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CONTROL OF CLOVER INFERTILITY IN SHEEP

A summary of practices recommended for the control of infertility caused by subterranean clover in West Australian sheep.

By H. G. NEIL, H. E. FELS and C. M. FRANCIS

PROLONGED grazing of green subterranean clover pastures often reduces ewe fertility. In more extreme cases, obvious signs of clover disease occur.

Workers at the University Institute of Agriculture have identified the isoflavone formononetin as the likely cause. Formononetin occurs in large quantities in the green leaves of some subterranean clover varieties, including Dwalganup, Yarloop, Dinninup and Geraldton. Many naturalised and recently introduced varieties, of sub. clover contain little formononetin.

For farmers who already have high-oestrogen pastures an obvious long-term solution will be to re-seed with low-oestrogen varieties after cropping. In the meantime, new knowledge about management of oestrogenic pastures and the sheep that graze them will reduce the effects of clover oestrogens.

This article makes recommendations about the use of low-oestrogen pasture species and varieties, and about the management of high-oestrogen varieties and the sheep that graze them. Recommendations are given under three headings:

A. New land, and initial pasture establishment on old cleared land:

Sow low oestrogen species or varieties suitable for the district and soil type.

The table below lists varieties and species with low and high oestrogenic potencies. The map, taken from Department of Agriculture Bulletin 3568, shows which low-oestrogen varieties of sub. clover are suitable for different climatic regions. Many pasture species listed in the table will also grow in various of these zones; some of these are lucerne, barrel medics, lupins, rose and cupped clovers and W.A. Serradella.

B. Established pastures with high oestrogenic potency:

These include green pastures containing more than about 50 per cent. Dwalganup, Yarloop, Dinninup or Geraldton sub. clover.

1. Superphosphate

Superphosphate-deficient pastures will have higher formononetin levels than usual. High superphosphate rates will not only alleviate this problem but may hasten the usual decline in proportion of sub. clover in the pasture.

THE AUTHORS: H. G. Neil, Officer-in-Charge, Sheep and Wool Branch; H. E. Fels, Adviser, Sheep and Wool Branch; C. M. Francis, Research Officer, Plant Research Division.

RECOMMENDATIONS

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Low-oestrogen subterranean clover suitable for climatic zones

Zone 1.—Woogenellup, Mt. Barker.
   Seaton Park on drier soils and on the drier margins.
   Yarloop* on waterlogged areas.

Zone 2.—Seaton Park generally.
   Woogenellup on wetter margins and on soils with good moisture relationships.
   Daliak on drier margins.

Zone 3.—Daliak.

Zone 4.—Daliak, Uniwager.

Zone 5.—Geraldton*, Uniwager.

* Satisfactory low-oestrogen varieties of subterranean clover are not yet available for sowing on waterlogged areas instead of Yarloop, or in Zone 5 instead of Geraldton. Likely low-oestrogen varieties are being evaluated.

2. Ewe purchase
   Buy ewes from non-clover areas. Regular purchase of suitable replacement ewes is the most effective procedure available if clover disease is obvious or if clover infertility is severe.

3. Lamb in winter or spring
   To ensure fast growth of lambs and to fit in with seasonal changes in quality and quantity of pasture feed, the Department of Agriculture usually recommends winter lambing if stocking rates are higher than about half of the limit of carrying capacity. In wetter areas spring lambing is often recommended, especially if stocking rates are high relative to carrying capacity.
   There is also growing evidence that pregnancy during part of the green-feed season tends to protect ewes against pasture oestrogens.

4. Grazing management
   Run ewe weaners and young ewes on non-oestrogenic pastures. As far as possible non-pregnant ewes (i.e., lactating or dry ewes) should graze pastures of low oestrogenic potency. This is more important for younger ewes because they have more years of production ahead of them.
Oestrogenic potencies for sheep of leguminous pasture species in Western Australia

LOW OESTROGENIC POTENCY
(Usually less than 0.3 per cent. of formononetin)

Subterranean clover var. Northam A* (in order of maturity)
Uniwager
Blackwood
Daliak
Seaton Park
Midland B*
Woogennellup
Clare
Bacchus Marsh
Mount Barker
Nangeela*
All varieties

Rose and cupped clovers
Strawberry clover
Medics (when green)

Serradella
Lupins

Vetches
"Wild" clovers

MODERATE TO HIGH OESTROGENIC POTENCY
(Usually more than 0.8 per cent. formononetin)

Subterranean clover var. Geraldton
Dwalganup
Yarloop
Dinninup
Stirling Range†
Howard
Rocky Gully†
Tallarooke
All varieties

Red clover
* Not available commercially.
† Non-commercial strains widespread in localities named.

Dry subterranean clover pastures are safe.
Avoid mating on green oestrogenic pastures. Note that seedlings of oestrogenic varieties are potent; beware of Yarloop seedlings after summer rains.

5. Cobalt deficiency
If cobalt deficiency occurs, treat it in ewes and ewe weaners by topdressing the pastures with cobalt-super. Cobalt bullets may worsen the effects of oestrogenic pastures.

6. Flock husbandry
Remember recommended husbandry practices; mate ewes in the best practicable body condition, use at least 2 per cent. of full-grown rams or more than 2 per cent. of two-tooth rams and feed ewes adequately in late pregnancy. If your farm is stocked at the limit of carrying capacity, reduce stock numbers or take steps to increase pasture production.

7. Replacing high-oestrogen varieties
In a clover ley farming system, plan to sow low oestrogen varieties after cropping. Heavy grazing in the spring before cropping, spring fallow, or cropping in successive years, will leave less seed of the high-oestrogen variety in the ground when the low-oestrogen variety is sown.

Where a ley farming system is not the usual practice the economics of replacing potent varieties may depend on the profitability of cropping.

C. Established pastures with moderate oestrogenic potency:
Pastures of moderate oestrogenic potency include pastures with about 25 to 50 per cent. of Dwalganup, Yarloop, Dinninup or Geraldton sub. clover.

Use management practices B1, B3, B4, B5 and B6. That is, use recommended rates of super, lamb in winter or spring, run the most susceptible sheep on the least oestrogenic pastures, treat cobalt deficiency with cobalt fertilisers and use normal good husbandry practices.

Replacement of high-oestrogen varieties should be considered if this will fit in conveniently with a ley farming cropping programme.
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