Bangladesh Rice J. 14 (I & 2) 1-6, 2008

Effect of Crop Establishment Method and Time of Nitrogen Application on the Productivity of Boro Rice in Lowland Ecosystem

M H Kabir[1], M S U Bhuiya[2], Abhijit Saha[3], M A H Khan[1] and Nur-E-Elahi[4]

ABSTRACT

An experiment was conducted at the farmers' fields of Pubail upzila in Gazipur district in the Boro season (2004-05) in lowland ecosystem to evaluate the performances of BRRI dhan29 under direct wet seeding with nitrogen (N) management options. Sprouted seeds were sown in lines 20cm apart and broadcast onto saturated soil under zero tillage by drum seeder. The standard transplanting method with BRRI recommended N application in three splits at 15, 45 and 55 days after seeding (DAS) was used as control. In case of N application. three splits (at 20. 40 and 80 DAS)' four splits (at 20, 40, 60 and 85 DAS) and leaf colour chart (LCC)-based N application were investigated. Seeding technique had complete factorial combination with N management options. The total seven treatment combinations were laid out in a fractional Factorial randornized complete block design. Direct wet seeding in lines gave the highest tiller, panicles, number of grains, grain yield, gross margin and incurred less variable cost compared to broadcasting zero tilled wet soil and transplanting. Application of N at 20, 40, 60 and 85 DAS gave the higher tiller, panicles, grains m[2], grain and straw yield and gross margin followed by LCC-based nitrogen application. So line sowing zero tilled wet soil method with four splits N/LCC-based N application might be the best management package to increase the production of Boro rice in the lowland ecosystem.

Keywords: Crop establishment method, nitrogen. boro rice. lowland and productivity.

Bangladesh Rice J. 14 (I & 2) : 7-14, 200S

Effect of Genotypes and Nitrogen Management for Improving Lodging Resistance of Hybrid Rice in a Tropical Irrigated Ecosystem

M Sirajul Islam, Shaobing Peng[1], Romeo M Visperas[1], M Sultan Uddin Bhuiya[2], S M Altaf Hossain[3] and A W Julfiquar[3]

ABSTRACT

Lodging often limit hybrid rice yield in high-yielding environments. Experiments were conducted to find out the effect of genotypes and different nitrogen management at high nitrogen level to improve lodging resistance of hybrid rice at the International Rice Research Institute farm in 2005 wet season (WS) and 2006 dry season (OS) Lodging related traits were measured at 30 days after flowering. Genotypic differences for all the lodging related traits were significant. In WS, IR7911SH and SL-II H and in OS, IR7911SH and SL-SH showed lower lodging index of 3rd and 4th internodes from the top, which were attributed to higher breaking resistance and higher dry weight unit' length of lower internodcs. Application of lower amount of nitrogen at the early vegetative stage slightly increased the lower internode dry weight and subsequently increased internode breaking resistance. But different nitrogen treatments in high yielding environment had little effects on the improvement of lodging resistance of hybrid rice. The results suggest that the effective approach to increase lodging resistance in hybrid rice is to develop genotypes with increased lower internode dry weight unir' length for higher breaking resistance.

Key words: Hybrid rice, Lodging. Breaking resistance, Internode.

Bangladesh Rice J. 14 (I & 2) 15-26.2008

Effect of Polyethylene Cover on Quality Rice Seedling Production during Winter Season

M A A Mahbub', J K Biswas', R Yasmeeri' and M A Haque?

ABSTRACT

Nursery management by covering seedbeds around night and day were examined at BRRI in Boro season (winter season) in 2001-2003 to observe whether these practices improved growth of rice seedlings with any carryovcr effect after transplanting. In :200 I, the treatments were night, day and day-night covering. Covering at day-night and day produced taller seedlings compared to other treatments. But percent seedling mortality after transplanting was significantly higher due to low dry matter content resulting from the impediment of the solar radiation. However the mortality was the lowest in the night cover treatment. In 2002. we re-arrange the day cover treatment as 2, 4. 6 and 8 hrs uncovering from sunrise to sunset. The seedlings recipient of 4 to 6 Ius uncovering were superior with respect to seedling height. dry matter content. percent mortality and grain yield. The effect of covering reduced growth duration by 10-15 days in both the years. Thus covering of seedling after 4-6 hrs from sunrise to sunset might protect the seedlings from severe cold and produce quality seedling during winter season.

Key words: Polythene cover. seedling quality and carry over effect.

