

Changes in leaf isoflavones during a growing season for diverse populations of subterranean clover in two permanent pastures in WA

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Background

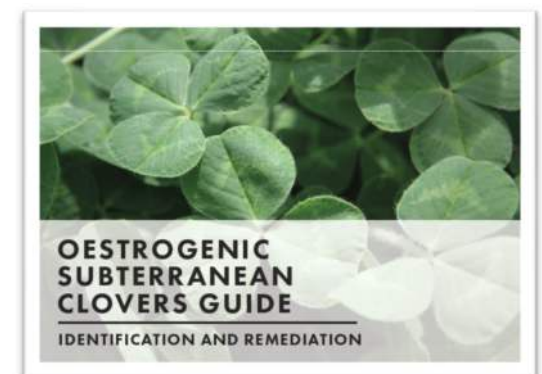
- Subclover can contain the isoflavone formononetin (F)
 - Infertility in ewes (permanent or temporary)
 - Reproductive difficulties in ewes (dystocia)
 - New cultivars selected for “safe” F limit:
< 0.2% leaf dry weight
- Old “high F” cultivars are persistent
- Permanent pastures: diverse populations of subclover cultivars/ecotypes
 - Difficult to identify/distinguish cultivars/ecotypes
- In two long-term permanent pastures we investigated:
 - Subclover cultivars/ecotypes
 - Shoot F concentrations for each cultivar/ecotype
 - ➔ Average subclover F concentration per paddock



Outdated cultivars of sub clover that are highly oestrogenic will reduce ewe fertility. It's time to check your pastures.

Methods

- Pingelly, WA
- Two permanent pasture paddocks
 - Paddock A – Rams
 - Paddock B – Lambing ewes
- Pasture cages installed
- Sampled July and August
 - Quadrats – composition (clover, grass, weed DW)
 - Cultivar/ecotypes identified using leaf and stem morphology
 - Green leaf F concentration
 - Rod-point technique - proportion of subclover as each cultivar/ecotype



Results - August

- Proportion of pasture DW as subclover

- Paddock A – 48%
- Paddock B – 58%

- Subclover populations and green leaf F %

- Paddock A

- Low F Dalkeith (0.07)
- **Medium F** Unknown I (**0.26**), Dwalganup (**0.45**)
- **High F** Dininnup (**0.74**), Geraldton (**0.75**)

- Paddock B:

- Low F Dalkeith (0.09), Unknown II (0.12)
- **Medium F** Unknown I (**0.28**)
- **High F** Dinninup (**0.86**), Geraldton (**0.98**)



% of subclover

Average F(%)

38

12

50

0.45

8

55

37

0.47

Discussion

- F results indicated that cultivars/ecotypes were correctly grouped
- Unknown ecotypes likely hybrids
- F concentration for a cultivar/ecotype varied:
 - Between sampling times
 - Between paddocks
- High F concentrations reflect genetic background not other factors e.g. poor nutrition or widespread waterlogging
- Average subclover F concentration per paddock (0.46% green leaf DW) double the “safe” limit (0.2%)
- Rams in Paddock A – subtle decrease in sperm quality (Pool et al. 2023)
- More research required on impact of “medium” F concentration on ewe, lamb and ram health

