With the exception of areas in Western Australia and South Australia predicted growth of thistles germinating in any season was sustained to seed maturity in the prime areas. In Western and South Australia the model predicted that plants would only grow to maturity when germinated in winter.

In general, the predicted optimum germinating date in temperate climates was spring to early summer, with plants behaving as biennials. Based on these predictions, strategies to control spring and summer populations could considerably lower the reproductive potential of the species.

EFFECTS OF 2,4,5-T ON BLACKBERRY

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Blackberries are widespread weeds in Victoria growing mainly in non agricultural land, pasture, and forest plantations. There are nine species in Victoria, the most common being *Rubus procerus*. Repeated applications of 2,4,5-T are necessary to kill blackberries. Information is needed on the absorption and translocation of this herbicide, and on its effect on the root system in order that it can be used more effectively.

Foliar penetration studies on *R. procerus*, carried out at the Keith Turnbull Institute, have shown that from 38% to 59% of 2,4,5-T, applied as the butyl esters, penetrated into detached leaves picked in summer and autumn respectively. The leaves were treated under identical conditions.

Leaf uptake of 2,4,5-T was found to be temperature independent in young leaves with ages up to about 8 days. In older leaves with ages from 10 days to about 60 days uptake was dependent on temperature. Uptake into older leaves was not affected by dinitrophenol, or light or darkness. This suggests that metabolic energy is probably not involved in the uptake process. Cuticle thickness, also, could not be used to explain the difference in uptake. The differences were probably due to changes in the wax type and content as the cuticle aged.

Further experiments were conducted to measure the effect of 2,4,5-T and picloram on regeneration of root segments of *R. procerus*. The formation of roots and shoots on root segments was prevented by soaking the segments for 24 h in a 10^{-4}M solution of 2,4,5-T or a 10^{-5}M solution of picloram. Shoot numbers were significantly increased after treatment with 10^{-9}M and 10^{-10}M 2,4,5-T, but were not significantly increased with picloram. Measurement of the concentration of 2,4,5-T in the extracambial tissue showed that roots treated with 10^{-4}M 2,4,5-T contained 5×10^{-8}m mole/mg dry weight, and by extrapolation, roots treated with 10^{-9}M 2,4,5-T contained 2×10^{-12}m mole/mg dry weight.

On the regeneration of root segments it was found that temperatures from 13°C to 30°C had no significant effect on the formation of shoots on root segments of *R. procerus*. Shoots were not produced at 8°C. Some new roots were produced on root segments at all temperatures between 8°C and 30°C although significantly larger numbers were produced at 26°C. The polarity of the root system is maintained in root segments. More shoots are formed towards the basal (crown) end of the cutting while more roots are formed towards the apical end.

Translocation experiments have shown that 2,4,5-T is translocated rapidly throughout the plant, although probably in sublethal amounts. The major resistance to translocation appears to be the crown, although this effect disappears within 7 days. Translocation to the root system is correlated with the amount of herbicide applied to the leaves.

This work indicates that for control of this blackberry, lethal levels of 2,4,5-T are required in the root system, that uptake of the herbicide is efficient, and that translocation is inefficient. Attention should now be directed towards increasing the efficiency of the translocation system by developing an understanding of the factors that control it and how they may be manipulated.