Bangladesh Rice J. 14 (I & 2) 27-31. 200g

Use of Fresh Poultry Litter for Growing Dry Season Irrigated Rice

J C Biswas', BC Royl, M A Badshah', G J U Ahmed ' and M R Mandaf

ABSTRACT

Field experiments were (2007 and 20(8) conducted at the Bangladesh Rice Research Institute (BR RI) Farm, Gazipur during two consecutive Boro seasons (dry season irrigated rice) to find out the feasibility of using Fresh poultry litter (PL. O-~ day-old droppings) for rice cultivation. Fresh PL was used in different rates along with variable application schedules and compared with BRRI recommended fertilizer dose (T,). Seedling mortality was also evaluated. The experiment was laid out in randomized block design with three raplications. There was no definite seedling mortality trend because of fresh PL addition compared to control. Grains panicle'' did not vary significantly due to fresh PL addition, but the highest number of panicles 11'·' was observed with T,. Use of fresh PL @ 2.5 t ha' as basal, 1.25 t ha' each at the active tillering (AT) stage and 15 days before panicle initiation (I)BPI) stage resulted in 2826 Tk ha ı additional income over chemical fertilizer-based rice cultivation. Although flRRI recommended fertilizer dose gave higher grain yield. rice could be cultivated without chemical fertilizers if fresh PL is used @ :\ t ha' for about 6 t ha' grain yield in the Boro season.

Key words: Poultry droppings. rate. fertilizer and rice yield.

Bangladesh Rice J. 14 (I & 2) 33-42. 2008

Stability Analysis for Grain Yield and Aroma in Rice under Different Environments

S M Shahidullah', M A Salam ' and A Khair'

ABSTRACT

Adaptability of 40 rice genotypes under 16 environments in Bangladesh was evaluated during July 2003 to June 2004. The regression coefficients for grain yield of seven genotypes were significantly higher indicating more responsiveness and lower adaptability. The b, values of eight genotypes were significantly lower than unity, indicating more adaptability for grain yield to environmental changes. Four showed their unpredictable nature of response to environments and exhibited maximum vulnerability in the GxE interaction. In the AMMI analysis for grain yield. the effects of genotype. environment and all the components of GxE interactions were highly significant. It was remarkable that all but two of the photoperiod-sensitive aromatic rice could be grown successfully in the Boro (winter) season. Bcnaful and Gandho k asturi showed extreme negative interactions with B4. C4. D4 and H4. In fact, Gandho kasturi did not flower at all in the 1301'0 season in all locations. On the other hand. I3R28 and Khazar had strong positive interactions with B4. C4 and H4. The genotype Khazar is an exotic variety of very poor performance in T. Aman. but excellent in 1301'0. Out of five exotic aromatic genotypes, Basmati PNR346, Neimat and Sarwati had no aroma at all. Seven cultivars were strongly, 16 were moderately and II weakly aromatic in T. Aman season. However, in the Boro season. six had moderate, 16 weakly and 12 had no aroma at all. However. aroma content did not vary over locations.

Key words: Aromatic rice. T.Aman. Boro. Genotype. Environment.

Bangladesh Rice J. 14 (I & 2) 43-48, 200g

Contribution of Crop Residue to Supply K in Rice-Wheat System

P K Saha+', A T MS Hossain", M A M Miah ', M M Rahrnan ' and M A Saleque '

ABSTRACT

A field experiment was conducted during Rabi 2002-03 to 2004-05 at the Hazi Mohammad Danesh Science and Technology University Farm, Dinajpur to assess contribution of crop rcsiducs 10 supply K and K use efficiency for the next crop in Wheat-Fallow-T. Arnan cropping pattern were investigated. The experiment reveals that application of K either from inorganic fertilizer or From wheat or rice straw increased spikes m.1 and grain and straw yields of wheat and rice, The highest grain yield of wheat was obtained with the application of 66 kg K ha' along with rice straw incorporation. Application of rice straw in Ko plot significantly increased the wheat grain yield, which was identical to 66 kg K ha ı. Application of K significantly increased the straw K content and total K uptake of both wheat and rice crops. Potassi urn replenishment through chemical fertilizer was not sufficient to balance K. However. incorporation of wheat or rice straw with inorganic K Fertilizer showed a positive K balance. A perceptible change in soil K status was also observed due to K Fertilization either From inorganic or from organic sources. Therefore, crop residucs may be used as a supplement of inorganic K fertilizer for sustainable crop production in Bangladesh.

