

EFFECT OF SOIL PH, TYPES AND TEMPERATURE ON THE PERSISTENCE OF READY-MIX FORMULATION OF SULFOSULFURON AND METSULFURON-METHYL

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Abstract: The present laboratory and pot experiment was conducted in during winter season of 2005-06 and 2006-07 at the Chaudhary Charan Singh Haryana Agricultural University, Hisar (India). To generate any sound and viable herbicidal recommendation for effective weed management in a crop, it is very important to explore the effect of different soil types, soil pH and temperature on the persistence of ready-mix formulation of sulfosulfuron and metsulfuron-methyl. The experiment was conducted in completed randomized design (CRD) with four replications. In the first experiment, two soil pH e.g., acidic and alkaline soils were used and four concentration (0, 20, 40, 80 g ha⁻¹) of ready-mix formulation of sulfosulfuron and metsulfuron-methyl were used at incubation period of 0, 10, 20, 40, 80 and 160 days. In the second experiment to access the effect of temperature on persistence of this ready-mix formulation, three temperature regimes including 15, 25, and 35 °C were used at the same concentration and incubation period. In third experiment, two soils were used i.e., sandy and clay loam. In the first experiment, the growth indices viz., dry weight of shoot per plant and shoot length of maize decreased as the sulfosulfuron + metsulfuron-methyl concentration increased from 0 to 80 g ha⁻¹. Both these parameters increased with increase in incubation period. In acid soil, dry weight of shoot per plant was more than that recorded in alkaline soil at each concentration of sulfosulfuron + metsulfuron-methyl. The mean value showed that acidic soil produced 14 per cent more dry weight of shoot as compared to alkaline soil. The phytotoxicity decreased significantly with corresponding increase in incubation period, and the phytotoxicity decreased from 65 to 47 percent as incubation period increased from 0 to 160 days. Alkaline soil exhibited higher phytotoxicity in maize than that in acidic soil. In the second experiment, the germination percent of maize increased from 43% at 15°C to 54% at 35°C temperature. Visual phytotoxicity significantly increased with successive increase in sulfosulfuron + metsulfuron-methyl concentration. However, it decreased significantly as temperature increased from 15°C to 35°C and incubation increased from 0 to 160 days. The dry weight of maize shoot increased by 25 percent at 35°C compared to 15°C temperature significantly incubation period resulted in 17, 37, 50, 63 and 73 percent increase in dry weight of shoot at 10, 20, 40, 80 and 160 days, respectively in comparison to 0 day incubation. The growth parameters of maize viz., dry weight of shoot per plant and shoot length decreased with corresponding increase in sulfosulfuron + metsulfuron-methyl concentration and these both parameters increased with each successive increase in temperature and incubation period. In the third experiment, visual phytotoxicity increased with increase in sulfosulfuron + metsulfuron-methyl concentration and decreased with increase in incubation period in both types of soil. Visual toxicity was more in sandy soil as compared to clay loam. Various growth parameters of maize viz. dry weight of shoot per plant decreased significantly as sulfosulfuron + metsulfuron-methyl concentration increased from 0 to 80 g ha⁻¹. Whereas, all parameters increased significantly as incubation period increased from 0 to 160 days in both soil types.

Keywords: Concentration, Ready-mix, Soil pH, Soil type, Temperature

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