Landcare Notes

Variegated thistle

Keith Turnbull Research Institute, Frankston

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Common Name

Variegated thistle, spotted thistle

Botanical Name

Silybum marianum (L.) Gaertner

Status

Variegated thistle is a Regionally Controlled Weed in the Glenelg, Corangamite, Port Phillip East, Goulburn, North East, West Gippsland and East Gippsland Catchment and Land Protection Regions. Landholders in areas where variegated thistle is Regionally Controlled must take all reasonable steps to control it and prevent its spread on their land and the roadsides which adjoin their land.

Origin and distribution

Variegated thistle originated in Mediterranean Europe, Asia Minor and the Soviet Union. It is widespread in Victoria and is capable of infesting established and degraded pastures and cereal crops.

Description

An erect annual herb in the family Asteraceae, commonly 1 to 3 m high, reproducing by seed. Main germination occurs after the first autumn rains with some emergence in late winter to spring and after summer storms. This results in infestations consisting of plants of different sizes and ages. Seedlings develop into rosettes and 'cabbage like' plants which can grow to 1 m diameter before flowering stems develop in spring. Plants die after flowering and dead stems can remain standing for several months.

Stems - Stout, erect, longitudinally ribbed, not winged, free of spines, hollow or containing pith; multi-branched from the base.

Leaves - Shining, variegated by white veins and patches on upper surface, duller and more hairy on the lower surface. Rosette leaves spiny, deeply divided, with wavy edges, up to 60 cm long. Stem leaves shorter, clasping the stem.

Flowers - Purple, in large heads surrounded by large, stiff spiny bracts (modified leaves at the base of the flower) with smaller marginal spines near the base. Heads up to 10 cm diameter, solitary at the ends of branches. Mainly produced late in the spring and early summer. In the wetter, more temperate areas variegated thistles can continue flowering through summer and early autumn.

Seeds - Black or brown, glossy, smooth, 6 to 8 mm long, attached to a pappus (parachute) of numerous fine bristles about 2 cm long. Each head can produce 50 to 200 seeds. Seed can remain viable in the soil for at least 9 years.

Roots - Taproot with numerous branches.

Figure 1. Variegated thistle rosette.

Figure 2. Variegated thistle seedling.

Properties

Variegated thistle is a very competitive weed in improved pastures where it favours fertile soils with high levels of

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nitrogen. When established, it eliminates most plants by shading and competition for moisture and nutrients. Variegated thistle is avoided by stock because of its spines, thus is encouraged by heavy g razing in pastures. If eaten the spines can cause damage to stock, particularly around the mouth. The dried leaves and spines contribute to vegetable fault in wool.

Variegated thistle is poisonous to stock under certain conditions, particularly after cutting and possibly after spraying. Cattle are more susceptible than sheep or horses. Toxicity is due to the high nitrate content of the plant which is converted to toxic nitrites in the animal's body. Poisoning is more likely when plants are eaten in wet weather and when soil moisture levels are high.

Dense infestations provide good cover for pest animals, especially rabbits. Variegated thistle has been used for various culinary and medicinal purposes.

Figure 3. Infestation of mature variegated thistle.

Dispersal

Plant dispersal is by seed only. Because seeds are large, the majority detach from the parachute close to the mother plant, but some can be carried large distances by the wind. Seed can also be spread in contaminated hay.

Control

Priorities for controlling different infestations must be worked out when planning a variegated thistle management program. A good strategy is to keep clean areas free of the thistle and manage them in a way that prevents new infestations. Lightly infested areas are best cleaned up as soon as possible to prevent spread. Extensive infestations are best quarantined and tackled progressively as part of pasture improvement programs, or with biological control. The integration of a number of appropriate control techniques coupled with good pasture management is likely to give the best long-term results.

Manual Control

Isolated plants and small patches can be cut or grubbed.

Cultivation

Ploughing is effective in killing plants and can be used as a preliminary action prior to establishing competitive pastures.

Slashing or mowing

These treatments are effective before flowers are produced but there is a danger of poisoning if animals eat wilting plants.

Pasture management

Strong, competitive, well managed pastures are effective in shading thistle seedlings, reducing establishment of the weed during the main germination periods. Careful grazing management is necessary to minimise bare ground which assists thistle seedling establishment.

Spray grazing is not recommended because of the danger of toxicity to animals.

Chemical Control

Under Victorian legislation there are controls on various aspects of the uses of agricultural chemicals. Some particular uses are prohibited and some require permits. Users of certain agricultural chemicals are required to obtain an Agricultural Chemical User Permit (ACUP) or work under the direct supervision of an ACUP holder. Additional restrictions on the use of some herbicides apply to particular geographic areas known as Chemical Control Areas (CCA).

It is the responsibility of chemical users to familiarise themselves with these controls. See Agriculture Note:* Agricultural chemical user permits (ACUP) and chemical control areas(CCA) *for further information.