Key words: Crop residue, K Fertilization, Rice-Wheat systems.

Bangladesh Rice J. 14 (I & 2) : 49-54. lOOS

Cattle and Poultry Manures as Alternative to Chemical Phosphorus Fertilizer for Lowland Rice

M A Saleque', A T MS Hossain ı, A Khatun? and S K Zaman ı

ABSTRACT

An experiment was conducted at the Bangladesh Rice Research Institute, Gazipur farm on a phosphorus (P) deficient soil to evaluate COWdU!lg (CD) and poultry manure (PM) as a substitute for chemical P fertilizer. Twenty kg P ha' from triple ~uper phosphate (TSP) was compared with I t ha' of CD and PM along with P control in a split-plot design using BRRI dhan28 and BRRI dhan29 in 2003, and genotypes BR4828-54-4-1-4-9 and BRRI dhan29 in 2004. The manure/fertilizer treatment was assigned in the main plot and the variety in the sub-plot. Each plot received a flat dose of 150 kg N, 50 kg K and 10 kg S ha:", respectively. In P control plot, ~R4828-54-4-1-4-9 and BRRI dhan29 yielded 5.44 and 4.71 t ha' respectively. Application of either p' fertilizer or manure increased rice yield by 14-39%. Phosphorus uptake and harvest index in the chemical P treated or manure applied plots were greater than in the control plots. Differences in grain yield and P uptake between TSP and CD or PM were insignificant. The experiment suggests that application of I t ha " CD or PM may substitute chemical fertilizer requirement for rice in a mildly P deficient soil.

Keywords: Maturity time, P uptake. P use efficiency.

Bangladesh Rice J. 14 (I & 2) : 55-59. 2008

Implications of Long-term Missing Element Trial: Efficacy of Potassium Fertilizer to Increase Rice Yield

A L Shah, M M Haque and S K Zarnan'

ABSTRACT

A long-term (23 yrs) missing for a particular major nutrient from complete Fertilizer treatment (NPKSZn) developed a nutrient stress in soil resulted in low yield. The objective of the study was to determine the effect of applying missing nutrient after 23 yrs on rice yield. Addition of the missing nutrient after 23 years produced equal yield to that of complete fertilizer treatment. Soil test-based (STB) fertilizer dose of K (80 kg ha'') application after 23 yrs increased yields of complete and reverse management treatments. Omission of N, P and K decreased yield from complete fertilizer treatment by 50, 44 and 41 %. respectively in Boro rice. Long-term application of 25 kg P and 20 kg S ha 'crop'' increased soil available P and S, while application of 35 kg K ha'' crop'' depleted exchangeable K in soil compared to initial soil test value.

Key words: Rice. missing element effect, yield restoration.

Bangladesh Rice J. 14 (I & 2) : 61-69. 2()()X

Agroeconomic Productivity of Boro-Fallow-Aman Cropping Pattern under Wet Seeded and Transplanted Method

M Harunur Rashid*'. M Sultan Uddin Bhuiya? and M Akhtcr Hossain Khan'

ABSTRACT

The agroeconomic productivity and resource utilization of Boro-Fallow-Aman cropping pattern was evaluated under wet seeded and transplanted method in the Iarmcrs ' fields at Hawli village. Damurhuda upazi la, Chuadanga in 2006-2007. Direct wet seeding and transplanting met hods of crop establishmcnt were compared in Boro-Fallow-Aman cropping pattern as wet seeded (WS) Aman-WS Boro. WS Arnan-transplanted (TP) Boro. TP Aman-WS Boro and TP Aman-TP Boro. All the four combinations of crop establishment in Boro-Fallow-Arnan cropping pattern gave similar grain yields. Water use efficiency was higher in TP Arnan followed by both WS Boro or TP Boro than WS Aman followed by either WS Boro or TP Boro. The WS Aman- TP Boro, TP Aman- WS Boro and WS Aman- WS Boro required about 9. 13 and 22% less man-day than conventional TP Aman-TP Boro cropping pattern. Transplanted arnan-w S Boro and WS Aman-WS Boro gave 4 and 5% higher gross margins. respectively, compared to conventional TP Arnan- TP Boro.

Key words: Productivity. Boro-Fallow-Aman cropping pattern. Establishment methods.

