



Slender Thistles

Department of Primary Industries

Common and scientific names

Slender thistle, shore thistle

Carduus pycnocephalus L. (slender thistle)

Carduus tenuiflorus Curt. (winged slender thistle)

Family Asteraceae (daisy family)

Origin and distribution

Slender thistles are native to Europe and North Africa. The range of *C. pycnocephalus* extends to Asia Minor and Pakistan while that of *C. tenuiflorus* extends northwards to Britain and Scandinavia. They are a problem in many areas of the world. Both species were present in Victoria during the 1880s and now occur throughout much of the State. Slender thistles are troublesome weeds in pastures and wastelands, favouring areas of winter rainfall and soils of moderate to high fertility. The two species often occur together in mixed populations.

Description

Erect annual herbs, commonly 60 to 100 cm high but up to 2m, reproducing by seed. Seed germinates in the 6 weeks following the autumn break. Seedlings develop into rosettes and remain in the rosette stage over winter. Flowering stems are produced in early spring and flowering continues from September to December. Plants die in early summer after flowering, but dead stems can remain standing for months.

Stems - flowering stems are single or multiple from the base, branched, strongly ribbed and slightly woolly. Spiny wings occur along most of the length of flowering stems.

Leaves - rosette leaves 15 to 25 cm long, stalked and deeply lobed with numerous spines on each lobe. Stem leaves shorter, deeply lobed with spines along the margin and with the base forming wings along the stem.

Flowers - pink or purple, in slender heads 2 cm long or less, lacking stalks; surrounded by numerous spiny bracts (modified leaves at the base of flower). Heads in groups at the ends of the branches or in the leaf axils.

Seeds - two types in each head: inner seeds and outer seeds. Inner seeds, comprising about 85% of seeds, occur in the central part of the head and have longitudinal striations. They are 4 mm long and grey brown in *C. tenuiflorus* and 5 mm long and yellowish fawn in *C. pycnocephalus*. Outer seeds are the same size but are grey

in colour. All seeds have a group of plumes (the pappus) about three times as long as the seed for wind dispersal.

Roots - branched, slender or stout tap root.



Figure 1. Slender thistle, *Carduus tenuiflorus*.



Figure 2. Slender thistle, *C. tenuiflorus* rosette.

The problem

Slender thistles are found mainly in areas with an annual rainfall exceeding 500 mm. Seedlings establish preferentially on bare and disturbed sites such as stock yards, sheep camps, rabbit burrowings and heavily grazed annual pastures. They are competitive weeds in improved pastures, outperforming subterranean clover and ryegrass, and significantly reduce pasture production, but tend to occur irregularly from year to year. Slender thistles are avoided by stock because of their spines and this encourages their spread in heavily grazed pastures. The spines can cause mechanical injury to stock and dogs. Slender thistles are potentially toxic to stock due to high

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How much do they cost you?**



levels of nitrate. Their spines and dead leaves contribute to vegetable fault in wool. The pollen produced in late spring is a useful bee forage.



Figure 3. Slender thistle, *C. pycnocephalus* flowering heads.

Table 1. Features used to distinguish the two species of slender thistle.

<i>Carduus pycnocephalus</i>	<i>Carduus tenuiflorus</i>
Rosette Stage	
Stalks of rosette leaves always green	Stalks of rosette leaves often purplish or with red/purple flecks
Leaves shiny, green, with lighter coloured areas at base of leaf spines (usually)	Leaves bluish-green. No lighter coloured areas at base of spines on leaves (usually)
Flowering Plants	
Wings discontinuous on the stems	Wings continuous on the stems
Stems usually without wings beneath the flower heads	Stems with wings to the base of the flower heads
Flower heads in clusters of 3 or 4	Flower heads in clusters of 3 to 8
Inner spiny bracts on flower heads are shorter than the adjacent florets	Inner spiny bracts on flower heads are as long or longer than the adjacent florets

Dispersal

Slender thistles are dispersed solely by seed which can be carried for long distances in the wind. Seeds have a parachute of barbed hairs (the pappus) which aids wind dispersal and attaches to clothing and animal coats, particularly the fleece of sheep. Goldfinches and other granivorous birds eat the seed but they remove the husk before consumption so do not disperse viable seed. Seed is spread in contaminated hay, silage and grain and on farm machinery, and can be dispersed in water.

Management program

Some control methods described in this note are only effective if used in combination with other control

Early treatment of new infestations will give you the best value for your weed control dollar.

options as part of a long-term management program.

If used in isolation, these methods do not effectively destroy the plant, allowing it to re-shoot or continue to grow. Authorised officers from DPI or DSE may direct landowners to undertake specific control activities to ensure methods are used that are capable of destroying plants and preventing their spread.

Where directed to do so, landowners must use the method or methods as directed by the authorised officer. In most cases the landowner will be able to choose from a variety of options appropriate for use in their particular situation.



Figure 4. Slender thistle, *C. pycnocephalus*.

Priorities for controlling different infestations must be worked out when planning a slender thistle management program. Clean areas should be kept free of the weed and managed to prevent infestation. Lightly infested areas should be cleaned up as soon as possible to prevent spread. Extensive infestations are best quarantined and tackled progressively as part of pasture improvement programs, in conjunction with other control techniques.

Any technique which kills the seedlings during the autumn germination period will give control until the next autumn. A pronounced autumn break with good rains generally leads to more uniform mass germination than a weak break with scattered rainfall, and thus allows for more effective control. Continuous and vigilant monitoring and control is the best approach to thistle management.

Manual Control

Isolated plants can be chipped or grubbed. Remove as much of the taproot as possible to prevent regrowth.

Cultivation

Ploughing is effective in killing young plants. Deep ploughing before flowering, followed up with repeated cultivations and pasture improvement will give the best

results.

