

## Seasonal Guide to Weed Management



A year-round weed management guide with practical and sustainable weed control techniques, and handy hints

This Seasonal Guide to Weed Management and the complementary Weed Fact Sheets have been developed to support the City of Whittlesea's Pest Plant Local Law.

For further weed control advice or more information, contact Council's Sustainable Land Management Officer on 9217 2493 or 9217 2323.

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## Weed Control Techniques

The most cost effective and successful weed control is achieved through an integrated weed control program, using a number of complementary methods together to achieve sustainable, long-term weed control.

**Chipping** with a mattock or similar tool to manually chip out weeds is very effective for smaller weed infestations. When chipping, it is important to minimise soil disturbance to avoid stimulating the weed seed-bank. Ideally, chipping should be undertaken when weeds are not in seed to minimise accidental spread. Chipped weeds are normally left to rot in the paddock.

**Hand pulling** weeds can be done at any time of the year, however, it is easiest when the soil is soft just after rain. Care needs to be taken to extract the whole plant and root system because many plants can regenerate from root fragments left in or on the ground. Hand-pulled weeds can be disposed of in the same way as chipped weeds.

**Cultivation** and ploughing are effective means of weed control and are usually used as a preparation for sowing or planting pastures and crops.

**Grooming** is carried out by a specialised machine or an attachment on an excavator. Groomers are commonly used to mulch large woody weed infestation, such as gorse and hawthorn, minimising soil disturbance and the use of chemicals. This technique is usually followed up with spot-spraying of any re-growth. Ideally, this technique should be undertaken in stages and the weed infestation substituted with native vegetation in order to replace lost habitat for native animals.

**Brushcutting/slashing** is used primarily to reduce overall weed cover or as a short-term measure to stop seed-set on a particular weed. Any resulting re-growth will need to be followed up with weed control, e.g spraying, grazing.

**Chemical:** Used correctly, herbicides can be a very effective tool to control weed infestations. It is important to select the most appropriate chemical for your circumstances. Selective herbicides only target weeds with a certain characteristic, e.g. broad leaves, leaving grasses unaffected. This is very useful when dealing with broadleaved weeds in pasture or areas of native grass. Non-selective herbicides will control a wide variety of weeds.

**Chemical safety:** Always follow the recommendations on the label to achieve the best results. Do not be tempted to alter the amount of chemical recommended on the label by adding 'a little bit more just to make sure'. Often, such practices can lead to substandard results, sometimes even making the herbicide inactive or dangerous. Many chemicals require the user to have an Agricultural Chemical Users Permit (ACUP), which is a certificate attained following training on safe use and handling of chemicals. When using chemicals, always wear personal protective equipment such as overalls, PVC or rubber gloves, PVC or rubber boots, washable hat, face mask/respirator, and if necessary, breathing apparatus.

Always take note of withholding periods for chemicals when spraying amongst crops or in areas used by livestock. Care should be taken to ensure that there is no spray-drift to 'off-target' plants on your own property or neighbouring properties. Particular care needs to be taken near waterways to avoid contamination. Restrictions also apply on the types of chemicals that can be used in the Agricultural Chemical Control Area (CCA).

For further information on the CCA or about obtaining an ACUP contact the Department of Primary Industries (DPI) on 136 186 or visit the DPI's website [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au)

There are a variety of chemical application techniques used for weed control. It is important to consider the target weed and desired outcome before selecting your technique. Be aware that the risk of weeds developing herbicide resistance is increased if the same chemical is used repeatedly on the same weed in the same location. It is advisable not only to vary the herbicide used but also the control method as part of an integrated control program.

**Spot spraying** can be undertaken using a hand-held spray unit, backpack, or large or small tanks fitted to a quad-bike, ute or trailer. An applicator such as a gun or a wand is used to direct the spray onto the target plant. Spot spraying is suitable for small outbreaks of weeds or when applying herbicide amongst desirable plants such as improved pasture or native vegetation. Foliar spraying is a form of spot spraying typically used on larger woody weeds such as gorse, blackberry and hawthorn.

**Boom spraying** requires specialised equipment fitted to a quad-bike or tractor, and is used for the application of herbicide on dense infestations of weeds or on large areas of weed infestation. Boom spraying is often undertaken prior to pasture renovation or cropping.

