

Yield potential of short duration rice varieties in south western New South Wales

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The development of shorter duration rice varieties adapted to local conditions is one of the major objectives of the rice breeding programme at Yanco. The growth duration from sowing to harvest of current varieties is 170-180 days however breeding lines are available with a duration of 140-150 days. The advantages of shorter growth duration over current long season varieties include decreased water use, greater flexibility in farm rotations, more time for land preparation and/or use of spring pasture growth, and faster establishment in the higher temperatures of November. This study examines the yield potential of a short duration variety.

Methods

Three closely related genotypes of short, intermediate and long duration (M101, YRM17 and M7 respectively) were sown in mid-October and mid-November in the 1986/87 season with three nitrogen rates (0, 75 and 150 kg N/ha). Quadrat samples of 1 square metre were taken at two week intervals throughout the growing season from which tiller number, dry weight and leaf area were determined.

Results and discussion

Yields at the highest nitrogen rate were not significantly different when sown in October. Biomass at panicle initiation and at maturity was positively related to growth duration but M101 had a higher harvest index (HI). The yield of M101 was significantly lower at the low nitrogen rate. Crop yields were lower when sown in November (Table 1). Establishment was much faster with late sowing however the pollen microspore development stage occurred late in the season and was affected by low temperatures. Temperatures below 10.5°C cause pollen damage and a subsequent decrease in the proportion of filled grains (1). The short duration genotype M101 was least affected by late sowing. Maximum leaf area index was similar for each genotype and was not affected by sowing time.

Table 1: Yield, and selected growth parameters for three genotypes of different maturity with 150 kg N/ha and two sowing dates.

	October sown				November sown			
	Yield (t/ha)	Maximum LAI	Dry Weight (t/ha)	HI	Yield (t/ha)	Maximum LAI	Dry Weight (t/ha)	HI
M7	12.35	13.0	21.67	0.49	4.63	12.8	16.96	0.24
YRM17	12.64	12.2	19.74	0.55	7.06	12.5	16.72	0.36
M101	12.19	12.3	18.07	0.58	8.61	11.0	17.57	0.42
L.S.D. .05	0.88	1.9	2.40	0.05	0.82	1.9	1.91	0.06

The reduction in growth duration from 180 to 150 days did not lead to decreased yield at the high nitrogen rate in the October sowing. The short duration genotype M101 had a lower dry weight at panicle initiation and heading but produced a high leaf area index (LAI) at heading and high yield. Since short duration genotypes yield less at low nitrogen rates the requirement for applying the correct nitrogen rate for high yields is emphasized. Further effort is warranted in breeding early maturing rice varieties with growth durations of 140 to 150 days.

1. Heenan, D.P. (1984). *Aust. J. Exp. Agr. An. Husb.* 21:255-259