

THE IMPACT OF LAND PREPARATION METHODS AND HERBICIDES ON WEED CONTROL OF RICE CULTIVATION IN POLONNARUWA DISTRICT OF SRI LANKA

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Weeds cause considerable damage to the rice (*Oryza sativa* L.) cultivation in Sri Lanka. Many farmers use chemical herbicides to control weeds in their paddy fields. Therefore, a field experiment was carried out at the research field of the District Agriculture Training Centre, Department of Agriculture, Polonnaruwa, Sri Lanka during *Yala* 2022 to check the impact of land preparation methods and herbicides on weed control of rice cultivation in the Polonnaruwa district. Sixteen treatments with three replicates in each were arranged in split-plot design using BG 300 rice variety. Four tillage systems *viz*; T1- recommended land preparation, T2- harrow+harrow (3-4 weeks), T3- harrow+harrow (within 1 week) T4- control (no tillage) and four chemical weed control methods *viz*; H1- Pretilachlor 300 g L⁻¹ EC 2 days after sawing (DAS), H2- Florpyrauxifen-benzyl 25 g L⁻¹ EC 10 DAS, H3- Bispyribac Sodium 100 g L⁻¹ SC 12 DAS, H4-Control (weed growth uninterrupted). Plant and weed samples from each plot were collected separately using a quadrant 0.25 m² at two weeks intervals. The weed density, relative density of major weed species, weed dry weight, growth parameters of rice and leaf chlorophyll content (SPAD) of rice were measured at different growth stages of the rice plant. The yield of rice was measured at the time of harvesting. Statistical data analysis results that, according to weed density and weed dry weight from the lowest to highest varied as T1<T2<T3<T4 land preparation methods and H2<H1<H3<H4 herbicides treatments. According to yield of rice from the highest to lowest varied as T1>T2>T3>T4 land preparation methods and H2>H1>H3>H4 herbicide treatments. The interaction was observed between land preparation methods and herbicide treatments. The highest grain yield (5.82 t ha⁻¹) was recorded from T1H2 plot. In conclusion, the recommended land preparation with the application of Florpyrauxifen-benzyl 25 g L⁻¹ EC at 10 DAS was identified as the best weed control strategy to achieve the highest yield in rice.

Keywords: Chemical herbicides, Land preparation, Rice yield, Weed density