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Evaluation of Different Herbicides to Control Weeds in Maize (*Zea mays* L.) Field in Kharif Season

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Abstract An experiment was conducted at the Research field of Bangladesh Wheat and Maize Research Institute, Nashipur, Dinajpur during Kharif season of 2023–24 and 2024–25 to find out the proper agronomic management along with post emergence herbicides to reduce the costs and risks of intensive weed control in Kharif maize. The experiment was laid out in Randomized Complete Block Design with three replications. The unit plot size was 4.2m × 4m and the variety was BARI Hybrid Maize 17. Seeds were sown on 29 April, 2024 and 16 April, 2025 with a spacing of 60 cm apart from rows and 20 cm from seed to seed. The selected herbicide treatments were 1) Calaris Xtra® 27.5 SC @ 3.0 L ha⁻¹; 2) Maize Clean® 55 SC @ 2.0 L ha⁻¹; 3) Bajna® 55 SC @ 3.0 L ha⁻¹; 4) Mesotin™ 50 WP @ 1.8 kg ha⁻¹; 5) Mingto® 38 SE @ 3.0 L ha⁻¹; 6) Triozine® 55 SC @ 2.0 L ha⁻¹; 7) Prism® 27.5 SC @ 2.0 L ha⁻¹; 8) Mia Bhai® 55 SC @ 2.0 L ha⁻¹; 9) Hand Weeding at 25 DAS and 10) Control (no weed control). Among the weed species *Digitaria sanguinalis* (L.) Scop., *Echinochloa colonum* (L.) Link., *Cyperus rotundus* L., *Eleusine indica* (L.) Gaertn. were the most dominant weed species in the experimental field. No phytotoxic effects of herbicides were observed in the experimental plot. Based on the two years result, it was found that Calaris Xtra® 27.5 SC @ 3.0 L ha⁻¹ and Mesotin™ 50 WP @ 1.8 kg ha⁻¹ recorded the highest WCE 81.39% and 88.15% in 2023–24 and 86.05% and 84.33% in 2024–25, respectively. All other herbicides also performed better in controlling weeds than hand weeding. The highest grain yield (9.30 t ha⁻¹) was obtained from Triozine® 55 SC @ 2.0 L ha⁻¹ in 2023–24, while in 2024–25, the highest yield (7.53 t ha⁻¹) was recorded in Calaris Xtra® 27.5 SC @ 3.0 L ha⁻¹. All other herbicides also recorded identical grain yield in both the years. The lowest grain yield (7.01 t ha⁻¹ and 5.05 t ha⁻¹) were obtained in control treatment in 2023–24 and 2024–25, respectively. The highest gross return (204125 Tk ha⁻¹) and MBCR (2.50) was obtained in Calaris Xtra® 27.5 SC @ 3.0 L ha⁻¹ followed by Triozine® 55 SC @ 2.0 L ha⁻¹, Mesotin™ 50 WP @ 1.8 kg ha⁻¹ and Bajna® 55 SC @ 3.0 L ha⁻¹ and the lowest (150750 Tk ha⁻¹ and 1.92) in control treatment. Considering economic performance, it can be concluded that application of Calaris Xtra® 27.5 SC @ 3.0 L ha⁻¹, Triozine® 55 SC @ 2.0 L ha⁻¹, Mesotin™ 50 WP @ 1.8 kg ha⁻¹ and Bajna® 55 SC @ 3.0 L ha⁻¹ were more beneficial than other treatments.

Keywords Weed control efficacy, Phytotoxicity, Yield, Marginal benefit cost ratio, Atrazin