



## Key Points:

- ⇒ Clovers containing oestrogens can significantly impact on lambing percentages
- ⇒ Know the 4 'bad' clovers
- ⇒ Rank your pastures
- ⇒ Graze toxic paddocks selectively or implement strategies to eliminate the bad clovers

# Good clover, bad clover



## Why manage oestrogenic pastures for sheep

Sheep grazing pastures containing oestrogenic subterranean clover can be affected by a number of reproductive disorders which together form 'clover disease' particularly in ewes. The main oestrogenic ('bad') subterranean clover cultivars of concern are Dinninup, Dwalganup, Yarloop and Geraldton. Simply these cultivars have substances in their leaves at a higher concentration than other cultivars that have an effect on sheep similar to that of natural oestrogens. Isoflavone formononetin is the most active of these substances and clover cultivars which have high amounts are known as oestrogenic clovers.

Levels of isoflavones are potent to sheep while the leaf material is still green, as the leaf senesces the isoflavones are broken down and so grazing dry pasture has reduced risk. However if very good clover hay is made from the oestrogenic clovers and the leaf material is cured very well and has kept its colour, such hay can still be oestrogenic.

Clover disease affects ewes and wethers. Symptoms include: lowered ewe fertility, increased difficult births, prolapse of the uterus, udder development in maiden ewes and wethers, and enlarged bulbourethral glands and urethral blockages in wethers.

## Introduction

This fact sheet has been developed as part of a MLA funded Producer Demonstration Site (PDS) project, coordinated by Mackillop Farm Management Group, and in partnership with Agriculture KI.

The project aims to increase producer awareness of the issues encountered with oestrogenic clovers, develop skills in 'bad' clover ID and implement strategies to overcome issues. Focus sites will be established in the SE and on KI.

Further details are available from Tiffany Bennett  
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## Background

Some older sub clover varieties can cause infertility in sheep and low lambing percentages. These varieties were well regarded pasture plants and widely sown in Australia from the 1930s up until the late 1960s. Although not planted for many years, like all sub clovers they produce a percentage of hard seed that results in carryover and regeneration following cropping rotations.



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## Lowered ewe fertility

Ewe fertility - the most important factor for flock productivity - is reduced when ewes graze moderate to high levels of oestrogens in the pasture. The effect can be permanent or temporary in the flock.

Permanent infertility occurs when ewes graze oestrogenic pastures for two or three years. Older ewes tend to have higher fertility rates than younger ewes on normal pasture but the cumulative effect on oestrogenic pastures results in much lower fertility, reflected by the time of exposure to the oestrogens in the pastures. Transport of sperm through the reproductive tract is severely restricted, producing poor conception rates and/or a spread of lambing time within the flock. Once exposed to two or three years of high oestrogens, if the flock is moved to non-oestrogenic pastures, the fertility remains affected.

Temporary infertility can occur where ewes graze germinating or green oestrogenic clover at mating or six weeks before mating. Lowered ovulation rates, poor sperm transport and a reduction in the number of ewes that mate may be the result. Summer rains at mating or spring mating on green clover increases the chance of temporary infertility.

## Difficult births

A higher than normal incidence of difficult births occurs in a flock affected by oestrogenic pasture. Ewes can show minimal effort to deliver their lambs and often may require assistance to lamb. The prolonged births often produce lambs born dead or weak from the process. Foetuses can also decompose or mummify resulting in the death of the ewe. The uterus can also prolapse and protrude from ewes at lambing or several weeks later. This often results in the humane destruction of the ewe and loss of the lamb.

## Udder development in dry sheep

The oestrogenic nature of the clover stimulates mammary development and milk secretion in non-pregnant ewes and wethers. The condition has no known harmful effects, but does provide a guide as to the potency of the oestrogens in the pasture.

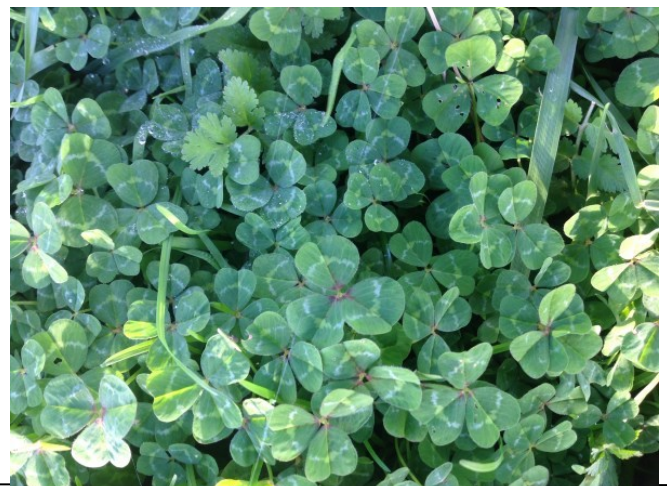
## Enlarged bulbourethral glands in wethers

Attached to the urethra of male sheep the bulbourethral gland can become cystic and enlarged in wethers grazing oestrogenic pastures. Badly affected animals can die. Urethral blockages can also be a problem more so on very clover dominant pastures.

## Identifying the 'bad' clovers

The main oestrogenic subterranean clover cultivars ('bad' clovers) are Dinninup, Dwalganup, Yarloop and Geraldton. They all have distinctive features and the 'Good clover, bad clover—clover ID' fact sheet highlights these features.

