

## ABSTRACT

Weeds are a major problem in agricultural production, particularly in coffee plantations, where they compete with crops for essential resources such as water, nutrients, and sunlight. *Persicaria longiseta* is one of the most persistent weeds affecting coffee plantations, necessitating effective control strategies. This study aimed to evaluate the effects of different doses of glyphosate and paraquat herbicides on *Persicaria longiseta* to determine the optimal application for effective weed management. The research was conducted using a randomized complete block design with four dosage levels for each herbicide: glyphosate (0 g/ha, 470 g/ha, 940 g/ha, and 1,411 g/ha) and paraquat (0 g/ha, 414 g/ha, 828 g/ha, and 1,242 g/ha). Observations were carried out at 15, 20, 25, 30, and 35 days after application (DAA), focusing on weed toxicity percentage, controlled weed percentage, regrowth ability, and dry biomass weight of resistant weeds. The results indicated that increasing herbicide dosage significantly improved weed control, with the highest glyphosate dose (1,411 g/ha) achieving 100% mortality at 35 DAA and the highest paraquat dose (1,242 g/ha) achieving 100% control by 30 DAA. Paraquat showed a faster initial effect, while glyphosate provided more sustained control by translocating to the roots. Both herbicides effectively suppressed regrowth at higher doses, but lower doses allowed some recovery. The findings confirm that optimizing herbicide dosage is crucial for sustainable weed management, minimizing environmental risks while ensuring effective control of *Persicaria longiseta* in coffee plantations.

**Keywords:** Agrochemicals, Herbicide application, Glyphosate, Paraquat, Weed management.