

**GETTING IT ALL TOGETHER:**

**INTEGRATED ENTERPRISES ON A TEMPERATE PASTURE SYSTEM**

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**SUMMARY:** This paper describes the use of dryland and irrigated temperate pastures to produce prime lambs and yearling cattle on a year round basis to meet the needs of a wholesale and retail operation. The fodder conservation strategies and use of pasture supplements are also discussed.

The breeding property of about 8000 hectares is located 25 km northwest of Armidale. Features of the climate are an annual rainfall of 750 mm., with a summer dominance and high variability. Elevation is about 1000 m and about 70 frosts are recorded annually.

A combined stocking rate of sheep and cattle over the whole property is 5 DSE/ha. Ten percent of the area is native country, eighty percent is semi-improved with aerial clover seed and superphosphate over a period of 15 years. The remaining ten percent of the area is sown to perennial grass pastures of Demeter fescue and Victorian ryegrass. It is intended to plant about 200 ha to new pasture each year. This program is subject to seasonal limitations.

Pasture is established by direct drill technique. The selected area is crash grazed in the autumn and sprayed with Roundup following rainfall. A mixture of fescue and rye, with white and sub clovers, is sown with fertiliser rates of 150 kg/ha of Starter 15. The area is locked up through the winter. The new pastures are grazed by cattle only for the first year and receive 200 kg/ha of superphosphate for the first few years.

Finewool production is combined with a prime lamb enterprise and cattle breeding herd. Additional store stock, both lambs and weaner cattle, are purchased when required throughout the year for finishing to market specification.

**Pasture availability**

The extent of variation in pasture growth both seasonally and between years, is a problem for graziers in this area. The variability between store and fat stock prices in addition to the seasonal variations resulted in unacceptable income fluctuations. The finewool enterprise, which can operate on a rela-

tively lower quality of pasture is less affected by seasonal fluctuations.

**Marketing strategy**

In an attempt to stabilise income a strategy of direct marketing livestock to the consumer was adopted, via a retail butcher operation. This business expanded to the wholesale arena as well. Over eighty percent of all livestock are now marketed directly. Animals not suitable for the trade are grown out for the feedlot market or are sold traditionally.

The economics of the strategy depend on the operation receiving the normal market price per kilogram plus the wholesalers margin, a premium price for the product and the benefits of reduced saleyard and handling costs.

In order to command a premium, it is necessary to deliver consistent carcass weights, fat thickness and improved carcass traits as a result of reduced handling, reduced pre-slaughter withholding periods and rapid pre-slaughter weight gains. Target weight gains of one kilogram per day for cattle and one hundred and fifty grams per day for lambs during the finishing period enable the production of acceptable carcasses. These are the production parameters that are crucial to the viability of the operation.

**Irrigation property**

Sporadic rainfall and temperature seriously limit dryland pasture production at various times throughout the year. This causes an inability to meet target weight gains and therefore market requirements. To overcome these deficiencies a property was acquired in an area with a longer growing season, with secure water rights and infrastructure for irrigation and close to Tamworth Abattoir. Four pads of 70 ha are laid out to irrigation by centre-pivot. The pastures chosen are one pad each of lu-

cerne, Concord ryegrass with white clover, Ellet ryegrass with white clover and Puna chicory and white clover.

The mixture of irrigated pastures are able to meet the target weight gains throughout most of the year. The Puna pad provides grazing from late spring to early autumn. The Concord and Ellet ryegrass pads provide autumn, winter and spring grazing. The lucerne and the balance of the property is used to produce high quality forage supplements as described below.

The irrigated pasture system requires intensive capital equipment, high quality pastures, reliable water and sufficient fertiliser inputs to provide the year round quantity and quality of pasture to meet the requirements of the fattening operation. Total cost of irrigation is \$36 per megalitre and fertiliser cost, mainly sulphate of ammonia, is about \$120 per hectare annually. The combined stocking rate of sheep and cattle is 12 DSE per irrigated hectare.

### Grazing management

An important factor in the operation is the management required to enable the finishing stock to utilise as much of the expensive feed as possible. Much debate centres around the relative merits of set stocking versus rotational grazing. Rotational grazing has many forms such as cell, strip or timed rotation. The economics of the whole enterprise is sensitive to this utilisation efficiency. To be efficient there needs to be within the organisation sufficient numbers of background stock available at all times so that feed can be utilised at its highest digestibility.

