FACT SHEET 6

Landcare Australia

# LANTANA

Lantana, *Lantana camara,* is classified as a Weed of National Significance in recognition of its impacts on primary industries, conservation and bio-diversity, and the extent of its distribution. It is one of Australia's most damaging invasive weeds. It has naturalised in Eastern Australia over a wide range of climatic conditions. Lantana is considered to be one of the ten worst weeds worldwide. Preventing further spread is an extremely high priority.

Image: View through Spotted Gums to Lantana infested bushland prior to the commencement of the project.

# LANTANA

Lantana and creeping lantana are natives 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.

## Description of Lantana

Lantana is a heavily-branched, scrambling, thicket-forming shrub, usually ranging from 2–4 m in height. Creeping lantana is a scrambling, low, woody shrub which often grows over rocks and along tree branches. 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. Lantana 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 there is adequate soil moisture, high air humidity and high temperatures.

## The cost of Lantana

In agricultural contexts, Lantana invades pastures and grazing lands, fence lines, riparian areas, cultivated land and orchards. The presence of Lantana in agricultural zones can lead to stock poisoning, increased mustering costs, reduced herd carrying capacity and increased maintenance expenditure as well as the cost of trying to control the weed. Lantana raises production costs, increases the risk of damage by fire, and restricts access in commercial forestry contexts. There is a high economic cost to environmental systems, as disruption to these systems affects ecosystem function, biodiversity, recreational and aesthetic qualities.

## Does Lantana have any benefits?

Lantana thickets can provide a substitute habitat for some birds and animals. At Bundanon, Lyrebird mounds are found hidden within the dense thickets. Bandicoots also shelter in these areas. These habitats, however, can't support the range of animals found in pristine environmental systems. Lantana can also provide shelter for feral animals such as cats, foxes and rabbits which compound the negative impacts on native flora and fauna. In some disturbed rainforest margin areas, Lantana prevents invasion by grasses and other weeds, however there is always the risk of seed spread to other areas. Lantana readily invades open-canopy systems.

## The Lantana problem

Lantana has a serious impact on native biodiversity, including more than 279 plants and 93 animals listed on state and/or national threatened species legislation. Lantana is a threat because it:

- Grows in dense thickets which smothers
- Introduces toxicity to other plants.
- Grows in thickets which may increase the intensity of wildfires
- Invades cleared areas including forest edges and roadsides
- Prolongs succession
- Reduces biodiversity
- Dominates the understory of forests

At Bundanon, the social impact of Lantana is evident, including:

- Increased stress associated with economic loss or increased cost
- Reduced aesthetic appeal of natural areas
- Reduced recreational opportunities due to lack of access

Image: Property staff member Ralph Dixon clearing Lantana at Riversdale. The extent of the infestation along the creek is evident. Ralph will leave pockets of Lantana alongside the cleared areas until the area is revegetated to allow safe places for native fauna.

# LANTANA REPRODUCTION, GROWTH AND SPREAD

Lantana invades disturbed areas, where soil is exposed, where the forest canopy has been lost or is broken. Seeds need warm temperatures, sufficient moisture to germinate. Seeds are dispersed by the following methods:

- Fruit eating birds spread seeds in their droppings
- Some mammals eat and disperse seed
- Studies show that seed germination is more likely if the seed has travelled through the digestive system of a bird or mammal

Lantana can also spread by a process known as layering, where horizontal stems take root when they are in contact with moist soil. Lantana also re shoots vigorously from the base of vertical stems. The shoots are frost sensitive and growth is reduced below 5 degrees celsius.

Lantana is pollinated by butterflies, moths, bees and thrips. Lantana produces an enormous amount of seed, which has very good viability. It tends to die only after long periods of extended drought.

