Susceptibility of rice varieties to molinate under water-seeded rice culture

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Molinate (*S*-ethyl hexahydro-1 *H*-azepine-1-carbothiote) preplanted incorporated with water-seeded rice is one of the most efficient methods to control red rice. In 1997 and 1998, the phytotoxicity of molinate on domestic rice varieties was studied at INIA Treinta y Tres, Uruguay. Untreated and treated large plots (10.5 × 9.5 m) with molinate were broadcast with seed of four rice varieties: INIA Tacuarí (short-season japonica type), INIA Caraguatá (mid-season japonica type), INIA Cuaró (mid-season indica type), and El Paso 144 (long-season indica type). These varieties interacted in a factorial arrangement with two seed treatments: dry or pregerminated seed in small plots (2 × 4 m). An alley of 0.5 m was left among small plots to help in seeding and data collection. The split-plot design was a randomized complete block design with three replications. Molinate was applied at 4.48 kg ai ha^{-1} with a CO_2 pressurized sprayer with a 4-nozzle boom with Teejet 8002 tips. A volume of solution of 140 L ha^{-1} was applied. The herbicide was incorporated right after the application. Dates of herbicide application, establishment of flooding, and rice seeding were 17 November, 20 November, and 26 November for the experiment in 1997 and 28 October, 9 November, and 13 November for the experiment in 1998, respectively. Six hundred and fifty viable seeds m^{-2} in each small plot were seeded in water. One half of the rice seed was soaked from 36 to 48 h and after that drained under shade from 36 to 48 h. In 1997, all rice varieties were evenly sprouted before seeding; however, in 1998, seeds germinated slowly and unevenly. The other half was seeded with dry seed (without pregermination). Every large plot was flooded and drained individually and pinpoint water management was used. A layer of 10-cm water depth was used. To avoid damage to the rice stand by birds and ducks, nets were placed. An assessment of injury from herbicide was done by counting seed-

lings at 15 days after seeding (DAS). Three and six samples per small plot were taken in 1997 and in 1998, respectively. The recovery of normal seedlings was statistically analyzed using the GLM procedure of SAS without data transformation. Mean separation was done using the Tukey honestly significant difference (HSD) at 5% of alpha level. The average of the rice stand was similar for both experiments. It was 232 (36% of recovery) and 243 (37% of recovery) seedlings m^{-2} at 15 DAS in 1997 and 1998, respectively. There was no significant main effect of the herbicide molinate on the rice stand. Pooled over years, the rice stand was 202 seedlings m^{-2} at 15 DAS for the herbicide-treated plots and 278 seedlings m^{-2} at 15 DAS for the plots without herbicide treatment. The tendency was to obtain more seedlings without molinate than with molinate. No rice variety difference was obtained and neither was an interaction observed among molinate, rice variety, and seed treatment. There was an interaction between year of the experiment and seed treatment. The difference between dry seed and pregerminated seed in the rice stand (236 vs 228 seedlings m^{-2} at 15 DAS) was not significant in 1997, but was significant (183 vs 303 seedlings m^{-2} at 15 DAS) in 1998.