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African boxthorn

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Introduction

African boxthorn (*Lycium ferocissimum*) is a member of the family Solanaceae, which also includes silver-leaf nightshade, tobacco and tomatoes.

It was introduced into Australia from South Africa in the mid 1800s and was commonly used as a hedge plant.

It is now a serious weed threat in all States and is one of the major weed threats to the semi-arid rangelands of western NSW.

Consequently, it is a declared noxious weed in most parts of NSW. (See map)



A close up of a mature African boxthorn shrub. Note the fleshy leaves, immature fruit (green berries), mature fruits (red berries) and spines at the end of the branchlets. Photo: Brian Worboys, Maitland City Council.

The problem

African boxthorn is an aggressive invader of pastures, roadsides, reserves, remnant bushland and waterways. It forms an impenetrable, spiny thicket that inhibits the movement of stock and provides a haven for feral animals.

Many insects, including fruit fly, the common house fly and the tomato fly, breed in the fruit of this weed.

Distribution

In NSW, African boxthorn is more prevalent on the well drained soils of the slopes and plains. Often, it has spread from around old homesteads and urban areas. It grows on all soil types but establishes best on lighter soils, particularly along dry creek beds.

The plant

African boxthorn is an erect perennial shrub. It can grow up to 5 m high and 3 m across but usually reaches only 2 or 3 m in height. It is characterised by its woody, thorny growth. The stems are rigid and very branched, and the main stems have spines up



An African boxthorn infestation. Commonly found under trees because the seeds remain viable when excreted by birds. Photo: Brian Worboys, Maitland City Council.

to 15 cm long. Each smaller spiny branchlet ends in a stout spine.

The leaves are smooth, fleshy and up to 3.5 cm long. They can be larger and more succulent on regrowth from damaged roots. The plant is drought resistant and in times of moisture stress can shed its leaves, making it look dead. In some locations plants can be deciduous, losing their leaves in winter.

Plants are at least two years old when they flower, and although this generally occurs in spring and early summer it may occur at any time of the year provided the conditions are right. The flowers are white with pale blue markings and fragrant. They have five petals.

Fruit set generally occurs in autumn, but, again, it can occur at any time of the year depending on conditions.

The berries are green when young and succulent, round, 5 to 10 mm in diameter, contain 35 to 70 seeds and are orange-red when ripe. Seeds can germinate at any time of the year if there is adequate moisture and warmth.

The plant has an extensive, deep, branched taproot that will sucker and produce new growth if broken. Early root growth is rapid to allow seedlings to compete with other plants.

Dispersal

The seeds are readily eaten by birds and animals and remain viable when excreted. Consequently, new infestations are commonly found under trees, along fences and under powerlines. Spread can also occur

if seeds contaminate agricultural produce, gravel or mud. The roots also have the ability to produce new growth from broken pieces, so care must be taken in removing and destroying all root matter when undertaking mechanical control.

Methods of control

The effective, long-term control of this weed will generally require the integration of a number of techniques, including mechanical removal, cultivation, herbicide application, replacement with appropriate plants and regular monitoring.

