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Tagasaste revolutionises production in the West Midlands

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The need to find a sustainable and profitable alternative to annual pasture systems for the poor sands of the West Midland area led to the development and adoption of tagasaste (*Chamaecytisus proliferus*). Today, tagasaste is seen as having an integral role in the expansion of the cattle industry in the West Midlands. Emma Davey highlights the evolution of tagasaste research from producers experimenting with growing the fodder tree, to a funded research program looking at optimising cattle production on tagasaste.

Tagasaste was discovered in the Canary Islands and its potential as a fodder shrub was first reported in 1870. However, it was not until the 1980s that tagasaste was adopted into systems in Western Australia.

The annual based farming systems at the time were failing in sand plain areas, farms were changing hands about every four years and the worst ones were being abandoned. Local farmers and advisors were desperate to try anything.

The area planted to tagasaste has now expanded to over 100,000 hectares throughout Western Australia, thanks to the efforts of farmers, extension officers and researchers working collectively on all aspects of tagasaste development and adoption.

Many of the early tagasaste trials had been developed and conducted by producers, and focused on establishment and agronomy. Now that producers have successfully established their tagasaste, the emphasis has turned to animal production.

**Maximising animal production**

Geoff Tudor of Agriculture Western Australia’s Meat Program put together a team of researchers spanning Agriculture Western Australia, Murdoch University and CSIRO to investigate how cattle production could be maximised from browsing tagasaste.

The research project, funded by Meat and Livestock Australia (MLA) and the Meat Program, began in 1997 and comprised two main trials. The trials were conducted at the same time on separate producer-properties – ‘Tagasaste Farm’ at Lancelin and ‘Dunmar’ at Badgingarra. The first of the trials looked at whether cattle browsing tagasaste were accessing enough phosphorus for maximum production. The second looked at supplementary feeding strategies for maximising production.

**Looking to phosphorus for maximum production**

Past fertiliser trials had shown that for optimum plant growth, tagasaste required 160 kilograms of superphosphate per hectare each year. However, for optimum liveweight gains in cattle browsing tagasaste, more than 200 kilograms of superphosphate per hectare each year was required.

The question posed was why?

- Was the extra liveweight gain at higher superphosphate levels due to an improvement in palatability and the overall quality of the plant?
Subsequent questions asked were:

- Would tagasaste fertilised with 300 kilograms per hectare of superphosphate supply all the phosphorus the animal required, or was it necessary to supply extra phosphorus in a mineral lick?
- What would be more economical?
  - Would the cattle browsing the 300 kilograms per hectare tagasaste put on sufficient weight to cover the cost of the extra fertiliser?
  - Would farmers be better off keeping the fertiliser at 100 kilograms per hectare and making a mineral lick with added phosphorus available?

Preliminary results in the second year of the three-year study showed:

- Cattle browsing tagasaste fertilised with 300 kilograms of superphosphate per hectare annually, and supplemented with the mineral lick with phosphorus gained 71 kilograms liveweight between early January and August.
- Gains on the other treatments ranged between 48 and 56 kilograms.

These results indicated that the tagasaste fertilised with 300 kilograms of superphosphate did not satisfy all the animals' phosphorus requirements, but that the mineral lick with phosphorus was required for the best gains (see Figure 1 - The liveweight gains were measured in cattle browsing tagasaste fertilised with either 100 kilograms or 300 kilograms of superphosphate each year, and with or without a mineral lick of added phosphorus.)

As phosphorus was more likely to be the limiting mineral, a trial was set up to investigate the performance of cattle browsing tagasaste all year round with a mineral lick (with and without added phosphorus), and with either 100 kilograms per hectare or 300 kilograms per hectare of superphosphate applied each year.
Additional data collected during the next year of the trial will hopefully give us an understanding of why this is happening.

**Looking to supplementary feeding strategies for maximum production**

Tagasaste in the West Midlands is ideally suited to a number of flexible cattle production systems ranging from carrying breeders and producing weaners through to finishing on tagasaste, or backgrounding steers and heifers for the feedlot industry and live export trade.

Tagasaste has a significant advantage over an annual pasture-based system in that the need for supplementation over the summer-autumn period is reduced or even eliminated. Over late summer into autumn on a pasture-based system, dry cattle will ordinarily be fed supplements to stop or reduce live-weight loss. In contrast, dry cattle on a tagasaste browsing system will hold their liveweight without supplementation.

Given the quality of the leaf and edible stem, many have questioned why cattle will merely hold their liveweight, and will not in fact grow over late summer and autumn. In order to obtain year-round growth from cattle on tagasaste, and to investigate the reasons for the lack of growth over summer and autumn, the project team commenced a series of supplementary feeding trials.

The questions being asked were:

- Are cattle actually *eating* enough tagasaste over the summer-autumn period to gain weight?
- Are there problems of fermentation in the rumen?
- Is it a combination of the two?

Supplements used in the trial have included lupin grain, cereal barley (with and without urea) and hay, which are generally fed from February through to June or July. The aim of the study has been to produce a least-cost program to help producers make decisions on the profitability of feeding supplements in order to target markets in late autumn.

Results to date show that dry cattle fed lupin supplements will gain weight twice as fast as those animals fed barley or hay supplements (see Figure 2). At this stage, the response to feeding barley with urea has been unclear.

![Figure 2](image-url) - The liveweight gains in cattle were measured against their intake of various feed supplements.
Conclusions

Information gained from these trials has indicated just how flexible tagasaste systems can be in allowing farmers to access various market opportunities. The time of year and the class of stock turned off can be manipulated by adjusting the rates of fertiliser and supplementary feeding.

While it was farmers who initially pursued the use of tagasaste in the West Midlands, it has been the successful team work approach between researchers, producers and extension staff that has ensured tagasaste continues to play an integral role in the West Midlands landscape.

Some of the advantages of tagasaste to date have been:

- Land that could not sustain one sheep to the hectare with annual pastures can now sustain one cow and calf to the hectare.
- Tagasaste is capable of utilising all annual rainfall as its roots go down more than 10 metres.
- Producers who crop the majority of their land can plant the poorer soils to tagasaste and lift overall productivity of the cropping land, as well as running more stock on less area.
- Successfully established tagasaste is aesthetically pleasing as well as productive and has increased the value of land.

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