**Cutting and painting** is generally performed on trees and shrubs with smaller trunks and stems using secateurs, loppers, handsaw or chainsaw. The main stem of the plant must be cut as close as possible to ground level to prevent potential suckering. To ensure the plant takes up the herbicide, paint the stump with undiluted herbicide within 15 seconds of the initial cut. If this procedure takes longer or the surface becomes contaminated with dirt, it may be necessary to re-cut or scrape the cut surface before applying the herbicide. A paint brush, atomiser or sponge can be used to apply the herbicide.

**Drilling/frilling and filling** is generally performed on trees and shrubs with thick trunks or where habitat for fauna needs to be maintained. Using a cordless, electric drill or hand drill, holes are made into the trunk on an angle 2-3cm deep and 5-10cm apart around the circumference. Alternatively, a hammer and chisel, an axe or tomahawk can be used to create wounds around the trunk. This technique is called 'frilling and filling'.

Within 15 seconds of the holes being drilled, or the frills being made, undiluted herbicide is injected/poured into each hole. To avoid suckering, the holes must be as close to the base of the plant as possible. It is important to treat every stem/trunk originating from the ground to prevent re-growth. Large multi-stemmed trees may also require the main branches to be drilled/frilled and filled. Deciduous trees should only be treated when they are actively growing, i.e. during spring and summer to ensure the plant takes up the herbicide

**Stem scraping** is a technique that is often used on vines or when trees are growing horizontal to the ground, preventing drilling or frilling around the entire trunk. Simply scrape back the bark using a chainsaw or hand-tools, then apply herbicide as described for 'cutting and painting'.

There are a variety of non-chemical and nonmechanical weed control methods which can be used as part of a sustainable, integrated weed control program.

**Solarisation** involves laying sheets of black plastic over weed infestations and letting the sun effectively 'cook' the plants. Best results are achieved on weeds growing in full sun, however, the sheet of plastic will need to remain securely in place for some time.

**Mulching** with a 10 cm layer of mulch will help reduce the chance of weed seeds germinating. Securely placed old carpet or underlay, or a thick layer of newspaper, presoaked in water, can also be an effective way to smother weeds.

**Biological weed control** using a biological control agent is an effective way to reduce the size and density of large weed infestations. Biological control should be viewed as a long-term weed control method that must be used in conjunction with other control techniques for an effective outcome. Results can sometimes take long periods of time before they become obvious. Biological control has the benefit of reducing the amount of chemicals required, minimising environmental impacts and reducing costs. All biological control agents must undergo stringent testing to ensure there are no detrimental impacts on agriculture or the environment.

**Fire** can be used to control and suppress weeds, however should only be used as a last resort because of the inherent risk of using fire. It generally does not kill the targeted weed, but is primarily used to reduce the overall cover of weeds and the need for large amounts of chemical. Fire can also be used to deliberately stimulate germination of weed seeds in the soil. The resulting new weed growth must then be controlled with followup weed control. It is important to note that using fire as a weed control technique may risk damaging or destroying all vegetation, including desirable plants, and can result in re-invasion of weeds.

**Competition/replacement:** One of the most effective weed control techniques is to prevent or minimise weed invasion by providing competition with desirable plants, e.g. pasture or native vegetation. Implementing replacement and management techniques is a long-term, cost effective and sustainable approach to weed management, and can enhance and protect natural resources. Providing competition will also ensure valuable resources such as water and nutrients are unavailable to weeds.

**Pasture improvement/management:** Healthy, well-managed pastures resist weed invasion far better than those that are rundown and poorly managed. Through appropriate management, including rotational grazing, resting paddocks and monitoring soil fertility, healthy and drought-hardy pastures can be achieved. It is important to allow pastures to rejuvenate from time to time. Removing stock during late spring-early summer will allow native pasture a chance to set seed and maintain adequate cover. This is an important strategy for encouraging competition against existing weeds and further weed invasion.

**Revegetation:** When controlling large infestations of weeds, particularly woody weeds such as gorse and blackberry, it is important to undertake it in stages. This allows the woody weeds to be substituted with native vegetation, replacing valuable habitat for native animals. Replacing woody weeds also provides valuable competition against re-invasion of weeds.

**Follow-up:** To achieve successful weed control, regular monitoring of treated areas must be undertaken for any re-growth or new germinations of weeds. New outbreaks of weeds must be controlled before they have a chance to reproduce and re-infest the site. Monitoring and follow-up weed control may need to occur for many years in order to eliminate an infestation completely.

