

# Primary Industries, Water, and Environment

## Service Sheet

PRODUCED BY THE DEPARTMENT OF PRIMARY INDUSTRIES, WATER, AND ENVIRONMENT

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### Spear thistle (Scotch thistle) (*Cirsium vulgare* (Savi) Ten.)

#### Identification and Characteristics

An erect annual or biennial herb, growing to 1.5 metres high, but more commonly 60 to 120 cm, reproducing by seed. Some plants are single unbranched stems except near the top, others are branched and spreading from near the base. The stems are winged, which have spines, stout hairs and cobweb like hairs. The root is a branched tap root.

The leaves are dark green, rough and hairy on the upper surface, lighter beneath because of a very dense covering of whitish hairs. Rosette leaves are lanceolate to elliptical, stalked and armed with spines on the margins and with wart like protuberances on the upper surface. Stem leaves are up to 25 cm long, sessile with bases extending along the stems as wings, deeply divided into lobes, the tip of each lobe ending in a stout yellowish spine.

Flowers are reddish to purple with the heads 3 to 5 cm in diameter, solitary or in groups of 2 or 3 at the ends of branches, surrounded by a large number of spiny bracts, about 100 florets per head.

Seed is grey or light brown with brown or black longitudinal markings, 3 to 5 mm long, 1.5 mm wide, smooth, somewhat flattened and sometimes slightly curved, with a pappus of soft feathery hairs 2 to 2.5 cm long.

#### Distribution

Spear thistle is found in all settled parts of the State, but is more common in the lighter rainfall

areas. Very heavy infestations occur in pastoral areas of the Midlands in some seasons, depending on rainfall distribution, grazing pressure and soil fertility status.

#### Life Cycle

Seeds germinate mainly after the autumn rains but a few shoot at other times when adequate moisture is available. During winter an extensive root system, consisting of several branched fleshy storage roots, develops. Rosettes grow rapidly through spring, reaching a diameter of about 60 cm. In a dry summer or in arid areas, the rosette dies off and a new rosette forms at the crown in the next autumn and winter. Normally, however, rosettes persist through summer and continue growth into the second autumn and winter. In either case, a flowering stem is produced in late spring of the second year and plants flower during summer and late autumn before dying. Up to 200 flower heads and 8000 seeds have been counted on individual plants. Dead plants often remain standing for one or two years. Seed germination in early autumn produce plants which over winter as rosettes before making rapid growth in early spring. They may flower and die in summer and autumn, thus behaving as annuals.

## **Dispersal**

Spear thistle reproduces by a seed furnished with a pappus or 'parachute' of long hairs which is capable of carrying the seed over long distances. However, the pappus separates readily from the seed, most of which falls within a few feet of the plant, leaving the 'thistle down' to float away empty. Most seed is distributed by farm machinery and vehicles, internally and externally on livestock, by run-off after heavy rains and very frequently by feeding out contaminated baled hay.

## **Economic significance**

Heavy thistle infestations in pasture may virtually exclude grazing stock. Under such conditions pasture grasses may become rank, predisposing the area to damage by insect pests. Thistle spines in the fleece of sheep grazing infested areas cause difficulties at shearing. The large rosette suppresses pasture growth and competes for moisture and nutrients.

## **Status under the *Weed Management Act 1999***

Spear thistle is not a declared weed in Tasmania at this time.

## **Control**

### ***Competition and Cropping:***

The best general control of spear thistles is obtained by encouraging competition from useful plants.

Vigorous pasture helps to restrict seedling establishment and growth, and management practices should be aimed at maintaining a vigorous and unbroken stand during the period when thistles are germinating.

In general block grazing should be used where possible in preference to set stocking.

Failure to control a heavy attack by pasture insects, which can lead to bare ground, may result in a serious invasion of spear thistles because of the lack of competition at a critical period. The sowing of useful species on patches of land left bare by insect attacks is recommended. The use of insect resistant species such as phalaris or cocksfoot grasses would be an advantage in areas subject to regular attack.

In heavily infested arable areas growing a cereal crop for one or two consecutive seasons can reduce the thistle population, provided a suitable spray program is used.

The cereal should be sprayed at the 5-leaf to fully tillered stage, when the thistles are still in the young rosette or seedling stage, using MCPA, 2,4-D amine or an MCPA/dicamba mixture (see Table 1). 2,4-D is not recommended for use on oats.

Any thistles not completely killed by the herbicide will be suppressed by the crop, provided it is vigorous.

