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DAIRYING WITH BORDER DYKE IRRIGATION

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INTRODUCTION

Dairying on border dykes is proving to be a viable alternative land use in Canterbury and North Otago. This 1984-85 season will see 20 border dyked farms in Mid-Canterbury area now dairying that have been converted from sheep to dairy in the past 6 years. The reason for this is simple. All the theoretical advantages of dairying on free draining irrigated land are real. I quote the Chairman of the New Zealand Dairy Board when questioned at Ruakura Farmer's Conference this year about the industry of growth in this region'. He said, "I wish I had never gone to see the area — it's attractive land offering immense opportunity".

We are now in our fifth season of production. I am finding the challenge of increasing production every bit as exciting now as it was in the first year.

FARM DESCRIPTION

Our farm is 149 ha on a Lismore stony silt-loam at Dromore, 100 m asl. All the farm is border dyked and subdivided into 24 paddocks of an average size of 5.7 ha. When we purchased the farm in 1980 it was running sheep with about 30 ha of crop. The irrigation was all developed and needed only minor improvements to make the efficiency satisfactory. We are able to irrigate 1 ha/hour giving an 18-20 days return interval within our 48 hours/week water contract. We needed to build a milking shed and install a reticulated water supply to turn it into a basic dairy farm. We have since done extra development including access lane construction and 5 km of shelter belt planting.

Since completing essential capital improvements on the farm we have been putting a big effort into learning to manage the growth pattern and capitalise on the benefits of an irrigated summer.

PASTURE MANAGEMENT AND MILK PRODUCTION

Over the past few seasons our farm has been the subject of a monitoring exercise with the Ruakura Research Station, to assess any limiting factors to high milkfat production. This has provided the necessary information to make management changes on.

Initially, a system of September calving to coincide with expected spring pasture growth and control the rapidly growing pastures during October, and haymaking as the conservation techniques, was employed during the 1982-83 season with the following results.

During October of 1982 the average dry matter (DM) cover of the farm was at 2400 kg/ha. Lax grazing ensured the per cow production continued to rise but so too did the average DM cover, up to 2600 kg/ha in November. Despite haymaking during December the DM cover of the farm continued to climb to a high of just on 3000 kg/ha in late December. At this time the digestibility of the material fell dramatically causing a serious drop in milkfat production. In spite of "topping" (that is bottoming) every paddock, this resulted in a large quantity of stem and dead material accumulating on the farm, which meant we were unable to make the best use of the potential irrigation offered,

When the short falls in our spring management became apparent several significant changes were made which gave a totally different result the following

year. The changes were:—

a. Higher stocking rate — from 2.8 cows per ha to 3 cows per ha.
b. Earlier calving date — 10 days earlier to 19 August.
c. Condensed calving — down to 50 day spread.
d. Silage making as a conservation method.

These changes gave us more ability to control spring growth effectively. Average DM cover on the farm remained at a constant 2200-2400 kg DM/ha from October to March. The area of the farm averaging above 3000 kg DM/ha never rose above 10%, compared to 70% in the previous year in January. Silage making was significant in achieving these results. We harvested about 20% of the farm but the crops were very light and all harvesting was complete by 7th November. These management improvements resulted in a good production increase. At the 1st December we were 15% per cow and 23% per ha ahead of the previous season. This satisfactory situation continued to the end of the seaon with final figures being 15% per cow and 25% per ha up, giving a total of 502 kgs milkfat per surveyed ha.

I predict these production increases will continue.

SOIL AND PASTURE IMPROVEMENT

Fertlllser

In 1980 the soil test values showed an average of; pH, 5.9; K, 6; P, 6 and Mg, 16. Obviously the phosphate levels were hopeless and the major portion of our fertiliser budget was spend on that with applications of 750-1000 kg/ha/year of superphosphate. In 1983 125 kg potash/ha was applied in addition, and 40 ha received 2.5 tonne lime/ha. Soil test values at June this year now showed averages of; pH, 5.8; K, 7; P, 14 and Mg, 16. These improvements, especially in phosphate, are resulting in greatly improved pasture growth at the critical times of the year.

Pasture renovation

Despite the dramatic effects of our topdressing programme, many of the pastures on our farm were not producing anything like the levels I was expecting. It became obvious that to reach these expectations, the browntop, crested dogstail, hair grass, goose grass and inferior ryegrass would have to go and be replaced with a vigorous ryegrasslwhite clover mixture.

Our pasture renovation programme is now producing significantly more feed. The last 2 seasons have seen 48 ha of the farm undergo pasture renewal. We have used a variety of establishment methods ranging from conventional cultivation, through total "Roundup" spraying with the seed being broadcast and harrowed, to direct drilling after spray, using both single and cross drilling. Results have usually been good, although we have had a disappointment using the cheap surface sow and harrow method. I am likely to use total spray and cross drilling for future establishment of ryegrass.

The general attitude of the seed merchants to my request for top quality first generation seed to establish permanent pasture was surprising. I wonder how much of the poor performances of some pastures can be attributed to the "permanent pasture" seed lines so readily available.

I have used Nui or Ellett with Manawa ryegrass and Pitau white clover on 36 ha. In one paddock I have 2 border strips planted in Nui and the rest of the paddock in Ellett. I have noticed a definite grazing preference in favour of Ellett, in fact it is not possible to get equal grazing pressure on the Nui area under normal grazing. I have therefore decided to use Ellett for future sowings. The Manawa is used in conjunction mainly for its superior winter growth. My seed mixture is now 12 kg Ellett ryegrass, 10 kg Manawa ryegrass and 2 kg Pitau white clover/ha.

My experience with Matua prairie grass is limited to 12 ha and less than one season, so perhaps my initial enthusiasm may change with time. However, my

reasons for considering this plant were; 1) good winter growing ability — perhaps an area on the farm growing 20-30 kg DM/ha/day for 100 days in winter would allow earlier calving: 2) increased palatability — my spring pasture management with the pressure grazing to keep the ryegrass plants vegetative seems in conflict with lactating cows best interest of *ad lib* feeding — perhaps a more palatable plant would have a future; 3) total production — a pasture plant consistently growing more dry matter per year has to be considered. To date I have not been disappointed.

I find this development phase most promising. With irrigation there seems no restrictions on the times of the year that pasture renovation can be done. Last year we had one paddock under "renovation treatment" right through the production year, as soon as the pasture was grazeable another paddock was begun. We notice a good lift in milk production whenever a new pasture is grazed and many paddocks are yielding an extra grazing in their first year. That one extra grazing pays for the whole renovation.

We recorded growth rates on our farm last autumn for the period April 27 — May 27. An unimproved paddock grew 18 kg DM/ha/day. A new ryegrass/clover paddock grew 29 kg DM/ha/day, while the Prairie grass (established one month) grew 41 kg DM/ha/day and continued to grow 19 kg DM/ha/day for the 80 days of winter.

I'm delighted with these results. By producing more feed when it really matters provides the opportunity to lengthen the lactation, lift the stocking rate, reduce the overdraft!

It will take another 6 to 8 years to completely improve the pastures on our farm. At the end of that time I'm hopeful that still better species will be available so that the cycle will continue. My super pasture grass would have to be; easily established, cold tolerant, grass grub resistant, highly palatable, tolerant of hard grazing, be a reluctant seed producer, and produce 20,000 kg DM/ha/yr!!