Bangladesh Rice J. 14 (I & 2) 71-77.200S

Influence of Planting Time on the Productivity of the Traditional Aromatic Rice in the Aman Season

M A Mannari'. M S U Bhuiya", H M A Hossain ' and M I M Akhand '

ABSTRACT

The experiment was conducted at the Bangladesh Rice Research Institute Farm. Gaz ipur in the Aman season to find out the o pt i mum planting time and selection of traditional aromatic rice varieties. Thirty-day-old seedlings of Kalijira. Kararibhog, Chinigura and Badshabhog were transplanted [ron: 22 July to 7 October at 15 days interval in 1999 and 2000. Rice planted from 22 August to 7 September gave more number of panicles and grains panicle ı resulted in higher grain yield. Compared to 22 August (Julian date 233) planting. grain yield decreased by 22. 13. 8. 30 and 66 percent. respectively. when planted on 22 July (Julian date 2(3). 7 August (Jul ian date 2Ig). 7 September (Jul ian date 248), 22 September (Jul ian date 263) and 7 October (Julian date 278) Chinigura and Kalijira gave higher grain yield which was statistically similar with Kataribhog. Higher number or panicles and low spikelct sterility of Chinigura and Kalijira and heavier individual grain weight of Kataribhog resulted in higher grain yield. While, the low grain yield was observed in Badshibhog irrespective or planting date. Chinigura matured earlier than the rest or the varieties. Chinigura and Kalijira could be transplanted from 22 August to 7 September for higher prodicuviry In Aman season.

Key words: Traditional scented rice. Planting time. Arnan season.

Bangladesh Rice J. 14 (I & 2) 79-86. 200X

Estimation of Marketable and Marketed Surplus of Rice in Some Selected Areas of Bangladesh

M A B Siddique.', M M Rahman ' and M S Islam'

ABSTRACT

The study was undertaken to determine the amount of disposal pattern and factors responsible for marketable surplus of rice by different farm sizes in selected areas of Bangladesh in 2003-04. The study showed that the per farm marketable surplus of Arnan and Boro paddy in the Northwestern Bangladesh (NWB) region was 9.82 and 12.07 quintal which is 50.28 and 60.31% of the total production, respectively. In the greater Mymensingh (GM) region, it was 9.36 and 10.99 quintal, recognized as 50.54 and 60.13% of total production of Aman and Boro, respectively. Total production and marketable surplus were positively related with the farm size in both the regions while percentages of marketable surplus of the total production of Boro in both the regions were little bit higher (6().~2% in the NWB and 60.13% in GM regions) compared to Arnan (50.28% in the NWB and 50.54'* in the GM regions). Medium and large farmers mostly sold their marketable surplus directly from home. while the most of the small farmers sold their marketable surplus to the local markets. Farmers began to sell their produce immediately after harvesting on account of paying labour wage. family obligations etc. However. some of the marginal and

small fanners bought it later with higher prices. It was observed that the factor influencing the level of marketable surplus was 'totul production'. Therefore. increase in production appeared to play a key role in creating marketable surplus.

Key words: Marketable surplus. total production. farm size etc.

Bangladesh Rice J. 14 (I & 2) 87-91. 2008

A Study on Producers' Shares on Consumers' Prices of Rice in Some Selected Areas of Bangladesh

M A B Siddique', M M Rahman? and M A Salarn '

ABSTRACT

The study was undertaken to evaluate producers' shares of consumers' prices and farm-retail spread of rice marketing system in the northwestern and greater My mcns i ng h (GM) regions of Bangladesh. Producers of the Northwestern Bangladesh' (NWB) obtained comparatively lower share from marketable surplus as spread was higher in this region. Consequently. middlemen of this region grabbed better net margin since their costs of marketing remained lower in the GM region. Irrespective of varieties, producers' shares were about *n-76%* of the consumers' prices as a whole which was not contemptible in Bangladesh where agricultural marketing system is not so developed. For augmenting the producers' shares, comprehensive measures like improved marketing conditions. application of contemporary market regulations along with inlrastructue development could supplement thinning the existing spread to a little more.

Key words: Producers' shares. consumers' prices, farm-retail spread.

