



Discussion Paper

Review of the Weed Management Plan for Neem (*Azadirachta indica*)

Rangelands Division

Department of Environment and Natural Resources

PO Box 496

Palmerston NT 0831

© Northern Territory of Australia, 2019

This product and all material forming part of it is copyright belonging to the Northern Territory of Australia. You may use this material for your personal, non-commercial use or use it with your organisation for non-commercial purposes provided that an appropriate acknowledgement is made and the material is not altered in any way. Subject to the fair dealing provisions of the *Copyright Act 1968* you must not make any other use of this product (including copying or reproducing it or part of it in any way) unless you have the written permission of the Northern Territory of Australia to do so.

Important Disclaimer

The Northern Territory of Australia does not warrant that this publication, or any part of it, is correct or complete. To the extent permitted by law, the Northern Territory of Australia (including its employees and agents) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and other compensation, arising directly or indirectly from using, in part or in whole, any information or material contained in this publication.

Purpose of this paper

This paper is intended to inform the statutory review of the Weed Management Plan for Neem (*Azadirachta indica*) 2015, any changes that may be required, whether targets within the plan are being reached and how the implementation of the plan is going.

We acknowledge all of the work that has previously been undertaken by individuals and organisations in preparing the original plan. We have prepared this paper to build on that work and seek feedback on our direction. It identifies areas requiring feedback on various aspects of the plan and its implementation.

How you can have your say

Comments are now invited on the review of the Weed Management Plan for Neem (*Azadirachta indica*) 2015 from members of the public.

There are various opportunities to have your say:

You may like to provide feedback via

- Completing an **online survey** at: <http://denr.nt.gov.au/open-for-consultation>
- Sending a **written submission** to The Director, Weed Management Branch, Department of Environment and Natural Resources

Neem Review

Weed Management Branch
Department of Environment and Natural Resources
PO Box 496
Palmerston NT 0831

- **Emailing comments** to weedinfo@nt.gov.au

PUBLIC COMMENT CLOSES: 17 May 2019

Contents

Purpose of this paper	3
How you can have your say	3
Why do we need to review the plan?	5
1 Introduction	5
2 The review	5
3 What is neem?	6
Focus areas for review	7
4 Are we achieving the objectives of the plan?	7
5 Has the plan facilitated better management outcomes?	10
6 Is the class B declaration of neem appropriate for the NT?	10
7 Would enforcement of the plan improve outcomes?	11
References	12

Why do we need to review the plan?

1 Introduction

In the Northern Territory (NT), weeds, including neem, contribute significantly to land and water degradation. They displace native flora, reduce productivity on pastoral land, take over sacred sites and compete with bush tucker on Aboriginal land, reduce wildlife habitat and access to waterways.

The statutory Weed Management Plan for Neem (*Azadirachta indica*) (the plan) is recognised under the NT *Weeds Management Act 2001* (the Act) as providing direction to mitigate the impacts neem is having on Territorians, agricultural production, the economy and our environment.

The plan was developed by the NT Government in 2015 on recommendation from the Katherine Regional Weed Reference Group. It is the first statutory weed management plan for neem. The plan was drafted with significant input from the regional reference group and Katherine community.

The Act describes the legislative requirements for weed management across the whole of the NT. Section 12 of the Act requires that a statutory weed management plan must be reviewed within three years of its implementation.

Neem is declared a class B (growth and spread to be controlled) weed in the NT.

2 The review

The review will take into consideration current Territory policy, future trends and developments, feedback from stakeholders and build on past achievements in order to determine current best practice management, respond quickly to new outbreaks and coordinate the management of existing infestations.

This paper takes into consideration some of the issues that need to be considered in the review. It is not meant to be conclusive, but rather to provide a starting point to encourage comment from land owners, land managers and other key stakeholders towards the review.

The review will be undertaken in two stages:

- **Stage 1** will consider how the plan is working, whether we are all reaching the targets identified in the plan, how it is used in alignment with legislation and whether any changes are required.
- **Stage 2** will include making any required changes to the plan from feedback and information gathered during the review, and gazettal of the updated plan.