There are two main forms of lantana in Australia: a cultivated form planted in gardens and a weedy variety found in bushland and pastures. The cultivated form of lantana is non-thorny, produces few seeds and is compact in shape. The weedy form is a prolific seeder with straggly, thorny stems. Both forms include many varieties, which differ from each other in shape, flower colour, prickliness, response to enemies and toxicity. Weedy lantana is a much branched, thicket-forming shrub, 2–4 m tall. The woody stems are square in cross-section and hairy when young but become cylindrical and up to 150 mm thick with age. The ovate (ie tear-shaped) leaves (20–100 mm long) occur in opposing pairs along the stem. The leaves are rough and finely hairy and emit a pungent odour when crushed. Each flower head is made up of 20–40 flowers, ranging in colour from white, cream or yellow to orange, pink, purple and red. The fruit has many berries, which ripen from green to shiny purple-black and contain a single pale seed. Lantana has a short taproot and a mat of many shallow side roots.

Detail images of Lantana camera in various stages: flowers are variable, fruit spreads easily; flower variations, problematic root systems spread the plant

# LEGISLATION

Landholders are required to reduce lantana infestations throughout some regions of Queensland, New South Wales and the Northern Territory. The sale of lantana in Queensland was banned in late 2003. Lantana importation is prohibited in Western Australia. Lantana is **allelopathic** and can release chemicals into the surrounding soil which prevent germination and competition from some other plant species.

*Non-native 'weed' species generally grow where the soil has been disturbed and the native vegetation has been cleared. Only a select few weed species can successfully compete with native plants in undisturbed bushland. These highly invasive species are of the greatest concern at Bundanon, the worst of these species is Lantana.*

*Quote from Total Earth care LMP 2011*

## Potential distribution of Lantana

Lantana may be able to spread west of the Great Dividing Range, and could expand its range throughout Southern Victoria, South Australia and South Western Western Australia. Follow this link to see the distribution map for NSW. http://weeds.dpi.nsw.gov.au/Weeds/Details/78

## What to do about it

Lantana is extremely widespread and abundant. Because it is so well established on the east coast, and prevention of spread is the most cost-effective weed management tool, the highest priority for lantana management is to prevent its spread into uninfested areas. This will require three main actions:

- Restricting further importation of lantana into Australia. Any new varieties brought in could escape cultivation and naturalise, or could cross-breed with naturalised varieties, leading to hardier new varieties more resistant to control
- Restricting the sale and use of lantana in gardens as these are potential sources of new infestation and new varieties. There are native and less weedy exotic ornamental alternative species
- Strategically controlling infestations that threaten areas where lantana is not yet a weed. Control methods are outlined below

## Summary of Integrated Management and control methods

An integrated approach that uses a variety of control methods gives best results when dealing with lantana. A range of methods including herbicides, mechanical removal, fire, biological control and revegetation should be used. Best results are obtained by working from areas of light infestation towards heavier infestation, and long-term follow-up control is required after initial attempts. Minimise both disturbance to land and excessive use of fire to retain vigorous native vegetation and reduce the opportunity for lantana to become established.

