



Preliminary assessment of the effect of water-seeding technique and herbicide application on weedy rice tillers

V. Jeyanny, Forest Research Institute Malaysia, 52109 Kepong, Selangor; S.R. Syed Omar, Faculty of Agriculture, Universiti Putra Malaysia, 43400 Serdang, Selangor; M. Azmi, Rice Research Division, Malaysia Agricultural Research and Development Institute, Seberang Perai, Peti Surat 203, 13200 Kepala Batas, Pulau Pinang; and A.S. Juraimi, Faculty of Agriculture, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia E-mail: jeyanny@frim.gov.my; syedomar@agri.upm.edu.my; ashukor@agri.upm.edu.my; azmiman@mardi.my

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Metsulfuron methyl has been recommended to control weedy rice under wet-seeded conditions (Zainal and Azmi, unpubl. data, 1994). Another weed control method involves broadcasting pregerminated seeds using the water-seeding technique. This study was undertaken to evaluate the effect of seeding methods and herbicide application on weedy rice tillers 45 d after sowing (DAS).

A factorial experiment was carried out in a glasshouse at Putra University Malaysia. Treatment 1 (T1) was the wet-seeding method – broadcasting seed on saturated soil and introducing water up to 10-cm flooding depth 7 d after seeding with (H1) and without herbicide (H0). Treatment 2 (T2) was water seeding – continuous flooding at 10-cm depth from seeding to date of data collection with H1 and H0. All treatments were replicated five times and arranged in a factorial randomized complete block design. Both weedy rice seeds and pregerminated MR219 seeds were sown on the soil surface (Tropic Fluvaquent) into 25.5-cm-diameter × 40-cm-high experimental containers using the MARDI-recommended seed rate (500 seeds m⁻²) (MARDI 2004) to achieve uniform establishment. Herbicide (metsulfuron methyl 1.75% combined with bensulfuron methyl 8.25%) was applied 14 DAS at 0.05 kg ai ha⁻¹. Water was brought in 7 DAS for treatments with herbicide (T1) to facilitate herbicide application. The effects of water seeding and herbicide application on tillering ability of weedy rice (45 DAS) were analyzed using ANOVA. The means of these treatments were compared using Duncan's new multiple range test.

Only the seeding method was significantly different at $P \leq 0.05$. There were no significant effects or interactions for the other sources of variation tested (see table). Weedy rice tillers decreased in both seeding methods (see figure).

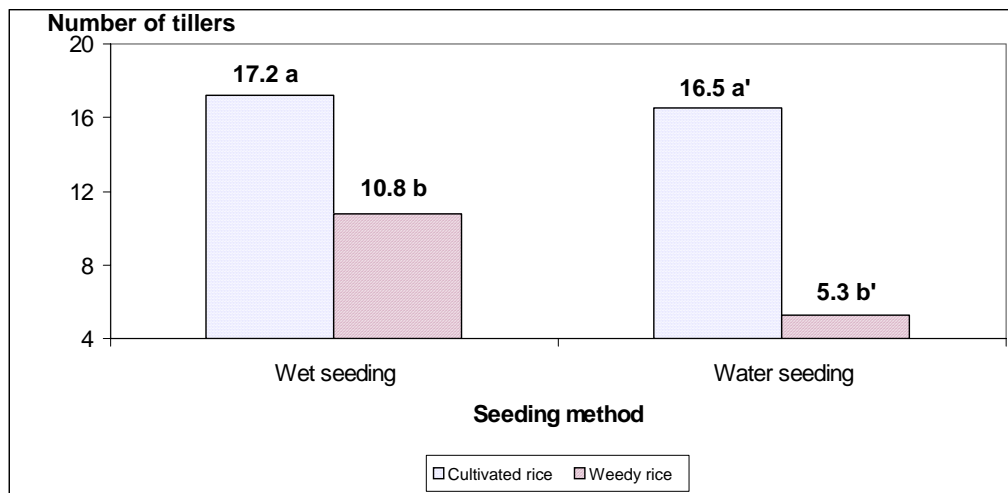
However, the decrease in weedy rice tillers in the water-seeding treatment was 50% more than that in the wet-seeding trial.

Partitioning of variance of weedy rice tillers according to seeding method, herbicide application, and interactions.

Source of variation	F value	P value
Seeding method (S)	10.90	0.0063**
Herbicide (H)	0.37	0.5543ns
S × H	2.03	0.1797ns
Block	0.71	0.5976ns

** = significant at $P \leq 0.01$; ns = not significant.

The decrease in weedy rice tillers was caused by suffocation of seeds, a delay in tillering under water seeding, and the vigorous establishment of pregerminated rice seeds. Findings by de Avila and Marchezan (2000) further confirmed the observation that anaerobic conditions reduce the germination rate of weedy rice seeds. The decline in weedy rice tillers in the water-seeding treatment (see figure) confirms the results obtained by Azmi et al (2004) – pregerminated seeds under water at 5–10-cm depth had a significant effect on the weedy rice population. The use of herbicide was not effective in reducing weedy rice under water seeding.



Tiller number of cultivated rice and weedy rice at 45 DAS following wet seeding and water seeding. Values above the bars represent the actual tiller number and individual bars with different letters within each seeding method are significantly different at $P \leq 0.05$ according to Duncan's new multiple range test.

Under the water-seeding technique, sowing of pregerminated seeds enhanced the emergence of cultivated rice. The sharp decrease in the number of weedy rice tillers suggests that water seeding can be a good crop establishment method to control weedy rice.

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