### ***Mechanical Control:***

Cutting or slashing when the plants are in the late bud or early flower stage, may help to reduce seed production. However, because spear thistles tend to mature over an extended period, this method of control is of dubious value. Moreover, in years when there is adequate soil moisture thistles are likely to recover and regrow.

Hand hoeing is effective for individual plants and small patches provided the growing point and the top 20 to 40mm of the tap root are removed.

### ***Control by Grazing:***

Spear thistles are not normally grazed by cattle or sheep.

However, block grazing, as opposed to set stocking, is likely to give some degree of control, particularly of seedlings.

Goats will graze spear thistles at the flowering stage, eating flowers, seed heads and stems. Over a period of several seasons this prevention of seed production can produce a significant reduction in thistle numbers.

### ***Chemical Control:***

Spear thistles at the seedling stage are susceptible to growth regulator type herbicides applied either as spot or boom sprays.

In years when there is an early autumn break and large numbers of thistles germinate before the temperature falls, autumn spraying can be very effective. Spraying at this time also requires lower

herbicide rates, is less damaging to clover and allows the desirable pasture species to grow with reduced competition from the thistles.

In most winters when the temperature falls to near freezing, spear thistles become dormant and very much less susceptible to herbicides. Susceptibility increases again with the onset of spring growth and spraying can usually be resumed effectively in September or October.

When practicable, spraying should be completed before the centre flowering stem develops. Although spear thistle remains reasonably susceptible even up to flowering, treatment at this late stage involves the use of more active forms of the herbicides and of higher application rates, with a consequent risk of greater pasture legume damage.

The use of a wiper applicator, where possible and if the thistle population is reasonably uniform in size, can overcome most of the problems arising from treatment of mature plants.

For effective chemical control the thistles must be growing actively. Plants subject to stress due to waterlogging, drought or low temperatures are far less susceptible to herbicides.

### ***Boom Spraying:***

#### *Pasture:*

In new sown pasture MCPA sodium salt or MCPA amine can be used in the autumn at a rate of 1.3 L/ha of a 250 g/L formulation or 700 ml/ha of a 500 g/L formulation respectively, once the grass is about 100 mm tall and the clover has at least 2 trifoliolate leaves. While this may not give complete control it will significantly reduce and weaken the thistle population.

The use of 2,4-D on new pasture is not recommended.

In established pasture MCPA amine or 2,4-D amine can be used in autumn or spring at 1 to 2 L/ha of a 500g/L formulation depending on the size of the thistles. Treatment at an early stage - before the thistles exceed a diameter of 100 mm - with the lower rate will minimise clover damage.

Once thistles have started to shoot they become much more resistant, and 2,4-D ester needs to be used. Control of thistles in or past the bud stage is generally poor.

#### *Crops:*

In crops, thistles should always be treated in the seedling or young rosette stage. In cereals a mixture of dicamba and MCPA controls spear thistle and a wide range of broad-leaf weeds.

### ***Spot Spraying:***

MCPA or 2,4-D amines, at the rates listed in the table, should be applied to give a light overall wetting of the plant in the seedling or rosette stages. Once plants have started to shoot 2,4-D ester is more effective than the amine.

Control of advanced plants, up to the early flowering stage, can be achieved by spot spraying with clopyralid. While this material apparently kills very slowly, and may not prevent the production of flowers, treated plants do not produce viable seed.

Clopyralid is highly active against clovers and is residual in the soil. For this reason it is not recommended for application by boom in pasture.

#### *Non-crop, Roadsides and Waste Areas:*

Spot or boom sprays can be used as recommended for established pasture. Clopyralid can also be used as a boom spray where clover destruction is not a problem.

For total vegetation control such as along fence line or roadsides products such as glyphosate or Oust<sup>®</sup> could be used.

### ***Wiper Application:***

Clopyralid has been found to be very effective for the control of advanced thistles when applied by wiper applicator. Because the herbicide is applied selectively directly to the thistle, not overall to the pasture, no clover damage results. The quantity of chemical used is also far less than with other application methods.

With this application method there is no spray drift, and since clopyralid is non-volatile and produces no vapour drift, this method of thistle control can be used safely in the immediate vicinity of highly susceptible crops such as grape vines. It is not recommended to apply clopyralid within a vineyard as residues may occur in woody tissue and become available to vines after the death of the thistles.

