

Managing Lantana

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Lantana (*Lantana camara*), is a heavily-branched, scrambling, thicket-forming shrub, normally ranging from 2–4 m in height. A native of the tropical and sub-tropical regions of Central and South America, lantana was first introduced into Australia as an ornamental plant. Its first recording in Australia was in 1841 and — by the 1860s — it was naturalised in the Sydney and Brisbane areas. This once-innocent garden plant has since escaped and thrived under the favourable tropical, sub-tropical and temperate conditions of eastern Australia. Due to its widespread distribution and impact on agriculture and the environment, lantana is now listed as a 'Weed of National Significance'.

Distribution

Lantana currently infests more than four million hectares of land across Australia, mainly in areas east of the Great Dividing Range in NSW and Queensland. Its current range extends from the Bega Shire in Southern NSW to Cape Melville in North Queensland. Lantana has now spread into the



Pink-edged, red-flowered lantana invading pasture. (Photo: Royce Holtkamp.)

Northern Territory, Western Australia and has the potential to invade Victoria. It is also present in all States and Territories as an ornamental plant.

It is generally considered that lantana has now reached its potential range in NSW, but that it continues to invade new habitats within its range and to increase its density.

In NSW, lantana occurs in all catchments within its range and also on Lord Howe and Norfolk Islands. It is most widespread in northern NSW, particularly in the Clarence, Kempsey, Bellingen and Coffs Harbour Shire areas. Lantana is most prolific in areas receiving average annual rainfall of at least 900 mm. It generally favours coastal areas inland to the Great Dividing Range and growing up to altitudes of 1000 m. It is, however, susceptible to frost and is generally not found on the Tablelands and west of the Great Dividing Range.

Lantana can sustain periods of drought and grows best in high rainfall, well-drained, fertile soils. It will also grow on stony hillsides and sandy soils but, generally not on heavy clay soils.

Lantana is a major weed along roadsides, riparian zones (river banks), fence-lines, forestry, pastures and waste areas. It also invades open native woodlands and sub-tropical rainforest fringes and can also grow in steep inaccessible areas making it difficult to control.

Lantana readily invades disturbed or neglected areas and where native woodlands have been thinned or cleared for grazing. Lantana is less common in undisturbed native vegetation communities.

Description

Lantana is a perennial, summer-growing, erect or scrambling shrub, growing up to four metres high and often forming dense thickets.

Flesh of the plant produces a strong, aromatic odour when crushed. The plant is a member of the *Verbenaceae* (*Verbena*) family which is characterised by square-shaped stems with short, curved, and hooked prickles.

Leaves are opposite and curved on a short stalk and are about 10 mm long. They are egg-shaped (ovate) to spearhead-shaped (lanceolate), with toothed edges; rough and bright green on the upper surface and hairy and pale green below; 2–10 cm long and 2–8 cm wide.

Flowers form in dense clusters and vary in colour from red–yellow, orange–pink, and white — depending on the type, maturity and location. Flowering and fruit production can occur almost year round in suitable areas where adequate soil moisture, high air humidity, and high temperatures, prevail.

The fruit is a succulent, one-seeded drupe or berry about 6–8 mm in diameter. These develop in clusters and consist of aggregate, fleshy segments that are green at first and then turn a shiny, dark purple–black when ripe.

Typically, the plant can produce several thousand berries per square metre in a growing season. Germination rates though are generally low, but the passage of seed through an animal's gut after eating can improve this viability.

Lantana has a shallow root system forming a dense root mat that grows mainly within the top 10–30 cm of soil. The plant does not sucker from damaged or broken roots but will regrow vigorously from the base of stems. Lantana is primarily spread by fruit-eating birds and mammals, which then pass the seed in their droppings. Water, contaminated soil and machinery, deliberate planting, and garden waste, can also help in its spread.

Varieties

The name, *Lantana camara* describes a species containing many wild and cultivated varieties.