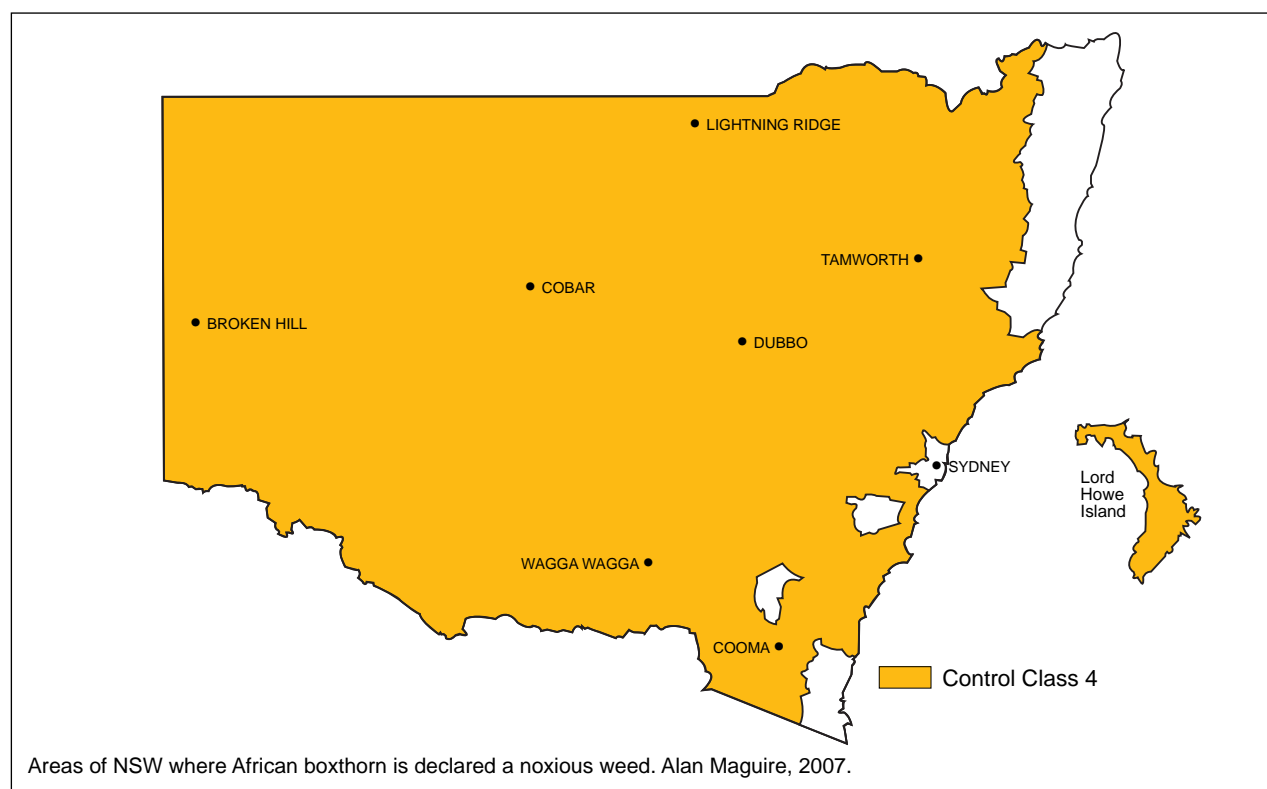
For invasive woody weeds such as African boxthorn, control is more effective and economical if done when the plants are young.

The control methods used will depend on the infestation size and location. For advice on the most appropriate methods for your situation, consult your local agronomist or council weeds officer.

Mechanical removal

The most cost effective way of controlling mature bushes forming thickets is to physically remove the top growth and as many of the roots as possible. The removed plant material should then be burnt. Removal of the roots is much easier and more effective when the soil is moist.

It is important to destroy all plant material after physical removal because:



- dead branches still pose a problem because of their thorns and the fact that they can harbour vermin;
- unripened fruit on cut branches can still ripen and produce seed; and
- broken root fragments may sucker and produce new growth.

Cultivation

After physical removal of the mature plants, suitable sites can be deep ripped, bringing most remaining root fragments to the surface to be raked and burned. In some instances cultivation may result in the deeper root fragments shooting. In this case, follow-up treatment will need to be directed at the regrowth.

It is essential that you perform follow-up treatment as new plants become established.

Do not treat regrowth with a foliar herbicide until the plants are at least 50 cm high (approximately 18 months old).

Chemical control

Only a registered herbicide used according to the directions on the label should be used to control this weed. Refer to the Department of Industry & Investment NSW publication *Noxious and Environmental Weed Control Handbook* for the chemicals recommended for the control of African boxthorn.

Herbicides can be applied to African boxthorn in many different ways. At times, the plant will lose its leaves and appear dead after the application of a herbicide, but later new leaves appear and the plant appears to recover. This cycle may happen several times before the plant eventually dies. The most appropriate form of herbicide application will depend on the location, size and maturity of the infestation.

