PREDICTING SULFONYLUREA DEGRADATION IN SOILS DEPENDS ON A VALID MEASURE OF PH IN THE SOIL SOLUTION

P.C. Pheloung[1] and W.M. Blacklow[2]
[1] Weed Science Section, Department of Agriculture, South Perth WA 6151, Australia
[2] Crop and Pasture Science, University of Western Australia, Nedlands WA 6009, Australia

Hydrolysis of the sulfonylureas, chlorsulfuron and triasulfuron, in aqueous solution is dependent on temperature and pH. We wanted to know if soil pH and temperature could be used to predict the degradation rate of sulfonylureas in soils. Our results, comparing sterilised and unsterilised soils, indicate that chemical hydrolysis is the main pathway for degradation in acidic to neutral Western Australian sandy soils. In soils at field capacity, up to 90% of the herbicide is adsorbed but the adsorbed fraction seems to be equally susceptible to degradation. We came to this conclusion since the rate of degradation was the same at 2, 5 and 10% water content. We developed a relationship to predict sulfonylurea half-life using temperature and pH as inputs, based on first order kinetics of hydrolysis in buffered water. This relationship successfully predicted the half-life in an acidic soil using the incubation temperature and bulk pH of the soil, but greatly overestimated the half-life of neutral soils. In these soils, the bulk soil pH, measured in a 10 mM $CaCl_2$ suspension, may underestimate the true proton activity adjacent to solid surfaces in the soil solution by a unit or more. When adjusted, the model more closely predicts the half life in these soils.

CONTROL OF HIMALAYAN HONEYSUCKLE *(LEYCESTERIA FORMOSA)*

G.H. Pritchard
Keith Turnbull Research Institute, Department of Conservation and Natural Resources, Frankston VIC 3199, Australia

Himalayan honeysuckle *(Leycesteria formosa)* is a deciduous, multi-stemmed shrub of Asian origin, which is spreading into native forests in Victoria. A trial conducted in the Mt Buffalo National Park evaluated four herbicides for the control of the plant. Low volume sprays, with a hand-held applicator were made in January 1992 either to the foliage or to the basal 30 cm of the stems.

Fourteen months after application, a complete kill of Himalayan honeysuckle was given by basal sprays of triclopyr at 1 kg/100 L of diesel fuel, triclopyr at 2 kg/100 L of a 1:4 mix of 'Ulvapron' spray oil and water, triclopyr plus picloram at 1 kg plus 0.33 kg/100 L of a 1:4 mix of 'Ulvapron' and water, and glyphosate at 9 kg/100 L of water. Metsulfuron methyl at 0.18 kg/100 L of water and 0.06 kg/100 L of a 1:4 mix of 'Ulvapron' and water were less effective. Foliar sprays of triclopyr at 1.71 kg/100 L of water, triclopyr plus picloram at 1 kg plus 0.33 kg/100 L of water and glyphosate at 4 kg/100 L of water also gave complete kills. However basal sprays, which require less spray volume, are preferable because they are quicker to apply, more target specific and lower in cost.