CROPS AND PASTURE IN THE RANGITIKEI DISTRICT

A. K. BOOTH

Farm Advisory Officer, Department of Agriculture, Masterton

THE predisposing factors of soil and climate have determined the type of farming that has developed in the intensively farmed areas of the Lower Rangitikei. In this area a system of fat lamb farming with the production of cash crops is predominant. The extent to which cash cropping is carried out depends mainly on the cash returns from crops when compared with the returns from livestock. However, there are some restrictions caused by soil fertility, poor drainage and soil contour.

Soil and Climate

The Marton Loam 13c, and the associated soils, Halcombe Silt Loam 13b and Ohakea Loam 12, make up approximately 90,000 acres of the area. The clay subsoils are fairly impervious especially on the Marton Loam and all three soils tend to be wet in winter. Drainage with tiles and moles is essential.

The natural fertility of these soils was not high and they have had a long history of phosphate and lime topdressing. In the early 1950s, the first potash response was recorded in field trials on the Marton Loam and since then potassium deficiencies have developed extensively in the area. Maintaining high pasture production depends on regular applications of lime, phosphate and potash.

The Kiwitea Loam 76a is a free draining soil of volcanic origin extending over approximately 20,000 acres. It lies in a higher rainfall belt and is extremely suited to potato growing. Phosphate is the major soil deficiency,

The moderate climate with a reasonable summer rainfall of the Lower Rangitikei are conducive to growing good crops and good pastures but also encourage plant diseases and weed problems.

Fat Lamb and Cropping Farm

These details have been compiled from information collected from the Rangitikei Farm Management Survey Group. The scheme was initiated by the Farm Advisory Division in 1959. The "model" farm is described as efficiently managed and the results shown are being attained by efficient farmers using similar practices.

Area	200 acres.
Soil type	Marton Loam 13c.
Topography	Flat to easy rolling, wheel-tractor country.
Stage of development	Well-managed pastures in good heart. Subdivided into 15 to 20 paddocks. All buildings in good repair. Reasonably well drained.
Replacement policy	Purchase 2-tooth Romney ewes in February. Purchase weaner cattle in May and sell in the following autumn.
Cropping policy	12 acres of choumoellier for winter feed followed by spring sown wheat then to new grass in the autumn.
Winter carrying capacity	5 ewes per acre. 1,000 ewes. 20 rams mainly Southdown. 50 hoggets. 30 heifers. Total 5.7 ewe equivalents per acre.
Lambing percentage	115.
Wheat yield	50 bushels per acre.
Ewe mortality	5%.
Lamb mortality	3% (Docking to sale or June 30).
Wool. total per acre	12,600 lb. 63 lb.
Lamb meat per acre	165 lb. All lambs fattened.

Pastures

Pasture production is inadequate to meet stock requirements during the winter. This is overcome by carrying the autumn surplus through into the winter, conserving some of the spring/early summer surplus as hay, and taking a grass paddock out of production in the late spring and growing a supplementary winter feed crop of choumoellicr or swedes.

Annual pasture production on good topdressed pasture would be 10,000 lb dry matter (D.M.) per acre. This figure is supported by trials carried out for many years at the Marton Experimental Area. The range of measured pasture production has varied from 7,000 lb D.M. per acre under low fertility conditions to 14,000 lb D.M. per acre under good fertility and good seasonal conditions.

Pastures in the area have tended to revert to flat weeds and low producing grasses the older they get. While this can be overcome to a certain extent by heavier and more balanced topdressing it seems inevitable that most pastures will slowly revert from ryegrass to *Poa trivialis* dominance. Other weed grasses are sweet vernal, goose grass, browntop and Yorkshire fog. Practically all farmers have found it necessary to carry out a regular pasture renewal programme. The renewal programme can be accelerated by ploughing a second old pasture in the spring, taking a crop of barley or soft turnips and resowing in the autumn.

Future Increases

In existing conditions, farms producing 11,000 lb D.M. per acre will carry approximately 5 ½ ewes per acre. That is with some wastage, allowing 2,000 lb D.M. per ewe with a lamb. The more efficient farmer is at present carrying these numbers.

On farms carrying only 4 to 4½ ewes per acre, the way is clear to increase to 5½ ewes as many farmers are in fact doing this. To go further depends on increasing pasture production by heavier but economic rates of fertilizer. by the development of higher-producing species with better summer and winter production, and reducing wastage by fuller utilization and better management.