The grazing system that we use is a mixture of the above strategies. The irrigated pasture pads are subdivided into quarters of 17 ha and the finishing mobs are rotated around the paddocks. An indicator of the capacity of the available irrigated pasture to produce target weight gains is leaf length. Average leaf length of the grasses or Puna in excess of 100 mm enables sufficient pasture intake to meet target weight gains. When average leaf length is less than 100 mm, stock are moved to the next available paddock.

Whilst not perfect, this is a very simple measure that can be easily implemented on the spot. Due to the heavy stocking rates, little material is left uneaten on the irrigation plots which have a fairly even distribution of the sward. If the pasture length available is not sufficient to maintain target gains then supplementation is commenced.

### Grazfeed

A more sophisticated method of estimating the ability of a given pasture to meet production target objectives is the Grazfeed system. The program should provide a more scientifically based grazing strategy, that is useful on dryland as well as irrigation pastures and for breeding as well as fattening operations. By making allowances for digestibility, proportion of green or dry matter and pasture availability and calibrating back to actual gains the grazing recommendations should be more efficient than rule of thumb methods currently used.

The nutritional models in the program enable the evaluation of various supplemental strategies to achieve a given level of production. This feature is particularly valuable to a market driven grazing operation, where there is a wide range of available supplements.

### Pasture supplements

For our dryland operations and on the irrigation property during rainfall periods, the three sources of pasture supplements we use are high protein haylage, manufactured by-pass protein pellets and coated cottonseed.

### Haylage

In any grazing operation there are times of surplus and we have chosen to conserve any surplus as wrapped haylage. Excess pasture is mowed and wilted to a target of 55% dry matter. It is then baled into high density square bales and wrapped using a Gray's Tubeline wrapper. A contractor provides the mowing, raking, baling and wrapping services.

Total conservation costs for the wrapped product average seventy two dollars per ton of dry matter. The equivalent hay conservation option is \$55/ton of dry matter. Hay production incurs a higher risk of weather damage, especially in the wetter years when most hay is conserved. In our experience hay can be up to four percentage points lower in protein and 25% lower in relative feed value than inoculated and wrapped haylage made from the same paddock. Pit silage is cheaper to produce but is not as flexible to feed out in small quantities and is difficult to transport or sell.

The wrapped product is suitable for sale or transport and lasts about two weeks when removed from the stack. There are now suppliers who will deliver wrapped fodder on a fortnightly basis, not dissimilar to the poultry industry. The haylage form of fodder conservation of lucerne can produce a very high quality product (20% protein and metabolisable en-

ergy levels in excess of 9 MJ/Kg DM ) that is suitable for fattening both lambs and cattle. Our experience is that the product is safe and easy to feed out in " Waste - Not " feeders which enable a highly efficient method of delivering the supplements.

In our operation the high quality haylage is used to maintain target weight gains when pasture quality is declining, especially on the dryland areas. When fed to balance protein deficient pasture, the high quality haylage is used very efficiently and has the advantage of being produced internally.

### **Manufactured feed**

Manufactured feed supplements can become very expensive in extended dry periods when feed ingredients increase in price. They have the advantage of being tailored to the exact nutritional requirement and can be easily fed.

### ***Coated cottonseed***

Coated cottonseed is a product that we are using extensively. It is a high protein supplement that can also incorporate various levels of urea and minerals in a safe product. The coating uses a byproduct of molasses which makes the product very palatable to lambs and cattle. The energy is in the form of fats and therefore there is no risk of grain poisoning as there may be with starch based supplements. The coated pellets can be handled and stored in conventional silos and self feeders. This supplement can be much cheaper than manufactured products of

comparable nutritional quality because of lower production costs.

### **Drought**

Pasture supplementation enables maintenance of the sales program in most seasons and therefore reduces grazing pressure at a time of declining pasture. As stock numbers are reduced to the base breeding herd, pressure on pasture and feed supplements is reduced. The use of a lower quality feed, such as a hay, might maintain liveweight but not generate income or reduce stocking rate via sales of finished animals. If a drought intensifies then extended feeding of a larger number of livestock will be required. The strategy aimed for is to feed so that the operation may generate income from sales of finished stock and reduce livestock numbers. This strategy requires high quality supplements.

### **Conclusion**

Pasture is the cheapest feed available to produce saleable livestock. Selection of pasture species, method of pasture establishment and seasonal conditions dictate the amount of available feed for production. Grazing management influences the conversion of pasture into liveweight gain. Supplementary feeding on pasture, which may include a mixture of available ingredients, can maintain production targets despite wide fluctuations in pasture availability and quality. These strategies can impart economic advantages to an integrated livestock marketing operation.