

# Weed Risk Assessment: *Solanum triflorum*

## 1. Plant Details

Taxonomy: *Solanum triflorum* Nutt. Family: Solanaceae. Synonyms: *S. calophyllum* Phil., *Solanum triflorum* var. *calophyllum* (Phil.) Bitter.

**Common names:** cut leaf nightshade.

**Origins:** Native to Southern America (Argentina) and Northern America (Western Canada (Alberta, British Columbia, Manitoba, Saskatchewan), North central USA (Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota), North western USA (Colorado, Idaho, Montana, Oregon, Washington, Wyoming), South central USA (New Mexico, Texas), Southwestern USA (Arizona, California, Nevada, Utah) (GRIN database).

**Naturalised distribution:** Naturalised in Britain (Norfolk) and Australia. Also in the Russian Federation and Western Siberia (Omsk) (GRIN database and the Crop Protection Compendium, 2004).



Distribution maps from the Crop Protection Compendium.

Red dots mean widespread in the region.

Yellow dots mean present in the region.

White dots mean present and localised

**Description:** *S. triflorum* is a sprawling herb that grows to 75 cm. Stems are sparsely hairy, creeping and sometimes take root from the nodes. Leaves are alternate, short stalked, ovate, lobed and toothed. Flowers are white or pale purple, usually occurring in clusters of one to three with a small terminal leaflet. The fruit is a small, whitish green, marbled, nodding berry. The plant also has an unpleasant smell ((Auld and Medd, 1987, Plant-Life.org).

## Biology and ecology:

**Habitat.** *S. triflorum* grows in open, sunny positions on a range of well drained soils. It does not tolerate excessive shade (Plants for a Future database). It is a weed of roadsides and other disturbed areas but is also sometimes found in relative undisturbed sites (Plant-Life.org).

**Life cycle.** Flowering occurs in summer and seeds are ripe by early autumn. Germination occurs over autumn-winter and the plant grows to maturity over spring. Some authors list this plant as an annual (eg. Auld and Medd, 1987) whilst others describe it as perennial (eg. Nita et al., 1990).

**Reproduction and dispersal.** *S. triflorum* reproduces from seed only. Flowers are hermaphrodites and pollination is via insects (Plants for a Future database). Seed longevity is mostly short but some authors report viability in small percentages after 9 years storage in soil (Doronin, 1991). Dispersal is by birds and movement of contaminated produce, soil or machinery. Rooting from the nodes is responsible for local spread but is not thought to be an important dispersal mechanism.



**Hybridisation.** There is limited information about hybridisation of *S. triflorum*.

**Competition.** *S. triflorum* is documented as causing significant yield decline in carrot, beet, cabbage and wheat crops in Siberia (Banshchikov et al., 2002, Moskalenko, 2002). It is also described as a highly invasive economic weed in the United States and Canada.

**Harmful properties.** All plant parts are poisonous to mammals.

**Economic benefit:** *S. triflorum* has little economic benefit although it is still used for culinary and medicinal purposes. (Plants for a Future database).

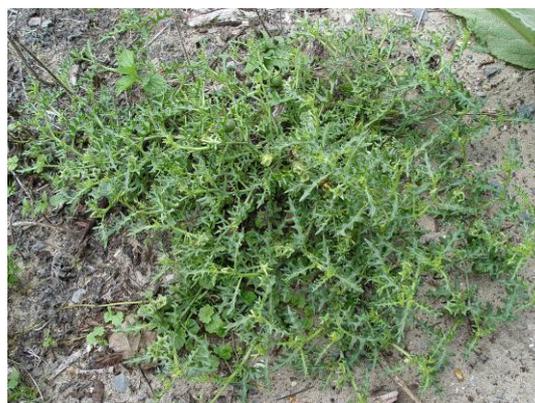
## 2. Weed Risk

### World weed status

*S. triflorum* is considered a significant weed in large parts of its native range (USDA PLANTS database). It is also a weed of Russian agriculture, especially in Siberia (Banshchikov et al., 2002, Moskalenko, 2002) and is a Russian quarantine weed (Vasyutin, 2004).

### Australian weed status

*S. triflorum* is naturalised in southern and eastern Australia. It is regulated in NSW and Victoria and is permitted entry Australia?? Groves et al. (2003) note that it is a major weed in three or fewer locations in Australia and that it is primarily a weed of agriculture or a ruderal weed.