Slashing or Mowing

These techniques are usually not effective because cut plants can regrow from the base and cut flowering stems may still produce fertile seed.

Pasture Management

Careful grazing management is necessary to minimise bare ground, which assists seedling establishment. Presence of a strong, competitive, perennial grass pasture giving good continuous ground cover during the autumn germination period will effectively limit thistle populations. Perennial grasses suppress slender thistle seedlings, reducing establishment. Phalaris and cocksfoot are suitable pasture species. When cattle are replaced by sheep, slender thistles may become more dominant. Applications of superphosphate encourage slender thistles. Contact your local DPI Catchment and Agriculture Services staff for pasture management advice.

Grazing

Deferred grazing, in which stock are excluded from infestations during autumn and winter, allows the rosettes to become erect and the spines to soften. Stock will often eat such plants in preference to other species. Deferred autumn grazing increases the suppressive effects of competition by more valuable pasture species: growth of thistles is systematically suppressed by shading. Goats readily consume slender thistle flower heads and have been used at the flowering stage to reduce seed production. Fencing must be adequate to restrict these animals to the chosen control area. Keep in mind that browsing animals eat a range of vegetation and may destroy desirable plants as well as thistles. Spray-grazing can be used at the rosette stage (see below).

Chemical Control

The Australian Pesticides & Veterinary Medicine Authority (APVMA) is responsible for the assessment and registration of agricultural and veterinary chemicals in Australia. As chemical products are registered on a daily basis and renewal of these registrations are undertaken each financial year, there is much change in the registration status of products each year. The APVMA information is available at: <http://www.apvma.gov.au/>
The Chemical Standards Branch (CSB) of the Department of Primary Industries provides information on agricultural chemicals registered in Victoria and their uses. Enquiries will be referred through the Customer Service Centre on 136 186. Information can also be obtained by visiting the CSB website: www.dpi.vic.gov.au/chemicalstandards

Under Victorian legislation there are controls on the use of agricultural chemicals. It is the responsibility of the user to be familiar with these controls. These responsibilities are outlined in Agriculture Note AG0520: "Responsible use and handling of farm chemicals".

Farm chemicals are registered for specific uses. Each chemical has a 'product label', which documents the approved use and the approved rate of use within each State of Australia. This label is important in determining the appropriateness of chemical use.

Choose only products registered for use on slender thistles in your particular situation. Read the product label carefully and follow all label instructions.

Your chemical retailers can provide information on registered chemical products that are available in their store. They can also supply a 'material safety data sheet' which outlines the health and safety issues associated with use of a product.

Legal use of some restricted chemicals requires the user to possess an Agricultural Chemical User Permit (ACUP). Other chemicals have restrictions on their use in Agricultural Chemical Control Areas (ACCAs).

Information on ACUPs, ACCAs and other chemical information can be found at the website:

www.dpi.vic.gov.au/chemicalstandards

Herbicidal control is most effective in autumn on young seedlings and rosettes. Control is much more difficult after plants have bolted.

Spray-grazing

Spray-grazing involves the use of sub-lethal rates of phenoxy herbicides on the actively growing rosette stage, followed by heavy grazing (preferably at more than five times the normal stocking rate) until the weed is eaten. The herbicide increases the attractiveness of the weed to stock by mobilising sugars and changes its growth form so that the leaves are more erect and accessible. Using low rates of herbicide minimises the impact on the legume component of a pasture.

Weed Wiping

Weed wiping using wicks, carpet or other materials can be used against slender thistles once they have started to 'bolt' or send up flowering heads. There should be a minimum height difference of 15 cm between the top of the thistles and the pasture so that the weeds can be wiped without contacting the pasture.

Biological Control

Biological control is a long term program which is best used on large, chronic infestations with a low priority for control due to inaccessibility, remoteness or low threat of spread. The single agent released to control slender thistle in Victoria, the rust fungus, *Puccinia cardui-pycnocephali*, will assist in integrated management of slender thistles.

The slender thistle rust has occurred in Australia since early this century. It infects both species of slender thistle and is common, but this particular strain of rust has had little effect on slender thistle infestations. Two new strains selected in Europe by the CSIRO Division of Plant

Weeds don't respect boundaries.

If a weed is a problem on your property, it's a problem for your neighbours.

Industry, have been released at numerous sites in Victoria since 1995. Strain IT2 from Italy and strain FR3 from France, are extremely virulent on Australian types of *C. pycnocephalus* and *C. tenuiflorus* respectively, although each strain will attack the other species. Thorough host specificity studies have demonstrated that the rust presents no danger to other species of plants.

Rust infection starts on new seedlings in autumn and builds up to epidemic proportions by spring, covering most of the leaves and flowering stems. Infection reduces the vigour and subsequent seed set of plants and makes them more susceptible to competition from desirable pasture species. Rust infection reduces plant height, plant mass and the production of viable seed. The rust has spread considerable distances and control appears to be most effective in wetter summers.



Figure 5. Autumn-spring spores of slender thistle rust are purplish on the leaf undersides and reddish-brown on the uppersides.

The thistle receptacle weevil, *Rhinocyllus conicus*, released in Victoria to suppress spear and variegated thistles, and the thistle rosette weevil, *Trichosirocalus horridus*, released in Victoria for control of spear thistle, attack slender thistles in New Zealand. Specific strains of these insects suitable for control of slender thistles have not been released in Australia.

- Further advice
- Contact your local landcare or friends group for further assistance and advice.
- Call the DPI/DSE Customer Service Centre on 136 186.
- Contact your local DPI Pest Management Officer for advice on local programs.
- Visit the DPI website at:
<http://www.dpi.vic.gov.au>
and the Weeds Australia website at:
<http://www.weeds.org.au>

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All land managers have a responsibility to control weeds on their property.