

## Effects of Seeding Depth on Weed Control in Drill-Seeded Rice.

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Rice (*Oryza sativa* L.) is one of the most important sources of human energy worldwide and is grown in a wide range of agroecosystems, though paddy (flooded) systems are the most prevalent. In California (CA), over 200,000 ha of flooded rice are grown in a water-seeded, continuously flooded system that has successfully suppressed certain non-aquatic weed species such as barnyardgrass and bearded sprangletop. Currently, rice growers in California flood fields at the beginning of the growing season, and then pre-germinated rice seed is direct-seeded onto the flooded field by airplane. A flood depth of 10-15 cm is maintained until approximately one month before harvest, when the field is drained to allow rice harvesting. Without rotation, and with herbicides as the only method of weed control, weed populations have grown to tolerate flooding and resist many herbicides. Dry drill-seeding of rice, however, is the most common method of mechanized rice planting in the world. Previous modern studies on drill-seeding rice in California have shown that the water use and yield potential are similar to continuous flood under good nutrition and weed management. A field study was conducted near at the Rice Experiment Station in Biggs, California to investigate the effects of burial depth and the use of herbicides on weed infestation. We drill-seeded rice at 0.5, 1.5, and 2.0 inch depths, applied 7 herbicide treatments and an untreated control. All herbicide treatments included glyphosate applied immediately prior to rice emergence. The experimental design used was a complete block design with four replications. Glyphosate applied alone controlled 50% of grass and sedge populations in all depths. In plots treated with glyphosate + pendimethalin + cyhalofop + penoxsulam, grasses were reduced by 98% at 0.5" and by 84% at 1.5" planting depths, and sedges were reduced by 100% and 98% at the same depths. In plots treated with glyphosate + pendimethalin + propanil, grasses were reduced by 88% at 0.5" and by 92% at 1.5" planting depths, and sedges were reduced by 91% and 100% at the same respective depths. The number of rice tillers was reduced by deeper planting. At 0.5" depth, rice plants had 56, 94, and 142 tillers m<sup>-1</sup> in untreated control, glyphosate alone, and glyphosate + pendimethalin followed by cyhalofop, respectively. At 1.5" depth, rice plants had 24, 76, and 123 tillers m<sup>-1</sup> in nontreated control, glyphosate alone, and glyphosate + pendimethalin followed by cyhalofop, respectively. However, the decline in number of tillers coincided with an increase in grain weight per panicle. The study suggests that weeds can be managed in drill-seeded rice with good cultural practices and proper weed management practices.