This paper relates to Stage 1 of the review program.

The NT Government is looking to receive feedback and submissions from industry, non-government organisations and individuals on the plan.

We will consider the information in Stage 1 to update the statutory plan and its future implementation.

3 What is neem?

Neem is a medium sized tree growing to a height of 15 metres. It has dark red-brown bark that cracks and flakes when aged and small white honey scented flowers. Adult leaves are dark green and serrated, and red-green when young. Neem plants also have a pungent smell and are valuable in some contexts due to their insecticidal properties.

In the NT, neem was deliberately planted to produce shade for cattle and has been found as far south as Tennant Creek. Believed to be first introduced into Darwin in the 1940s and more widely planted as a street tree in Darwin in the 1960s, neem remains a common garden plant in Darwin, Katherine and the rural areas. It was also grown for the production of azadirachtin, a broad spectrum insecticide.

Between 1965 and 1988, trial neem timber plantations were established in Darwin. Plantations were also established in Queensland and Western Australia. Neem continues to be promoted as a multi - purpose plantation species by some advocates in Queensland. Despite this, a viable neem industry does not seem to have developed in Australia and many plantations have since been abandoned.

Neem has become naturalised in many areas across northern Australia, where the expansion of unmanaged populations has demonstrated neem's capacity to compete with native plant species in intact environments. Neem infestations are developing in riparian areas across the Top End including the Katherine, Wickham, McArthur and Roper river systems. In these areas, neem is proving to be highly invasive and competitive. Mature neem trees produce a prolific amount of seed, which are readily dispersed by birds, bats and humans. Plants are capable of establishing in relatively undisturbed vegetation. Suckers can also be produced following damage to the roots.



Neem infestation in the Katherine River Corridor

Focus areas for review

There are four main areas that will be assessed for review:

1. Are we achieving the objectives of the plan?
2. Has the plan facilitated better management outcomes?
3. Is the class B declaration of neem appropriate for the NT?
4. Would enforcement of the plan improve outcomes?

4 Are we achieving the objectives of the plan?

Objective 1: To prevent further introduction of neem into the Northern Territory.

Until its declaration in 2014, neem was sold in nurseries around the NT as it was a popular shade plant that has insecticidal properties and is termite resistant. As a declared weed, movement and trade of neem is now illegal.

The NT Government needs to determine if enough people in the community and relevant industries are aware that it is illegal to sell or move neem to or within the NT. Increasing awareness reduces the risk of new neem infestations occurring from inadvertent spread by people.

Being able to identify neem and understand the risk it poses to the NT is also important to help protect the NT's environment, production and cultural values from the impact of neem.

Management requirement	Target
<ul style="list-style-type: none"> • Prohibit the production, sale or purchase and transport of neem, seed or products. • Ensure that the public and industry can identify neem and understand the risk it poses to the Northern Territory. 	Design and implement information and awareness resources and campaigns to raise awareness to prevent the further introduction of neem to or within the NT.
	Design and implement information and awareness resources and campaigns for the public and industry to identify and understand the risks.

Questions to consider:

1. Can you identify neem and do you know what affect it has on the environment?
2. Do you know it is illegal to buy, sell or transport neem plants and seeds?
3. What information have you seen or received from the Weed Management Branch in relation to neem and the restrictions on its transport and sale?
4. Is that information useful? What is the best way for the Weed Management Branch to get information to you, and how best is this information provided to you? For example, hard copy brochures, letters, via the internet, facebook or email?

Objective 2: To control the growth and spread of neem.

When the first Weed Management Plan for Neem was released in 2015, it was acknowledged that neem had been widely planted throughout the NT as a shade plant and was abundant in many stations and in residential gardens, as well as street trees in some communities. As such, the focus for implementation of the first plan was on control of seedlings and saplings, and where feasible, mature trees (understanding that it was quite expensive to remove established trees and some trees had an important role in a few communities as large shade trees).

Considering that it is the mature trees that present the most risk to the NT and its environment, as seed producers, it is timely that this review be used to consider the community's view on pursuing greater control or removal of mature neem trees and updating the plan to reflect this.

