

# Lantana Control Tips

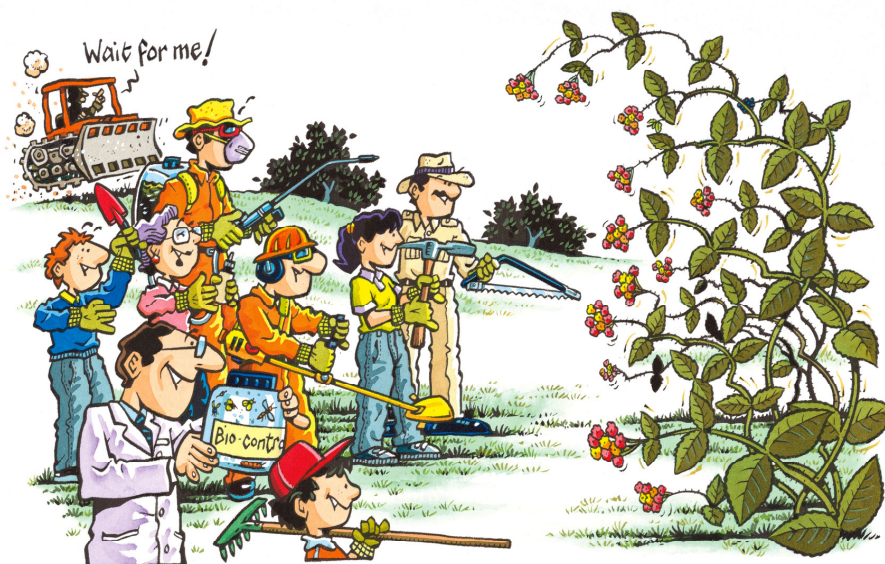
## Answers to common control questions

### General

- Think about what you want to achieve before you begin and build a control program in support of these expectations. For example, if you are controlling to promote native plant regeneration and preservation, ensure your practices compliment native survival (minimise use of heavy machinery, minimise frequent burning, minimise off target spray drift potential, etc.)
- Always develop a property pest management plan that deals with all your weed problems, because if not done correctly other weeds may take over where you have cleared the lantana.
- Plan your management program for each area of lantana infestation separately. A range of different control sequences may be required to deal with lantana growing in different situations on a single property.
- Regardless of whether you are controlling for production or conservation outcomes, assess the environmental impacts of the management strategies you intend to implement.
- Where possible plan to first remove the majority of biomass (the bulk of the plants) before follow-up with a herbicide based treatment. This is particularly important for dense infestations (50% density +) over more then 5 acres/2 hectares. Biomass removal can be done through the use of machinery, fire or another technique appropriate to the area. This will reduce the amount of herbicide required (and therefore cost) as well as the volume of chemical introduced to the local environment.
- In a pasture system, re-seeding to provide good competitive plant growth will significantly reduce the level of lantana seedling germination.
- Conservation areas are susceptible to off-target impacts when using some of the control methods described in the following document. Many of these impacts will be specific to your area, so please contact your local pest officer for further information.
- Please be aware that any management activities that affect native plants in areas protected under state or federal vegetation management or conservation laws may leave you liable to prosecution. It is vital that you seek advice if you are unsure of the legislative and permit approval requirements.

### And finally...

- You must face the facts. It is going to take more than one season (probably three or four) to control each area of lantana effectively, so plan and budget for follow up treatments or your initial investment may be wasted.