Image: Thick infestation of Lantana at Riversdale in the creek area

## Research

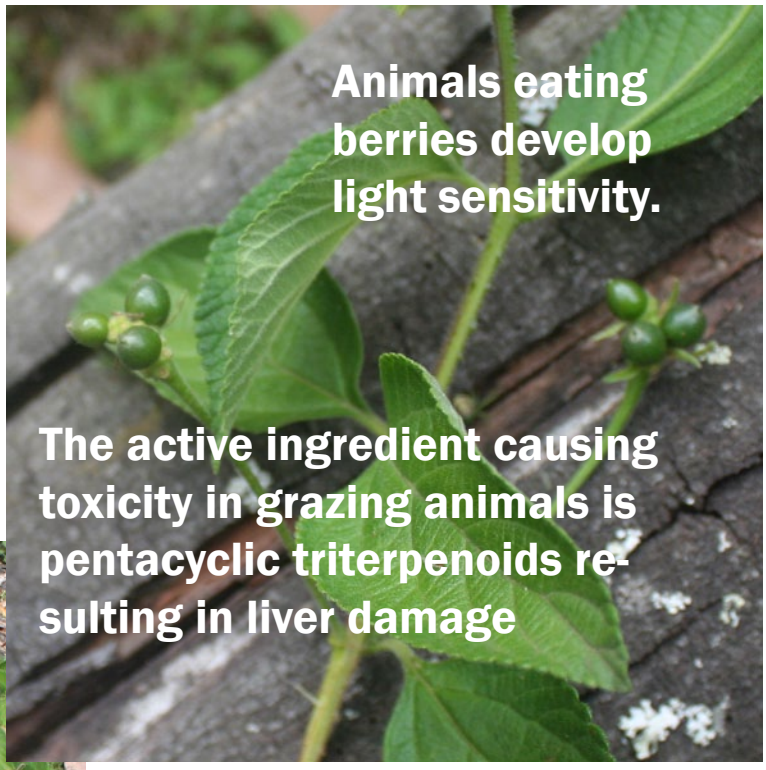
Students and staff from the University of Wollongong have been engaged in site-based research on the Bundanon Trust properties since 2009.

## Linden Brown Honours Thesis

Linden Brown's "A Sociocultural and Biogeography Assessment of Weed Management at Bundanon", explored the significant social and economic effects of invasive species at Bundanon. He investigated the various social, ecological, and economic factors affecting management. Field assessments of the weed management sites at Bundanon Trust were combined with interviews with key players associated with weed management at Bundanon Trust in order to determine the exact factors which are affecting management. Through these methods, a range of factors were discerned. The key factors which were determined included public perceptions regarding weed management practices, and therefore the need for public education and involvement in weed management programs; the ability connected properties to aid the spread of weeds, and therefore the need for regional cooperation in managing weeds; and the need for long-term funding in order to implement successful weed management programs. This paper can be found in the additional resources section of the Bundanon Trust website, Living Landscape Case Study page.

# FASCINATING LANTANA FACTS

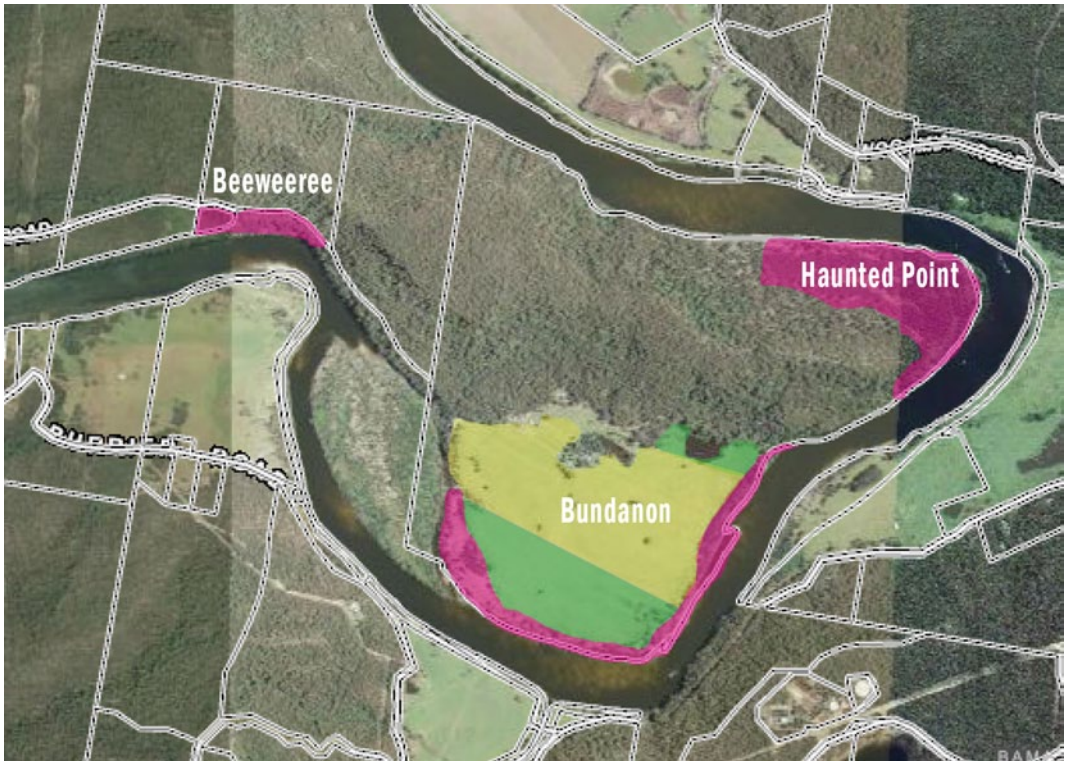
**Dried lantana leaves that have been burned in a glass jar can be a natural mosquito repellent**