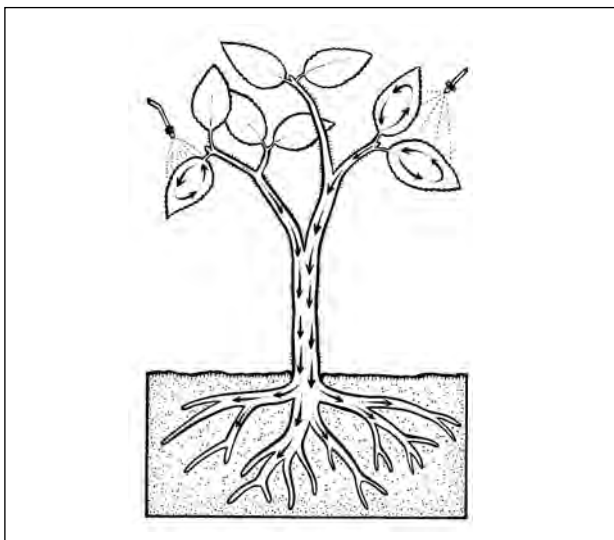


Figure 1: Applying chemicals through foliar spraying is more effective if the plant is actively growing. Queensland Natural Resources and Mines.

Foliar spray

Foliar spraying is the most commonly used method of control. Its effectiveness depends on adequate soil moisture to allow active growth of the bush. For effective control by this application method, spray the whole bush thoroughly during a time when the plant is actively growing (Figure 1). This will vary depending on the location but is generally during spring after rain. For large bushes it is very costly and difficult to obtain good coverage with the herbicide. It may be more cost effective to bulldoze thickets of large bushes and spray the regrowth. The uptake of foliar-applied herbicides is dependent on total leaf area, so foliar spraying should not be done until the regrowth is at least 50 cm high (approximately 18 months old). For effective results, do not treat infestations during hot, dry, summer periods or when the plant is stressed from drought, water logging or cold.

Basel bark treatment

This technique is appropriate for infestations in environmentally sensitive locations. It is most suited for small bushes with stem diameters up to 5 cm. Spray a herbicide registered for this activity around the complete base of every stem to a height of 30 to 40 cm above the soil surface (Figure 2).

Cut stump treatment

This technique is also appropriate for small infestations in environmentally sensitive locations. It is most suitable for large plants with stem diameters greater than 5 cm.

Cut each stem off 15 cm above the soil surface. Liberally apply a herbicide registered for this activity to the cut surface within 30 seconds of the cut being made (Figure 3). This can be done by paintbrush or by spraying.

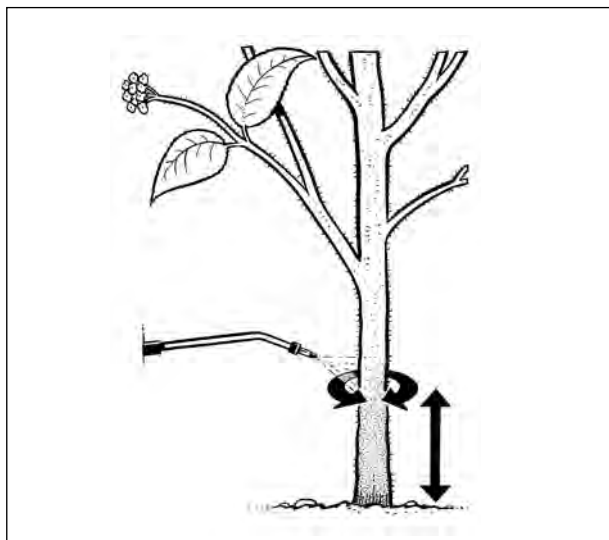


Figure 2: Basal bark application of chemicals should be around the complete base of every stem to a height of 30–40cm above the ground. Queensland Natural Resources and Mines.

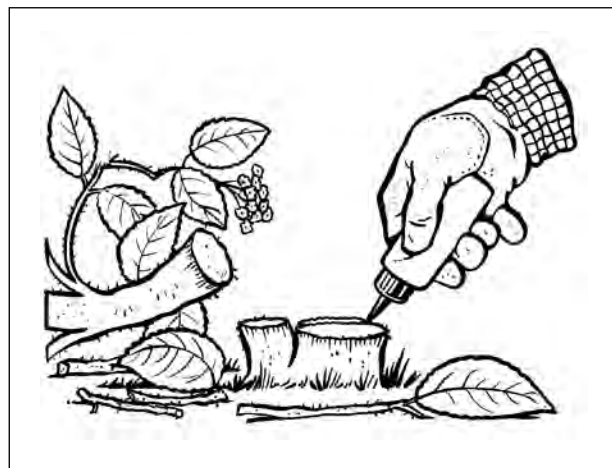
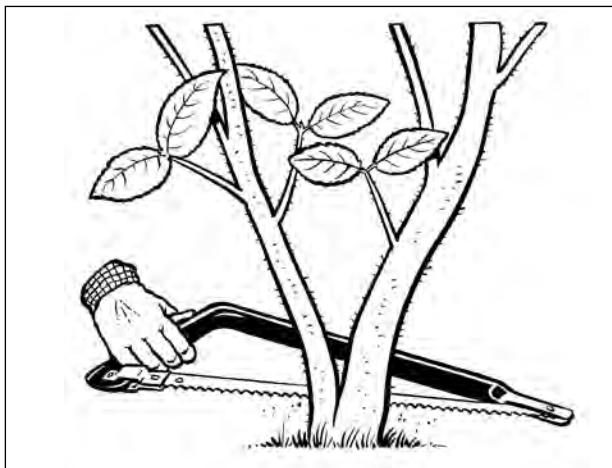