Bangladesh Rice J. 14 (I & 2) Å93-98. 2()()<)

Effect of NaCI and Na_2SO_4 on Germination, Callus Induction and Subsequent Plant Regeneration in Some BRRI Developed Rice Varieties

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ABSTRACT

The experiment was conducted to evaluate the effects of NaCI and Na,SO, on germination, cnl lus induction and subsequent plant regeneration of 14 BRRI developed rice vuricrics at the Biotechnolog , laboratory. BRRI in 2007. Stcril dchusked rice seeds were placed on t\IS media supplcmerucd with NoCl and Na,SO, at six concentration, (0, 1.0,2.0, 3.0. 4.0 and 5.0 giLl. After germination and callus induction, the embryogenic calli were transferred to regeneration media. All the test parameters were affected sorely by Na,SO, followed by NaC\. The parameters were highly impinged at 5.0 *glL* salt concentration compared to control (0 *g/L* salt). Out of 14 test varieties. BRRI dhan41 performed hest for germination (9846%) and callus induction (95.31 *'if).* but B RR I dhan38 \ı as good for plant regeneration (87.50%). Germination was not badly affected due to addition of salts in the callus induction media. However, regeneration was found highly affected from calli developed on the media containing salts BRRI dhan41 was found as a compenent variety for germinauon. callus induction at lower salt loading while BRRI dhan38 was identify as a potential material for regeneration at lower "tit level (1.0 and 2.0 g/L). So, the variety can be used as a potential material for transformation.

Key words. rice, NaC\. NalSO~. embryogenic. callus, regcneration.

Bangladesh Rice J. 14 (I & 2) 99- I I 1. 2009

Soil Qualities of Saline and Non-saline Deltas of Bangladesh

M A Salcquc'. M N H Mahmud', A Khaturi', M M Haque ',
A T MS Hossain? and S K Zaman '

ABSTRACT

Delta soils, containing relatively more carbon. N. P and K than upland soils play an important role in carbon sequestration and mitigation of global warming. We. therefore. investigated different fractions of organic carbon content in 32 saline and non-saline delta soils from the Barisal region along with some chemical properties. Electrical conductivity in the saturation extract of the topsoil varied from 0.48 to

13.1 dS/m in December. The soil pH ranged from 4.64 to 7.63 and soil organic mauer (Walkley and Black) from 0.74 to 1.96'70. Mincralizable carbon (C"„) varied from 0.15 to 0.32 *g/kg* and potassium permanganate oxidizable C (C"„) 986 to 1195 ppm. Fractionation of organic carbon showed that the range of very labile C fraction was 0.32-1.52%. labile C fraction varied from 0.07-1.68% and less labile fraction was in the range of 0.04-1.17%. The tested soils had a wide range of available P (2-13 mg/kg) and available K varied from 0.18 to as high as 0.81 cmol kg ı soil. Across the soils. the K saturation was 1.01-3.75% of thc basic cations. The soil analysis indicated mild Zn dcficiency (less than 1.0 ppm available Zn) in the coastal delta soils with a pH above 7.0. Estimated nutrient supplying capacities according to the quantitative evaluation of fertility of tropical soil (QUEFTS) model is 42-163 kg N. 6-23 kg P and 33-447 kg K/ha. Many of the tested soils showed ability to support 5 t/ha yield without any N, P and K fertilizers. while some others would require fertilization. Given the fact of higher proportion of labile C. delta soils need attention for carbon sequestration to reverse global warming. The notion of higher fertility in delta soils seems to be reinvesrigatcd and site-specific nutrient management need to be done for sustainable rice yields in the coastal region.

Keywords: Carbon fractions. delta soils, rice, salinity. soil-rest based lcn il i zcr recommendation.

Bangladesh Rice J. 14 (I & 1) 113-117.2009

Nutrient and Heavy Metal Contents in Poultry Litter

F Rahman ı, A T M S Hossain ' and M R Islam?

ABSTRACT

Two studies were conducted at the Soil Science Laboratory. BRRI, Gaz ipur in 2007 to determine the available plant nutrients and heavy metals from fresh to 110 days decomposed poultry litter collected from the layers poultry of Chandana farm, Gazipur. The heavy metals and trace elements in poultry feeds and poultry liners collected from different layer types of poultry farm at Gazipur were also determined. Fresh poultry liner contained the highest amount of different elements. Poultry feeds and poultry litters of different poultry farms varied widely in metallic elements. Elements content in poultry litter reduced gradually with increased decomposition period. The heavy metal content in the test poultry litter was below the proposed maximum allowable standard in Bangladesh. Therefore. poultry litter may be used judicially as a safe organic fertilizer for sustainable rice production.

Key words: Poultry litter. Heavy metal, Allowable limit.

