PERENNIALS IN THE TABLELANDS & SLOPES:

SUSTAINABLE PASTURE/CROP SYSTEMS - WHOLE FARM MANAGEMENT

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Abstract: *With good management practices, crops and pastures should not only be profitable but sustainable in the long-term. In both crop and pasture systems the managerial aspects relating to soil fertility, weeds, pest and disease control, and manipulation of stock numbers to feed availability for example, can affect production and significantly alter profitability of the end product. In the present environment, many farm enterprises are proving uneconomic due to reductions in asset base and weaker purchasing power of the dollar earned. Good crop/pasture rotations may increase efficiently and profitability of farm enterprises.*

In any system irrespective of whether it involves crops, livestock or management, goals of production are essential for success. I believe that there are four basic goals for success in any pasture/crop enterprise:

- **Sustainable systems:** controlling and utilising the land and plant resources without exploitation;
- **Return on investment:** to maximise production and profit without degrading the asset ;
- **Lifestyle:** enjoy what you do; and,
- **Emotional:** undertand what you are doing and why you are doing it.

CROP SYSTEMS

In crop systems many aspects of management will affect production and significantly alter the end result.

WEEDS

Weed infestations through carry-over from crop to crop, resistance to herbicides, and the quantity of herbicide used can all be affected through rotations. A sound rotation is the basis for all good crop systems. It is easier to control weeds and disease with good rotations than to face the problems of poor weed kills and future resistance to chemical treatments.

However, the most appropriate rotation will vary with location, soil type and rainfall. In our particular system we use canola, wheat, lupins (or peas), wheat, pasture undersown barley followed by five years of mixed clover and grass pasture.

FERTILITY

With this rotation, we find that less inputs are required due to better weed/disease control and nitrogen build-up during the crop breaks. Soil structure and fertility are improved so that costs are also reduced by minimum tillage practices.

SOILS

Like most soils in Australia, our soils are low in phosphorus. This is partly due to soil type, but is aggravated by direct removal of phosphorus in harvested grain and soil degradation due to unsound farming practices in the past. Low soil phosphorus is compounded by the lack of real returns to the farmer who in turn cannot afford to fertilize adequately.

Acidification is another soil problem that is causing concern. This increasing problem is directly related to to every practice which increases production per hectare, *ie*. stocking rate, clover content of pastures, hay production, and grain legume crops. All these either increase nitrate production or alkaline removal.

While acidification is solvable in technical terms, the financial benefits and production increases preclude action being taken in many instances. Freight costs are partly to blame for reluctance to commence liming programs. In Hamilton, for example, lime

costs $25/t while in Wagga Wagga the cost is more than double that figure.

Loss of soil structure is another problem which has surfaced in many crop systems in Australia. We have found that once disease control and nutrition are optimised, then most of the structural problems are minimised. However, this does not apply to water-logging

SALTING

At present, this is only a minor problem in our area. There seems to be evidence to suggest that deep rooted perennial grasses are more effective then trees in controlling potential salt problems. Better use of our effective rainfall may also be a means of protecting our system from salting. Yields at present are about half the potential, *ie.* 47 mm of annual rainfall/ DSE or 16 kg grain/mm.

Table 1: Costs and returns for wheat production and purchasing power per tonne of wheat, 1974 to 1991.

	1974	1984	1987	1991
WHEAT $ TONNE	101	150	120	58
BUY				
TON. SUPER	6	1.5	0.9	0.26
LIT. FUEL	2020	405	240	82
TRACTOR HP	1.3	0.4	0.25	0.08
COST TO GROW A CROP $/HA	26	71	83	150

PASTURE SYSTEMS

Pasture is a commodity with a series of end uses. Pasture management will therefore depend on the choice of product or product mix that is appropriate to the management system that is chosen by the farmer. The system chosen will in turn, determine the techniques employed to manipulate the timing and type of production achieved from pasture.

Most crop management systems mentioned above are also relevant to pasture production, *eg.* fertility and soil properties.

HERBICIDES

The new herbicides that have appeared over recent years are a powerful addition to the traditional management practices of grazing and cutting. The chemicals allow much more precise control of pasture composition in the short-term.

STOCK MANAGEMENT

However, the management of pasture growth to match the feed requirements of livestock can alter the entire production system. For example, with a change from an autumn to spring lambing the DSE available are more easily manipulated to allow more stock to be carried than is possible with autumn lambing. This in turn leads to higher productionand profit by matching the maximum DSE requirements with peak pasture production.

SPECIES

Selection of appropriate species can also influence the the level of production and allow for greater flexibility in operation. The use of perennial pasture species, for example, will not only increase the potential stocking capacity in summer and autumn, but will aid the maintenance of soils in good condition.

Pasture production is equal to quantity x quality x grazing frequency.

GOALS AND RETURNS

Like any business activity, farmers require a return on the labour and capital they invest in their properties. In the present environment, many enterprises are uneconomic due mainly to the reduction in our asset base and purchasing power.

For example, the figures given in Table 1 show all to clearly the cost;price squeeze with the 1991 price for wheat representing only half the dollar value of wheat sold in 1974. This does not take into account inflation which has eroded the purchasing value of our dollar over the past 17 years. In contrast, the per hectare cost to grow a wheat crop has risen by about 500% over the same period.

CONCLUSION

With good management practices with appropriate crops and pastures farms should not only be profitable but also sutainable over the long term. Returns from crops can be increased by rotations, grazing enterprises run more effectively and the whole resource is protected.