**Leaf chemicals are more soluble**

# AREAS OF LIVING LANDSCAPE PROJECT WORK

## Land Use at Bundanon and Haunted Point and Beweeree




**Key**

Grazing

Revegetation

Regeneration

## Land Use at Eearie Park

## Land Use at Riversdale

# METHODOLOGY OF THE LAND REHABILITATION WORKS PLAN (LRWP)

The methodology proposed for the LRWP was to:

- Undertake Preliminary Rapid Site Assessments for priority sites across the properties.
- Undertake random meander weed species and extent assessments and compile base weed mapping data.
- Liaise with Bundanon Trust to establish mapping of targeted rehabilitation sites and the distribution, species composition and density of weed infestations in order to facilitate priority and works schedule.
- Refine the Draft Land Rehabilitation Works Plan outlining priority recommendations for project works implementation includ ing works schedule and budgets. This includes detailed techniques (works implementation methods) for the following;
  -Noxious and woody weed eradication program within remnant bushland vegetation communities and agricultural production lands across the Bundanon Trust properties.
  -Remnant forest habitat reconstruction program post weed eradication works.
  -Riparian rehabilitation and revegetation works program within identified riparian zones and cleared lands across Bundanon Trust properties.
  -Grazing management guidelines for agricultural production lands.

The scope of project works; weed control, revegetation and management for both biodiversity resilience and production resilience and continued maintenance of the area for aesthetics, are extensive. An indicative timeline was proposed in the LRWP. This timeline requires modification dependant on a number of factors including;

- Availability of project management
- Availability of project funds
- Season and climate variation
- Monitoring results and varying approach to address indications from results
- Availability of suitable seed and plant stock

## Priority land management actions

The following land management actions were prioritised:

- Reforestation works – Bundanon and Eearie Park.
- Riparian rehabilitation and revegetation works within adjacent cleared lands along the Shoalhaven River at Bundanon, Eearie Park, and Riversdale.
- Exotic weed eradication within remnant bushland vegetation communities and agricultural production lands across Bundanon Trust lands.
- Remnant bushland habitat reconstruction works in sites treated for weed removal.
- Management guidelines for agricultural lands; time control grazing.
- Works implementation schedule and budget estimates for materials, labour and works coordination.

A number of project sites were identified. These are detailed in FACT SHEET 10

## Rapid Site Assessment

All sites identified for rehabilitation works within the LRWP required a Native Vegetation Rapid Site Assessment for biodiversity, flow line (streams & wetlands), drainage line and recovery potential (ecological function). Assessment criteria included; age profile, species richness, connectivity, existing weediness, security from other threats and containment of all potential offsite degrading impacts. An overall assessment summarises the above criteria to provide a score of the site's health, functionality and recovery potential. The Rapid Site Assessment uses existing identified vegetation types (floristic assemblages) and land use as its baseline with ground-truthing to establish a consistent monitoring and continuing assessment of rehabilitation sites for project evaluation, further actions required, and works costings. This was carried out from December 2011 to February 2012, and included water-based surveys of the banks of the river.

Images: before and after clearing at Beweeree site, opening views to the Shoalhaven River