Bangladesh Rice J. 14 (I & 2) 119-125.2009

Effect of Water Management and Sowing Date on Direct Wet-seeded Aman Rice Cultivation by Drum Seeder

Shahana Parveen', M A Sauar' and M S Alam '

ABSTRACT

The performance of direct wet-seeded Arnan rice (WSR) under four sowing dates and three irrigation regimes was evaluated by sowing I3RRI dhan39 with drum seeder at the I3RRI research farm in the Aman season 2005-06. The four sowing dates were 16 June. I July. 16 July and 31 July. Three irrigation regimes were i) rainfed condition. i i) two irrigations at the maximum iil lcring and panicle initiation stages and iii) three irrigations at the ma'x i mum tillering. panicle initiation and grain filling stages. Daily rainfall (RF) pattern showed that I July and 31 July sowing required irrigation in land preparation in both the years. Grain yield was significantly inllueneed by different sowing dates and water management practices in both the years. The highest grain yield (3.77 t/ha) was obtained from crop sown on I July and 31 July in 2005 with three supplemental irrigations. With the same irrigation practices. the highest yield Cl.97 t/ha) was obtained from 31 July sowing in 2006. Under rainfed conditions. grain yield was significantly inllueneed by different sowing dates. In both the years. I July sowing gave the highest yield. It was 3.26 t/ha in 2005 and 3.17 t/ha in 2006. Water use efficiency (WUE) varied from 66 to 89% in 2005 and 93 to 100% in 2006. Water productivity varied from 2.40 to 3.64 kg/ha-mm in 2005 and 3.07 to 4.50 *kg/* ha-mm in 2006. For securing good yield with direct wet-seeded drum sown T Arnan crop from Illid to 31 July with three supplemental irrigations may be recommended.

Key Wor ds: Drum **seeder. supplemental irrigation. water** manugerncnt. **water** use **efficiency**. water productivity.

Bangladesh Rice J. 14 (I & 2) 127-132,2009

Evaluation of Transplant Aman Rice on Raised Bed in Rice-Wheat Cropping Sequence

M I U Mollah', M S U Bhuiya', M H Kabir', S M A Hossain? and A Saha"

ABSTRACT

An experiment was carried ouı at the Bangladesh Rice Research Institute farm, Gazipur during wet seasons (June-November) in 200} and 2003 10 evaluate effects of bed width. plant row number per bed and plant-to-plant distance on the agroeconomic produci ivity of rransplant Amun rice under bed planting in Rice-Wheat cropping system. Transplanting on 70, XO and 90 cm width bed with two and three plant rows per bed along with flat (convenuoual) and 10, 1.' and 20 cm plant-to-plant distances were tested. Bed planting with 70 cm bed width of increased grain yield 10 *17'10,* over conventional method. It increased the grains panicle·' of rice. The cost of cultivation in bed planting (Tk 13,645- 15,716 ha') was much lower than conventional method (Tk 19,765 ha:') whereas gross return, gross margin and benefit-cost ratio in 70 cm beds (Tk 41.960-44,900 ha', Tk 26,310-30,450 ha' and 2_68-3. I I, respectively) were higher than conventional method (Tk 38,700-38,800 ha', Tk 18,930-19.030 ha' and 1.96, respectively). Thus bed planting appeared 10 he promising for both yield advantage and cost-effccrivencss.

Bangladesh Rice J. 14 (I & 2) : 133-138,2009

Nitrogen Use Efficiency of Direct-seeded Aman Rice under Bed Planting Method in Rice-Wheat Cropping System

M I U Mollah', M S U Bhuiya", M H Kabir', A Khatun and A Saha.j

ABSTRACT

An experiment was conducted at the Bangladesh Rice Research Institute farm, Gazipur and at farmer's field in Chuadanga during *Kharit-1 I* season 2002 (June to November) to determine the effect of different doses of N fertilizer on growth and yield of direct-seeded arnan rice (DSRLand to compare N use efficiency of DSR in bed with the conventional method. Bed planting with 0, 60, 80, 100, and 120 kg N ha I and the conventional (flat) method with () and 100 kg N ha' were tested. Yield increase in bed planting with RO and 100 kg N ha' over Ion kg N ha' in the convcntional method was 6-X'if, which increased the grain number panicle' and fertility. Weed infestation was less in bed planting. Partial factor productivity was higher in bed planting (,)240-.'i') 10 kg grain kg' N) than the conventional method (4900-')2.10 kg grain kg; N) with the same N rate (100 kg ha '). Likewise, agronomic e tficicncy was higher in bed planting (1').60-20.10 kg grain Increased kg' N) than conventional method (12.60-1710 kg grain increased kg' N). Bed planting saved 20-40 '/r N fertilizer without losing yield.

