DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

Bellyache bush

Jatropha gossypiifolia

HABIT	STEMS & BRANCHES	LEAVES	FLOWERS	FRUIT & SEED
				
Bellyache bush is an erect, perennial shrub that can grow up to 4m in height, with most plants averaging between 2 - 3m.	Bellyache bush is a multi-stemmed bush. The stems, leaf stalks and leaf margins are covered with coarse, gland tipped, sticky, brown hairs.	Leaves alternate, and are divided into 3 - 5 segments. Leaf lobes are pointed. The 'Darwin Purple' has predominantly purple/red foliage and the 'Katherine Green' has green foliage.	The small, red flowers have yellow centres and are found in clusters around the top part of the plant.	The fruit capsules are oblong, approximately 1cm in diameter and contain 3 - 4 seeds. Each seed is about 8mm long.

Bellyache bush is a declared weed in accordance with the *Weeds Management Act* and is a Weed of National Significance in Australia. The class of declaration varies according to the location in the Northern Territory.

- Class A – to be eradicated (all areas of the Northern Territory except where it is classified as Class B)
- Class B – growth and spread to be controlled (in the area roughly described as the Aroona, Mathison and Scott Creek subcatchments in the upper Daly River catchment, and the Greenant Creek subcatchment in the lower Daly River catchment)
- Class C – prevent new entry (all areas of the Northern Territory).

In all instances Class A and B areas are also classified as Class C. This results in the mixed declaration classes A/C and B/C. Areas identified as Class A/C (the eradication zone) generally have lower density infestations which are considered to have a high feasibility of eradication and control. Areas identified as B/C (the management zone) generally have higher density infestations which have a lower feasibility of eradication or control.

The problem

Bellyache bush seedlings are particularly hardy and competitive; they have been observed to reduce the recruitment of native species in both disturbed and undisturbed areas. Native riparian plants are particularly susceptible to bellyache bush invasion. High rates of opportunistic succession by bellyache bush have been observed after natural disturbance events such as flooding. By excluding native flora, and subsequently fauna, bellyache bush can reduce local biodiversity and ecosystem functioning. Thickets of bellyache bush may be used as refuges by feral animals, hindering their control.

Bellyache bush can spread into pastoral land, forming dense thickets which render land unsuitable for grazing, hinder mustering and obscure fence lines. Direct stock losses have been attributed to poisoning, particularly when viable food sources are scarce.

Habitat and distribution

Bellyache bush, a native of Central and South America, has been recorded in at least 30 localities across the Northern Territory. These sites range from extensive well established infestations in the Daly river catchment, through to isolated, less established sites elsewhere in the Darwin, Katherine and Gulf regions. Bellyache bush is an opportunistic coloniser of disturbed sites, rapidly forming dense monocultures in areas where native vegetation has been compromised. It thrives in riparian zones and can also spread into intact savanna woodland and grassland habitats.

Preventing spread of bellyache bush

In optimal conditions a single bellyache bush plant may produce up to 12 000 seeds per year, with the initial seeding occurring as early as 55 days after germination. Growth can also occur from stem and root segments, including dumped cuttings, slashed plants and plants damaged in events such as flooding.

Spread prevention is the most successful and cost effective way of managing weeds. Bellyache bush seed can be spread via water, ants, livestock and other animals (e.g. feral pig and buffalo) and machinery contaminated with seed. It can also be spread inadvertently if any fill, gravel or bailed hay contains seeds. By implementing the following recommendations potential seed spread can be significantly reduced:

- map infestations to enable the development of a coordinated and planned management approach
- design and implement a seed spread prevention program
- follow strict hygiene regimes to prevent spread into clean areas
- where attempting to eradicate or contain bellyache bush infestations schedule works prior to seed maturation
- spray/destroy any plants that establish on fence lines, fire breaks and roadsides or outside paddocks;
- ensure any gravel, sand, livestock, hay or any other product is free of seeds
- where possible integrate weed management into a broader natural resource management program. Weeds often thrive in degraded areas, such as those impacted by erosion, wild fire and feral animals.