Identification of subterranean clovers is simplified by assessing three sections of the plants: the leaf markings, the hairiness of the runner, and the colour of the flower calyx.





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## Assessing the 'potency' of paddocks

Regardless of what might have been sown recently, the varietal mix of clovers in pastures changes greatly due to the influence of grazing, crop rotations and seasonal conditions. Early maturing types can build up relative to other varieties in years with a dry spring.

Once oestrogenic cultivars have been identified the next step is to determine how potent the pasture may be to sheep. This will vary with the botanical composition of the pasture across the paddock. Other good cultivars low in oestrogen and other pasture grasses and broadleaf plants will collectively dilute the amount of oestrogens that the sheep will consume.

Paddocks can be assessed by one of two methods—visually by the 'stick method' or by collecting clover samples and sending them for laboratory analysis of oestrogen levels. Both methods are described below.

**Stick method:** Using a stick of approximately 40 cm in length, walk a transect across a paddock, throwing the stick at random intervals. Record what plant is touching each end of the stick e.g. clover, grass or broadleaf. Also record whether the clover is a 'bad' clover or not. Repeat this 50 times.

From this calculate the percentage clover and percentage bad clover. If the bad clovers comprise more than 20% of the pasture record the paddock as potent.

**Laboratory test:** Walk a transect taking random selections of clover plants at ground or grazing level. Roughly chop the collected sample & subsample out a large handful overall & place in labelled paper bag. Freeze if accumulating samples or if it is late in the week. Post in paper bags so samples dry rather than sweat in plastic.

Post samples to: Southern Scientific Services, PO Box 234, Hamilton Vic 3300.

## Flock management on ranked pasture

There is no cure for permanently infertile ewes caused by clover disease, so with careful management the highly potent pastures must be avoided. The aim is to keep the youngest ewes (ewe weaners) on the lowest oestrogen ranked paddocks as long as possible while the clover is green. Higher ranked paddocks may be able to be utilised once the pasture has senesced. The safest pastures should be reserved for ewe hoggets and maiden ewes. The mid aged breeding ewes on the next safest and so on. The plan is not to graze potent pastures until late in the ewe's reproductive life.

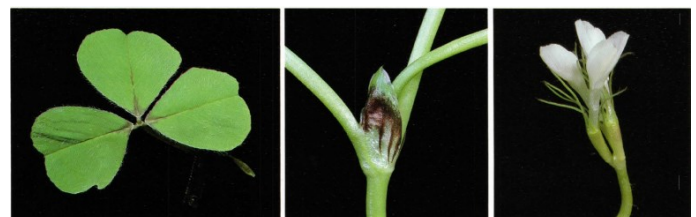
The higher oestrogen ranked paddocks should be kept for older breeding ewes, cattle, wethers or cropped. These higher ranked paddocks could be also targeted for pasture renovation with more suitable low oestrogen cultivars of clover. An assessment of the ranked paddocks and that of the sheep enterprise and business goals will determine overall management strategy.

Examine overall ewe management as a number of factors can attribute to poor lambing performance. These include inadequate nutrition of ewes at mating, poor ram fertility, over feeding in late pregnancy, and other general health problems which can overshadow the effects of grazing oestrogenic pastures.

Clover disease affected ewes can have intermittent fertility, dry ewes can often lamb in subsequent years.

Whilst it is believed that cattle are generally not affected, further research needs to be undertaken.

### Yarloop clover—leaf, stipule & flower



Source: Ramsey Seed Inc., California



# Good clover, bad clover

## Key tips to improve fertility

- ⇒ Do not graze young ewes on pastures that are high in oestrogenic clovers
- ⇒ Paddocks with less than 20% clover are likely to be safe
- ⇒ Delay joining ewes until at least six weeks after the clover has died & ensure ewes are in condition score 3
- ⇒ Test pasture hay for oestrogens, and if levels are high avoid feeding to ewes
- ⇒ Check ram health pre-joining and aim for 3% rams at joining
- ⇒ Consider culling adult ewes scanned not pregnant as they are likely to be permanently infertile
- ⇒ Consider drilling in winter feed to 'dilute' the clover and/or don't grass clean highly oestrogenic pastures



Source: Colin Trengove

## Further Information

For further details contact: David Woodard - 0417 803 525

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## Renovation of pastures

The aim is to reduce the percentage of oestrogenic cultivars and replace them with low oestrogenic cultivars with improved productivity benefits. Select cultivars suitable to the soil type, rainfall and required tolerances, disease resistance and targeted growth habit.

Dominant clover pastures often have a very large seed reserve in the soil ranging from 300kg/ha to 500kg/ha. In highly oestrogenic clover pastures these seed reserves need to be strategically reduced in order to allow a seeding rate of new clover at 10kg/ha to 20kg/ha to dominate over the existing cultivars. Reducing seed set in the years prior to renovation is a key step by cropping or cutting hay. Maximise the number of clover kills pre-seeding of the crop by encouraging existing seed to germinate.

In the year of pasture reseeding, maximise clover kill and ensure adequate soil nutrition, weed and insect control prior to and after pasture seeding. The aim is to achieve maximum seed set of good healthy seed of the preferred cultivars. A light grazing may assist runner and seed potential prior to closing up for seed development.

Seek further advice from your local agronomist.

## Funding Partners



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