The porina caterpillar *(Wiseana* spp.) has become widespread in the last two years and is causing serious reductions in pasture production throughout the area,

Cropping

Once a run-out pasture is ploughed up for renewal it must be cropped to kill the old turf and weeds. Choumoellher or swedes are sown from the middle of November to the middle of January and are fed-off in the winter. Spring-sowing new pasture is risky because of weed problems and dry weather. These winter crop paddocks are put down in spring-sown wheat or barley and the new pasture is sown down in the autumn. On the heavier, free-draining soils the winter feed crop paddocks mostly go into potatoes.

WHEAT

It has been very difficult to maintain a suitable wheat variety in the Rangitikei. A quick-maturing spring-sown variety is required that is resistant to stem rust disease, lodging, sprouting and shaking, and the last ten years have seen ten varieties come and go. Tainui, Gabo, Cross 7, Hilgendorf, Aotea, Festival, Cross 7 '61, Hilgendorf '61, Mengavi and Eureka have all been grown commercially and succumbed to stem rust. Only Gamenya and the new hope, Mendos, remain. Gamenya first showed stem rust in the 1962-3 season and its future is uncertain. Mendos has the qualifications but is, until the present season, untried.

The practical problems of wheat growing in the district are fairly well known. A tremendous amount of field research work has been carried out in the district by the Department of Agriculture. Results have shown that wheat is best sown in September. At least 2 cwt phosphate per acre is necessary but potash or nitrogen have not given increased grain yields. The seed must be sown at 3 bushels per acre. Effective weed control is possible and payable. Most of the varieties available have been field tested. The aphids that spread Barley Yellow Dwarf virus disease can be killed with systemic insecticides. The one remaining problem is that of developing a suitable new wheat variety for North Island conditions that will maintain its resistance to stem rust. Here is a big challenge to the plant breeding scientists.

BARLEY

Field trials in 1959-60 indicated that the new Carlsberg variety of barley yielded at least 15% higher than the standard variety Kenia. As a result of this work, there was virtually a complete change within three years from Kenia to Carlsberg in the North Island.

Barley can be sown in October-November. It can be grown successfully out of grass and on soils not good enough to produce a wheat crop. Barley yields of 80 to 100 bushels are now quite common and lodging is the main problem.

OATS

There is only a very limited scope for oats and then only for chaff. It is not economic to grow for grain. Even for chaff the market is most unpredictable and the demands for reaping, binding, stacking and chaffing are beyond most farm units in the area.

POTATOES

Potatoes are a very important cash crop on the Kiwitea Loam soil and limited areas of rich river alluvium. The Rangitikei accounts for at least 1,500 acres an'd the average yields have lifted from about 5 tons per acre in 1950 to over 10 tons per acre in 1965. Some growers are regularly averaging 15 tons or more. This a genuine indication that most of the problems of potato growing have been overcome and the standard of potato growing in the area has improved greatly during the last 10 to 15 years.

The potato grower has become a specialist and while a lot of farmers do grow potatoes on their own farms the biggest proportion would be grown on rented ground by potato contractors or other farmers who also growpotatoes. Ground rent of up to E25 per acre is not uncommon.

The main varieties grown are Ilam Hardy and Aucklander Short Top or "Suttons" as they are known in the trade. The next important would be Sebago followed by Rua, Katahdin, Glen Ilam and small areas of Tahi, Arran Banner and Ulster Supreme.

Recent developments in the use of systemic insecticide in the granule form at planting time to control aphids and the consequent spread of virus disease, particularly leaf roll, should see further improvements in seed quality and yields. Bulk harvesting is also in the early stages of development. The market demands a regular and reliable supply of quality table potatoes. Hand-picking in the paddock is not always reliable and unless all potato pickers can turn in top quality jobs they will find that within a few years bulk contract machines will be harvesting all the potatoes. Machine-grading would then be carried out at central points.

Potential Cropping Acreages

Providing the economic climate was favourable, the potential cash cropping acreage is about three times the present levei in the Rangitikei (Table 1).

TABLE 1: POTENTIAL CASH CROPPING ACREAGE OF RANGITIKEI COUNTY

	Present	*Potential*
Wheat	3,500	12,000
Barley	2,000	6,000
Potatoes	1,500	4,500

Economics

The amount of wheat and barley cash cropping carried out depends very much on the prices of meat and wool. On land carrying 5 or more ewes per acre, it takes very good grain yields and prices to compete with sheep on an economic basis. Returns from stock show a definite advantage in favour of sheep. As a general rule, cattle can only be profitable on this country by buying in the autumn, wintering them, finishing them off on the surplus spring growth and selling the following autumn. With wet winter conditions light cattle are essential.

To give an indication of the relative returns from wheat, barley and sheep, some Gross Margin comparisons are shown in Table 2. The gross margin is the difference between gross return and the running or direct costs of each enterprise.