Weed species	Summer			Autumn			Winter			Spring		
Month	December	January	February	March	April	May	June	July	August	September	October	December
artichoke thistle (Cynara cardunculus)	<p><b>Life Cycle:</b> Plants ranging from small rosettes to mature. Plants flower in early summer, dying back to rootstock in late summer</p> <p><b>Physical:</b> Hand-weed small infestations or isolated plants. Destroy seeds heads by burning or stockpile for burning later.</p> <p><b>Mechanical:</b> Cultivate larger infestations, slash isolated plants before seeds develop.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Cut &amp; paint or spot spray isolated plants or small infestations. Treat plants at rosette stage to minimise herbicide required.</p> <p><b>Planning:</b> Map any new infestations. Monitor these areas and undertake further treatment if necessary.</p>			<p><b>Life Cycle:</b> Seedlings growing after autumn rains. Small rosettes present, depending on level of rain.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Cultivate to treat large, widespread infestations and prepare for replacement strategies.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations. Treat plants at rosette stage to minimise herbicide required.</p> <p><b>Replacement:</b> Crop or sow pastures. Plan and implement replacement strategy e.g. pasture improvement.</p> <p><b>Planning:</b> Monitor previously mapped infested areas.</p>			<p><b>Life Cycle:</b> Watch for emerging seedlings. Small rosettes and some mature plants present.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray or cut &amp; paint isolated plants or small infestations. Treat plants at rosette stage to minimise herbicide required.</p>			<p><b>Life Cycle:</b> Plants ranging from rosettes to mature. Seedlings emerging. Plants flower in late spring.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Plough large infestations while still at rosette stage.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray or cut &amp; paint isolated plants or small infestations. Treat mature plants before flowering. Burn cut plants with welldeveloped seed heads or stockpile for burning later.</p> <p><b>Replacement:</b> Crop or sow pastures.</p> <p><b>Planning:</b> Map any new infestations. Monitor these areas and undertake further treatment if necessary.</p>		

Weed species	Summer	Autumn	Winter	Spring
blackberry  (Rubus fruticosus)	<p><b>Life Cycle:</b> Actively growing; leaves and fruit present.</p> <p><b>Physical:</b> Grub out young plants. Stockpile canes ready for burning.</p> <p><b>Mechanical:</b> Where possible, slash every 2 months. Groom large infestations.</p> <p><b>Chemical:</b> Spray foliage with selective herbicide. Erect warning signs to warn berry pickers of any spraying undertaken. Cut &amp; paint isolated plants.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth. Remove stock and undertake follow-up control options.</p> <p><b>Strategic Planning:</b> Plan treatment and replacement strategy to be implemented later in the year. Control in conjunction with fox control program.</p>	<p><b>Life Cycle:</b> Leaves and fruit present until mid-autumn. Leaves change colour before leaf-fall in late autumn.</p> <p><b>Physical:</b> Grub out young plants. Stockpile canes ready for burning.</p> <p><b>Mechanical:</b> Groom large infestations. Brushcut canes. Stockpile canes ready for burning.</p> <p><b>Chemical:</b> Spray foliage with selective herbicide when plants are still actively growing. Erect warning signs to warn berry pickers of any spraying undertaken. Cut and paint isolated plants.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth. Remove stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options. Burn stockpiled canes.</p> <p><b>Replacement:</b> Revegetate or sow pastures in areas where plants have been controlled.</p>	<p><b>Life Cycle:</b> Plants have lost their leaves</p> <p><b>Physical:</b> Grub out young plants. Stockpile canes ready for burning.</p> <p><b>Mechanical:</b> Brush cut canes. Stockpile canes ready for burning. Groom larger infestations.</p> <p><b>Strategic Planning:</b> Plan treatment and replacement strategy to be implemented later in the year.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options. Burn stockpiled canes.</p>	<p><b>Life Cycle:</b> Plants actively growing; leaves present on mature plants. Seedlings appearing.</p> <p><b>Physical:</b> Grub out seedlings and young plants.</p> <p><b>Mechanical:</b> Groom large infestations.</p> <p><b>Chemical:</b> Spot spray seedlings and mature plants. Cut &amp; paint isolated plants. Spray re-growth from brush cut plants.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth. Remove stock and undertake follow-up control options.</p> <p><b>Replacement:</b> Seedlings are very susceptible to shading. Establish desirable plants e.g. trees, shrubs.</p> <p><b>Planning:</b> Control in conjunction with fox control program.</p> <p style="text-align: right;">Page 7 of 17</p>

