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# Effect of Dates of Sowing on Yield of Rice Varieties Under Northern Telangana Zone

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**ABSTRACT**

Field experiments were carried out during *kharif* 2007 and 2008 at RARS, Jagtial to study the yield potential of rice varieties under different dates of sowing. The experiment was conducted in split plot design with six varieties *viz.,* (JGL – 3844, JGL-3855, JGL-11470, JGL-11727, JGL-13595 and JGL-1798) with four dates of nursery sowings (15th May, 30th May, 15th June and 30th June) and replicated thrice. The crop was fertilized with 120, 60, 40 and 20 kg N, P, K and $ZnSO_4$ respectively. Results indicated that the mean grain yield reduced significantly during both the years of experimentation with delay in planting from 15th June to 30th July. Number of panicles hill$^{-1}$, filled grains panicle$^{-1}$ and straw yield decreased with delay in date of planting when compared to early planting (June 15th). Among the six varieties tested, JGL-3844 performed well under delayed sowing (30th July) by recording a grain yield of 5838 kg ha$^{-1}$ and 5905 kg ha$^{-1}$ during 2007 and 2008, respectively.

**Key words :** Dates of sowing, Rice varieties and Yield

Rice is the major *kharif* crop grown under Northern Telangana Zone of Andhra Pradesh. Off late, due to delay in release of canal water, plantings of rice are delayed beyond August resulting in poor yields as critical stages like flowering and fertilization coincide with low temperatures. Among various cultural practices planting date, variety and spacing are of utmost importance for yield maximization. Further, adoption of suitable variety is still the prime importance in enhancing productivity levels. Hence, the present experimentation was carried out to find out the performance of different rice varieties suitable for delayed plantings.

## MATERIAL AND METHODS

A field experiment was carried out at Regional Agricultural Research Station, Jagtial during *Kharif* 2007 and 2008 in split plot design with four dates of nursery sowings (15th May, 30th May, 15th June and 30th June), with six rice varieties (JGL-3844, JGL-3855, JGL-11470, JGL-11727, JGL-13595 and JGL-1798) and replicated thrice. The soil of the experimental site was sandy clay in texture, low in organic carbon (0.42%) and available nitrogen (198 kg ha$^{-1}$) medium in available phosphorus (18.6 kg ha$^{-1}$) and high in available potassium (384 kg ha$^{-1}$). Seedlings of 30 days old were transplanted (15th June, 30th June, 15th July and 30th July) adopting a spacing of 15x15 cm with two seedlings per hill. The crop was supplied with 120, 60, 40 and 20 kg N, P, K and ZnSO4 respectively. Nitrogen was applied as per treatments in three equal splits (1/3 as basal, 1/3 at maximum tillering and 1/3 at panicle initiation stage). Phosphorus and potassium were supplied through single super phosphate and muriate of potash and were uniformly applied to all plots as basal. Recommended agronomic practices and plant protection measures were followed.

## RESULTS AND DISCUSSION

### Yield attributes:

Significant interaction effect of varieties and dates of sowing was observed with regard to yield attributes *viz.,* panicles per hill, filled grains per panicle and panicle length during both the years of experimentation.

It is evident from the data (Table 1) that early planting (15th June) recorded significantly higher panicles per hill and there was a gradual decrease in the panicle number with delay in planting from June 15th (D1) to July 30th (D4) among different varieties during both the years of

Table 1. Effect of dates of sowing on panicles per hill and filled grains per panicle.

