Increasing production through stocking rate

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Abstract

Our objectives as farmers are to sustain a pastoral farming system that converts the optimum amount of grass grown to milk solids. The key to achieving this is by adopting the correct stocking rate. On our property, production has increased from 330 kg milkfat/ha in the first year to 430 kg milkfat/ha in the second year. Conservation is not the preferred option when dealing with surpluses. A combination of supplements, nitrogen and off-farm grazing is used to make up the deficits. The absence of a mid-season slump in grass growth results in a sustained production curve through the season. This is a feature of borderdyke dairy farming. The correct stocking rate will enable costly grass surpluses and deficits to be kept to a minimum. The distribution of grass growth on our farm is what is really important, not total dry matter. The availability of crop residues and off-farm grazing in this area can be used profitably to make up feed deficits. Production increases in the short term will come through improvements in sward composition, fertility, cow quality and irrigation. Longer term, production increases can come only through growing more grass and finding the correct blend of calving date, stocking rate and drying-off date, to utilise that grass to the optimum.

Keywords dairy farming, stocking rate, borderdyke, pasture management

Introduction

We purchased a 113-ha property at Winchmore in Mid-Canterbury in 1987, which had a history of sheep and cropping. One hundred ha are borderdyked, about 10 ha are wild flooded and the balance is taken up with races, shelterbelts and buildings. The property was converted into a dairy farm and began production in August 1988.

Our objectives as dairy farmers are: "to sustain a pastoral farming system that converts the optimum amount of grass grown into milk solids".

The key to achieving this is by adopting the correct stocking rate. We will discuss the following topics:

1. The importance of per cow **performance** on stocking rate.
2. The results after 2 years' production.
3. Managing the surpluses and deficits.
4. Production increases in the short term.
5. Further into the future?

The importance of per cow performance on stocking rate

By matching the cow requirement with the feed supply, the decision on the correct stocking rate should be straightforward. But is it really as simple as that? Lack of relevant information initially on grass growth rates makes the decision a difficult one. Rate-of-growth trials carried out elsewhere are going to be of value only until we have acquired enough information about growth rates and the distribution of that growth on our farm.

It is important not only to decide on the number of cows to be milked but also what per cow production is expected. We welcome the proposed introduction of the "standard cow unit", as this takes into account not only breed, but also production.

The standard proposed is equivalent to a Jersey cow producing 150 kg milkfat/year from dry matter (DM) consumption of 3.4 tonnes/year. What this really means is that it is possible to increase stocking rate without milking more cows.

We reduced cow numbers by about 10% for the second season, but the stocking rate increased as per cow production increased from 132 kg/cow to 177 kg/cow. Although the first season saw drought conditions affect grass growth, the cows were not heavy enough to perform in the important early part of the season.

Through better winter feeding levels, we began last season with heavier cows that had the capacity immediately after calving to produce daily milkfat levels of 0.9 kg a day.

Results after 2 years' production (Table 1)

The absence of a pronounced slump in grass growth after Christmas is characteristic of borderdyked dairy farming (Figure 1).

No surpluses were apparent in either season, so no

Figure 1 Relative pasture growth and dairy cow demands on irrigated pasture.

supplements were made on the farm and no topping was done. Young stock are reared off the farm.

The last two seasons have seen growth rates take off from about 20 September. For this reason, it is vital to have as many cows calved by this date as possible and preferably to have finished calving by the end of September. A long protracted calving will mean that there are not enough mouths eating 15 to 17 kg DM/day during the last week of September and the beginning of October and, as a result, the grass surplus will be greater.

Our planned start of calving is 15 August. Cows calving in October and later will be induced to calve by the middle of August. It is our intention to gradually put the calving date back towards the beginning of August, but only at the rate of 2 or 3 days a season.

Figure 2 confirms that with the “controlled environment” that irrigation gives pasture, it is possible to sustain high per cow production for at least 6 months of the season. The drought in the first season resulted in poor production in April and none in May, and last season the dry April resulted in a finish at the start of May.

Even though we did not see a surplus last season, we believe we could have milked another 10 cows without a drop in per cow production.

This 1990-91 season we will milk 30 extra cows that will require an extra 500 kg DM/day. This equates to an additional 5 kg DM/ha/day over the whole farm. With the improvements, mentioned later in the paper, we believe this is possible.

Table 1 Performance statistics for the first two seasons.

Season	kg milkfat	Cows	Ha	Calves reared	Milkfat kg/cow	kg/ha
1988/89	36 212	276	110	64	131	329
1989/90	44 205	249	102	94	177	433

Managing the surpluses and deficits

The correct stocking rate will minimise surpluses and deficits and should maintain pasture quality through the season.

Surpluses

If we do have any surpluses, the main objective is to confine them on as small a percentage of the farm as possible. Growth rates accelerate very rapidly towards the end of September, and it is essential that all paddocks are well grazed and in an optimum state for regrowth.

There are four major options, listed in order of preference, to minimise surpluses.

Figure 2 Monthly butterfat production.