The most common lantana varieties in New South Wales are common pink, common pink-edged red, round red and Stafford red. These are all classified as different varieties because of their colour and flower shape.

The Common Pink-edged Red lantana variety is found on the North Coast, around Kempsey, south-east of Dorrigo, Bellingen, in the Coffs Harbour and Grafton areas, and on the Central Coast. Tests have shown it to be very toxic if the leaves or stem are eaten.

The Round Red and **Stafford Red** varieties are found on the North Coast, around Kempsey, Bellingen and Coffs Harbour. Tests have shown both of these varieties to be toxic.

Impact of Lantana

Widespread lantana infestations regularly impact on agriculture, the environment, forestry management, recreation and transport. Lantana, however, does provide some minor benefits for native fauna and the horticultural industry.

Toxicity

All forms of lantana are thought to be toxic with the red-flowered forms being the most dangerous to stock. Lantana poisoning in cattle is quite common and causes major economic losses. Most cases of poisoning occur in animals newly-introduced into country where toxic forms of lantana are already growing. Older cattle that are used to grazing lantana-infested areas are not as susceptible. During droughts or when other feed is scarce, stock are also more likely to graze lantana.



The 'common pink' is the most widespread and abundant lantana variety in NSW. (Queensland Dept of Natural Resources and Mines.)



The red-flowered lantana is very toxic.

Early symptoms of lantana poisoning include depression, loss of appetite, constipation and frequent urination, followed by 24–48 hours of jaundice. The eyes of poisoned animals can also become inflamed with a slight discharge. The muzzle may become inflamed, moist, and very sensitive with a pink nose. Photosensitisation usually follows with death typically occurring 1–4 weeks after the appearance of symptoms. This slow and painful death is due mainly to liver insufficiency, kidney failure and, in some animals, myocardial damage and internal paralysis.

Pasture Productivity

In addition to stock deaths, lantana also greatly reduces pasture productivity. Lantana will readily invade pastures, particularly when they are poorly-managed. If left uncontrolled, it will spread and exclude useful native grasses and improved pastures. Lantana also persists along roadsides, riparian zones and fence-lines which again increases the loss of available pasture.

Environment

Lantana is a serious invader of disturbed ecosystems including national parks and reserves. The weed can form a dense understorey competing with native plants and limiting natural regeneration. Increases in lantana composition can also increase the fuel load for fires.



Pink lantana invading pasture land.

Forestry Management

Lantana is a serious weed of commercial eucalypt and pine plantations. It competes with tree seedlings for light and nutrients and also interferes with plantation access and general management. If uncontrolled, it can establish and become a prolific understorey invader that reduces forestry production.

Recreation and Transport

Lantana can restrict access in bushland and riverbanks and also reduce the overall visual amenity of an area. Lantana also invades roadsides, railway land and powerline easements.



Lantana growing along a roadside.

Control and Management

Widespread infestations of lantana can be difficult to control due to: the enormity of the problem; poor access to invaded areas; and the cost of continuing treatment programs. A control program therefore needs to be tailored to each situation with this usually involving a combination of control methods.

A national control strategy for lantana has recently been launched with a major focus on preventing its introduction and spread. Lantana also has an ability to easily hybridise with some new commercially-introduced varieties thereby adding to the genetic diversity of the wild population.

This ability makes biological control, especially, much more difficult. Therefore, to try and contain these constant genetic changes, it is necessary to limit new introductions of lantana to non-invasive forms. More importantly, the control strategy encourages the use of safe, alternative native plants that offer similar growing and ornamental features.

ALWAYS READ THE LABEL

Users of agricultural (or veterinary) chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Integrated Management

Integrated weed management is the coordinated use of a range of suitable control methods for a pest plant. The aim is to incorporate the most-efficient variety of chemical and non-chemical control methods which are also cost-effective and practical.