Knowing where infestations and isolated neem trees are located allows us to plan strategic management and develop programs and partnerships to undertake projects or help the community control their neem. It is well known that coordination and integration of weed management effort is a challenge because of the small population and large area of the NT. As a consequence partnerships and engagement between all stakeholders is pivotal in order to conduct and resource systematic surveillance and on ground works.

Even with this challenge, a number of successful management programs have been developed and implemented for neem control since the plan's inception. Works are most often undertaken by landholders and communities with support from Government (both Commonwealth and NT) and the NT's natural resource management body. As a result, good progress is being made towards reducing the impact of neem on the environment, particularly around the Katherine region.

Weed spread prevention and early detection of new infestations of weeds are two of the most important things when it comes to weed management. Implementing these as programs in your business, industry or even on your property will greatly reduce the need for control and excessive control costs and time needed for control efforts in the future.

Management requirement	Target
<ul style="list-style-type: none"> • Eradicate isolated plants and outbreaks. • Implement early detection and eradication programs. • Active containment of priority infestations. • Prevent/minimise further seed production. • Design and implement a seed spread prevention program. • Prohibit the production, sale or purchase and transport of neem, seed or products. 	Identify location, extent and density of infestations of neem.
	Prioritise areas for control by identifying isolated and small infestations which are easy to treat, significant seed sources or areas with a high probability of seed spread and/or infestations in high value, neem free catchments or vulnerable areas.
	Programs and partnerships developed and implemented to manage infestations of neem in urban areas/townships.
	Programs and partnerships developed and implemented to manage infestations in remote localities (including outstations, communities and stations).
	Programs developed and implemented to prevent the spread of neem through pathways of spread by using best practice management.
	Programs developed and implemented to control and/or eradicate (where feasible) neem on all NT Government and Defence controlled lands.
	Results of management activities are obtained from land holders.
	The number and size of infestations of neem is reduced.
	Neem is actively managed.

Questions to consider:

5. Do you think it is reasonable to expect that people remove mature neem trees from their properties?
6. Do you think the neem programs that have been in place over the past few years have helped with the control and growth of neem in the NT? If so, how? If not, why?
7. Do you have a weed spread prevention program in place on your property or for your business or industry? What does it involve?

Objective 3: To apply an adaptive approach to weed management.

Monitoring and evaluation of programs allows us to determine if what we are doing is achieving our desired results, for whatever it is we have been working towards. Keeping accurate records of control and results from that control helps us to make that analysis. Sometimes it feels like we are losing the battle in weed control, but there are many battles we win. If we feel like we are losing, it may not be about the effort we are putting in, but something as simple as not applying the correct control methods at the right time, or at the right rate. Keeping records makes working these problems out much easier in the long run. If control has been done accurately, then this means something else may be happening, like herbicide resistance or even hybridisation of species who are less susceptible to certain control methods. When this happens, we have the opportunity to reassess our control options and adapt them to the new conditions.

When neem was declared in the NT, there was limited knowledge on its control options. As a result, the Weed Management Branch conducted neem herbicide trials to make sure there was a viable option for the community to undertake their legislative obligations. Outcomes from those trials are now being widely used across the Katherine community for successful neem control.

Management requirement	Target
<ul style="list-style-type: none"> • Develop and maintain an ongoing monitoring program. • Maintain an accurate record of control methods applied and results achieved for possible collation at a Territory level. • Evaluate the efficacy of control and containment programs. 	Results of successful eradication or control activities are shared.
	Information and awareness resources and campaigns are developed and implemented to raise awareness and capacity of landholders to control and contain the spread of neem

Questions to consider:

8. Do you keep records on your control efforts? Do you submit this information to the Weed Management Branch?
9. Have you changed the way you do control works from evaluating and assessing things when it hasn't worked?
10. Have you seen any 'good news' stories from neem control? What is the best way to let you know about these success stories?