| Varieties | 2007 | | | | | 2008 | | | | | 2007 | | | | | 2008 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Panicles/hill | | | | | | | | | | Filled grains/panicle | | | | | | | | | |
| | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean |
| JGL-11470 | 8.0 | 8.6 | 8.0 | 7.0 | 7.9 | 8.3 | 8.7 | 8.2 | 7.3 | 8.1 | 203 | 154 | 138 | 98 | 148 | 223 | 158 | 140 | 110 | 158 |
| JGL-11727 | 9.0 | 10.0 | 8.6 | 6.6 | 8.6 | 8.4 | 10.1 | 8.8 | 6.8 | 8.5 | 147 | 122 | 108 | 100 | 119 | 167 | 125 | 115 | 109 | 129 |
| JGL-13595 | 12.3 | 8.3 | 8.6 | 6.0 | 9.0 | 13.0 | 7.8 | 8.9 | 6.5 | 9.0 | 183 | 164 | 165 | 130 | 161 | 185 | 160 | 172 | 159 | 169 |
| JGL-1798 | 8.6 | 10.6 | 7.3 | 7.5 | 8.4 | 9.4 | 11.0 | 7.6 | 7.4 | 8.9 | 166 | 161 | 157 | 145 | 157 | 168 | 165 | 130 | 135 | 150 |
| JGL-3844 | 11.3 | 8.3 | 8.0 | 77 | 8.9 | 11.0 | 8.5 | 8.2 | 7.5 | 8.8 | 180 | 186 | 171 | 159 | 174 | 181 | 189 | 154 | 132 | 164 |
| JGL-3855 | 7.6 | 11.3 | 8.0 | 8.3 | 8.8 | 7.4 | 12.0 | 8.3 | 7.8 | 8.8 | 176 | 159 | 152 | 106 | 148 | 174 | 161 | 155 | 87 | 157 |
| Mean | 9.5 | 9.5 | 8.1 | 7.1 | - | 9.6 | 9.6 | 8.3 | 7.2 | - | 176 | 158 | 149 | 123 | - | 183 | 160 | 144 | 130 | - |
| CD(P = 0.05) | D | 1.3 | | | | 1.5 | | | | | NS | | | | | NS | | | | |
| | V | NS | | | | NS | | | | | 38 | | | | | 40 | | | | |
| | D x V | 3.0 | | | | 3.2 | | | | | 50 | | | | | 54 | | | | |

· Dates of nursery sowing

D1-15th May

D2- 30th May

D3-15th June

D4 -30th June

* NS – Non significant

Table 2. Effect of dates of sowing on panicle length (cm), grain and straw yield (kg ha$^{-1}$).

| | 2007 | | | | | 2008 | | | | | 2007 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Panicle length (cm) | | | | | | | | | | Grain yield (kg ha$^{-1}$) | | | | |
| Varieties | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean |
| JGL-11470 | 23.0 | 21.0 | 22.0 | 19.6 | 21.4 | 23.1 | 21.2 | 22.3 | 19.8 | 21.6 | 6329 | 4634 | 5125 | 2047 | 4534 |
| JGL-11727 | 26.0 | 23.0 | 25.0 | 22.7 | 24.1 | 26.2 | 23.1 | 25.2 | 22.5 | 24.2 | 6216 | 5125 | 4903 | 2451 | 4674 |
| JGL-13595 | 22.0 | 20.0 | 21.0 | 20.7 | 21.0 | 22.4 | 20.8 | 21.6 | 20.9 | 21.4 | 6796 | 5281 | 5437 | 4791 | 5576 |
| JGL-1798 | 20.0 | 18.0 | 17.0 | 17.3 | 18.0 | 20.3 | 18.1 | 17.8 | 17.6 | 18.4 | 5972 | 5793 | 5459 | 4568 | 5448 |
| JGL-3844 | 23.0 | 22.0 | 22.0 | 19.8 | 21.7 | 23.5 | 22.8 | 22.5 | 19.9 | 22.1 | 6796 | 6128 | 5791 | 5838 | 6138 |
| JGL-3855 | 22.0 | 20.0 | 21.0 | 20.3 | 20.8 | 22.0 | 20.8 | 21.0 | 20.8 | 21.1 | 6061 | 4724 | 5080 | 4285 | 5037 |
| Mean | 23.0 | 21.0 | 21.4 | 20.0 | - | 22.9 | 21.1 | 21.7 | 20.3 | - | 6361 | 5280 | 5299 | 3996 | - |
| CD | D | NS | | | | NS | | | | | D – 654 | | | | |
| (P = 0.05) | V | 2.6 | | | | 2.8 | | | | | V – 678 | | | | |
| | D x V | 3.5 | | | | 3.2 | | | | | D x V- 958 | | | | |

