

# Biological control of Noogoora burr in the Katherine Region

Noogoora burr (*Xanthium strumarium* L. formerly *Xanthium occidentale*), a declared weed, is an annual plant that can grow to 2.5 m, but typically grows to 1 m in height. Noogoora burr produces hard, woody burrs in clusters of 2-13. Burrs have numerous hooked spines which facilitate spread by vehicles, animals and water. A pair of seeds is contained in each burr. One seed will germinate in the first season and the second in a following favourable season.

The distinctive leaves of Noogoora burr are similar in shape to grape or maple leaves. Leaves have a rough texture and prominent veins.

Native to North America, Noogoora burr was thought to have been introduced to Australia in cotton seed. Noogoora burr has now established in all regions of the Northern Territory. It has spread along many Top End waterways, including the Daly and Victoria Rivers.



Plate 1: Noogoora burr



Plate 2: Close up of dry, woody burrs

Noogoora burr infestations can impede access to water for wildlife, stock and anglers.

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Noogoora burr can also form dense infestations in crops and pastures. Seeds and seedlings are poisonous to animals. Burrs can also lodge in animals hooves causing infection and injury.

## Biological control

Biological control is used when weed eradication is no longer feasible and when growth and vigour can be reduced by introducing the weeds' natural enemies. A biological control program for Noogoora burr commenced in 1929. Multiple attempts at introducing agents resulted in limited impact on Noogoora burr distribution and spread.

Land managers are likely to see stem damage from the moth *Epiblema strenuana* a biological control agent which is widely established across the Northern Territory. The larvae of the moth burrow into the stem and feed internally. This weakens the stem and can cause it to drop off, resulting in stunting and a reduction of seed producing stems. Despite these impacts the moth is not significantly reducing Noogoora burr populations.

The accidental or illegal introduction of the rust *Puccinia xanthii* in 1974 resulted in significant control of Noogoora burr infestations across eastern Australia. The rust has also established in Northern Australia, including the Katherine Region.

Rusts do not kill a host plant but can severely reduce growth and yield. *Puccinia xanthii* develops pustules which feed exclusively on the leaves of Noogoora and Bathurst burrs, eventually killing the leaves. Affected plants can become stressed due to loss of foliage. Once stressed, plants may partially or completely stop seed production.

## Collecting and spreading rust

Rusts produce spores which can be deliberately spread to new plants and infestations. Use of *Puccinia xanthii* rust by land managers is encouraged, particularly where its use forms part of an integrated weed control program.

The rust *Puccinia xanthii* is easily spread by collecting infected leaves and relocating to new infestations or unaffected plants. As Noogoora burr is an annual plant it will die off naturally after producing seeds, as the rust takes some time to take affect there is no benefit in releasing rust on mature plants.

The timing of treatment and the process for collection and redistribution of the *Puccinia xanthii* rust is as follows:

- At the end of the Wet season locate Noogoora burr plants which are showing rust pustules, such as those in Plate 4.
- Transfer infected leaves to young healthy plants by stapling or tying leaves on to plant.
- Best results are achieved when moisture levels are high, due to irrigation, humidity or dew and temperatures are cooler, ideally between 20 – 25°C e.g. early morning or late evening.
- Monitor if the rust is spreading. If flowers or immature seeds are present then chemical or mechanical control will be required.
- Rust infected leaves may be collected and kept for next season by air drying leaves in a paper bag or by freezing.

## Integrated control

The successful long-term management of weeds depends on a combination of biological, chemical and physical control. Ideally these methods should be applied in conjunction with appropriate land management techniques.

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**Plate 3: Mature Noogoora burr**



**Plate 4: *Puccinia xanthii* rust pustules - photo CSIRO**



**Plate 5: Rust infected leaves of Noogoora burr**