Bangladesh Rice j. 7(1&2): 1-9, 1996

Response of Dry Matter Accumulation and Distribution to Water at Different Growth Stage of Rice

M R Ahmed[1], F Jameel[1] and K T Ingram[2]

ABSTRACT

Effects of water stress on dry matter accumulation and distribution in rice was studied at the International Rice Research Institute, Philippines, in 1991. Water stress at different growth stages of rice reduced the dry matter of leaf blade, leaf sheath, culm, panicle and that of the entire shoot. Root dry matter was significantly affected by water stress only at the vegetative stage. Among different plant parts, panicle was mostly affected and plants stressed at the reproductive stage had the least panicle dry matter. Among the cultivars used in the experiment, IR72 had the most shoot dry matter accumulation except in plants having water stress at the reproductive stage.

Bangladesh Rice j. 7(1&2): 11-15, 1996

Water Management for Higher Productivity in Rice-Based Cropping Systems under Irrigated Environment

M N Islam, M A Sattar, G Mowla, M K Mondal, Nazrul Islam, M R Rashird, M N Hassan, H R Molla, M A K Khan, M T Islam and N J Joarder

ABSTRACT

The study was conducted in the Ganges-Kobadak Irrigation (GK) Project and the North Bangladesh Tubewell (NBT) Project with the objective of judiciously utilizing rainfall and irrigation water by proper selection of rice-based cropping pattern. In GK Project area, the highest yield both under research management (RM) and farmers' management (FM) plot was obtained in Onion - BR1 - BR11 pattern. Farmers' of the GK Project cultivated a wide range of non-rice crops in the Rabi season by using residual soil moisture. Of all the non-rice crops,

khesari was the most popular followed by onion, gram and wheat. In NBT Project area, the pattern Sonalika - Purbach - BR11 gave the highest yield. Total yield in RM plots was 12.21 t/ha in which rice yield was 10.33 t/ha. Similarly, in FM plots, total yield was 11.09 t/ha in which rice yield 9.12 t/ha. Coverage of potato (4%) and mustard (2%) as Rabi season has been increasing in NBT Project area.

Bangladesh Rice j. 7(1&2): 17-21, 1996

Effect of Rate of N Fertilizer on Growth and Yield of Japonica and Japonica-indica Hybrid of Rice

K Ahsan

ABSTRACT

A field experiment was conducted at the Tsukuba International Agricultural Training Centre (TIATC) farm in order to determine the varietal response to N application and to findout the optimum rate of N fertilizer application for higher grain yield. The treatments were N_o, N_{50}, N_{100} and N_{150} kg/ha and the two rice varieties Kinuhikari (Japonica) and Ohchikara (Japonica-indica hybrid) were tested. Tiller number, leaf area indes (LAI) and the number of panicle and spikelets per hill increased with the increase of F fertilizer application up to 150 gk/ha but the effective tiller percent, sink/source ratio, percent ripened grains and 1000-grain weight decreased with increasing levels of J application in both the varieties. Kinuhikari showed higher tillering capacity, higher LAI and higher number of panicles and spikelets per hill compared to those in Ohchikara but the sink/source ratio, percent ripened grains and 1000-grain weight obtained lower compared to Ohchikara. Considering the grain yield, 100 kg/ha appeared to be the optimum rate of N fertilization for both varieties.

Bangladesh Rice j. 7(1&2): 23-26, 1996

Time of Urea Incorporation to Soil on Nitrogen Use Efficiency in Wetland Rice Soil

M A Rashid, F Jameel, M Ishaque and K A Billah

ABSTRACT

This experiment was conducted in farmer's field to evaluate the effectiveness of applied urea-N incorporation and to determine the optimum time of urea-N incorporation to the soil. Six different times of urea-N incorporation were tested. Generally, incorporation of applied urea to the soil increased some agronomic parameters and grain yield. The increment was highest when urea was incorporated at the day of application. Delay in urea incorporation gradually decreased the N use efficiency. The nitrogen content of straw and rice was not influenced by the time of incorporation. However, a maximum of 111.5 kg N/ha was absorbed in case of N incorporation on the day of N topdressing.

Bangladesh Rice j. 7(1&2): 27-30, 1996

Effect of Water Stress on Root Length Density Of Dry Seeded Rice

M R Ahmed, K T Ingram and F Jameel

ABSTRACT

In a field experiment conducted at the International Rice Research Institute, Philippines during 1991 dry season, the effect of water stress on root length density (RLD) of four rice cultivars was evaluated. Water stress as imposed during vegetative and reproductive growth stages significantly decreased total RLD. Roots in the shallow soil layers were more affected than those in the deeper soil layers. Most of the roots were confined within 0-10 cm soil layer and very few roots in the deeper soil layer (20-40 cm). Among the study cultivars, BR20 and IR72 had greater RLD in the deeper soil layers which is an important drought resistance mechanism. The greatest RLD was observed near heading stage in all cultivars.

