and M A Quddus!

ABSTRACT

An experiment was conducted at farmer's field, Kapasia, Gazipur to identify suitable late transplanted Aman variety at appropriate population density for increasing rice productivity in 1999. Three modern rice varieties were tested at four-plant spacings. BR23 and BR22 gave higher grain yield (3.61-3.81 t/ha) than Binasail. The higher grain yield of BR23 and BR22 was associated with higher number of panicles m^{-2} and heavier grain weight. The spacing 15- x 15- cm produced significantly higher grain and total dry matter yield than all other spacings. Economic analysis indicated that higher gross margins of Tk 19,454 and 17,625 came from the varieties, BR23 and BR22, respectively, at same spacing, 15- x 15- cm.

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Evaluation of Flag Leaf Photosynthesis and Related Traits in Modern and Traditional Rice Varieties

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ABSTRACT

The study was conducted in pots at Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU). Salna. Gazipur during 1999 to identify potential rice genotypes in relation to photosynthesis and specific potential traits of flag leaf for economic yield. The study included BR 11, Barud, Lalrnota and Kurimalati. Photosynthetic rate (Pn) of flag leaf at booting, flowering. milking, dough and hard dough stages were measured. The psysico-chernical properties of flag leaves were determined and yield and yield components were recorded. Flag leaf stomatal and rnesophyll conductance of BRII were poor. while its sink capacity and psysico-chemical properties of flag leaf were impressive contributing to higher grain yield. Barud showed impressive performance in respect of stomatal and mesophyll conductance, while its sink capacity was poor contributing to lower-yield compared to that of BRll. The genetic potentiality of photosynthetic traits such as stomatal and rncsophyll conductance of flag leaf of Barud may be incorporated in other high yielding varieties to improve the present observed achievable yield.

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Evaluation of Rice Genetic Resources Based on Leaf Chlorophyll Contents

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ABSTRACT

Studies were conducted at Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU), Gazipur, Bangladesh to identify potential rice genotypes capable of maintaining higher leaf chlorophyll contents during wet season. The study included 66 and 69 rice genotypes, respectively in 1999 and 2000. Chlorophyll-a, -b and -ab at each of maximum tillering (MT), panicle initiation (PI) and flowering (FL) stages were used in hierarchical cluster and step-wise discriminant function analysis and Mahalanobis distances (D^2) analysis to identify potential genotypes. The genotype numbered 53 (unknown collection numbered 78 from Rajshahi) was identified as the most potential genotype (donor), capable of maintaining higher leaf chlorophyll contents. Besides, BR22, BRRI dhan32 and Kamarga chikon might also be considered as potential donors.