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Short Communication

# Adaptability of Aman paddy under Sundarban areas of West Bengal

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The vast areas of coastal saline zone of West Bengal, popularly known as Sundraban, are mainly monocropped with rice. To increase the rice productionof these areas it is necessary to identify the high yielding genotypes adaptable to the prevailing conditions. Adaptability is one of the most important chracteristics of a genotype which could also be utilized to breed a variety for specific environment. Finlay [1] has observed in oat and barley that a high percentage of lines with greatly increased yiled and adaptability can be obtained by crossing a widely adapted genotype with the one specifically adapted to high yielding environments i.e., one which has potentiality for yield. Norden [2] also suggested to select high yielding lines from the same area of adaptationfor breeding of higher yield in groundnut. In this context, the present investigation was undertaken to identify the adapted genotypes from large collection of Aman rice suitable for Sundarban areas as well as to identify the parent material for rice improvement programme.

The 40 diverse Aman rice genotypes (Table 1) were evaluated during consecutive four kharif seasons (1997, 1998, 1999 and 2000) under rainfed lowland condition at Kakdwip. The experimental plot consisted of 6 rows of 6m length and spacing was 20 × 20 cm. The recommended agronomic practices were followed to obtain a good harvest. Observation on maturity days were recorded from the date of seed sowing to date of maturity and the grain yield per plot were also recorded. Data were analyzed using the method of Eberhart and Russell [3].

The pooled analysis indicated significant differences among genotypes for grain yield and maturity days revealing the presence of high variability in the material. Genotypes also interacted significantly with the environments, as evident from significant genotype × environment (G × E) interaction variance for both the characters. Further partitioning of G × E interaction revealed the presence of linear and nonlinear components [4, 5]. Significant G × E (linear) component against pooled deviation suggested that the prediction of genotypes performance across the environments would be highly effective for these traits.

Simultaneous considerations of three stability parameters *viz.*, mean performance ($\bar{X}i$), regression coefficient, (bi) and deviation from regression $\bar{S}^2_{di)}$ (Table 1) revealed that out of 40 genotypes tested 21 genotypes were stable for maturity days. Among them six genotypes, *viz.*, CR-626-26-2-3, CR-383-10-Dudhraj, Lilabati, Dhusari and Bogamanohar were late maturing which is one of the desirable characteristics for Aman paddy cultivation in Sundarban areas. They also showed wide adaptability against this trait. Twenty two genotypes were highly stable for grain yield. Among these CR-626-26-2-3, CR-726-7-2-2, Aswinikaniar, Lilabati, Kahigula nd Satras were found to be widelty adapted genotypes for Sundarban areas and Ikorasali, CR-1016 and CR-260-77 showed their specific adaptability for favourable environments. CR-644 and Dudhraj were specifically adapted to less favourable environments in this regard. On the basis of adaptability a crossing programme involving widely adapted genotypes (CR-626-26-2-3, CR-726-7-2-2, Kahigul, Satras, Aswinikaniar and lilabati) as one parent and specifically adapted genotypes for favourable environments (Ikorasali, CR-1016 and CR-260-77) as other parent is suggested to obtain high yielding lines suitable for these areas of West Bengal.

Therefore, the present finding revealed that six genotypes, *viz.*, CR-626-26-2-3, CR-727-7-2-2, Kahigul, Satras, Aswinikaniar and Lilabati were ideally adaptaed genotypes and could be recommended for wide cultivation at Sundarban areas of West Bengal. Ikorasali, CR-1016 and CR-260-77 were the suitable genotypes specifically for favourable environments and they could be cultivated at the highly fertile deltaic soil of Sundarban

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**Table 1.** Stability parameters for days to maturity and grain yield in rice

