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Fitting pastures in

How will the conventional legume pasture fare as the predicted increase in cropping intensity continues?
It will still fit in, through integrated crop-stocking systems, according to Kwoylin farmer E. J. Cook.
He is convinced that the technology now available will allow a number of alternative farming systems to be practiced in Western Australia. The indications are for intensified land-use systems to be developed within the constraints of economics of production and resource availability, taking into account conservation and environmental factors as well.
Here are some of the options he suggests, related to stock-feed availability, and some possible problems:

Rotational cropping
Using legume pasture:
Quality pastures and stubbles are available from this proven, low energy-low risk system, particularly if it is coupled to minimum cultivation and optimisation of legume pasture composition and use.
This optimisation has been overlooked with the advent of cheap, nitrogenous fertiliser. But it will need much closer monitoring as nitrogen becomes an increasingly expensive resource.
Perhaps a monitoring approach to legume pastures, as the "2 and 3-Tonne Club" members apply to their wheat crops, may pay dividends.
Legume dominant pastures can have problems. For example:
• The lack of early winter feed resulting from reducing the grass component of pastures. This can follow "in crop" grass control and pasture manipulation by herbicides. It could be offset by reserving large package hay or processed stubble, and making better use of clover burr.
• A reduced seed bank, caused by dry seasons, poor soil structure and burial of burr by ploughs. Annual
resowing with improved hard-seeded varieties such as Nungarin clover, and use of minimum tillage would reduce the problem. Clover reseeding under crop gave increased sheep body weights and wool weights, as well as higher crop yields, in a CSIRO trial at Dalwallinu.

- Naturally and induced acid soils can suffer from reduced molybdenum availability. This may require liming and trace element adjustment.
- Seasonal deficiencies of leaching nutrients such as potassium and sulphur on deep sands.

**Using grain legumes:**
This is a low energy-high risk system, which leaves seasonal cereal and grain legume stubble available. In the growing season, lot feeding of stock, or agistment to pasture areas would be necessary.

Its main problems are:
- The risk of grain legume crop failure, due to disease or moisture stress, pending improved varieties.
- The risk of grain legume stubble deterioration, e.g. Lupinosis.
- Soil structure deterioration if conventional cultivation and incorporated herbicides are used, because grain legumes yield less organic matter than pasture.
- Difficult weed control strategies, due to the sensitivity of grain legumes to 2,4-D herbicides.

**Continuous cropping**
*As a monoculture:*
This high energy-high risk system may be capable of high, short-term returns. But the only feed available would be cereal stubbles. It may have a short-term role in improving poorly-structured soils if minimum cultivation is used.

Its main problems are:
- The risks of monoculture.
- The possibility of serious soil structure deterioration, if conventional cultivation and incorporated herbicides are used.
- Higher fire risk from stockless properties.
- The specialised machinery for stubble retention systems is generally not suited to W.A. soils.

- It would need to be integrated with the livestock production area for stubble utilisation.

The brewers' grain that could result from ethanol production, could have a future role in complementing stubble residues for feedlot situations.

**Combined crop in pasture:**
This low energy-continuous crop and pasture system is being developed by CSIRO. It could offer a safer and more stable system than cropping as a monoculture.

This system has the potential for increased annual cereal and pasture production, compared with a rotational system.

Its problems could be:
- It would need proving and fine tuning, before commercial adoption.
- The moisture stress from the pasture component could cause crop failure in dry years.
- It would need to be integrated with a feedlot or pasture area in the growing season.

**Alternative land use systems**
To preserve ecological balance in landscapes, strategic reafforestation and agro-forestry should be undertaken in our over-cleared agricultural areas.

This is also important in a world perspective, for its influence on the atmospheric carbon-dioxide balance, which is threatening world climatic changes.

Although intensive systems such as "crop in pasture" could reduce salinity problems by better moisture utilisation and soil structure, deep-rooted perennial browse shrubs should be considered to reduce down-slope sub-surface water movements.

We are armed with a sound technology to meet the challenges of rapidly changing farming practices, yielding variable quantity and quality of livestock feed.

With a responsible attitude by farmers and commercial organisations, and close monitoring of systems by scientists, highly productive, integrated crop stocking systems should predominate, which will support a healthy, permanent agriculture in W.A.