## Foliar Spraying Tips

- Only use pesticides that comply with Australian Pesticide and Veterinary Medicines Authority (APVMA) regulations and always read and follow the label directions.
- Always use the required personal protective equipment and follow safety instructions.
- Always maintain your equipment, as dirty/faulty equipment will affect herbicide delivery and control effectiveness.
- Always use the cleanest water possible, especially when mixing with Glyphosate as this chemical binds to clay particles and becomes inactive.
- The best spray season is between February and April when the plants are actively growing, but spraying can be undertaken as long as the plants look lush and the night-time temperatures aren't too cold (Spring/Summer/Autumn). Flowering is a good indicator of active growth.
- Spraying when soil moisture is high will increase the kill rate.
- If good spring weather occurs and lantana is lush, spraying during this early part of the year will often allow time for regrowth to reach a suitable size (at least knee-height) for a follow-up treatment in late summer. This will give you a better chance of control in a shorter period of time.
- The best time to spray is in the morning (before 10am) and in the afternoon (after 3pm) as this is when the plant will be most susceptible to herbicides. During the middle of the day the plant will close its pores and reduce sap flow, thus reducing the likelihood of herbicide entry and translocation.
- Excessive dew can also reduce the effectiveness of herbicides so it is important to assess the level of moisture present on the leaves when spraying early in the morning.
- There are a range of herbicides available for use on lantana. It is important when planning your control program to consider the comparative cost and effectiveness of each formulation; and whether there are other weeds that you also want to tackle. Pricing for chemicals that have a wider application is frequently higher but you need to factor in the value of the time you will have to invest in doing a second pass using a different chemical to control other target weeds.
- A fast brown off of a lantana plant can indicate that it has gone into shock and dropped its leaves as a protective mechanism. This does not guarantee a good kill and sometimes the slower the brown off, the more effective the long term control is as the chemical has had the opportunity to spread throughout the plant and into its root system.
- Dichlorprop based herbicides (e.g. Lantana600) should not be used when temperatures exceed 30°C as their effectiveness is reduced.
- Some herbicides should be applied at different mix rates depending on the lantana bush size. Always take note of these (as listed on the label) and apply as required.
- Don't be tempted to add that "extra bit for good measure" when making up a herbicide mix. The recommended rates have been calculated as a result of extensive testing and the rate quoted will give the best results. High concentrations of chemical can send the plant into shock and actually reduce the kill rate.
- Always  $\frac{3}{4}$  fill your tank with water, and then add the herbicide to the required mix rate. This will minimise frothing which can reduce the spray effectiveness.
- Only mix what you intend to use that day. Some herbicides can be stored mixed for up to five days but their effectiveness can not be guaranteed.
- Only buy sufficient herbicide to use in a single season as the shelf life of herbicides is not long and stock piling for more than one year can reduce their effectiveness.
- Don't mix herbicides that are not recommended as tank partners. The effectiveness of incompatible herbicides can be dramatically reduced as some cause chemical reactions that negate the active ingredients.
- Excessive spraying of non-selective herbicides can result in off target damage to grasses and other vegetation, reducing competition to lantana regrowth and seedling germination.

- Ensure you read the herbicide label and are aware of the other plants your chosen herbicide will affect. Even ‘selective’ herbicides may have an impact on legumes, eucalypts and acacias and should be used with care, particularly in and around environmentally sensitive areas.
- Most herbicides work best on regrowth, following biomass reduction. In these circumstances the growth tends to be small and compact, making it easy to spray to the point of run-off; and the plants reserves have already been depleted making it more vulnerable.
- When spraying regrowth it is important to allow the plant to recover enough foliage to effectively take up the herbicide. Typically, regrowth to knee-height will be sufficient.
- It is important to keep stock animals away from recently sprayed lantana as herbicide treatment can induce increased sugar levels in the leaves making them more palatable to cattle. Even animals that have been raised on lantana country are susceptible to poisoning under these circumstances.
- Withholding periods must be adhered to as these are critical to ensure meat is not tainted and commercial markets are not affected.
- Once brown off and leaf drop has occurred (this may take up to six months depending on the herbicide used), trampling by cattle can be an effective means of compacting the canes and opening up the country for good fodder growth. If sufficient fuel loads are present, fire can also be an effective tool (please note exceptions in fire tips section).
- Red, pink edged red and orange varieties of lantana are generally harder to control and will usually require the addition of surfactants to ensure herbicide absorption.

## Splatter Gun Tips

- Only glyphosate and metsulfuron-methyl are registered for use on lantana using this technique.
- 1:9 (glyphosate:water) is the registered rate for Glyphosate 360g/L. When using other Glyphosate concentrations refer to the table below.

<b>Active</b>	<b>Rate (glyphosate:water)</b>	<b>Amount to add per 5L pack</b>
Glyphosate 360g/L	1:9	500mL (to 4500ml water)
Glyphosate 450g/L	1:11	415mL (to 4585ml water)
Glyphosate 480g/L	1:12.33	405ml (to 4395ml water)
Glyphosate 540g/L	1:13	355mL (to 4645ml water)

- Ensure you only apply the recommended quantity of herbicide (for glyphosate 360g/L that is two squirt lines of 2mL of mixed chemical per half meter of plant height ~ approximately 16mL of mixed herbicide in total for a two metre bush).
- It is vital with this technique that you do not spray to the point of run-off as you would with conventional foliar spray techniques. Application of too much chemical at this concentration will put the plant into shock and inhibit herbicide uptake.
- You must use clean water, as dirty/heavy water can bind the glyphosate and dramatically reduce the kill rate.
- Ensure the spray nozzle delivers thick, heavy droplets. A fine spray or mist will not be effective.
- This technique works best on lush healthy growing lantana. It is particularly useful for dense thickets or ‘walls’ of lantana in any terrain or land use situation.
- Splatter gun does not work well on spindly canes (as it is important that the total required volume of herbicide is applied to the leaves).
- You should not need a surfactant or additive—these increase the costs with little additional benefit.
- A marker dye might be required when spraying large areas or when multiple people are working together, to ensure you know what has been sprayed.
- The best times to spray are before 10am and after 3pm as this is when the plant will be most susceptible to herbicides.

- A 5L bottle of herbicide mix should cover approximately 2000m<sup>2</sup> (0.5 acres or 0.2 hectares) of moderate density lantana.
- The gas powered option will allow a longer day's work when compared to the manual option but costs more to buy and operate.
- This technique does not work well in rainy conditions, when there is dew or moisture on the plants or if it rains before the herbicide has dried.