5 Has the plan facilitated better management outcomes?

We need to determine if the plan is facilitating the aim of the plan, which is to mitigate the damage caused by neem in relation to production, environmental and cultural values. This can be indicated by a number of factors. Are we achieving eradication, containment, spread prevention and reduction in infestations across the NT?

Questions to consider:

11. Have areas of management been prioritised in the regions or catchments?
12. Have priority land parcels developed a property management plan to eradicate, contain or manage neem? Are these plans being implemented? How? Are you seeing benefits from having a property management plan?
13. Does the plan have enough information for landholders to manage neem as per their requirements?

6 Is the class B declaration of neem appropriate for the NT?

In 2015, a weed risk assessment of neem was conducted by the Weed Risk Management Technical Committee, using the Weed Risk Management System.

The assessment determined neem to have a weed risk of 'very high' in the NT with a 'medium' feasibility of control across the Darwin, Katherine and Tennant Creek regions and a 'very high' feasibility of control in the Alice Springs region. This assessment resulted in neem being declared as a class B weed across the whole of the NT. This meant that eradication was not a realistic or feasible option, however, that growth and spread of neem was to be controlled.

Neem is/was considered a contributing factor of flooding in the Katherine River corridor, and as such, has been a target for control works in the corridor by the NT Government to mitigate the flood threat to Katherine township through the collaborative woody weed control program.

Questions to consider:

14. Does neem affect your property? Has it impacted you? If so, how?
15. Have you heard about or been involved in a neem control program? If so, please provide an example.
16. Can you describe the benefits you have experienced by controlling neem? For example, amenity, production increases, better environmental conditions.
17. Do you believe neem should still be declared a weed for the purposes of control of its growth and spread?

7 Would enforcement of the plan improve outcomes?

The Weed Management Plan for Neem is a statutory document. Its management requirements are legal obligations for all those with neem on their land. Being a statutory document, the plan needs to be capable of being used for enforcement and compliance activities by the Weed Management Branch.

Requirements in the plan need to be fair and reasonable and in the event of non-compliance with the plan, it is necessary to determine if the plan is legally sound. Is it easy to follow? Are the requirements obvious, measurable and reasonable to implement? This review will look at those elements to determine if management requirements need to be clearer, if the plan is suitable for its intended use and if it can be used as a fair target to measure compliance against.

If the plan's requirements are fair and reasonable, and the plan is enforced on non-compliant land holders or occupiers, the plan would improve the situation on-ground and reduce the impact of neem on the NT.

Questions to consider:

18. Are the management requirements in the plan obvious, measurable and reasonable? If not, why or how can they be improved?
19. Is the plan suitable for its intended use (mitigate the impact neem is having)?
20. Can the plan be used to measure compliance?

Issues identified already

Issues identified	What we are considering
Identifying priority areas for control.	Emphasis on eradication of outlying infestations, particularly the 'occasional and localised' areas identified on the current neem distribution map found in the plan.
Removal of large infestations – require erosion or vegetation replacement strategies.	Not to be included in the statutory plan, but identify in smaller catchment, localised or property scale plans.
Information on catchment planning and landscape scale management.	Add general information to the plan on smaller scale catchment planning.
Requirement for wash-down facilities.	Provide a generic spread prevention protocol as requirement for wash-down facilities is not essential for neem control and spread prevention.
Management requirements for urban settings not clear enough.	Include clear management objectives as they relate to parcel sizes.
Difficult to address neighbouring issues on small parcels of land (in core infestation zones) under current framework.	While the requirement to manage mature trees 'only where feasible' was well intended, it does make it difficult for those controlling their own infestations when they are being affected by neighbouring adult trees and seeds falling over the fence. Include control of adult trees in future plans.
Some measurements are too intensive and difficult to report on.	The degree of reporting should better reflect the management objectives and also the overall level of priority for neem management.

References

Northern Territory Government: Northern Territory Weed Data Collection Manual, www.nt.gov.au/weeds

Northern Territory Government: *Northern Territory Weeds Management Act 2001*, <http://www.nt.gov.au/nreta/natres/weeds/legislation/index.html>

Northern Territory Government: Weed Management Plan for Neem (*Azadirachta indica*) 2015