PERSISTENCE OF RESIDUAL HERBICIDES IN MAIZE SILAGE FIELDS

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Annual ryegrass (Lolium perenne) is typically grown in the winter following maize (Zea mays) silage, but alternative crops, such as oats (Avena sativa) and triticale (x Triticosecale), are being investigated. The persistence of residual herbicides used in maize silage crops was investigated in three field trials located in Waikato (5.5% organic carbon), Taranaki (8.4% OC) and Canterbury (3.7% OC) planted on 3, 5 and 16 October 2008 respectively. Herbicides investigated included atrazine and acetochlor applied pre-emergence, and mesotrione and nicosulfuron applied 6–12 weeks after planting. Broadleaf weeds in control plots were removed with the non-residual herbicide bromoxynil. Soil samples (10 cm depth) were collected about the time of silage harvest, and herbicide residues determined by glasshouse bioassay using oats and mustard (Brassica nigra). Detection limits ranged from 0.01–0.1 mg/kg for atrazine and acetochlor, 0.005–0.02 mg/kg for mesotrione and 0.002–0.01 mg/kg for nicosulfuron. Using oats, no residues were detected at any of the sites, but the mustard bioassay found about 0.005 mg/kg nicosulfuron at the Taranaki site, which was the last site treated post-emergence and with the least rainfall (180 mm) between application and sampling (215 mm for Waikato; 350 mm for Canterbury).