Weed species	Summer	Autumn	Winter	Spring
Chilean needle grass (Nassella neesiana)	<p><b>Life Cycle:</b> Actively growing in early summer. Flowering stems and purple flower-heads noticeable. Plants become dormant in late summer. Plants respond rapidly to rainfall and are able to produce numerous generations of flowering stems throughout the year. The majority of seeds mature by early summer.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Regular slashing / mowing can minimise seed production. Plants can produce more seeds within 2 weeks of slashing. Regular mowing can cause flowering stems to grow along the ground, making slashing difficult.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p><b>Grazing:</b> Crash-graze before flowering stems emerge. Stock won't eat flowering stems but will</p>	<p><b>Life Cycle:</b> Plants may be dormant if the weather is too dry. Sporadic flowering. Watch for emerging seedlings. Plants respond rapidly to rainfall.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Cultivate / plough larger infestations.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p><b>Replacement:</b> Crop or sow pastures.</p> <p>! Plants must be treated before seeds reach 'milky-dough' stage.</p>	<p><b>Life Cycle:</b> Plants may be dormant if the weather is too cold. Sporadic flowering.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p>! Native grasses can easily be mistaken for Chilean needle grass. Ensure correct identification of Chilean needle grass before controlling it.</p>	<p><b>Life Cycle:</b> Actively growing. Seedlings emerging. Plants flower in mid - late spring, depending on the weather.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Cultivate / plough larger infestations.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p><b>Grazing:</b> Crash-graze before flowering stems emerge. Stock won't eat flowering stems but will eat everything else, reducing the level of vegetation.</p> <p><b>Replacement:</b> Crop or sow pastures. Replace with native grasses in high conservation areas.</p> <p><b>Strategic Planning:</b> Map any new infestations. Monitor these areas and undertake further treatment if necessary.</p> <p>! Plants must be treated before seeds</p>

Weed species	Summer	Autumn	Winter	Spring
	<p>eat everything else, reducing level of vegetation.</p> <p><b>Strategic Planning:</b> Map infestations for treatment later in the year. Plan replacement strategy to be implemented later in the year.</p> <p>! Plants must be treated before seeds reach 'milky-dough' stage. Stems contain hidden seeds. Slashing can spread these seeds.</p>			<p>reach 'milky-dough' stage.</p>
<p>gorse (Ulex europaeus)</p>	<p><b>Life Cycle:</b> Plants actively growing, flowering and seeding.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p><b>Mechanical:</b> Groom large infestations.</p> <p><b>Chemical:</b> Boom spray heavy, low-growing infestations. Spot spray or cut &amp; paint isolated plants or small infestations. Spray re-growth from cut stumps or burnt plants.</p>	<p><b>Life Cycle:</b> Sporadic flowering. Seedlings emerging in early autumn.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p>Mechanical: Groom large infestations.</p> <p><b>Chemical:</b> Boom spray heavy, low-growing infestations. Spot spray or cut &amp; paint isolated plants or small infestations.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth and seedlings. Remove</p>	<p><b>Life Cycle:</b> Sporadic flowering. Seedlings emerging in late winter.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p><b>Mechanical:</b> Groom large infestations.</p> <p><b>Chemical:</b> Boom spray heavy, low-growing infestations. Spot spray or cut &amp; paint isolated plants or small infestations. Spray re-growth from cut</p>	<p><b>Life Cycle:</b> Actively growing. Watch for emerging seedlings.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p><b>Mechanical:</b> Groom large infestations.</p> <p><b>Chemical:</b> Boom spray heavy, low-growing infestations. Spot spray or cut &amp; paint isolated plants or small infestations.</p>