### **Protection of Susceptible Crops**

Growth regulator herbicides such as MCPA and 2,4-D, can cause severe damage to a wide range of vegetable and horticultural crops. Great care must be taken to prevent either spray or vapour drift reaching crops such as grape vines, tomatoes, vegetables, poppies or flower crops.

Grape vines in particular are highly sensitive to 2,4-D. **The application of 2,4-D is restricted to the period between 15 April and 15 September.** To use 2,4-D outside this time period a permit is required from the Registrar of Chemical Products.



### Bee Careful !

Some herbicides are toxic to bees. As a general rule, avoid applying herbicides when and where bees are foraging. Always read the label.

**Note: These herbicide recommendations are made subject to the product being registered for that purpose under relevant legislation. It is the user's responsibility to check that registration or an off-label permit covers the proposed use. If in doubt, check with the Registrar of Chemical Products, Department of Primary Industries, Water and Environment. Statewide Freecall 1300 368 550.**

## SPEAR THISTLE

### CHEMICAL CONTROL RECOMMENDATION

#### BOOM SPRAY APPLICATION

Situation	Growth Stage	Herbicide	Commercial product (Content of active ingredient)	With holding Period (days)	Application Rate of Commercial Product per hectare
<b>New Pasture</b>	<i>seedling</i>	MCPA Sodium salt	(250 g/L formulations)	7 days	1.3L
		MCPA amine	(500 g/L formulations)	7 days	700 ml
<b>Established Pasture</b>	<i>seedling to rosette</i>	MCPA Sodium salt	(250 g/L formulations)	7 days	2 - 4 L
		MCPA amine	(500 g/L formulations)	7 days	1 - 2 L
		2,4-D amine	(500 g/L formulations)	7 days	1 - 2 L
	<i>shooting plants</i>	2,4-D ester	Low Volatile Ester 400 Herbicide®(400 g/L )	7 days	2.5 L
<b>Non-crop, Roadsides and Waste areas</b>	<i>rosette to early flowering</i>	clopyralid	Lontrel® (300g/L)	7 days	0.3 L
<b>Cereal crops</b>	<i>seedling to rosette</i>	dicamba plus MCPA#	(80 g/L dicamba + 340 g/L MCPA formulations)	7 days	see label directions and note below
		2,4-D ester	(400 g/L formulations)	7 days	see label directions

# Several commercial formulations are marketed. For Tasmanian conditions a higher MCPA content as a tank mix, may be an advantage.

### WIPER APPLICATION

Situation	Growth Stage	Herbicide (Active Ingredient)	Commercial Product (Content of active ingredient)	With holding period (days)	Application Rate of Commercial Product	Comments
Pasture	<i>advanced shooting to early flowering</i>	clopyralid	Lontrel® (300 g/L)	7 days	1 L product plus 11L water (i.e. 1 in 12 of mixture)	The wiper must be set high enough to avoid any contact with a susceptible crop

A wiper equipped with a broad felt is to be preferred to one fitted with rope wicks. Herbicide must not be allowed to drip onto pasture or crops if damage is to be avoided.

### SPOT SPRAYING

Situation	Growth Stage	Herbicide (active ingredient)	Commercial Product (Content of active ingredient)	With holding period (days)	Application Rate of Commercial Product per L	Comments
Established Pasture	<i>seedling to rosette</i>	MCPA Sodium salt	(250 g/L formulations)	7 days	4-8 ml	Use the lower rate for seedlings, the higher rate for medium sized rosettes.
		MCPA amine	(500 g/L formulations)	7 days	2-4 ml	As for MCPA sodium salt
		2,4-D amine	(500 g/L formulations)	7 days	2-4 ml	As for MCPA sodium salt
		2,4-D ester	(400 g/L formulations)	7 days	2.5-5 ml	Use the lower rate for seedlings, a middle rate for rosettes and the higher rate for shooting plants
	<i>shooting</i>				5-10 ml	
	<i>shooting to early flowering</i>	clopyralid	Lontrel® (300 g/L)	7 days	3.5 ml	Can be used on early flowering plants to prevent seed production.
Non-crop, Roadsides and waste areas	<i>seedling to shooting plants</i>	glyphosate	(glyphosate 360 g/L formulations)	Not applicable	10 ml	Add surfactant. Not to be used on pasture
		sulfmeturon	Oust® (720 g/kg)	Not to be used on pasture	2 - 4 g	Add surfactant. Use higher rate for dense infestations or where weeds are greater than 15 cm diameter. May be mixed with glyphosate