TABLE 2: GROSS MARGIN COMPARISONS OF RETURNS FROM WHEAT, BARLEY AND SHEEP

1. WHEAT

Gross Return	£ s. d.
45 bushels @ 16s. 6d.	37 2 6
	£37 2 6

Running Costs	£ s. d.
Ploughing	2 5 0
Double Discing	1 10 0
Harrow	7 6
Drill and harrow	1 5 0
Seed (3 bushels)	3 19 6
Super. (2 cwt)	1 2 0
Aerial spraying	1 5 0
Weedkiller	14 3
Syst. insecticide	16 0
Heading	4 10 0
Sacks (15 @ 10d.)	12 6
Cartage and loading	18 9
	£19 5 6
Gross margin	£17 17 0

Wheat **Yield per acre**	**Gross** *Margin per acre* £ s. d.
(a) 40 bushels	13 19 6
(b) 45 bushels	17 17 0
(c) 50 bushels	21 14 6
(d) 60 bushels	2912 6

2. BARLEY

Gross Return

	£ s. d.
60 bushels @ 9s. 27	0 0
	£27 0 0

Running ***Costs***

	£ s. d.
Ploughing	2 5 0
Double discing	1 10 0
Harrow	7 6
Drill and harrow	1 5 0
Seed (3 bushels)	3 0 0
Super. (2 cwt)	2 0
Acrial spraying	1 0 0
Weedkiller	14 3
Aerial spray — army worm	1 14 0
Heading	410 0
Sacks	16 9
Cartage and loading	1 1 0
	£19 5 6
Gross margin	£7 14 6

Burley Yields per acre	***Gross Margin per acre*** £ s. d.
(a) 60 bushels	714 6
(b) 70 bushels	11 17 6
(c) 75 bushels	13 19 0
(d) 80 bushels	16 0 6

3. WOOL, LAMB AND BEEF

(Running 5 ewes per acre plus 30 cattle per 200 acres)

Gross Return

	£ s. d.
Lambs (112% fattened) @ £2 15s.	15 8 0
Wool 60 lb @ 40d.	10 0 0
Cattle @ f12 head profit	116 0
	E27 4 0

Running ***Costs***

	£ s. d.
Ewe replacements	3 0 0
Shearing and crutching	15 0
Wool charges	14 0
Ram replacement	12 0
Vet. expenses	15 0
Freight and incidentals	1 0 0
	£6 16 0
Gross margin	***E20 8 0***

Fat Lamb Farm	***Gross Margin***
(a) 5 ewes plus cattle 112% fat lambs sold)	£20 8 0
(b) 4 ewes plus cattle (100% fat lambs sold)	£15 5 0

Conclusion

This paper has endeavoured to demonstrate the relationship between pasture production with the subsequent stock carrying, and cropping in the Rangitikei. The soil and climate are suitable for producing both pastures and crops. The extent to which cash cropping replaces sheep on fat lamb farms is mainly dependent on current market prices and consequent returns for meat, wool, wheat and barley. At present prices, they are in a very delicate balance with equal returns being obtained from 45 bushels of wheat, 85 bushels of barley or 4½ ewes plus cattle per acre. Technical problems in producing these farm commodities also affect current trends. Those problems remaining unanswered at present include facial eczema and salmonella in sheep, stem rust in wheat and the low market price of barley.

DISCUSSION

Often on traditional farms* of *approximately* 5½ *ewes per acre, and where good use is made of pasture, about 2,000 lb of dry matter per ewe is being used. What sort of dry matter quantities would be required for the high-carrying capacity farms, i.e., the 10 to 12 stock units per* *acre?

There is room for improvement **on** the 5% ewe per acre "traditional" farm. The problem is that good topdressed pasture in an average season will produce only 10,000 lb of dry matter per acre and practically all farms have a proportion of run-out, lower-producing pastures, as well as areas out in crop. Higher carrying can be achieved by fuller utilization, less wastage, more topdressing and more higher producing pastures. I do not know what dry matter pasture production would be required to carry 10 to 12 stock units per acre.

The grain crops occupy the land for only part of the season. How does Mr Booth consider this affects the gross margin factor which he has discussed?

This is one of the weaknesses that are unavoidable when using such factors. It must be remembered that the crops are also a fairly heavy drain on the soil, and, by the time the new pasture is established and producing, it is nearer 9 months from the time the winter crop was fed-off. The gross margin approach must be considered in the light of all these other factors as they affect particular farms.

If there was* a more complete *utilization* of pastures,** would not one ***tend to obtain more dry matter than has been mentioned?

Yes, it must move in that direction, with the fertility build-up which follows increased stock numbers.