Adjusting rotation length. A fast rotation of **10-14** days in late spring will depress growth rate, retard seed head production and keep the plant in a vegetative phase for longer. If the surplus involves the odd paddock then we put the cows back in to clean up. If the cows are continually being presented with more grass than they can consume then production will fall as pasture quality declines.

Pasture renewal. There are always paddocks on a dairy farm that could be growing more 'DM. These paddocks are selected, sprayed, grazed and then drilled. This can be done at any time during the season.

Deferred grazing. This involves removing a paddock from the rotation, probably in October, leaving it to go to seed and then introducing it back into the rotation in February or March. It has the advantage that, in the event of an unplanned deficit, there is DM on the farm, albeit of low quality, available to the cows. While we have not had the opportunity to try this yet, we will, when the conditions are right.

Conservation and topping. A good spring may result in a large surplus, in which case silage or hay may have to be made. Conservation economics suggest that even if we make a reasonable job of it, it can still be expensive DM. On a dairy farm, conservation coincides with the peak work-load and is a distraction from the main task of milk production. If an error has been made in the grazing management then it may be necessary to tidy the odd paddock by topping.

Deficits

Deficits can occur at any time on a dairy farm. The grass growth curve (Figure 1) indicates that they are most likely to occur between March and September. We address this imbalance by having our cows as heavy as possible before calving and by using a combination of autumn nitrogen, supplements and off-farm grazing.

Autumn nitrogen. 125 kg per ha of Cropmaster 20 is applied at the end of February. The extra DM grown may be converted to extra milk solids by increasing the lactation length. We are not keen on using spring nitrogen, as it tends to create more problems than it solves by accentuating the surplus, resulting in the potential for pasture quality decline.

Supplements. Barley and **ryegrass** straw on neighbouring properties are baled up in **January** and fed out from March onwards.

Off-farm grazing. A special feature of **dairying** in Mid-Canterbury is the availability of suitable **off-farm** grazing. It is common for cows to be off the farm on green feed oats for 6-8 weeks during winter. Pasture DM levels at drying off and the amount of supplements on hand, will affect the length of time the cows are away.

There are four major advantages of off-farm grazing:

1. More milk production by eliminating the need for extending the rotation in autumn usually at

the expense of cow condition.

2. Average DM cover at drying off can be lower, allowing more DM to be converted to milk solids.
3. Eliminates the need to store grass at DM levels in excess of 3000 kg for long periods with the subsequent reduction in sward quality.
4. Less opportunity for pasture damage through **pugging**.

Production increases in the short term

The 1990-91 season will see 280 cows being milked and, we anticipate that per cow production will increase to 190 kg **milkfat**. At the time of writing in May, cow condition is good (Score 5) and we have more grass on hand than last year, so we are confident of achieving this.

Next season's extra production will come from the following improvements:

Pasture composition

We have direct-drilled **15** kg/ha 'Grasslands Nui' **ryegrass** and 2 kg/ha 'Grasslands Pitau' white **clover** into 20 ha of poorer pasture and **oversown** a further 50 ha. The improvement in pasture quality and quantity on the "shoulders" of the season should result in a longer lactation length.

Soil fertility

Regular soil testing and the selection of the appropriate fertiliser have seen **pH**, P, K and S levels all approach optimum.

Cow quality

The cows entering the herd are genetically superior to the ones that have left the herd. Good feeding levels will see this genetic potential expressed.

Irrigation

We have upgraded some dams and sills, resulting in more efficient watering.

Information

By monitoring grass growth rates and production, not only on this farm, but also on several other properties, the quality of information we are gathering is increasing. This should lead to a greater understanding of what is actually happening on our farm.

The quality of the decisions on how many cows to milk, when to start **calving** and when to stop milking, will only be as good as the quality of information we use to make these decisions.

Further into the future?

In the longer term, production increases can come only through growing more grass and then finding the correct blend of calving date, drying off date and stocking rate to utilise that grass.

An average lactation length of 240 days is not long enough for our farm. Low milk flows into the factory in August and September result in poor

utilisation of the manufacturing facilities. Herein lies the challenge. We need grasses that can not only provide better growth rates in winter and early spring, but they also need to be persistent and contribute through the rest of the season.

Cow-based field trials on grasses that demonstrate the superiority of one species over another in terms of extra milk solids, are of far more value than the traditional cutting trials giving us DM yields.

Calving 10 days earlier would result in an additional 1500 kg **milkfat** at **\$4/kg**, equalling \$6000 extra income.

The Alpine Dairy Company has about 280 suppliers (average herd size approximately 300 cows) and, if they all calve 10 days earlier, this could result in \$1.68 million of additional income.

Summary

High per hectare production under borderdyke dairy farming in Mid-Canterbury is achievable where the correct stocking rate is adopted.

The correct stocking rate will allow surpluses and deficits to be kept to a minimum and will maintain pasture quality through the season. Poor grazing management in the spring will result in inevitable production losses.

The rate-of-growth trials confirm that it is taking us 40% of the year to grow 20% of the total DM. More grass growth between April and August would result in a profitable increase in production through either having a longer lactation or carrying a higher stocking rate, or preferably both. Less grass growth in October and November will minimise the problems of surpluses.