

THE EFFECTS OF A SULPHONYLUREA HERBICIDE ON ANNUAL MEDIC IN ALKALINE SOIL

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Sulphonylurea (s.u.) herbicides are commonly used on the alkaline soils of South Australia's Eyre Peninsula. Coarse textured topsoils allow these herbicides to be easily leached into the subsoil. Recent evidence suggests these herbicides may be accumulating at depth (N. Pederson, pers. comm.) and could present problems for sensitive species, for example annual medics. A pot experiment was established in 1995 to investigate residual rates of (s.u.) herbicide triasulfuron on root growth of annual medic (*M. truncatula* (c.v. Caliph)).

MATERIALS AND METHODS

Pots were filled with alkaline (pH=9.0) subsoil from Minnipa Research Centre (10-60 cm) and topsoil (pH=8.0), also from Minnipa (0-10 cm). The topsoil was treated with essential plant nutrients. Triasulfuron is normally applied to the soil (0-5 cm) at about 50 µg/kg. The herbicide was mixed with 10 cm sections of the subsoil (10-20 cm, 30-40 cm, 40-50 cm) at two rates; 0.5 and 2.0 µg/kg. These rates represent 0.01 and 0.04 of the original application rate respectively, and were chosen as representing the estimated residual range in the topsoil, twelve months after application at the commercial rate. The pots were watered to represent natural rainfall. When the medics had set seed the plants were harvested. Roots were carefully washed out of the soil and weighed.

RESULTS AND DISCUSSION

There were no visible symptoms in shoots of medic plants in any of the four replicates. The application of 2 µg triasulfuron/kg soil in the 10-20 cm depth interval reduced dry matter of medic shoots by 25% ($P \leq 0.01$). Roots in this treatment did not penetrate below 25 cm. In general, roots were not able to grow deeper than any treated layer (for 2 µg/kg). The placement of 2 µg/kg triasulfuron/kg soil between 30 and 40 cm reduced shoot weight by 12% ($P \leq 0.01$); 0.5 µg/kg triasulfuron/kg soil placed between 10 and 20 cm reduced shoot weight by 18% ($P \leq 0.01$).

From this data it is evident that very low concentrations of triasulfuron at discrete depth intervals in alkaline subsoils can significantly reduce dry matter production of annual medics, and can severely restrict root penetration. The study supports the contention that the continued use of sulphonylurea herbicides on alkaline soils has significant implications for the maintenance of the pasture ley farming system.