

Seeds can remain dormant for a number of years. Germination is greatest in alternating temperatures from 15°C to 35°C if soil moisture is adequate. Under laboratory conditions, up to 80% germination of seed has been achieved under these conditions. Little is known of the factors governing establishment and survival of seedlings in the field; however glasshouse studies have produced seedlings with a root 19 cm long 3 weeks after germination.

The root system is extensive both vertically and horizontally. Roots have been traced to a depth of almost 3 m in Mallee soils. Lateral roots may give rise to new plants, thereby increasing the density and size of colonies of the weed. Although glasshouse studies have shown that small root segments are capable of producing new plants, studies in the field, following summer cultivations, have revealed that more than 95% of the regrowth arises by multiple sprouting from the old root-stock, and not from transplanted material. However, it is reasonable to suggest that some transplanting may occur following autumn cultivations, when soil moisture may be adequate for the survival of root segments.

Victorian evidence suggests that cultivation has played a more important part in the spread of the weed on the sandy loam soils of the Mallee region than on heavier clay soils. Under similar cultivation regimes silverleaf nightshade occurs in discrete colonies on heavier soils whilst it dominates whole paddocks on sandy loams.

Present control methods rely on 2,4-D to reduce topgrowth and prevent seeding, and on picloram + 2,4-D to eradicate small patches and contain large infestations.

#### SOLANUM KARSENSIS - A NEW WEED

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A recent change of land use from grazing to irrigated cropping at Lake Tandou, a 20 000 ha playa of the Darling River system, has resulted in *Solanum karsensis* Symon assuming major importance as a weed of summer crops in this situation.

*Solanum karsensis* is a native, summer growing, perennial shrub 24-30 cm in height, similar in habit to silverleaf.

nightshade, *S. elaeagnifolium*. Earliest herbarium specimens date to 1921; it was described in 1971 by David Symon (Waite Institute). It was reported as a weed of irrigation in December 1974.

Its distribution is limited to western New South Wales, mainly between the Darling and Lachlan Rivers, in areas subject to flooding. The plant shoots in October and top growth dies back in April. The root system is perennial, extensively branched and deep rooting (2 m).

In the natural situation the plant is first obvious in spring after floods. The following year spring regrowth occurs when moisture is adequate. The plant is grazed by sheep.

With the continued supply of moisture from irrigation, spring regrowth occurs wherever an area was infested the previous year. Regrowth from the crown and from verticals and laterals of the intact root system has been observed in the field. Regeneration has also been observed in the laboratory from root and stem fragments.

The seed is heavily coated in resinous and possibly germination-inhibiting substances. Germination is increased from 0.5% with no pre-treatment, to 20% with 24 hours flushing in running water. This increase indicates the possibility of a role of flooding in germination.

It is not known whether the root system survives drought to shoot after floods, or whether the seed, as well as being an agent for dispersal, is responsible for growth after floods.

Although regeneration from root fragments has been observed in the laboratory all regrowth observed in the field in both cultivated and uncultivated areas under irrigation was from the entire root system. Therefore, cultivation may not be important in increasing the density of an infestation.

*Solanum karsensis* would seem to compete with the crop for nutrients rather than for moisture or for light since ground cover, though extensive, is not dense. Nitrogen application seems to increase crop vigour and ability to compete with the weed.

A research program to study the plant's mode of dispersal, regeneration and competition with the aim of control has been commenced and has already given some results which have been included above.