| S. No. | Genotypes | Days to maturity | | | Grain yield (kg/plot) | | |
|---|---|---|---|---|---|---|---|
| | | $\bar{X}i$ | bi | $\bar{S}^2_{di}$ | $\bar{X}i$ | bi | $\bar{S}^2_{di}$ |
| 1. | CR-626-26-2-3 | 161.00 | 1.30 | 1.53 | 2.64 | 1.20 | 0.00 |
| 2. | CR-383-10 | 160.33 | 1.27 | 0.73 | 2.33 | 0.87 | –0.02 |
| 3. | Andewsali | 160.92 | 1.17 | 5.37** | 2.28 | 0.90 | 0.03 |
| 4. | Guarai | 162.83 | 1.39 | 46.84** | 2.29 | 1.34* | –0.02 |
| 5. | NC-492 | 157.75 | 0.76 | 8.12** | 2.67 | 0.65 | 0.69** |
| 6. | Dudheswar | 153.58 | 0.86 | –0.11 | 1.63 | 0.43 | 0.15** |
| 7. | Palui | 157.25 | 0.93 | 4.63** | 2.67 | 1.28 | 0.80** |
| 8. | CR-726-7-2-2 | 160.00 | 1.47 | 3.13* | 2.41 | 1.28 | 0.02 |
| 9. | Jauche | 154.75 | 0.61** | –0.80 | 1.66 | –0.26** | –0.01 |
| 10. | Kalamdani | 155.33 | 0.65 | 0.98 | 2.34 | 1.20 | 0.09* |
| 11. | Bogamanohar | 158.67 | 1.22 | 0.13 | 2.46 | 0.87 | 0.12** |
| 12. | Sonabarsha | 159.42 | 1.52 | 6.22** | 2.08 | 1.37* | –0.02 |
| 13. | Balam | 152.42 | 0.72 | 0.34 | 1.28 | 0.34 | 0.22** |
| 14. | Picher | 155.67 | 0.88 | 1.54 | 1.78 | 0.02 | 0.19** |
| 15. | Irosadbbog | 153.08 | 0.71* | –0.51 | 1.53 | –0.03 | 0.12** |
| 16. | Kahigul | 157.83 | 1.10 | –0.57 | 2.59 | 1.56 | 0.03 |
| 17. | CR-644 | 154.42 | 0.44** | –0.44 | 2.45 | 0.61* | 0.00 |
| 18. | Dudhraj | 159.25 | 1.17 | 0.85 | 2.84 | 0.77** | –0.03 |
| 19. | Bor Jatinga | 152.33 | 0.47 | 2.55** | 1.27 | –0.44 | 0.65** |
| 20. | Satras | 155.83 | 0.91 | 4.45** | 2.50 | 1.03 | 0.01 |
| 21. | CR-260-131 | 156.33 | 0.71 | 3.48** | 2.67 | 0.98 | 0.18** |
| 22. | Lakhibilasa | 156.50 | 1.39 | 4.34** | 2.03 | 1.00 | –0.02 |
| 23. | Ikorasali | 158.83 | 1.07 | 4.47** | 2.35 | 1.41* | –0.02 |
| 24. | C-300BD-50-11 | 157.75 | 0.94 | –0.06 | 2.91 | 1.31 | 0.14** |
| 25. | Aswinikaniar | 158.42 | 1.03 | 2.41* | 2.87 | 0.86 | 0.02 |
| 26. | CRM-30 | 155.33 | 0.84 | 1.11 | 2.52 | 1.07 | 0.10** |
| 27. | Lilabarti | 159.67 | 1.17 | 0.51 | 2.39 | 1.37 | 0.01 |
| 28. | Dhusari | 159.58 | 0.91 | 1.43 | 2.30 | 1.03 | 0.00 |
| 29. | Chalisa | 155.83 | 1.04 | –0.42 | 2.16 | 0.79 | 0.05 |
| 30. | Kasonjha | 159.17 | 1.34* | –0.34 | 2.24 | 1.34 | –0.03 |
| 31. | Baroger Doma Desaria | 157.75 | 0.95 | 0.21 | 2.58 | 1.30 | 0.28** |
| 32. | Umtha | 156.25 | 0.56 | 13.32** | 2.76 | 1.91* | 0.23** |
| 33. | Haldiguri Dhan | 156.00 | 0.78 | 1.57 | 1.83 | 0.39 | 0.14** |
| 34. | Dhoohsali | 161.33 | 1.23 | 10.87** | 2.33 | 1.34 | 0.05 |
| 35. | CR-1016 | 164.00 | 1.02 | 6.80** | 2.64 | 1.47* | –0.02 |
| 36. | Khayersal | 158.75 | 0.75 | 28.79** | 2.30 | 0.69 | 0.24** |
| 37. | Bankisali | 159.83 | 0.62 | 12.76** | 2.01 | 1.08 | 0.03 |
| 38. | Miyapur | 161.92 | 0.99 | 6.34** | 2.38 | 1.10 | 0.19** |
| 39. | CR-260-77 | 163.92 | 1.99 | 25.08** | 2.81 | 2.14* | 0.04 |
| 40. | Lunisree | 157.25 | 1.13 | 1.19 | 3.40 | 2.43* | 0.08* |
| | Population mean | 157.93 | | | 2.33 | | |
| | S. E. (Mean) | 0.14 | | | 0.22 | | |

bi *, ** = Regression co-efficient significantly different from unity at P = 0.05 and P = 0. 01, respectively; $\bar{S}^2_{di}$, *, ** = Deviation from regression significantly different from zero at P = 0.05 and P = 0.01, respectively.

while CR-644 and Dudhraj were the suitable genotypes specifically for poor or less favourable situations. These genotypes may be regarded as the promising parents for rice improvement programme at this coastal areas of West Bengal.

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## References

1. **Finlay K. W.** 1968. The significance of adaptation in wheat breading. Third Int. Wheat Genetics Symp., Academy of Science, Canberra, Australia, 5-9 Aguust. 1968, pp. 403-409.

2. **Norden A. J.** 1973. Breeding of the cultivated peanut. *In*: Peanuts cult. and uses, Amer. Peanut Res. Edu. Asso. Still Water, Oklahoma, pp. 175-208.

3. **Eberhart S. A. and Russell W. A.** 1966. Stability parameters for comparing varieties. Crop Sci., **6**: 36-40.

4. **Mahapatra K. C. and Das Sujata.** 1999. Stability in yield in relation to component trait in rice. Oryza, **36**: 301-305.

5. **Senapati B. K., Senapati A. K. and Maiti D.** 2002. Adaptabilityof some photo insensitive rice genotypes at Coastal Saline Zone of West Bengal. J. Interacad, **6**: 17-20.