Bellyache bush control

All control methods should be undertaken prior to seeding events to minimise the risk of spread and regeneration. Flowering generally correlates with the wet season (Feb-Apr), and seeding follows (May-July), although these times may vary depending on the availability of water.

Chemical control

Chemical and concentration	Rate	Situation, method and comments
Fluroxypyr 200 g/L Various trade names	500 ml / 100 L or 3 L / ha (boom) 3 L / 100 L (diesel) 500 ml / 100 L or 3 L / ha (boom)	**Seedling (individuals or infestation)** Foliar spray – apply when actively growing **Adult (individuals)** Cut stump or basal bark – all year round **Adult (infestation)** Foliar spray
Metsulfuron-methyl 600 g/L Various trade names	10g / 100 L 10g / 100 L	**Seedling (individuals or infestation)** Foliar spray - apply when actively growing, need wetting agent **Adult (infestation)** Foliar spray

Optimum treatment times – Darker colours represent preferred months for foliar treatment											
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Non-chemical control

Individual plants (seedlings and juveniles) can be removed by hand or by using a mattock. The entire root mass should be removed and excess soil shaken off the root system to ensure regrowth does not occur. Physical removal is very laborious and may therefore only be effective and/or feasible where plant numbers are limited.

Slashing will not eradicate bellyache bush however slashing will kill most plants, reduce the biomass, provide easy access for other treatment options and create opportunities for more desirable species to establish. Slashing can be undertaken at any time of year. Ensure equipment and machinery is cleaned prior to moving to new sites.

Grazing should be minimised after any control efforts to encourage the growth of any perennial grasses. The competition from many pasture species can reduce bellyache bush germination and seedling growth.

Bellyache bush is sensitive to fire, providing there is enough grass or other vegetation to carry a fire. Young plants tend to be more susceptible than mature plants. A large portion of the seed bank will usually survive, as many are buried beyond the reach of lethal temperatures.

The creation and management of a buffer zone free of bellyache bush which isolates all infested areas from adjoining properties will reduce the amount of seed transferring into clean areas.

Follow up

It is vital that follow up works are carried out to control seedling recruitment and regrowth after a site has been treated. Treatment areas must be revisited no less than four weeks after spraying, but prior to seed-set. Seeds in the soil can remain viable for at least four years, and up to seven years under dry conditions, so follow-up control to kill any regrowth or new germinants should be done for at least four years after treatment. Areas should be checked for two years after eradication. If left uncontrolled, seedlings and regrowth may develop into a bigger problem than the initial infestation.

Disclaimer

In the Northern Territory, a registered product must only be used in situations consistent to those appearing on the label, unless authorised under a permit; and a person:

- must not have in their possession or use a chemical product unless the product is registered in Australia (exemptions apply)
- may use a registered product at a concentration, rate or frequency lower than that specified on the label unless this is specifically prohibited on the label. This does not apply to herbicide use occurring under an APVMA permit
- may use a registered product to control a pest not specified on the label provided the pest is in a situation that is on the label and use on that pest is not specifically prohibited on the label
- may also use a registered product using a method not specified on the label unless this is specifically prohibited on 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 any conditions of any permit. Users are not absolved from compliance with the directions on the label or conditions of the permit by reason of any statement made in or omission from this publication.

Further information

Weed Management Officers from the Weed Management Branch can provide advice on all aspects of weed management including control techniques, biological control, legislative responsibilities, policy advice, monitoring and reporting and regional planning.

For further information on weed management planning, integrated control, herbicide application techniques and monitoring please refer to the NT Weed Management Handbook. The Bellyache bush Weed Management Plan and Management Guide can be found at www.nt.gov.au/environment/weeds/weed-management-planning.