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Short communication

Some preliminary observations on varietal influences on yield components of rice.

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Data on the phenology, dry matter (DM) and radiation use efficiency (RUE) of aerobic rice varieties, Varaalu (V1) of 100 days duration and Erramallelu (V2) of 120 days duration, in the kharif season of 2003 and 2004 for four dates of sowing at Rajendranagar, Hyderabad have been presented by Sreenivas *et al.* (2008) for the above varieties, dates of sowing and years, pooled data on grain and DM yield of all additional examination on varietal influences on all the above three parameters in view of the following.

Several studies have shown that the total drymatter (TDM) produced by a crop cultivar is directly proportional to the amount of photosynthetically active radiation (PAR) intercepted by it. The quantum of intercepted PAR depends on life-duration of the cultivar from ground shading to physiological maturity and its leaf-architecture and the temporal march of solar radiation regime in the crop period. The ground-shading stage is a physical and not a physiological one. Time from sowing to ground shading stage is governed by initial population density and temperature. For a given location and season, the duration from ground overage to physiological maturity will be varietal-dependant.

Radiation use efficiency (RUE) denotes the amount of drymatter (DM) produced per quantum of PAR intercepted. PAR is 0.45 times global solar radiation (GSR) (Monteith, 1965). The economic yield component of a crop expressed as of fraction of TDM constitutes the Harvest Index (HI). Enough data on HI values of many crop cultivars under varied environmental and cultural practices are available. However, Data on varietal influence on RUE is scanty.

Data of Sreenivas *et al.* (2008) show that in 2004 production of DM is lower for the varieties and dates of sowing than 2003 and that the differences in the life duration of the two rice varieties in all dates of sowing in the two years are entirely due to differences in the duration of the phase from emergence to panicle initiation. In studies relating to assessment of weather relations of crop attributes it is necessary to analyse data in which the crop is not subject to any environmental stress. It is seen that sowing dates D2 and D3 in 2003 and D1 and D2 in 2004 produce the highest DM (Sreenivas *et al.* 2008). Data relating to the above two varieties and 4 sowing dates are presented in Table 1.

It is seen from Table 1 that the production of DM of longer duration Erramallelu in the 2 sowing dates in 2003 is 30% higher than Varaaalu. The per day production of DM and RUE for the above sowing dates are 7% and 8% higher respectively for Erramellulu than Varaalu.

From the data of Sreenivas *et al* (2007) the following emerged. In 2003 DM and grain yield for Varaalu are 9.59 and 2.86 t ha^{-1} respectively leading to a HI of 0.40. For Erramallelu in 2003 DM and grain yield are 12.65 and 5.28 t ha^{-1} giving a HI value of 0.40. Thus, despite differences in production of DM and grain, both varieties have the same HI. Yield of DM and grain are 7.88 and 2.45 t ha^{-1} respectively in 2004 giving a HI value of 0.31. For Eraamallelu the yield of DM and grain yield in 2004 are 9.82 and 3.08 respectively

Table 1: DM, RUE and yield for varieties V1 and V2

Variety/ Sowing date	Duration of Phases (Days)			Dry matter (kg ha^{-1})	Radiation ($MJm^{-2}day^{-1}$)	Dry matter ($kg\text{-}^{1}ha^{-1}day^{-1}$)	RUE
	A	B	C				
V1 26-6-03	42	27	30	10190	1664	102.93	6.12
V1 7-7--03	40	26	32	10001	1658	102.05	6.03
V2 26-6-03	63	25	31	13090	1979	110.00	6.61
V2 7-7-03	62	26	30	12890	1970	109.24	6.54
V1 16-6-04	42	26	31	8470	1639	85.55	5.17
V1 26-6-04	42	25	31	8691	1613	88.68	5.39
V2 16-6-04	63	25	31	11601	1966	97.49	5.90
V2 26-6-04	67	24	30	10800	1983	89.26	5.45

Legend: A- emergence to panicle initiation (PI) B- PI to flowering; C- flowering to physiological maturity.

giving a HI value of 0.31, the same as that of Varaalu. The same features of DM, grain yield and HI obtain for the other two varieties Jagtala Sannalu and Polasa Prabha and for pooled data for sowing dates (Sreenivas *et al* 2007).

One may conclude that in rice varietal differences in (a) crop life duration (mainly due to differences in duration of vegetative phase), (b) per day production of dry matter and (c) RUE will significantly affect grain yield. HI is little influenced by cultivars but can be significantly lowered for crops under environmental stresses.

The present practice of presenting pooled data of (i) varieties against sowing dates and (ii) sowing dates against varieties is not conducive to evaluate varietal and sowing date influences on economic crop yields. For agrometeorological analyses pertinent and associated crop and yield data relating to the two highest yields must be presented variety-wise for the 2 sowing dates and sowing date-wise for all varieties.

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