In many situations, the treatment of large infestations of lantana with herbicides is not economically-feasible. However, with proper, long-term planning and knowledge of the weed's life cycle, lantana can be controlled by using a combination of mechanical control, herbicides, fire, pasture improvement, and grazing management techniques.

Proper grazing management is a preventative technique for many pasture weeds — including for lantana. Conversely, overstocking and overgrazing will generally lead to pasture degradation and allow the invasion of weedy species. Allowing a bulk of pasture to remain in the paddock all year round under normal weather conditions will, normally help prevent competition from weeds. Oversowing treated areas with suitable pasture mixes will also provide competition for emerging lantana seedlings. Consult your local agronomist for a suitable pasture improvement program.

In environmentally-sensitive areas, bush regeneration techniques may also be appropriate. These techniques involve the minimal use of herbicides for control combined with the promotion of existing native species or the planting of new species. A continuing maintenance regime will see the reduction of lantana and an increasing dominance in beneficial species.

Mechanical Control

Mechanical control by bulldozing or slashing plants can be successful; providing it is followed up with herbicide treatments and by the weed's replacement with pasture or vegetation cover. This method can remove large mature bushes quickly, but regrowth will usually occur from the stump and seedlings. Follow-up spot spraying or further mechanical control is therefore essential until the preferred desirable species becomes dominant.

Care should also be taken when mechanically clearing areas on steep land or near stream banks to prevent soil erosion. Avoid clearing or disturbing large areas at any one time to minimise leaving bare ground. Once an area is cleared, a suitable pasture mix or native species should be planted to re-establish ground cover and to provide competition for lantana seedlings.

Herbicides

A number of herbicides are registered for the control of lantana, see NSW Agriculture's *Noxious and Environmental Weed Control Handbook* for details. Herbicide control can be effective either as a stand-

alone method or combined with mechanical methods. Treating large areas with herbicides though, can become costly and allowances must be made for follow-up treatments for regrowth and seedling control.

When selecting an appropriate herbicide, consideration should also be given to the application technique to be used. The aim should be to minimise off-target damage to native species and pasture grasses. Depending on the size of the infestation and access to individual plants — spraying, cut stump, and basal bark application techniques can all be effective.

Because of the genetic variation between lantana varieties, herbicide application can sometimes result in poor control. The red-flowered forms are normally the most difficult to control while the pink forms are the easiest. Plants can be sprayed at any time during the year, provided that they are actively-growing and not under stress. Best results have been shown during the autumn months.

Biological Control

Successful biological control of lantana has proven difficult. This is mainly due to the number of varieties of lantana and the wide range of habitats that it invades. Lantana was one of the first weeds in Australia to be targeted for biological control. Since it was recognised as a potential weed for biological control in 1914, 30 different insect species have been imported and released as biological agents. Of these species, 16 have become established, but only four currently impact on lantana growth.

The two insects causing the most damage are the leaf-mining beetles, *Uroplata girardi* and *Octotoma scabripennis*. Larvae of both these insects mine leaves of all lantana types, thereby suppressing plant growth and causing a reduction in flowering. Another insect that can damage the plant is the leaf-sucking bug, *Teleonemia scrupulosa*. The fourth insect that affects their growth is the lantana seed fly (*Ophiomyia lantanae*). Adults of this insect feed on the flowers while the larvae feed on the developing fruits and seeds.

Because of its indifferent success in controlling lantana, a collaborative project between NSW and Queensland Government agencies started in 1996 to revive the biological control program. This program is jointly-funded by the NSW Lantana Biological Control Taskforce and has imported and released several new agents.

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing in October 2003. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up-to-date and to check the currency of the information with the appropriate officer of NSW Agriculture or the user's independent adviser.

The leaf-sucking bug (*Falsonia intermedia*) can cause plant stunting and reduced flowering of lantana. This insect has caused widespread damage overseas and it is hoped that similar results can be replicated here.