Weed species	Summer	Autumn	Winter	Spring
	<p><b>Grazing:</b> Graze with goats to reduce plant growth. Remove stock and undertake follow-up control options.</p> <p><b>Strategic Planning:</b> Plan treatment and replacement strategy to be implemented later in the year.</p>	<p>stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options.</p>	<p>stumps.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth and seedlings. Remove stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake followup control options. Burn stockpiled plants.</p>	<p><b>Grazing:</b> Graze with goats to reduce plant growth and seedlings. Remove stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options. Burn stockpiled plants.</p>
<p>Paterson's curse (Echium plantagineum)</p>	<p><b>Life Cycle:</b> Plants ranging from small rosettes to mature, however most plants are dying. Watch for emerging seedlings after rainfall. Plants flowering sporadically. Most plants have large amounts of seeds present.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Cultivate larger infestations before plants develop seed.</p>	<p><b>Life Cycle:</b> Plants ranging from small rosettes to mature, however most plants are dead. Seedlings emerging after rainfall. Plants flowering sporadically.</p> <p><b>Physical:</b> Hand-weed small infestations.</p> <p><b>Mechanical:</b> Cultivate to treat infestations and prepare for replacement strategies.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations. Treat</p>	<p><b>Life Cycle:</b> Plants ranging from small rosettes to mature. Watch for emerging seedlings. Plants flowering sporadically.</p> <p><b>Physical:</b> Hand-weed small infestations and isolated plants. Destroy plants with flowers and seeds by burning.</p> <p><b>Mechanical:</b> Plough large, widespread infestations while still at the rosette stage, usually late in season.</p>	<p><b>Life Cycle:</b> Plants ranging from small rosettes to mature. Seedlings emerging. Plants flowering continuously.</p> <p><b>Physical:</b> Hand-weed small infestations. Destroy any plants with seeds by burning.</p> <p><b>Mechanical:</b> Plough heavy infestations before plants have bolted.</p>

Weed species	Summer	Autumn	Winter	Spring
	<p><b>Chemical:</b> Boom spray heavy infestations with selective herbicide. Spot spray isolated plants or small infestations.</p> <p><b>Strategic Planning:</b> Map infestations for treatment later in the year. Prepare to implement replacement strategy next season.</p> <p>! Always check fodder / hay for Paterson’s curse. Use containment yards or sacrificial paddocks for feeding stock to avoid spreading weeds elsewhere on the property.</p>	<p>plants at small rosette stage to save money and minimise herbicide required.</p> <p><b>Strategic Planning:</b> Plan and implement replacement strategy e.g. pasture improvement. Monitor previously mapped infested areas.</p>	<p><b>Chemical:</b> Boom spray heavy infestations with selective herbicide. Spot spray isolated plants or small infestations. Treat plants at small rosette stage to save money and minimise the amount of herbicide required.</p> <p><b>Strategic Planning:</b> Prepare to implement replacement strategy next season.</p>	<p><b>Chemical:</b> Boom spray heavy infestations Spot spray isolated plants or small infestations. Treat plants at small rosette stage to minimise herbicide required.</p> <p><b>Replacement:</b> Crop or sow pastures.</p> <p><b>Strategic Planning:</b> Map infestations for treatment later in the year. Plan and implemented replacement strategy.</p>
<p>serrated tussock (<i>Nassella trichotoma</i>)</p>	<p><b>Life Cycle:</b> Mature plants have seeded. Seeds become detached and airborne late in season. Watch for seedlings following rainfall.</p> <p><b>Physical:</b> Hand-weed small infestations. Grub out individual plants with a mattock.</p>	<p><b>Life Cycle:</b> Watch for seedlings following rainfall.</p> <p><b>Physical:</b> Hand-weed small infestations. Grub out individual plants with a mattock.</p> <p><b>Mechanical:</b> Cultivate larger, widespread infestations or where pasture improvement or cropping is planned.</p>	<p><b>Life Cycle:</b> Seedlings emerging at end of season. Due to changed weather patterns, some plants have been observed flowering in mid-winter.</p> <p><b>Physical:</b> Hand-weed or grub out individual plants or small infestations.</p>	<p><b>Life Cycle:</b> Plants actively growing. Seedlings emerging. Flowering in mid-late spring, depending on weather.</p> <p><b>Physical:</b> Hand-weed or grub out individual plants or small infestations.</p> <p><b>Mechanical:</b> Cultivate larger infestations before seeding.</p> <p><b>Chemical:</b> Boom spray heavy</p>