Bangladesh Rice j. 7(1&2): 31-34, 1996

Inheritance of Basic Vegetative Phase and Photoperiod Sensitivity in Rice

S Khatun, N M Miah and M A Salam

ABSTRACT

Inheritance of basic vegetative phase (BVP) and photoperiod-sensitivity in rice was determined in seven crosses comprising two photoperiod-sensitive (PS) varieties, Nizersail and Latisail, four photoperiod insensitive (PI) genotypes viz BR3, BR4, IR36 and Mala J15. Short BVP and photoperiod sensitivity showed dominance effects in F_1 generation in all the crosses. In F_2, segregation pattern in a cross IR36 x BR3 (long BVP x short BVP) showed a good fit to the genetic ratio 15 (short BVP):1 (long BVP) suggesting a digenic inheritance of BVP. A segregating ratio of 3 (PS): 1 (P1) was obtained form the PS x PI crosses Viz, Nizersail x BR3, Nizersail x BR4, Latisail x BR3 and Latisal x BR4 in F_2. On the other hand, Nizersail x Mala J15 and Latisail x Mala J15 showed respectively 9 (PS) : 7 (PI) and 15 (PS) : 1 (PI). These observations indicated a monogenic to digenic inheritance of photoperiod sensitivity in rice.

Bangladesh Rice j. 7(1&2): 35-39, 1996

Development of an Animal Drawn Seed Drill for Upland Rice

M Maqsudar Rahman, M Syedul Islam and A Haq

ABSTRACT

A two-bullock drawn four row seed drill for upland paddy was designed, developed and tested in the Bangladesh Rice Research Institute (BRRI) for seeding Aus paddy in rows. The seeder was developed to reduce seed requirement for sowing and to take advantage of machine weeding and thus reducing the weeding cost per ha compared to traditional hand broadcasting method of sowing. It was observed that only 50-60 kg seed was required per ha of land by the seeder with a field capacity of 0.13 ha/hr. There is no adverse effect on seed germination and yield by the seed drill method of sowing upland paddy. The draught power requirement of the implement is 0.25-0.30 kw which is within the capacity of two bullocks. The weeding cost in the seed drill seeded plot was Tk. 3,635/ha and that of the band broadcasting was Tk. 5,628/ha.

Bangladesh Rice j. 7(1&2): 41-44, 1996

Nitrogen use Efficiency of Urea Supergranules and Prilled Urea in Irrigated Rice Cultivation

M A Rashid, K A Billah, M A Mazid and F Jameel

ABSTRACT

Field experiments were conducted in two locations of Gazipur district during the Boro season (Jan-May) of 1989 to determine the nitrogen use efficiency of urea super granules (USG) and prilled urea (PU) in irrigated rice cultivation. It was observed that 87 kg N/ha from USG produced the highest grain yield. However, 58 kg N/ha from USG and 87 kg N/ha from PU produced statistically similar grain yield to that of 87 kg N/ha from USG. Therefore, one third of the nitrogen required for the conventional split application of PU (87 kg N/ha) can be saved by using USG (58 kg N/ha) to have same level of crop yield.

Bangladesh Rice j. 7(1&2): 45-48, 1996

Effect of Intercropping Sesbania with Mungbean and Different Row Ratios on Mungbean and Nitrogen Yield

Nur-E-Elahi and William D Pardee

ABSTRACT

An experiment was conducted at the IRRI experimental farm in the Philippines during 1989 in the pre-rice dry-wet transition period under irrigated condition. The experiment included 1:1, 2:1, 4:1, 2:2, 4:2 mungbean:sesbania intercropping row ration and sole cropping mungbean and sesbania. The experiment was conducted to determine the performance of mungbean-sesbania intercropping and mungbean and sesbania sole cropping on mungbean grain yield and production of organic nitrogen for subsequent rice cultivation. Results showed that sole mungbean produced 46% higher mungbean yield that the mean ykeld of mungbean + sesbania intecropping row ratio. All intercropping row ratio produced mungbean yield ranging from 310 to 494 kg/ha. The mungbean+sesbania intercropping and sole sesbania produced comparable organic nitrogen yield. This suggests the possibility of intercropping sesbania with mungbean in the pre-rice dry-wet period for grain and nitrogen for the subsequent rice crop.

