How do I improve my subtropical grass based pastures?

The issue:	Subtropical perennial grass-based pastures are productive in southern WA, particularly kikuyu, but maintaining productivity and legume content can be challenging.
The impact:	Producers are missing an opportunity to improve their feedbase by only growing subtropical grass.
The opportunity:	Annual legumes are compatible with subtropical grasses and provide low-cost nitrogen. They increase red meat production by providing nutritious feed during the colder months and filling the autumn/summer feed gap.

Subtropical perennial grasses make a valuable contribution to forage production on the south coast of WA. They are useful for filling the feed gap in summer/autumn, resulting in increased stocking rates and reduced reliance on supplementary feeding.

Research has established there are annual legumes which can boost subtropical grass-based pastures by:

- increasing the overall dry matter production, particularly in winter and spring
- lifting the nutritive value of subtropical grass-based pastures during the growing season
- increasing soil N fertility through nitrogen fixation.

And the gain? MLA-funded research found a quality legume-based component in subtropical grass pastures in WA led to increases in gross margins (GM) by an average of $40/ha.

Improving the legume content

Sub-clover is the most commonly found legume in kikuyu pastures on the south coast of WA. However, sub-clover density can decline when kikuyu outcompetes it, particularly for soil moisture at the break of season.

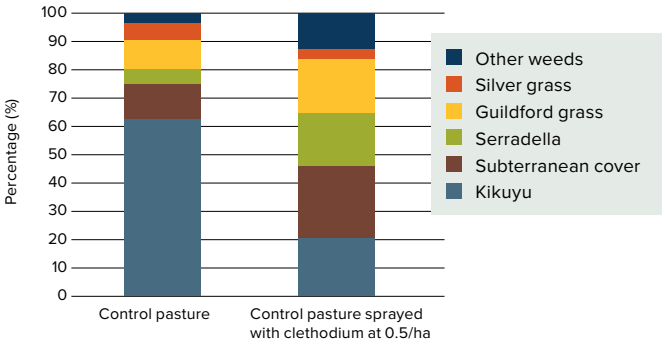
Predation by redlegged earth mite or an excess of kikuyu biomass preventing light and moisture from reaching the soil surface can also reduce sub-clover production. Soil fertility and subsoil acidity also needs to be managed for sub-clover to ensure adequate soil nutrients and soil pH.

This situation can be managed by incorporating the following techniques:

Good grazing practices – applying sufficient grazing pressure before the break of season provides space for annual legumes to establish successfully provided there is sufficient soil moisture, adequate pest control and a sufficient legume seed bank. The residual biomass should be 800–1,000kg dry matter/ha or roughly the height of half a golf ball.

Grass suppression – using a grass-selective herbicide after the break of season can suppress the subtropical grass, thereby reducing competition for resources and allowing legumes to establish and become a substantial component of the pasture, assuming there is an adequate legume seed bank. (Figure 1). Glyphosate can also be used to reduce kikuyu density, however, the timing of application needs to be carefully considered to avoid any impact on germinating sub-clover.

Figure 1. Botanical composition (%) of a kikuyu-based pasture sprayed with clethodim (0.5L/ha) following the break of season in May, compared to untreated pasture in August 2014 in Esperance



Sowing – if the legume seed bank is poor, kikuyu can be suppressed and the legume seed drilled into the pasture.

Species selection – while sub-clover is the best companion legume for kikuyu, serradella is a good option in deep sands and can be sown as a pod in summer or a seed in winter.

How do I increase production of my subtropical pastures?

1. Address soil constraints

Aspects of the soil including acidity, nutrient constraints, non-wetting, wind erosion and waterlogging all impact pasture productivity, and managing these should be the first step in increasing production.

When beginning, soils should be managed for the sub-clover rather than the kikuyu component of the sward as the sub-clover is more sensitive to both pH and phosphorous. After assessing paddock history and the soil type, soil and tissue testing is a good way to understand the soil limitations. Most legumes are sensitive to pH, which can lead to poor legume content on acid soils. Address soil acidity before tackling soil fertility.

Sub-clover is highly responsive to soil phosphorus availability and both potash and sulphur are essential for sub-clover growth.

2. Control weeds

When suppressing kikuyu to allow legume production to increase, weeds, particularly silver grass, can increase and become a problem. Silver grass germinates early in the growing season and sets seed early in spring. It can be dominant over autumn and winter. Producers need to be aware of the limited silver grass control options within pastures and the need to manage effective applications in terms of timing and rainfall. This is particularly important for control options like simazine.

In challenging situations, spraying the kikuyu out with a knockdown and oversowing the pasture with a crop can help short-term weed control.

3. Getting the mix right

MLA-funded research attempted to identify legumes that could equal annual ryegrass in increasing the production of a kikuyu pasture. While woolly pod vetch was found to produce a lot of winter dry matter, it was not found to be consistent across trial sites and seasons.

Research indicates sub-clover or annual ryegrass significantly increase winter production of kikuyu pastures. Producers who wish to try something different could trial woolly pod vetch. (Warning: woolly pod vetch seed is toxic to livestock and can cause death. Grazing is only recommended from the 10-node stage to podding. It can be cut for hay or silage.)

Serradella is also an option on deep, sandy soils. Serradella will tolerate a soil pH similar to kikuyu and has a fairly deep root system, enabling it to compete for soil moisture effectively. It should, however, only be considered where sub-clover has failed.

4. Use of nitrogen

The strategic use of nitrogen (N) can be an effective strategy for increasing kikuyu production. The application of up to 25 units of N when the kikuyu is in an active growth phase can lift yield, however, it can be an expensive tactic and should only be used when feed availability is low. Urea, sulphate of ammonia or any other N source can be used, however, sulphate of ammonia is a good option if rainfall is not expected immediately as it generally has lower rates of volatilisation.

More information

Download WA Department of Primary Industries and Regional Development's pasture species manuals:

Improving subtropical grass pastures on the south coast of Western Australia

Companion legume options for sub-tropical grasses in southern Western Australia

Highly productive sub-tropical grass–serradella pastures in southern Western Australia

Rhodes grass in southern Western Australia

Panic grass in southern Western Australia

MLA's: *Five Easy Steps* phosphorus tool

How to conduct a soil test and *how to interpret a soil test* fact sheet.

Link to fact sheet on *measuring dry matter and increasing pasture utilisation*

Link to *persistent pastures* fact sheet. Link to *inoculation and nodulation* fact sheets.

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