Weed species	Summer	Autumn	Winter	Spring
	<p><b>Mechanical:</b> Cultivate larger infestations before seeding. This must be undertaken before seeds are at 'milky-dough' stage.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p><b>Strategic Planning:</b> Map infestations for treatment later in the year. Plan replacement strategy to be implemented later in the year.</p>	<p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p><b>Replacement:</b> Crop or re-sow pastures. Improve pasture fertility to encourage competitive growth from desirable plants. Re-vegetate with trees and shrubs to provide competition.</p> <p>! Spot spray or grub out plants on rocky knolls. Rocky knolls commonly contain native vegetation. Sensitive weed control in these areas will maintain native vegetation as competition against serrated tussock re-invasion.</p>	<p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations.</p> <p><b>Replacement:</b> Improve pasture fertility to encourage competitive growth from desirable plants. Re-vegetate with trees and shrubs to provide competition.</p> <p>! Plants must be treated before seeds reach the 'milky-dough' stage.</p>	<p>infestations. Spot spray isolated plants or small infestations.</p> <p><b>Grazing:</b> Crash-graze pastures before treatment to reduce off-target damage and reduce amount of herbicide required.</p> <p><b>Replacement:</b> Crop or re-sow pastures. Improve pasture fertility to encourage competitive growth from desirable plants. Re-vegetate with trees and shrubs to provide competition.</p> <p><b>Strategic Planning:</b> Map any new infestations. Monitor these areas and undertake further treatment if necessary.</p> <p>! Stock generally do not eat serrated tussock and will starve to death if no other feed is available.</p>

<p>spear thistle (Cirsium vulgare)</p>	<p><b>Life Cycle:</b> Actively growing; leaves and fruit present.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning</p> <p><b>Mechanical:</b> Groom large infestations. Brushcut smaller infestations.</p> <p><b>Chemical:</b> Boom spray heavy infestations with selective herbicide. Spot spray or cut &amp; paint isolated plants or small infestations. Spray re-growth from cut stumps.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth. Remove stock and undertake follow-up control options.</p> <p><b>Strategic Planning:</b> Plan treatment and replacement strategy to be implemented later in the year. Control in conjunction with fox control program.</p>	<p><b>Life Cycle:</b> Leaves and fruit present. Leaves change colour before leaf-fall in late autumn.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p><b>Mechanical:</b> Groom large infestations. Brushcut smaller infestations.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray or cut &amp; paint small infestations or isolated plants. Spray re-growth from cut stumps.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth and seedlings. Remove stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options. Burn stockpiled plants.</p>	<p><b>Life Cycle:</b> Plants are dormant.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p><b>Mechanical:</b> Groom plants in stages e.g. mosaic pattern or from edges of infestations towards densest areas.</p> <p><b>Chemical:</b> Boom spray heavy infestations. Spot spray isolated plants or small infestations. Re-spray regrowth from cut stumps.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth and seedlings. Remove stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options. Burn stockpiled plants.</p>	<p><b>Life Cycle:</b> Actively growing and flowering; fruits developing late in season. Seedlings emerging.</p> <p><b>Physical:</b> Grub out young plants &amp; stockpile ready for burning.</p> <p><b>Mechanical:</b> Groom large infestations. Brushcut smaller infestations.</p> <p><b>Chemical:</b> Boom spray heavy, low-growing infestations. Spot spray or cut &amp; paint isolated plants or small infestations.</p> <p><b>Grazing:</b> Graze with goats to reduce plant growth and seedlings. Remove stock and undertake follow-up control options.</p> <p><b>Burning:</b> Conduct mosaic fuel reduction burn in consultation with local fire authorities; undertake follow-up control options. Burn stockpiled plants.</p> <p><b>Strategic Planning:</b> Plan and implement replacement strategy. Control in conjunction with fox control program.</p>
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## Handy hints

The best way to manage weeds is to prevent them becoming established in the first place.

The following handy hints can help to minimise weeds becoming established on your property and also help landowners reduce weed invasion and spread.

### Machinery Hygiene

- Insist on a vendor declaration when buying machinery. This is a guarantee that machinery is weed free, and is particularly important when buying from interstate or known weed-infested areas.
- Designate strategic areas on your property to clean down vehicles/machinery before moving to weed-free areas. Monitor these areas and control any weeds that emerge.
- Work from weed-free areas into weedy areas to minimise weed spread.
- Insist that contractors clean machinery in a designated area prior to commencing work on your property.

