## Yield ability of tillers separated from standing transplanted aman rice and replanted

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To help farmers in postflood agricultural rehabilitation when new seedlings are not available, we conducted an experiment using rice tillers separated from a standing crop. We examined the number of tillers/ hill needed for an economic yield and using old seedlings for late planting. In fields that had been planted with 45-d-old BR11 seedlings, we pulled the hill 35 d after transplanting and separated the tillers with roots. The uprooted tillers were replanted 17 Sep 1987 at 1, 3, 5, and 7 tillers/ hill. Control was 65-d-old seedlings.

Soil was silty loam with pH 6.0-6.5. Plots were 5 × 3 m in a randomized block design with 4 replications. All plots were fertilized with 80-60-40 kg NPK/ ha, using urea, triple superphosphate, and muriate of potash.

Tiller counts were done at 2-wk intervals from 10 randomly selected hills/plot. Grain and straw yield was measured at 15% moisture.

It is possible to multiply seedlings by detaching tillers from mother hills and replanting at 3 tillers/ hill (see table). Planting 65-d-old seedlings could cause heavy yield loss. □

**Plant development, yield components, yield, and harvest index (HI) of replanted tillers of transplanted Mukta rice in Bangladesh.** [a]

| Treatment | Days to | | Plant height (cm) | Panicles (no./$m^2$) | Grains (no./panicle) | | 1000-grain wt (g) | Yield (t/ha) | | HI |
|---|---|---|---|---|---|---|---|---|---|---|
| | Flowering | Maturity | | | Filled | Unfilled | | Grain | Straw | |
| 65-d-old seedlings | 74 | 104 | 88.0 | 266 | 93 | 21 | 21.62 | 3.8 | 7.1 | 0.35 |
| Retransplanted 1 tiller/hill | 68 | 99 | 100.5 | 218 | 149 | 21 | 20.78 | 4.4 | 5.5 | 0.44 |
| Retransplanted 3 tillers/hill | 62 | 96 | 100.3 | 228 | 149 | 22 | 21.00 | 5.3 | 5.3 | 0.48 |
| Retransplanted 5 tillers/hill | 59 | 91 | 105.0 | 230 | 147 | 23 | 21.20 | 5.3 | 5.0 | 0.51 |
| Retransplanted 7 tillers/hill | 56 | 87 | 106.8 | 228 | 149 | 24 | 21.35 | 5.2 | 5.2 | 0.50 |
| LSD (0.05) | 1 | 2 | 4.2 | 10.2 | 10 | ns | ns | 0.938 | 1.2 | – |
| CV (%) | 1.5 | 1.3 | 2.6 | 2.7 | 4.7 | 9.6 | 3.2 | 12.2 | 13.3 | – |

[a] Mean of 4 replications. ns = not significant.

## Effect of Triacontanol on rice seedling weight and grain yield

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Triacontanol has been found to stimulate growth of several crop plants. We treated seeds of rice cultivars Jaya, IR20, and Mukthi with Triacontanol (source: Trianol-CF) at 3 concentrations: 0.01, 0.1, and 1.00 ppm.

**Table 1. Dry weight 22 d after sowing of 3 rice varieties grown in pots after 1-h seed treatment withTriacontanol.**

| Triacontanol (ppm) | Biomass (mg dry wt/plant) | | |
|---|---|---|---|
| | IR20 | Jaya | Mukthi |
| 0.01 | 248 | 271 | 410 |
| 0.10 | 309 | 292 | 399 |
| 1.00 | 216 | 249 | 309 |
| 0 (control) | 231 | 226 | 318 |
| CV (%) | 11.3 | 9.1 | 11.5 |
| LSD | 19 | 14 | 17 |

Seeds were soaked 1 h just before seeding in pots containing evenly mixed soil. Biomass weight was measured 22 d after seeding. Seedlings treated at 0.01 and 0.10 ppm were superior to those with no Triacontanol (Table 1).

In a field experiment, IR54R seedlings were sprayed with the same concentrations of Triacontanol, at 3 d before transplanting (15 Mar 1988), at maximum tillering (15 Apr), and at grain ripening (3 Jun). Grain yield increased slightly with all treatments (Table 2). Tillering capacity did not change, but 1,000-grain weight was higher with 0.01 ppm. □

**Table 2. Grain yield of IR54R treated with Triacontanol.**

| Triacontanol (ppm) | Grain yield (t/ha) |
|---|---|
| 0.01 | 10.2 |
| 0.10 | 9.8 |
| 1.00 | 9.7 |
| 0 (control) | 8.9 |
| CV (%) | 2.7 |
| LSD | 0.4 |

# Soil fertility and fertilizer management

## Large granule urea efficiency in rice

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With increasing fertilizer prices, it has become important to increase the efficiency of applied fertilizer without additional cost. One technique is to use modified large size or large granule urea (LSU/LGU). We studied the performance of LSU/LGU (6-8 mm) in transplanted irrigated rice during 1987 wet season (kharif).