Bangladesh Rice J 14 (I & 2) 119-146, 2009

Bed Planting: A Water Saving Technology in Rice-Wheat Cropping System

M I U Mollahl, MS U Bhuiya", A Khaiun ', M H Kabir4, MS Ali' and A H Khan"

ABSTRACT

Two experiments were conducted one at the Bangladesh Rice Research institute (BRRI) farm, Gazipur and other at fanner's field in Chuadanga in 2001-2003 10 evaluate bed plaming as water saving technology for Rice- Wheat cropping systems. Bed planting with 70, 80 and 90 cm wide beds along with conventional planting method for wheat. direct-seeded rice (DSR) and transplant rice (TPR), and Wheat-Mungbean-DSR, Wheat-Mungbean-TPR, Whcal-Fallow-DSR and Wheal-Fallow-TPR cropping patterns methods were tested. Bed planting with 70 c m wide bed increased grain yield of rice, wheat and mungbean over the conventional method. Bed planting saved 41-48 '7(irrigation water for wheat and supplemcntal migarion water of 76-79 % in DSR and 49-57 '7.: in TPR in Aman rice. About 5()')f inig ation water and lime for application could be saved through hed planting ill Whear-Mungbcan-Ricc cropping system.

Bangladesh Rice J. 14 (I & 2) 147-151.2009

Evaluation of Different Water Distribution Systems at STW Irrigation Project

M N Hassan'. M A Khair2, A F M Salch' and L R Khan~

ABSTRACT

This study was undertaken to compare the conveynuce loss. command area and cost effectiveness of different distribution systems in the Boro season. 2003-04 at three selected shallow tubewell (STW) sites In Thakurgaon. Conveyance losses varied from 5.25 to 6.44 IIslI OOm for earthen canal which was -10-47"k of the actual STW discharge: for improved canhen canal it varied from 3.67 to 3.97 //s/ lOOm which was 28-31 % of the STW discharge and for hose pipe it varied from 0.26 to 0.30 //s/ lOOm which was only 2%. For improved compacted earthen canal water distribution system. saving of irrigation water and distribution time and increase of irrigated area were 29-380/,. 25-299< and -10-44'7<. rcspectix ely in comparison to that of uncornpacted (farmer's practice) earthen canal. Similarly for hose pipe distribution system, the above parameters were 9-1-96%. 56-61o/r and 80-R6o/r respectively in comparison to that of uncompacred earthen canal system. The average command area increased by 87 and 133% for operating the pUIl1P 8 and 10 hr/day. respectively. Saving ti i mc and conveyance losses due: to introduction of improved earthen canal and hose pipe for water distribution. the command area could be doubled. Considering only the construction and material cost of different water distribution system. the average costs were 24.3. 'i0.8 and 21.0 Tk/rn/yr for typical earthen canal. improved earthen canal and hosepipc. respectively. The improved earthen canal and hose pipe are advocated to i nc rcase the conveyance efficiency greatly by reducing water loss and time for water distribution.

Bangladesh Rice J. 14 11 & 2) 153-15'1. 2()()9

Raised Bed Furrow Irrigation for Wheat and Boro Rice Cultivation in Shallow Tubewell Irrigation Project

M Hassan ı. M A Khair. A FM Salch' and L R Khan~

ABSTRACT

The experiment was conducted to assess the irrigation effectiveness and optimum size of bed widths for wheat and 801'0 rice cultivation at Thakurgaon in 20()3-0-l and 2004-05.Three bed widths (40. 60 and 80 cm) having 30 cm furrow widrh were compared with fanners practice (I'lat bed). The highest yields of 3.36 and 3.33 tlha for wheat were obtained from -10 cm bed width plot in both the years. About 25'7r water was saved by this practice over the farmers' Il.u bed. The highest net return (Tk 24,517 and 20.844) and benefit-cast-ratios 18CR) (2.11 and 2.Y;) were obtained trmn ~10 cm bed in both the years. Thus 40 cm bed with 30 cm wide furrow seemed to be suitable for obtaining high wheat yield. The highest yields of 6.60 and 6.73 tlha or 801'0 rice were obtained from flat bed (conventional system) in both the years. Although about 6 and 12'/' water were saved by 4() cm bed width plot over the farmers' flat bed. The highest net return (Tk 22.-10-1 and 23,890) and 8CR (1.93 and 1.94) wen; obtained from fanners' flat bed in both the years. Thus Iarmcrs ' flat bed is more suitable to produce rice than raised beds.