The lantana rust (*Prospodium tuberculatum*) is a fungal pathogen that has been recently-introduced from Brazil. While it is too early to determine how this agent will perform, there have been a number of pathogens released in other biological weed control programs that have been very successful. This rust attacks the widespread pink-flowering variety of lantana and appears to have a wide tolerance of climatic conditions.

Currently, biological control cannot be relied upon in themselves for controlling lantana. Once the current suite of released agents have established though, biological control may become an effective long-term control option. Landowners are therefore advised that, at present, biological control is only one tool in the integrated management of lantana.

Declaration

Lantana camara is a declared noxious weed under the NSW *Noxious Weeds Act 1993* in most areas of eastern NSW. There is some variation, however, between regions in the varieties declared noxious and the declaration categories. For specific declaration details, enquire with your local council or NSW Agriculture's website, noxious weed list; at <http://www.agric.nsw.gov.au/noxweed/>

The responsibility for control of noxious weeds on private land rests with the landowner or the occupier of the land. Failure to control noxious weeds can result in a notice being served, a fine

and/or your local council may enter the land and eradicate the plants, charging the costs to the landowner.

Further Information

For more information, contact your local council noxious weeds officer or an office of NSW Agriculture.

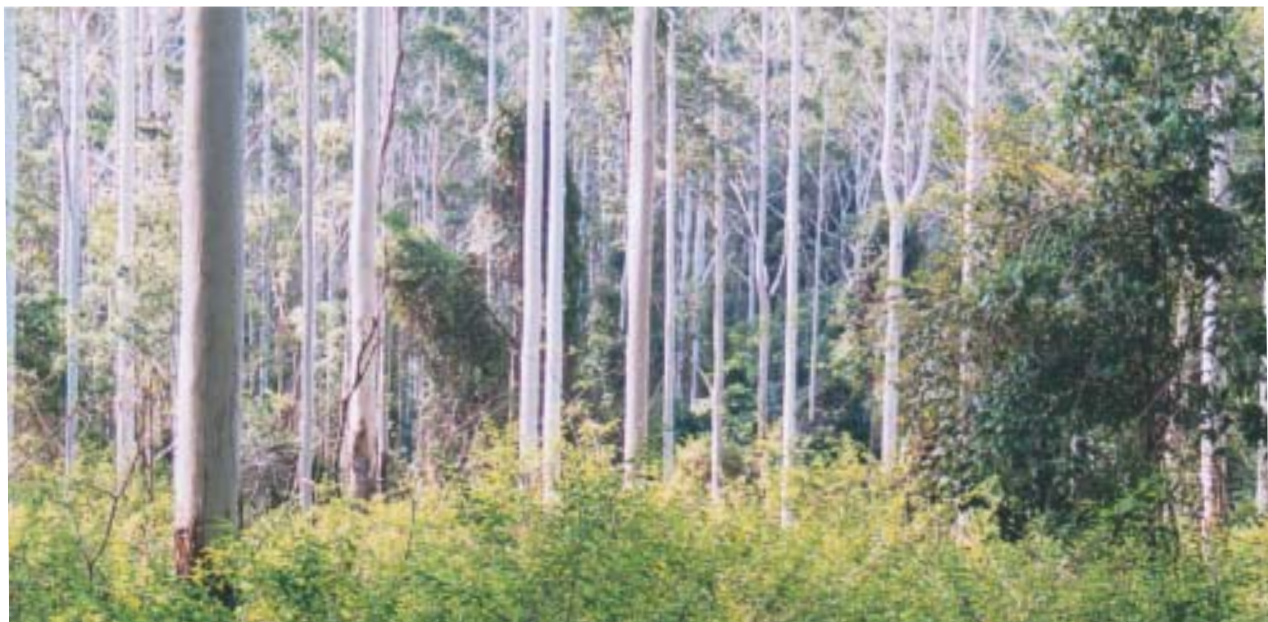
Acknowledgements

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Lantana invading a coastal woodland area. (Queensland Dept of Natural Resources and Mines.)