Figure 3. In cut stump applications it is important to apply the chemical immediately to the cut stem. Queensland Natural Resources and Mines.

If the herbicide is not applied immediately, the plant will heal the cut, the chemical will not be translocated through the plant, and control will not be effective.

Root application

Take great care when using this technique.

Many desirable trees, in particular eucalypts, are susceptible to the residual herbicides used for this control method. Do not use these chemicals within a distance of at least twice the height of adjacent desirable trees or shrubs.

To control African boxthorn, apply an appropriate registered residual herbicide directly under the plant towards the edge of the foliage (drip line). The herbicide should preferably be applied under the soil to prevent degradation by sunlight and possible contamination of surface run-off after rain. It is most effectively applied when the soil is moist—usually in spring or autumn.

These herbicides have the advantage of being easy to apply, and the timing of the application is not as critical as for other application methods. The residual effect of these herbicides may also give control of seedling regrowth for some time after application.

Replacement with appropriate plants

Like most weeds, African boxthorn seedlings are susceptible to competition from other plants. It is essential for the long-term control of this weed that, once removed, it is replaced with other suitable vegetation.

The vegetation you use will depend on your site. It can include the establishment of native vegetation or perennial pastures.

Native vegetation

If the weed infestation is providing a valuable habitat for native fauna, use a staged control program. This will allow the gradual replacement of the weed habitat

with suitable indigenous vegetation. Consult a local vegetation expert for advice on suitable local species and their establishment and management.

Pastures

Vigorous perennial pastures provide competition to prevent the invasion of African boxthorn. At suitable sites they should be established as soon as possible after the removal of the weed infestation but not after the application of residual herbicides. Consult your local agronomist for advice on pasture establishment and appropriate pasture management. For further information refer to the range of publications available at any Industry & Investment NSW office or at www.dpi.nsw.gov.au

Regular monitoring

All control methods will require follow up treatment for long-term management of African boxthorn. Once the initial infestation is removed, regular monitoring of the site for regrowth from root fragments or germinating seedlings should be carried out. Control of these small plants is easy if you use cultivation or apply an appropriate registered herbicide.

Who is responsible?

African boxthorn is a declared noxious weed in many areas of NSW. See www.dpi.nsw.gov.au/weeds. For a complete list of declared noxious weeds for each control area.

African boxthorn has been declared as a Class 4 weed in NSW. A Class 4 weed poses a threat to agriculture, the environment or the community and has the ability to spread to other areas. The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority.

The Noxious Weeds Act 1993 is enforced by the local control authority (usually local government).

The responsibility for control of noxious plants and appropriate disposal of weed plant material on private land rests with the owner or occupier of the land. Failure to do so could result in the local control authority issuing a weed control notice, a fine or taking court action.

Local control authorities must adequately control noxious weeds on land under their control to prevent the infestation of adjoining land. The community can help control this weed by notifying the local control authority of any known infestation of African boxthorn on public land.

Further information

For further information on the management of African boxthorn contact your local council Weeds Officer or Industry & Investment NSW District Agronomist.

Publications available

For a complete list of Industry & Investment NSW publications, please see www.dpi.nsw.gov.au, or contact the Industry & Investment NSW Bookshop on 1800 028 374 or by email bookshop@dpi.nsw.gov.au.

Acknowledgements

Information for this Primefact was taken from:

African boxthorn Agfact P7.6.31, first edn

WT Parsons and EG Cuthbertson 2001, *Noxious weeds of Australia*, second edn, CSIRO Publishing, Collingwood, Melbourne.

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