Bangladesh Rice j. 7(1&2): 49-52, 1996

Effect of Planting Geometry on the Agroeconomic Productivity of Wheat, Lentil and Chickpea Intercropping System in the Upland Environment

A M Bhuiyan, A H Khan, Nur-E-Elahi and N U Ahmed

ABSTRACT

The agroeconomic productivity of wheat (*Triticum aeastivum,* L) lentil (*Lens culinaris,*L) and chickpea (*Cicer arietinum,*L) were evaluated under sole and intercropping system in BRRI farm, Joydebpur, Gazipur, All crops grown as single stand were found to produce higher yield. Yields of lentil and chickpea were drastically reduced under intercropping system.It was observed that all treatments produced comparable wheat equivalent yield. But treatments$_8$ and treatment$_9$ were found compatible. Sole crop of lentil and chickpea were found to fetch significantly higher net return and benefit-cost ratio; followed by treatment T_8 and T_9. For farmers' diversified need for cereal and legume protein in the regular diet, treatment T_8 and T_9 may be an ideal agronomic practice to satisfy the farmers' diversified need for cereal and legume protein.

Bangladesh Rice j. 7(1&2): 53-59, 1996

Profitability of T. Amana Rice Cultivation in Coastal Saline Soil of some Selected Areas of Bangladesh

M A Quayum, M R Islam, M A Jabber and B A A Mustafi

ABSTRACT

The average farm sizes in Noakhali and Chittagong districts (coastal saline soil of Bangladesh) were found 1.52 ha and 1.33 ha, respectively. The average yield of local improved variety (LIV) and modern variety (MV) in Noakhali district were found 1921 kg/ha and 4129 kg/ha, whereas in Chittagong district, these were 1784 kg/ha and 4252 kg/ha, respectively. The gross returns in Noakhali and Chittagong were Tk 23398/ha and Tk 23384/ha for MV as well as Tk 11682/ha and Tk 1246/ha for LIV. The total costs of production of MV and LIV in Noakhali district were Tk 13633/ha and 10033/ha, but in Chittagong district, the total costs were Tk 15623/ha and Tk 10433/ha on full cost basis. The average net returns of MV and LIV (T.Aman) obtained in Noakhali district were

Tk. 9765/ha and 1649/ha on full cost basis but in Chittagong district, these were Tk 7761/ha and 2034/ha, respectively. On full cost basis, the benefit cost ratio of MV (T.Aman) in Noakhali and Chittagong districts were found 1.72 and 1.50, whereas for LIV, these were 1.16 and 1.19 respectively. Thus the cultivation of MV rice in the T. Aman season is more profitable than that of LIV rice in the selected coastal saline soils of Bangladesh.

Bangladesh Rice j. 7(1&2): 61-67, 1996

Development of an Animal Drawn Moldboard Plough

M Maqsudar Rahman, M Muzzammil Haq and K A Haq

ABSTRACT

A moldboard plough was developed in the Bangladesh Rice Research Institute (BRRI) in two stages, namely prototype 1 and prototype 2 to overcome the demerits of the country plough. The landslide of plough bottom is made of 3 inch M S angle bar and the share and moldboard made of single piece of 4 mm thick MS sheet metal. Each prototype was compared to the country plough in BRRI farm in two different soil conditions namely clay soil and sandy clay soil with moisture content between 15% and 19%. Results indicated that the field capacity of the improved moldboard plough was 0.024 and 0.027 ha/ha and that of the country plough were 0.022 and 0.022 ha/hr in sandy and sandy clay soil respectively. The inversion of soil by improved plough was 40 and 75 percent in clay and sandy clay soil respectively and that of the country plough was negligible. The pulling force per unit area of soil disturbed by the improved moldboard plough were 1.35 and 0.66 kg/cm^2 in clay and sandy clay soil respectively whereas the corresponding figures for the country plough were 1.32 and 1.11 kg/cm^2 respectively. The improved plough performed better that the country plough in the sandy clay soil in terms of soil inversion, pulling force per unit area and field capacity. Wood could be saved using mild steel in manufacturing the plough.

Bangladesh Rice j. 7(1&2): 69-73, 1996

Effect of Sesbania and Mungbean Intercropping on Yield of Rice

Nur-e-Elahi and William D Pardee

ABSTRACT

A field trial was designed to examine the effect of sesbania [Sesbania rostrata (Brem)] and mungbean [Vigna radiata (L.)] intercropping at two ratios on the yield of rice. The irrigated trial was conducted at the International Rice Research Institute (IRRI), Los Banos and Guimba, Nueva Ecija, Philippines. Both 1:1 and 2:2 (mungbean:sesbania) row ratios has been found ideal for producing higher organic nitrogen. Sesbania could be a better source of organic nitrogen than mungbean under sole cropping. Intercropping of sesbania reduced the grain yield of mungbean at the rate of 345 kg/ha at Los banos and 245 kg/ha at Guimba, than the grain yield of mungbean grown as sole crop. Grain yield of rice with sesbania and urea-N were comparable. This suggested that sesbania could substitute 45 to 90 kg/ha of urea N. Higher nitrogen efficiency (30:1) was found at Guimba than that at Los Banos.