Key words: Raised bed. irrigation. wheat. rice

Bangladesh Rice J. 14 (I & 2) 161-167.2009

Performances of Direct and Standard Cooling Systems for Small Engine Used in Irrigation

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ABSTRACT

This study was conducted to determine the effect of cooling on shallow tubcwcll engine in terms of fuel consumption, discharge and specific discharge (SPD). Two types of diesel engine (12 and 6 hp), two sizes of centrifugal pump (43 medium heavy and 43 light pumps) and one fixed well were chosen. The operating speeds of the pump were maintained 12,'\0, 1320 and 1400 rpm. In standard cooling system, the temperature of water was 10 I-S2°e whereas in direct cooling system, temperature of water in water tank fallen up to 46°C, The fuel consumption of standard cooling was low compared to direct cooling for all types of engine and pump. In direct cooling system of 12 hp engine, fuel consumption was 5-17% higher than standard cooling. For 12 hp engine, the percent increase of SPD of standard cooling was 17-23% compared to direct cooling of medium heavy pump. This increasing trend was also found in case of 12 hp engine with light pump. The fuel consumption was 4-7% higher and SPD was 5-8% lower in direct cooling compared to standard cooling for 6 hp engine with light pump. Six hp diesel engines with

combination of 4" medium heavy pump followed the same role. Therefore, standard cooling was recognized as economical and environmental friendly compared to direct cooling.

Key word: Specific discharge, Direct cooling, Standard cooling, Engine and Pump.

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Integrated Approach for Mitigating Drought in Transplanted Aman Rice in Northwest Region of Bangladesh

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ABSTRACT

The study was conducted to mitigate drought in T Aman cultivation. Drought severity (drought amount of a particular duration) was simulated by a conceptual daily water balance model. Data on daily rainfall and evapotranspirnti on. soil texture, seepage and percolation rate, crop growth duration, transplanting date and plot bund height were used in simulation. It was simulated at different growth phases and the entire growth period of T Aman rice. The integrated approach included (I) selection of drought escaping variety, (2) determination of transplanting period in terms of drought risk and (3) determination of levee height responsible for reducing drought by conserving rainwater. Transplanting from *IS* June to 25 July and from 15 June to 5 July were identified as low risk of drought for short and medium duration varieties, respectively. Levee height of 200 mm was found enough to address drought. The study suggests for transplanting a short duration variety (120-125 days), in low-risk transplanting period (from *IS* June to 25 July) with 200 mm bund height to minimize drought in T Arnan cultivation in northwest region of Bangladesh.

Key words: Drought, T. Aman, hund, simulation, rainwater.

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Determination of Optimum Nitrogen Dose for BRRI dhan29 Using Two Specific SPAD Meter Readings

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ABSTRACT

The conventional 'Split nitrogen (N) application schedule' was compared to optimize N use with 'the Soil Plant Analysis Deve lop ment (SPAD) based N application met hod ' 10 determine a su n ab!e N management practice. The field experiment was conducted at the research farm of BRR!. Gazipur during the winter (Boro) seasons of 2002 and 2001 with BRRI dhan29 as the test variety. There were six N treatments (20, 25, 30, 35 and 40 kg N In') against two SPAD values (36 and 38). The BRRI recommended three split N fertilizer application schedule served as control treatment. Rice leaf calor (greenness) was measured weekly starting from 24 to 87 days after transplanting (DAT) during the growing season and N fertilizer was top dressed when the leaf greenness faded below certain levels on the SPAD numerical scales. Rice grain yield and N use efficiency parameters were used as indicators of efficiency of the N management techniques. T, (SPAD'',N,o gave the highest grain yield (1i.41i t ha ') with the highest agronomic use efficiency of applied N (37 kg grain increased kg' N) and partial factor productivity (58.75 kg kg' N) Application of 20 kg N ha' at each split based on SPAD'', reading appeared best for BRRI dhan29.

Key words: SPAD meter. Nitrogen dose, Nitrogen use efficiency. BRRI <lhan29

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Short Comunication

BRRI dhan46 : A Variety for Late Planting in the Flood-prone Environment of Bangladesh

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