Biological control of Prickly acacia: Progress and issues

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Background

- Vachellia nilotica ssp. indica
  - Acacia nilotica ssp. indica
  - From Indian subcontinent
  - For shade and fodder
  - Weed of National Significance

• Many management options
  - Most not economical
• Approved biocontrol target
  - Biocontrol efforts since 1980
• Biocontrol – most viable option
  - 6 agents introduced
  - 2 agents established

Agents from India

- Anomalococcus indicus
  - Babul scale
  - Testing near completion
- Phycita sp. B
  - Green leaf-webber
  - Testing in progress
- Dereodus denticollis
  - Leaf-feeding weevil
  - Testing to commence

Babul scale

• Host testing in Australia
  - No-choice tests
    - 71 non-target plant species tested
    - Development completed on 15 species
    - Only 4 species sustained development comparable to prickly acacia
  - Choice tests
    - Prickly acacia more preferred than non-target species

Babul scale

• Field trial in India
  - Choice test under field conditions
    - Trial 1: Acacia fabata, Vachellia rufa, Neptunia major and N. monosperma
    - Seeds exported to India
    - High mortality of test plants
  - Trial 2: N. major and prickly acacia
    - Localised flooding disrupted one site
    - Preliminary results: 77 prickly acacia & 0/7 N. major plants infested with babul scale
Green leaf-webber

- Host testing in Australia
  - No-choice feeding assay
  - 19 non-target plant species tested
  - Development completed on 10 species
  - Oviposition no-choice tests
    - 10 non-target plant species tested
    - Egg lay only on *N. major*
  - Oviposition choice test
    - Prickly acacia and *N. major*
    - Egg lay only on prickly acacia

Issues

- Colony crashes (Feb & May 2015)
- Inconsistent egg lay
  - Dec 2014 – 2 out of 6 cages
  - January 2015 – 1 out of 6 cages
  - February 2015 – 0 out of 3 cages
  - May 2015 – 0 out 3 cages
- Female moths were not reproductively mature
- No spermatophores present – moths had not mated

Progress

- Peak activity in India occurs during winter season (shorter day lengths)
- Manipulate day-length in quarantine
- New material imported August 2015
- Import new material October 2015

Leaf-feeding weevil

- Long lived adults
  - Been in culture since 2013
  - Adults feed on leaves
  - Larvae presumed to feed on roots or under bark?

Issues

- Virtually no egg lay in quarantine cages
- No survival of larvae

Biology in India

- Prickly acacia drought stressed during summer
- Peak egg lay occurs during monsoon season
- Combination of these two elements may be required to stimulate egg lay and larval development

Progress

- Oviposition chambers established
- Eggs laid in glass jars with cut foliage
  - Drying foliage may stimulate egg lay
  - Eggs laid in saturated floral foam
**Leaf-feeding weevil**

- **Progress**
  - Trialled various different food sources
    - Roots, stems, leaves
    - Semi-artificial diet (containing root powder)
  - Proposed trial of a completely synthetic artificial diet

**Future agents - Ethiopia**

- **Gall thrips & mite galls**

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