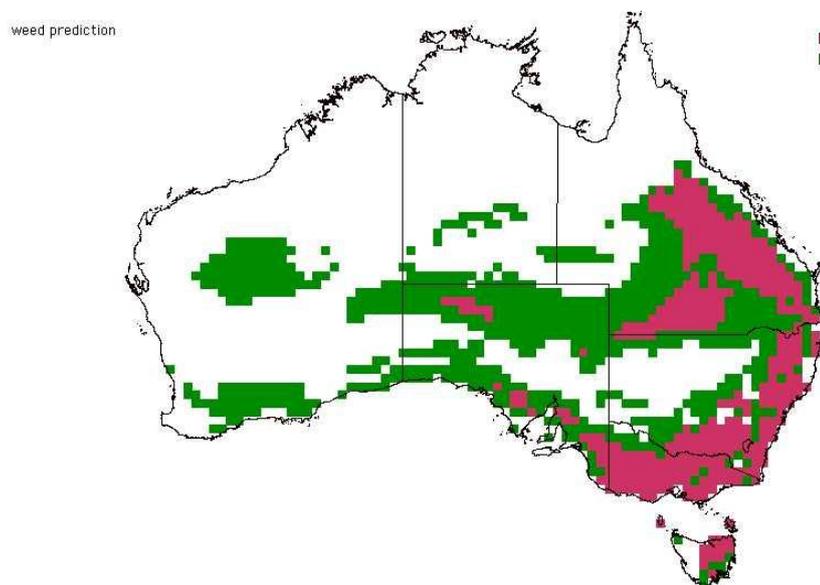


### Weed potential in Tasmania.

*S. triflorum* is naturalised in Tasmania and was first recorded at a disturbed site on Parks and Wildlife property at Seven Mile Beach in 2000. It is not known to occur at any other locations.

Climate matching indicates the plant is likely to grow well in a range of Tasmanian environments, The following analyses describe the weed potential of *S. triflorum* in Tasmania.

Potential distribution of *Solanum triflorum* in Australia using CLIMATE (Pheloung, 1995)



### Weed risk assessment

Weed risk assessment undertaken by DPIWE involves use of a point scoring system devised by Pheloung (1996). *S. triflorum* scores 21 on a scale that is positively correlated to weediness. The nominal score for rejection of a plant on this scale is 7 or greater (see Appendix 1 for risk assessment scoring).

### 3. Weed Impact Assessment

Weed impact assessment is based on the DPIWE scoring system designed for that purpose. *S. triflorum* scores 4 points on a scale where 4 points or more indicates a plant has significant potential impact. The impact scoring system requires that questions be answered with a particular land use and potential density in mind. *S. triflorum* was assessed for its potential impacts upon agricultural systems at moderate densities.

**Economic impact.** The economic impact of *S. triflorum* could manifest in terms of vegetable and grain crop contamination. It is a host for Tomato Spotted Wilt Virus and some studies suggest it is relatively difficult to control in field crops such as potatoes (Crop Protection Compendium, 2004). A relative, *S. nigrum* is already a major weed of many cropping ventures in Tasmania.

**Environmental impact:** *S. triflorum* is unlikely to have significant environmental impacts in Tasmania though its presence at the Seven Mile Beach location suggests it may persist in natural environments that are periodically disturbed. Groves et al. (2003) note that it is a major weed in three or fewer locations in Australia and that it is primarily a weed of agriculture or a ruderal weed.

**Social impact.** *S. triflorum* is unlikely to have significant social impacts in Tasmania.

#### **4. Management Feasibility.**

Weed eradication assessment is based on the DPIWE scoring system designed for that purpose. *S. triflorum* scores X points on a scale where Y points or more indicates there is significant potential for the plant to be eradicated successfully from the entire state.

**Current distribution:** *S. triflorum* was first recorded in Tasmania in 1999, at a disturbed site on Parks and Wildlife property at Seven Mile Beach, southern Tasmania.

**Detectability:** The creeping habit of this plant allow it to be distinguished from other *Solanum* species in Tasmania.

**Control Options:** A range of control options are available. Control of *S. triflorum* with xxx has been effective in Tasmania to date.

**Chance of Reinvasion:** The nature of introduction of *S. triflorum* to Tasmania is not known but its it may have been brought in as a grain or animal feed contaminant. It may have been transferred to the Seven Mile Beach site by birds or in contaminated soil or equipment. It is not recorded as a common contaminant of grain (M. Dearing, pers. comm) therefore the chances of reinvasion are probably small. It is unlikely to be promoted for ornamental use.

**Persistence:** The seeds of this species have been shown to survive for up to nine years but the rate of survival was relatively low. Thus, with a concerted control effort, the plant is unlikely to persist in large numbers for many years. This has implications for resource requirements for both the state and affected landowners.

**Compliance Issues or Conflicts of Interest:** There are no extraordinary issues related to compliance and conflicts of interest. Reluctance of the PWS to release funds for weed control in that area can be addressed by pointing out the risks to agriculture posed by this particular plant.

**Eradication Feasibility:** Eradication of *S. triflorum* at this time appears both achievable and desirable.

#### **5. Declaration Recommendation.**

*S. triflorum* appears to have potential to establish, reach moderate densities and have detrimental effects upon agricultural in Tasmania. Therefore it should be nominated for declaration under the *Weed Management Act 1999*. This will support timely eradication of existing infestations.

#### **6. References.**

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USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN), online database at [www.ars.grin.gov/cgi-bin/ngps/html](http://www.ars.grin.gov/cgi-bin/ngps/html), National Germplasm Resources Laboratory, Beltsville, Maryland.

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