Mechanical weed control evaluation in dry seeded rice in Italy

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Poster

In a field study carried out 2021 in Pavia (N-W, Italy) combinations of mechanical and chemical weed control methods where compared with the aim to reduce the use of chemical inputs in rice. In a split plot design with four replicates, an untreated treatment (M1) was compared to three inter-row hoeing weeders: weeder 1 with 15 cm row spacing (RS) (M2); weeder 2 with 30 cm RS (M3); weeder 3 with 36 cm RS (M4). Inter-row hoeing was complemented with two (in M4) or three passages of finger harrowing along the rows. Each mechanical treatment was evaluated under three herbicide programs: i. herbicide untreated plot (H1); ii. early post-emergence treatment (H2); iii. early and late post-emergence treatment (H3). "Caravaggio" rice variety was drill seeded on May 17 (140 kg/ha) at 15, 30 or 36 cm RS. Weeding interventions with the different weeder types were carried out on June 11 (M2) and 14 (M3 and M4), with rice at BBCH stage 13-20 and with a working depth of 5-7 cm. Cyhalofop-butyl, clomazone and pendimethalin were applied in treatment H2 (June 1) and profoxydim in treatment H3 (25 June). The use of weeder and finger harrowing resulted in a high *Echinochloa crus-galli* control in the intra-row space, with a reduction compared to control of about 78, 43 and 33% for M4, M3 and M2 treatment, respectively. No control was observed on the row. High control of *Cyperus esculentus* was obtained both in the intra-row space (96, 92 and 70% for M2, M4 and M3) and on the row (91, 71 and 69% for M4, M2 and M3). Yield was not statistically different among different weeders (8.7, 8.0, 7.5 and 7.2 t/ha in M2, M3, M1 and M4, respectively), while M2 showed a statistically higher panicle density (410 panicle/m2). Lower yield performance of M4 were primarily due to difficulties in the weeder setup. Herbicide application resulted in significantly higher yield (8.9 t/ha for both H2 and H3) respect to the untreated plot (5.7 t/ha). Number of herbicide applications did not affect yield, yield components and weed control, with similar results for H2 and H3 treatment. The results showed that hoeing and harrowing can reduce weed pressure in rice, while maintaining high yield performance.

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