Biosecurity series – pest plant factsheet

Thistle: nodding and plumeless
*Carduus nutans* and *C. acanthoides*

**WHY IT IS A PEST PLANT**

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<tr>
<th>Production threat</th>
<th>Environmental threat</th>
<th>Public threat</th>
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Nodding and plumeless thistle are agricultural pests in the Waikato region. They are highly invasive pests and have unpalatable foliage, reducing pasture production throughout New Zealand. Seeds remain viable in the soil for many years. Their dense stands obstruct livestock movement and inhibit and suppress the growth of desirable pasture species. ‘Tufted’ seeds are spread between properties mainly by contaminated hay and machinery, uncertified seed and stock feed and also through wind dispersal.

**Related species**

Variegated thistle (*Silybum marianum*). This is a very conspicuous spiny thistle up to 2m high, which is easily recognised by cream marks on its leaves (hence the ‘variegated’ appearance). The Regional Pest Management Plan objective for the Waikato is to eradicate variegated thistle.

**RESPONSIBILITY FOR CONTROL**

All landowners/occupiers in the Waikato are responsible for controlling nodding and plumeless thistle on their properties and are required to work with Waikato Regional Council in areas where control programmes are in place. If you graze the roadside then you are responsible for controlling these pest plants on that land. The level of control depends on where the property is.

- On properties in ‘total control’ areas, all nodding and plumeless thistle plants must be controlled.
- On properties in ‘boundary control’ areas, any plants within 50m of the property’s boundaries must be controlled on complaint from an adjoining landowner.

See the map inside for an overview of the locations of the two types of control zone.

Nodding and plumeless thistle are also banned from being sold, propagated, distributed or included in commercial displays.

**IDENTIFYING FEATURES**

- **Flower**
  - Flower heads are a distinctive bright crimson colour.
  - The nodding thistle flower head is about 4cm in diameter, the plumeless thistle’s flower head is smaller.
  - Nodding thistle flower heads droop down, nodding in the wind, plumeless thistle flower heads do not.
  - Flowering is from November to February.

- **Fruit/seed**
  - Parachute-like dark-coloured seeds attached to fine hairs.
  - The fine hairs open out to form a fluffy ball (thistledown).
  - The fluff helps the wind to spread the seed more widely.

- **Leaf**
  - Rosettes can be up to 60cm in diameter.
  - In the rosette stage, the leaves are usually long and narrow (up to 18cm long and 10cm wide).
  - Leaves are deeply cut with spiny edges.
  - The upper surfaces of the leaves have a metallic sheen and appear whitish at the base of the spines.

Keep nodding and plumeless thistle from affecting nearby land.

www.waikatoregion.govt.nz/thistlenodingandplumeless
HOW TO CONTROL NODDING AND PLUMELESS THISTLE

The best returns from thistle control come from managing the most productive land. Relatively low returns for sheep and beef make thistle control marginal in hill country, except after a drought.

High livestock value and gross margins increase the value of the pasture and make weed control more worthwhile.

Many principles which apply to nodding and plumeless thistle and are also relevant for other thistles such as Scotch and winged thistles.

Some options for managing thistles are included in this factsheet, but there are many others. For more information contact your herbicide representative or check www.pestweb.co.nz.
**Physical control**

Grubbing plants is an effective method of controlling thistles, provided they are grubbed at least 5cm below the crown and control work takes place before the onset of seed. Mowing (or topping) thistles is less effective as the plant is able to regrow from the crown. You will need to mow repeatedly to make sure the plants do not reach flowering/seeding stage.

**Grazing management**

- Goats will eat and control thistles, but only when the plants are flowering.
- Careful grazing in autumn, spring and summer to ensure strong pasture cover, especially in autumn, will give most effective control of this weed.
- Pasture damage caused by overgrazing or pugging encourage thistles and other weeds.

**Pasture species/cultivars**

- Dense, vigorous pastures stop thistles from establishing and reduce their growth and survival.
- Pasture cover is most important in autumn.
- Where new improved cocksfoot grass varieties perform well they may keep thistles out.

**Mowing/grubbing**

- Thistles are killed by mowing only after flowering has started, but some may regrow and flower if soil moisture is adequate.
- If mown too early, flowering is delayed and multiple crowns can be produced.
- Mowing is recommended in summer.

**Herbicide control**

There are many herbicides that will control nodding and plumeless thistle. The herbicide best suited to your property will depend on the level of infestation, the application equipment you have available and the stage of growth the plants are at.

Some suggested herbicides are included in the table in this factsheet. Contact your local biosecurity pest plant officer on freephone 0800 BIOSEC (0800 246 732) for free advice on what herbicide and application method would best suit your situation.

**Spray application**

Spot spraying plants should be done before flowering, as mature plants are less susceptible to herbicides. Spraying after seed has set is ineffective, so make sure you do not allow nodding or plumeless thistle to go to seed. Boom spraying in autumn and early winter with a herbicide such as MCPA, 2,4-D or Batton provides effective control of seedlings and reduces the likelihood of pasture damage compared to a spring application.

Because plumeless thistle germinates at a later stage it is difficult to control both plumeless and nodding thistle with one autumn/winter application.