## Basal Barking Tips

- You must have access to all stems as full coverage from ground to approximately 30cm height is required to achieve a successful kill. Leaving one stem untreated can result in regrowth and recovery of the plant. You may have to cut other vegetation away from around the lantana to gain access.
- This technique works best on stems less than 5cm in diameter as thick lantana stems can reduce herbicide penetration.
- Basal barking can be used on defoliated plants. This can extend the treatment period into the drier months of the year.
- Do not spray wet stems as this will reduce herbicide absorption into the plant.
- Thick old-man lantana may require more herbicide than younger plants to ensure absorption through the stems.
- This technique works well in situations of light to medium infestation.

## Cut Stump Tips

- This technique is too laborious for large infestations but works well for isolated bushes and small/sparse infestations, particularly when there is the potential for off target damage to streams or environmental systems.
- Works best on smaller lantana, as really thick lantana stems can reduce herbicide penetration.
- You must ensure application over the full surface of each cut stem as untreated stems can re-grow and result in recovery of the plant.
- You should cut stems as close to the ground as possible and apply herbicides within 15 seconds to ensure the plant hasn't started to form a protective seal over the cut surface (work in pairs).

## Mechanical Control Tips

- Mechanical control is not normally appropriate for environmental management situations.
- For dense infestations (50% density +) over more than 5 acres/2 hectares it is most economical to remove the biomass first using mechanical techniques before spraying herbicides.
- For best results a mechanical control plan should include re-seeding (and possibly ploughing) to ensure sufficient competition to reduce lantana seedling germination. This is particularly the case if grass cover is less than 50% before lantana removal. These costs need to be factored into your planning.
- Mechanical control is best undertaken in late winter or early spring to allow time for regrowth to reach a size suitable for follow-up spraying between spring and late summer.
- Disc blades and cutter bars can help by damaging lantana root systems and reducing regrowth but soil disruption may encourage increased seed germination—hence the need for grass competition.
- Rough ground reduces the effectiveness of bulldozers and stick rakes. Follow-up with a slasher (where safe to do so), will ensure regrowth is clumped and uniform and easier to foliar spray.
- Repeated slashing can reduce lantana density and may be a good maintenance option, but will not guarantee a long term kill. Slashing can be used to reduce biomass and/or the spread of an infestation, and will make spraying regrowth easier.

- Bobcat grubbing (with fork attachment) works very well where you can gain access to the base of a plant. There is only localised soil disruption and a close to 100% kill is guaranteed. However it is not practical on large scale, dense infestations.
- Bobcat grubbing works best when soil moisture is present as this increases the ease of root mass removal.
- Always keep a bag of seed on your bobcat as throwing a handful into the disturbed area where the plant was grubbed can increase competition for potential lantana seedlings and regrowth.
- Bobcat pushing (with a bucket) can be used on thicker infestations but will result in considerable soil disturbance. In this circumstance it becomes imperative that follow up seeding is done.
- It is not essential to get every last root out. As long as you remove the major root ball there will be little to no regrowth.

## Using Fire Tips

- “Although fire can be used to control lantana, especially if integrated with other methods, it must be remembered that some Australian ecosystems are not tolerant to fire and most are not tolerant to fire management that is used frequently. In most cases, fire events cannot be repeated with high enough frequency and/or intensity without adverse effects on native species diversity” (J. Hodgson pers. comm.)
- Repetitive fires can help reduce the level of infestation but marginal results are achieved using fire as a sole control technique.
- A large grass biomass is required for fire management to impact on lantana density in grazing areas and little control will be achieved burning green lantana without an external fuel source.
- Burning browned off canes can help open up land after chemical treatment and increase grass growth in grazing situations.
- In production systems careful planning should go into the timing of fire events to ensure regrowth appears at an appropriate time of year for follow-up spraying. Burning in the late winter/early spring (where applicable) will allow sufficient regrowth in late summer to enable follow up foliar spraying and provide good confidence of achieving a kill.
- Fire must be integrated with appropriate vegetation management - be this seeding or the promotion of native regeneration; otherwise an increased weed problem may result.
- Check with your local council or shire to determine what the permit regulations are for your area.

## Biocontrol Tips

- Biocontrol in most instances will only suppress lantana growth and spread, and won't kill it. Continuation of active management should therefore be carried out where-ever possible.
- Current research programs release biocontrol agents in areas where they have the greatest chance of establishment (based on climatic and environmental modeling). From there agents will spread to their full potential range.
- If you are able to treat lantana when it is under stress due to biocontrol attack you will increase your chances of reducing and/or killing your lantana infestations.
- Recent trials have indicated that herbicides where the major active ingredient is Fluroxypyr (e.g. Starane), used at registered foliar spray rates, provide a good kill for lantana stressed by biological control agents. However, further research is required to confirm this.
- If plants are defoliated, basal barking or cut stump techniques can be used as foliage is not required to achieve a kill.



Lantana biocontrol agent *Ophiomyia camarae*.