

# Oestrogenic sub clover pastures: identification and remediation

## What is the problem?

Recent surveys conducted in the medium to high rainfall zones of southern Australia have found that old cultivars of subterranean clover remain common in many pastures. Some of these cultivars contain high levels of oestrogenic compounds which can negatively impact sheep health.

## History

The link between sheep reproductive health problems and high levels of the oestrogenic compound, formononetin, in the leaves of sub clover was first made in the 1960s. In response, plant breeding programs quickly developed and released new cultivars with lower, safer, levels of formononetin. By the 1980s, the problem was thought to have been largely resolved. Communication about the problem declined and knowledge on how to identify and remediate highly oestrogenic pastures diminished.

## How does grazing highly oestrogenic sub clovers affect livestock?

- most commonly, an increased dry ewe percentage
- unexpected low lambing percentages due to temporary declines in ewe fertility
- an increase in uterine prolapse
- an increase in ewe and lamb mortality around birth
- in severe cases, permanent loss of ewe fertility, milk secretion in maiden ewes and wethers, false bladders in wethers – ‘clover disease’.

## Why might highly oestrogenic cultivars be common in a paddock?

High oestrogen cultivars can be very persistent. Even if they were sown > 25 years ago, they can now dominate pastures, even including some renovated pastures.

## When might the presence of highly oestrogenic sub clover cause a problem?

If they contribute 20% or more of pasture biomass.

## Which cultivars are high in oestrogens?

Dwalganup, Geraldton, Dinninup and Yarloop are most likely to contribute high levels of oestrogens in pastures. Tallarook is present only in districts with very high rainfall. Some locally evolved sub clover variants are also highly oestrogenic, including Eden Valley in SA and Book Book in NSW.

### Dwalganup



Leaf – crescent with white arms, leaf often has fold, brown flush in winter. Hairy runner. Early flowering.

### Geraldton



Leaf – narrow, triangular, distinctly spaced leaflets, band leaf mark and often brown flush midrib. Hairy runner. Early flowering.

### Dinninup



Leaf – full crescent with distinctive flush pattern and thin line surrounding leaf mark. Hairy runner. Late flowering.

### Yarloop



Leaf – no crescent only white arms, brown flush midrib. Hairless runner. Late flowering. Adapted to waterlogging. Cream/amber seed.

### Tallarook



Leaf – crescent with white arms which fade in spring, often brown flush below the leaf mark in winter. Hairy runner. Very late flowering.

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## How to manage a paddock if you suspect a problem

- Manage the stock rotated onto the paddock:
  - don't graze young ewes or lambs
  - limit grazing by wethers to avoid high exposure
  - rams are not thought to be affected
  - cattle may be affected, but likely this is rare
- Be aware that high oestrogen levels can be maintained over long periods of time in hay cut from these pastures if dried quickly or used to make silage
- Ensure soil phosphorus nutrition is adequate as deficiency may increase pasture formononetin levels
- Dilute the proportion of feed intake that contains oestrogens:
  - provide alternative feed sources e.g. shrubs or grasses in adjacent paddocks
  - sow other species into the pasture e.g. rye grass or oats to dilute the intake of sub clover
  - do not grass clean, dilution is part of the solution
- Remember to consider other reasons for poor lambing percentages.

## Pasture renovation – the ultimate solution

- To aid success with replacing high oestrogen pastures:
  - reduce clover seed bank by cropping for several years, and prevent sub clover seed set
  - choose a well-adapted, 'recently released' low oestrogen cultivar
  - consider a higher seeding rate than normal/ recommended to aid the new cultivar to become dominant
  - apply recommended rhizobia at sowing
  - fertilise adequately based on soil tests
- when renovating pastures ensure certified seed is used to avoid contaminated seed.

### More information

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## Acknowledgements

This project is a collaboration between The University of Western Australia (UWA) and the Department of Primary Industries and Regional Development, Western Australia, with funding by The UWA Institute of Agriculture through the UWA Future Farm and Meat & Livestock Australia Donor Company.