***An ACUP is required for the use of prescribed chemicals containing the active constituents marked with an asterisk* (*) in the following list. *Records of the use of these chemicals must be made by the user and these records must be kept for 2 years. Restrictions on use in CCAs apply to the chemicals marked with a hatch* (#).**

Contact the Regional Chemical Standards Officer of the Department of Natural Resources and Environment if further advice is required.

You should read the product label and follow all label instructions carefully before using any herbicide.

Use a product containing one of the following active constituents or combinations of active constituents that is registered for use in Victoria to control variegated thistle in the particular situation in which you need to use chemical control, eg. in pastures. Consult the product label for detailed information.

- 2,4-D B POTASSIUM AND SODIUM SALTS
- 2,4-D DIETHANOLAMINE SALT#
- 2,4-D DIMETHYLAMINE SALT#
- 2,4-D ETHYL ESTER*#
- 2,4-D ISOPROPYLAMINE SALT#
- 2,4-D ISOPROPYLAMINE SALT + GLYPHOSATE ISOPROPYLAMINE SALT#
- 2,4-D ISOPROPYLAMINE SALT + PICLORAM#
- ATRAZINE*
- BENTAZONE
- BROMOXYNIL N-OCTANOYL ESTER
- BROMOXYNIL N-OCTANOYL ESTER + MCPA ISO OCTYL ESTER*#
- BROMOXYNIL OCTANOATE
- BROMOXYNIL OCTANOATE + BROMOXYNIL HEPTANOIC ACID ESTER
- BROMOXYNIL OCTANOATE + DIFLUFENICAN
- BROMOXYNIL OCTANOATE + MCPA 2-ETHYL HEXYL ESTER + MCPA ISO OCTYL ESTER*#
- BROMOXYNIL OCTANOIC ACID ESTER
- BROMOXYNIL OCTANOIC ACID ESTER + MCPA ETHYL HEXYL ESTER*#
- BROMOXYNIL OCTANOIC ACID ESTER + MCPA ISO OCTYL ESTER*#
- BROMOXYNIL OCTANOATE AND HEPTANOATE MIXTURE + MCPA ETHYL HEXYL ESTER*#
- CLOPYRALID TRIISOPROPANOLAMINE#
- DICAMBA DIMETHYLAMINE SALT#
- DICAMBA DIMETHYLAMINE SALT + MCPA DIMETHYLAMINE SALT#
- DICAMBA ISOPROPYLAMINE SALT + GLYPHOSATE ISOPROPYLAMINE SALT#
- DIFLUFENICAN + MCPA 2-ETHYL HEXYL ESTER*#
- DIURON + GLYPHOSATE ISOPROPYLAMINE SALT#
- GLUFOSINATE AMMONIUM
- GLYPHOSATE FREE ACID#
- GLYPHOSATE ISOPROPYLAMINE SALT#
- GLYPHOSATE MONOAMMONIUM SALT#
- GLYPHOSATE MONOAMMONIUM SALT + METSULFURON METHYL#
- GLYPHOSATE TRIMESIUM#
- IMAZAPYR ISOPROPYLAMINE SALT
- LINURON
- MCPA 2-ETHYL HEXYL ESTER*#
- MCPA DIMETHYLAMINE SALT#
- MCPA ISO OCTYL ESTER*#
- MCPA SODIUM SALT
- METSULFURON METHYL#
- NORFLURAZON
- SIMAZINE

This list of chemicals is based on information supplied to the Department of Natural Resources and Environment by the National Registration Authority for Agricultural and Veterinary Chemicals (NRA). The State of Victoria through the Department of Natural Resources and Environment has not assessed or checked the accuracy of the information supplied to it from the NRA as that responsibility rests with the NRA.

Variegated thistle is best controlled in the seedling and rosette stages. Mature plants are harder to kill. Chemical control will not destroy the soil seed reserve. Long term control requires repeated treatments or pasture improvement.

Biological Control

A program is under way to introduce a number of natural enemies of thistles from Europe after testing to ensure they are specific to particular thistles and present no danger to native plants or plants of economic importance.

An insect which reduces seed production is being released, a strain of the thistle receptacle weevil, *Rhinocyllus conicus*, adapted to variegated thistle. Larval weevils feed in the flower head and can prevent the development of seed. Adult weevils cause minor damage to bracts around the flower head. If the insect successfully establishes and builds up to large population levels it could be expected to reduce seed production and in turn slow down the spread of variegated thistle and decrease the density of infestations. This process will take many years because there is likely to be a large bank of seeds in the soil. Biological control is a long-term program which is best used on large, chronic infestations with a low priority for control.

For more detailed biological control information refer to Landcare Note LC0148 *Spear, variegated and nodding thistle suppression with the thistle receptacle weevil*, or contact the Keith Turnbull Research Institute on (03) 9785 0111.

References

Parsons, W.T. and Cuthbertson, E.G. (1992) *Noxious Weeds of Australia.* Melbourne, Inkata Press.

Woodburn, T.L., Briese, D.T. and Corey, S. (1996) Thistle management. Proceedings of a workshop held at CSIRO Division of Entomology, Canberra on 12-13 June 1996. *Plant Protection Quarterly* **11** Supplement 2, pp. 231-292.

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