Bangladesh Rice j. 7(1&2): 75-79, 1996

A Computer Programme for Stability Analysis

Manotosh Howlader, Kamal Rahim, R K Das and Jannatul Ferdous

ABSTRACT

A computer programme for estimating stability parameters of genotypes and their significance tests are provided in BASIC language.

Bangladesh Rice j. 7(1&2): 81-84, 1996

Effect of some Cultural Practices on the Yield Components and Yield of BR3 in Dry Season

A L Shah, A H Khan and A R Gomosta

ABSTRACT

Two field experiments were conducted in BRRI Regional Station farm, Habiganj during 1992 dry season to study the effects of spacing, seedling number and N rate on the yield and yield components of BR3. Panicle number/m^2 increased with the increase in number of seedlings/hill and nitrogen rate and with the decrease in spacing. Filled spikelets/m^2 followed the trend of panicle number. The 1000-grain weight remained similar at different spacings and seedling numbers but found to decrease at increased rate of added N. Grain yield was observed to increase up to 60 kg N/ha. Grain yields were comparable with different seedling numbers, and 20- x 20-cm and 10- x 10-cm spacings. A 30- x 20-cm spacing produced the lowest yield. Results revealed that 20- x 20-cm spacing and 3 seedlings/hill with 60 kg N/ha was optimum for BR3 yield in the haor soils of Habigonj.

Bangladesh Rice j. 7(1&2): 85-88, 1996

Effect of Foliar Application of Nitrogen on Deepwater Rice

H Ali, M I U Mollah, P C Bhattacharya, S Alam and M N I Miah

ABSTRACT

Experiment with foliar application of nitrogen was conducted under farmer's field conditions at Shubulla, Mirzapur, Bangladesh in 1991 and 1992. The objective was to determine the effect of foliar application of nitrogen on grain yield and yield contributing characters of deepwater rice. The highest grain yield was produced when 20 kg N/ha was applied as topdressed along with 20 kg N/ha as foliar application at the panicle initiation stage. This treatment also produced increased grain per panicle and 1000-grain weight.

Bangladesh Rice j. 7(1&2): 89-93, 1996

Increasing Farmers' Prosperity through Crop Resource Management in Acid Upland Environment of Madhupur Tract

P C Bhattacharya, M Nasim, M I U Mollah, N-E-Elahi and N U Ahmed

ABSTRACT

Improved cropping patterns were tested against the existing farmers' patterns for three consecutive years in the farmers' fields of acid upland environment of Madhupur tract in Sreepur. Improved cropping patterns showed superiority over the farmers' patterns both in agronomic and economic points of view. In the chala land, both the improved patterns of sugarcane sole and sugarcane intercropped with Gimakalmi produced higher economic return of Tk 36,100 and 48,300/ha, respectively than Tk 17,600/ha of existing sole sugarcane cropping pattern. Improved cropping pattern of DSR MV Aus (BR21)-Radish (Tasaki San Mula-1) showed highly promising economic return of Tk 64,310/ha tyhan Tk 2,750/ha of the existing cropping pattern (LV-Blackgram). In the byde land, modern varieties of rice are cultivated in the existing cropping pattern. However, improved cropping pattern with better management practices produced higher economic return of Tk 29,600/ha than Tk 18,810/ha of existing one. In all the cases, the total variable costs of improved cropping patterns were higher than that of existing ones but net returns superseded that resulting in higher benefit-cost-ratio.

Bangladesh Rice j. 7(1&2): 95-98, 1996

Evaluation of in vitro Pollen Germination in Rice

S Khatun and K A Billah

ABSTRACT

Pollen germination of rice cultivar IR36 was assessed by in vitro method in various concentrations and combinations of sucrose, boric acid and $Ca(NO_3)_2$ in 1% agar medium. Twenty percent sucrose and 20 ppm boric acid were essential for maximum germination (51%) of pollen. Germination did not improve by the presence of $Ca(NO_3)_2$ indicating that calcium was not vital for the germination of rice pollen. A medium containing 1% agar, 20% sucrose and 20 ppm boric acid proved optimum for testing pollen germination by in vitro method in rice.