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Crop selectivity and weed control efficacy of vinegar and pelargonic acid

Silvia Fogliatto, Marco Milan, Fernando De Palo, Aldo Ferrero, Francesco Vidotto
University of Torino, GRUGLIASCO, Italy

Selectivity and weed control of vinegar and pelargonic acid were assessed in two greenhouse trials. One trial was carried out with vinegar on maize and the other with vinegar and pelargonic acid on rice. The study on maize was carried out in trays (20x30x5 cm) filled with soil with a history of maize cultivation maintained at the field capacity to permit weed emergence. Main weeds were: *Viola tricolor*, *Digitaria sanguinalis* and *Cyperus esculentus*. In each tray, six maize seeds were sown. Treatments based on one, two, three and four applications of vinegar (12% acetic acid at 500 L ha⁻¹) were carried out at different timings: maize pre-emergence, emergence (BBCH 09), early post-emergence (BBCH 12-13), late post-emergence (BBCH 14-15). Twenty days after last treatment, weeds were counted and weed and maize biomass weighted. For the study on rice weeds, seeds of *Echinochloa crus-galli*, *Oryza sativa* (weedy rice), *Ammania coccinea* and *Heteranthera reniformis* were sown in pots and treated at 2-3 leaf stages (BBCH 12-13) with either vinegar (12% acetic acid) or pelargonic acid (18.8%) at the following rates: 10, 20, 30, 50, 70, 90, 100% of the label rate (pelargonic acid: 100 L ha⁻¹; vinegar: 500 L ha⁻¹). After 20 days weed biomass and visual efficacy were assessed. Maize biomass was not affected by treatment with vinegar at different growth stages. Best maize weed control was obtained with three treatments (pre-emergence+emergence+early post-emergence) with 96% and 98% weed density and biomass reduction, respectively. On rice weeds, pelargonic acid at 90% and 100% label rate always resulted in a higher weed control compared to vinegar at the highest rate.