Small block owners who may not have access to spray equipment could consider grubbing out plants (see 'physical control' above) or selecting a herbicide such as picloram granules. Picloram is a dry application powder which does not require mixing or spray equipment.

**Note:** using non-selective herbicides (which you may have already purchased for other plant control jobs) will destroy surrounding pasture species and reduce competition against new thistle seedlings.

**Herbicide control tips**

- The most cost-effective control is achieved by spraying young thistles in late autumn or in winter after drought.
- Thistles are most susceptible to herbicides when small, that is in autumn and winter.
- Blanket spraying small thistles (up to six leaf stage) in autumn and winter is less damaging to clover than spraying in spring.
- Grazing before spraying in spring will reduce the amount of clover leaf present and reduce clover damage.
- In spring and summer, spot spraying or weed wipers can be used for larger thistles, although clover may also be damaged.
- Check the tap root diameter before spraying. Two year old plants may have small rosettes but a large root system with a larger diameter tap root. They look similar above ground to one year old plants, but two year old plants need more herbicide to kill them.
- For low use rates, or to use clover-safe herbicides like MCPB, the root diameter below the crown must be smaller than a five cent piece.
- In some areas, thistles have developed resistance to phenoxy herbicides such as MCPA, MCPB and 2,4-D. Use non-phenoxy herbicides such as metsulfuron-methyl, clopyralid or glyphosate to control them.
**Safety when using herbicides**

- Follow the instructions on the manufacturer’s label.
- Always wear protective clothing.
- Always minimise the risk to your other plants.
- Contact the supplier for further advice.

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>WHEN TO APPLY</th>
<th>RESIDUAL EFFECT</th>
<th>GRASS DAMAGE</th>
<th>CLOVER DAMAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>Up to small rosette</td>
<td>Slight</td>
<td>No</td>
<td>Slight</td>
</tr>
<tr>
<td>Dicamba</td>
<td>Up to large rosette</td>
<td>Severe</td>
<td>No</td>
<td>Severe</td>
</tr>
<tr>
<td>Triclopyr/picloram</td>
<td>Up to large rosette</td>
<td>Yes</td>
<td>No</td>
<td>Severe</td>
</tr>
<tr>
<td>Metsulfuron-methyl</td>
<td>Up to large rosette</td>
<td>Yes</td>
<td>Usually moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>Picloram</td>
<td>Up to large rosette</td>
<td>Yes</td>
<td>No</td>
<td>Severe</td>
</tr>
<tr>
<td>MCPA</td>
<td>Up to small rosette</td>
<td>Moderate</td>
<td>No</td>
<td>Slight</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Any stage</td>
<td>No</td>
<td>Severe</td>
<td>Severe but temporary</td>
</tr>
<tr>
<td>Clopyralid</td>
<td>Up to large rosette</td>
<td>Severe</td>
<td>No</td>
<td>Moderate – severe</td>
</tr>
<tr>
<td>MCPA/MCPB</td>
<td>Seedling</td>
<td>Moderate</td>
<td>No</td>
<td>Very little</td>
</tr>
<tr>
<td>Mecoprop/dichloroprop/MCPA</td>
<td>Up to small rosette</td>
<td>Moderate</td>
<td>No</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Herbicide rules will apply. You may need to notify neighbours if spraying. The Waikato Regional Plan explains the agrichemical (herbicides) use rule in section 6.2, online at www.waikatoregion.govt.nz/regionalplan.

**Management**

After initial control, it’s important to clean out the site again at least annually to control regrowth.

**Biological control**

Biological control involves importing insects or fungi that feed on plants in their native countries. Biological control agents reduce infestations but do not eradicate plants from an area so control work still needs to be carried out.

Four biological agents have been released in the Waikato to feed on nodding thistle:

- receptacle weevil
- crown weevil
- gall fly
- green thistle beetle.

Each of these agents will also feed on plumeless thistle. The receptacle weevil has had the most significant impact on nodding thistle in the region. The larvae feed on the receptacles, reducing the amount of seed being produced. The effect is obvious only long term, as this agent does not reduce plant growth.

Landcare Research runs a national biological control programme. Waikato Regional Council supports the programme and maintains a local biological control programme for the Waikato.

**Advises**

- For advice and additional information on control methods, call our pest plant staff on freephone 0800 BIOSEC (0800 246 732).
- Chemical company representatives, farm supply stores and garden centres can also be good sources for advice.

**Publications**

View, download or order the following publications at www.waikatoregion.govt.nz/publications or call our freephone 0800 800 401.

- National Pest Plant Accord (Manual of plants banned from sale, propagation and distribution) ($10.00 plus GST)
- Plant Me Instead! (Plants to use in place of common pest plants) (free)
- Poisonous Plants and Fungi in New Zealand – A Guide for Parents, Schools and Child Minders (free)
- Waikato Regional Pest Management Plan (RPMP) (free) (Section 5.58, page 143)
- Waikato Regional Council pest guide (free)
- What makes a pest a pest? A summary of the Waikato Regional Pest Management Plan (free)

**Web**

- www.waikatoregion.govt.nz/thistlenoddingandplumeless
- www.weedbusters.org.nz
- www.waikatoregion.govt.nz/rpmp