Results from U.S.A. and Canada have also shown its effectiveness as a pre-emergent treatment. Promising results with a similar compound, HOE 22870, have also been obtained, although this product is not effective against *Avena* spp.

HOE 23408 could well be of considerable value in developing minimum cultivation techniques, and a shortening of the period between initial working and seeding, thus reducing delays in, or advancing, seeding.

SILVERLEAF NIGHTSHADE POPULATION IN RELATION TO WINTER CROPPING

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The main competitive effect of silverleaf nightshade (*Solanum elaeagnifolium*) is, like that of skeleton weed, the removal and retention of soil nutrients in the period before the crop is sown. The degree of competition experienced thus becomes a function of weed density at the end of the summer season.

In the eastern Riverina at least, the current cropping practice is to delay cultivation of fallows as long as possible to take advantage of the available fodder for grazing. As a result preparation of the seedbed occurs over a short period of time and may not be as thorough as it could be. This suggested that longer fallows might offset the nutrient loss. On the other hand it has been shown with skeleton weed (Myers and Lipsett 1958; Cuthbertson 1969) that removal or suppression of the weed for about a month prior to sowing was sufficient to improve wheat yields. It seemed probable that reducing the regeneration rate of silverleaf nightshade by more thorough soil preparation could have the same effect as longer fallows. At the same time it was expected that the reduction of energy reserves brought about by the artificially shortened growing season would tend to reduce weed numbers in the following season. Consequently local tillage methods were compared with fallows of the same length, (a) given twice the number of cultivations; (b) rotovated at first then scarified as in local practice; (c) rotovated twice then scarified as in (a); and (d) the response to no cultivation.

Although waterlogging prevented sowing in 1974, the end of year nightshade populations which occurred as a result of the cultivation treatments given and the subsequent volunteer pasture provide some interesting comparisons.

The overall silverleaf nightshade numbers fell from 14.4 to 7.5 plants m^{-2} over the intersampling period of 10 months. Most of the reduction seems to be due to the waterlogged conditions experienced. Some is probably due to the second sampling occurring before the weed population normally attains its maximum development. However covariance analysis showed a trend towards reduced weed numbers as a result of the cultivation treatments.

Contrary to expectation even the limited soil disturbance given in the local short fallow reduced weed numbers though not significantly. The further reduction in weed population with more thorough cultivation methods parallels the results reported by Davis, Smith and Hawkins (1945) in Arizona. There seems little doubt that maintaining weed-free fallows by more frequent cultivation reduced the plant's energy reserves and minimized its regenerative capacity in the second season.

In these experiments the initial cultivation not only cut off the main stem from the taproot but also brought long sections of the major laterals to the surface. Where subsequent cultivations were with tined scarifiers most remained on the surface. The second rotovation, however, reburied them. It seems probable that the drying out experienced by these root fragments was insufficient to prevent new plants forming on some after reburial. This would account for the higher nightshade population on this treatment as compared with the single rotovation.

These initial results, despite the absence of crop yields, suggest that cultivation can be used as a means of reducing silverleaf nightshade populations and maintaining crop yield. The response to longer periods of fallow and more frequent soil disturbance, as well as the response of root fragments to various periods of desiccation, are to be investigated more fully.