### Stock & Overgrazing

- Never over-stock. Always consider the land's sustainable carrying capacity when deciding on stock numbers.
- Avoid overgrazing. Bare ground encourages weed invasion. Pastures should not be grazed lower than ankle depth on average.
- Consider rotational/cell grazing to allow paddocks to rest and re-generate. Healthy pastures are better able to resist weed invasion.
- Feed stock hay and other fodder to reduce grazing pressure on paddocks.
- Always contain new stock in either stockyards or a sacrificial paddock prior to release in other paddocks. This will allow weed seeds to pass through the animal's digestive system, minimising weed spread throughout the property.
- Monitor containment areas and control any new weed outbreaks.
- Consider shearing new sheep or other long-haired livestock prior to release.
- De-stock when necessary.

### **Fodder**

- Only purchase fodder/seed with a vendor declaration.
- When good quality, weed-free fodder is scarce e.g. during drought, consider feeding stock in containment yards or in a sacrificial paddock.
- Consider hard-feeding animals in designated areas to minimise soil disturbance and weed spread.

### **Soil & Rock or Fill**

- Never import fill or rock in rural areas without a Council planning permit.
- Only purchase landscaping supplies from reputable suppliers. Enquire about a vendor declaration, guaranteeing that the material is weed free.
- Consider using a stiff brush to dislodge weed seeds from rocks prior to use in landscape works.

### **Fence-lines & Waterways**

- Always treat weeds along fence lines, waterways and other hard-to-reach areas. This will assist in preventing re-infestation into weed-free or recently treated areas.

### **Soil Disturbance**

- Weeds invade disturbed ground first. Minimise soil disturbance caused by vehicle movement or excavation to prevent weed invasion.
- Avoid creating bare-ground. Weeds can rapidly invade these areas and out-compete desirable plants such as native grasses.
- Always replace bare-ground with desirable plants e.g. pasture or revegetation.

### **Strategic Approach**

- Carefully plan weed control prior to commencing control works.
- Prioritise areas for weed control. Work from least infested areas to most infested areas.
- Control 'satellite' or isolated outbreaks of weeds immediately.
- Work from edges of large weed infestations inwards to help minimise reinvasion into weed-free areas.
- Map weedy areas, particularly when in flower, to help plan future control works.
- Only undertake manageable amounts of work. Do not over-commit your resources e.g. time and finances.

- Treat weeds before they flower and set seed – every seed produced is adding to the problem.
- Seek assistance or further information when needed.
- Record progress by taking photos.
- Be encouraged by your weed control successes, large or small.

## Glossary

**Bolting:** Stage of growth-cycle when the plant has completed rosette stage and started to produce a stalk and flowers.

**Crash-graze:** Very high stocking rate for a given area to reduce vegetation levels quickly

**Groom:** Use specialised equipment to mulch woody weed infestations such as gorse, sweet briar and blackberry.

**Milky dough stage:** A field test of the viability of seeds on some weed species. Check seeds by crushing them with fingernails. Seeds are not viable if they are empty or slightly milky. Once the seeds turn to a milky-dough texture, they are viable.

**Mosaic burning:** Burning technique undertaken in strategic locations, often implemented over a number of years in order to undertake replacement program and ensure safety.

**Sacrificial paddock:** Paddock that is already weedy or of poor quality where stock can be contained after transportation to a property, or fed with hay/fodder to reduce spread of weeds.

**Withholding period:** The period of time that must elapse between the last application of a chemical and any grazing by livestock or cutting for stock food, harvesting of plants, or consumption by a human or animal after post-harvest use. Always refer to the chemical manufacturer's label as withholding periods and restrictions vary.

## Note

It is an offence to sell, trade or transport fodder containing declared noxious weed seeds. Report fodder/ hay contaminated with declared noxious weed seeds to the DPI on 136 186.

It is an offence to transport the seeds or any other part of a noxious weed within Victoria without a permit.

Always read chemicals labels before use. Always ensure that personal protective equipment is worn when using chemicals.

## **Disclaimer**

The advice contained in this publication is intended as a source of information only. Always use chemicals in accordance with manufacturer directions on the product label or in Material Safety data sheets available from the manufacturer. The City of Whittlesea and its officers do not guarantee that the publication is without fl aw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from your relying on this information.