Soil was red sandy loam (Alfisols), with pH 6.7, 0.031% available N, 10.9 kg available P/ha, 171 kg K/ha, and cation exchange capacity of 12.6 meq/100 g. Rice varieties were Rasi (120 d) and Mandya Vijaya (145 d).

LGU was applied by broadcasting on drained soil. Prilled urea (PU) was applied according to recommended practice in the area (50% broadcast and incorporated 3-4 h before planting, 25% broadcast without incorporation at tillering, and 25% broadcast at panicle initiation).

Ammonia volatilization loss was measured in the field by direct trapping procedure and leaching loss was measured by periodically inserting leaching tubes (with microporous ceramic base) below the rooting zone, 30 cm deep to collect leachate for determining ammoniacal and nitrate N. Cumulative loss of ammoniacal N and nitrate N was computed on the basis of percolation loss of water using drum culture technique.

Application of LSU/ LGU in two splits increased yield significantly in both varieties (see table). This appeared to be due mainly to better uptake of N by the plant and lower loss of fertilizer N through volatilization and leaching. Three splits of LSU/LGU did not show any advantage over two splits. LSU/ LGU applied all basal did not show any significant reduction in yield from PU applied in three splits. □

**Rice yield as affected by LSU/LGU.**

| Treatment[a] | Grain yield (t/ha) | | Total N uptake (kg/ha) in grain + straw | | Cumulative loss of Fertilizer N[b] (kg/ha) |
|---|---|---|---|---|---|
| | Rasi | Mandya Vijaya | Rasi | Mandya Vijaya | |
| Control, no N | 2.0 | 3.7 | 43 | 56 | – |
| LSU/LGU, all basal | 4.8 | 5.3 | 94 | 126 | 24 |
| PU in 3 splits (recommended practice of 50-25-25 at planting, tillering, PI) | 4.5 | 5.4 | 95 | 112 | 28 |
| LSU/LGU in 2 splits (66-34 at planting and tillering) | 5.1 | 5.8 | 136 | 129 | 20 |
| LSU/LGU in 3 splits (50-25-25 at planting, tillering, PI) | 4.9 | 5.5 | 105 | 117 | 19 |
| LSD (0.05) | 0.3 | 0.3 | | | |
| CV (%) | 7.5 | 7.5 | | | |

[a]N rate is 100 kg N/ha. All treatments received 22 kg P and 41 kg K/ha. [b]Through volatilization and leaching.

## Synergistic effect of organic manure and N fertilizer on irrigated rice

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We evaluated the efficiency of N source and method of application in irrigated rice KS-282 in a field experiment.

Soil was Typic Camborthids, sandy clay loam in texture having pH 7.9, ECe 0.70 dS/m and CEC 7.8 mmol (I)/ 100 g. Organic matter was 0.52%; N content 0.04%. Plot size was 16 $m^2$ and plant spacing 20 × 20 cm in a randomized complete block design with 4 replications. All plots received 40 kg PK/ha.

Urea supergranules (USG) and prilled urea (PU) were compared with *S. aculeata* and *S. rostrata* as green manure and barnyard manure (BM) in combination with PU. N rate was 87 kg/ ha for each source.

USG was superior in all respects (see table). *S. rostrata* + PU was statistically equivalent to USG. Growth and yield of rice were low with *S. aculeata* + PU, and BM + PU compared to PU alone, but N recovery from PU alone was the lowest of all sources. □

**Effect of organic manure and N fertilizer on growth and yield of irrigated rice.[a]**

| Treatment[b] | Plant height (cm) | Tillers/$m^2$ | Grain (t/ha) | Straw (t/ha) | Agronomic efficiency (kg rice/kg N) | N recovery (%) |
|---|---|---|---|---|---|---|
| Control(no N) | 80 c | 239 d | 3.7 c | 4.4 e | – | – |
| USG | 95 a | 340 a | 5.7 a | 7.8 a | 23.1 | 54 |
| PU | 87 b | 266 cd | 5.3 b | 7.0 c | 18.4 | 46 |
| *S. aculeata* + PU | 86 b | 298 bc | 5.2 b | 6.5 d | 17.2 | 48 |
| *S. rostrata* + PU | 89 b | 307 ab | 5.6 a | 7.3 b | 21.5 | 52 |
| Barnyard manure + PU | 88 b | 261 d | 5.1 b | 7.1 bc | 16.7 | 48 |
| SE | 2 | 11 | 0.06 | 0.08 | | |

[a]In a column, any 2 means followed by the same letters are not significantly different at 5% level by LSD test. [b]N source applied at 40 kg N/ha.

## Effect of zincated diammonium phosphate (Zn-DAP) on rainfed lowland rice

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We studied the effect of different grades of Zn-DAP on grain yield of IR50 in wet season (kharif) 1985 and summer 1986. Soils were clay loam with pH 7.5 and 7.9, low DTPA-Zn (0.7 and 1.1 ppm) and organic C (0.21 and 0.34%), low available N (234.5 and 210.6 kg/ha), and high available P (38.5 and 40 kg/ ha) and K (325.6 and 316.9 kg/ ha).