Table 2 cont....

| | 2008 | | | | | 2007 | | | | | 2008 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Grain yield (kg ha$^{-1}$) | | | | | Straw yield (kg ha$^{-1}$) | | | | | | | | | |
| Varieties | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean | D1 | D2 | D3 | D4 | Mean |
| JGL-11470 | 6459 | 4680 | 5089 | 2188 | 4613 | 7535 | 9358 | 7576 | 7576 | 8011 | 7562 | 9426 | 8268 | 7598 | 8214 |
| JGL-11727 | 6236 | 5155 | 5026 | 2530 | 4706 | 8690 | 7575 | 7130 | 7130 | 7631 | 8506 | 7655 | 9244 | 7194 | 8150 |
| JGL-13595 | 6816 | 5360 | 5501 | 4865 | 5620 | 9581 | 8467 | 6907 | 6907 | 7966 | 9620 | 8522 | 7386 | 6935 | 8116 |
| JGL-1798 | 6022 | 5804 | 5115 | 4630 | 5478 | 10472 | 9358 | 6016 | 6016 | 7966 | 10361 | 9410 | 7610 | 6036 | 8354 |
| JGL-3844 | 880 | 6336 | 5182 | 5905 | 4578 | 8690 | 7576 | 6686 | 6686 | 7410 | 8588 | 7612 | 8320 | 6665 | 7796 |
| JGL-3855 | 6079 | 4756 | 5280 | 4480 | 5099 | 7575 | 8244 | 7130 | 7130 | 7520 | 7620 | 8328 | 8596 | 7096 | 7910 |
| Mean | 5415 | 5349 | 5199 | 5000 | - | 8757 | 8430 | 6908 | 6908 | - | 8710 | 8492 | 8237 | 6921 | - |
| CD(P = 0.05) | 625 | | | | | D- 1705 | | | | | 1780 | | | | |
| | 701 | | | | | V-NS | | | | | NS | | | | |
| | 971 | | | | | DxV- 1495 | | | | | 1320 | | | | |

experimentation. However, there was no significant difference among the varieties in terms of panicles per hill.

Perusal of data (Table -1) indicated that the varieties JGL – 3855 ,JGL- 3595 and JGL – 3844 recorded higher panicles per hill under June 15$^{th}$ planting and the same varieties recorded higher number of panicles under delayed planting (July 30$^{th}$) in comparison to rest of the varieties tested. Filled grains per panicle (Table -1) differed significantly among different varieties and there were no differences observed due to different dates of sowing. The varieties JGL – 3844 and JGL – 1798 recorded higher filled grains per panicle under delayed planting (July 15$^{th}$) over other varieties which was reflected in higher grain yield (Table - 2) during both the years of study. Data recorded on panicle length indicated that with delay in planting from June 15$^{th}$ to July 30$^{th}$ there was a significant decrease in panicle length among the varieties. However, the effect of dates on panicle length was found to be non significant (Table 2) during both the years of study.

**Yield :**

Earlier planted crop (June 15$^{th}$) recorded significantly higher grain yields and there was a significant and gradual decrease in yield with delay

in planting. Variety JGL – 3844 recorded higher yields (5988 kg $ha^{-1}$) and (5905 kg $ha^{-1}$) under delayed planting during both the years of experimentation.

Data on straw yield indicated that highest straw yield was recorded with early planting (June 15th). Significant reduction in straw yield was observed with delay in date of planting from June 15th to July 30th. However, under delayed planting (July 15th) there were no significant differences among different varieties with respect to straw yield (Table -2).

Higher yields under early planted crop might be the effect of favourable temperatures at vegetative and ripening stages which helped in better photosynthesis and translocation of photosynthates to sink, thereby resulting in better grain filling (Satyananda Jena *et al.,* 2010).

Decreased yields with delayed planting (July 30th) might be due to the existing low temperatures at flowering resulting in poor grain filling (Ramana *et al*., 2007, Rai and Kushwaha, 2008).

## LITERATURE CITED

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