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DAIRY FARMING IN THE BUSSELTON-MARGARET RIVER DISTRICT

PART 4—PASTURE PRODUCTION

By R. A. BETTENAY, B.Sc. (Agric.), Adviser, Dairying Division

If deteriorated pasture and underdeveloped pasture in the Busselton-Margaret River district could be improved to the standard of the present highly productive pastures stocking rates could be improved by more than 50 per cent.—final article in a series reporting the results of a survey of farm practices in the district.

EARLIER sections of this series dealt with stage of development, stocking rate and fodder conservation on 100 farms surveyed in the Busselton-Margaret River district. In this section an attempt is made to assess the quality of the pastures. Farming practices which may be expected to influence pasture quality are discussed.

In Part 2 of this series it was shown that average stocking rate was 3.15 acres per large beast unit (L.B.U.), and making allowance for beef stock carried, on the acreage devoted to dairying it was 3.92 acres per milking cow. To achieve this stocking rate the average farmer conserved 0.84 tons as hay equivalent per L.B.U. or 1.37 tons per milking cow, almost entirely in the form of hay.

Type of Pasture Sown

Mt. Barker subterranean clover together with Wimmera ryegrass, is sown on most new land. Winter-wet areas are usually sown to Yarloop subterranean clover instead of Mt. Barker whilst mixtures of the two are common. Limited areas are sown to the Tallarook or late variety of subterranean clover whilst Woogenellup is increasing in popularity in the last few years.

Other sown species include serradella, drooping flowered clover, and perennial ryegrass with very restricted areas of Currie cocksfoot, phalaris and lucerne. Paspalum and Lotus major are sown on some swampy areas, whilst kikuyu and couch are also sown, generally from sods.

Deterioration of Pastures

An important part of the survey was an attempt to define the extent to which deterioration had reduced pasture growth and an attempt to relate deterioration to pasture management. A difficulty was that there is no simple definition of what constitutes deterioration in a pasture and it was necessary to rely a lot on experience in grading pastures according to the extent of deterioration.

In a normal process of maturation over a number of years, pastures commence by being clover-dominant for a few years. As the nitrogen level in the soil is built up, grasses tend to dominate and naturalised species such as Yorkshire fog, various brome grasses, barley grass, sweet vernal and silver grass gain a foothold. This is not necessarily a process of deterioration, and in fact is likely to improve carrying capacity if not carried to
This area was totally cleared but is not fully developed and is not very productive.

extremes. Allowance was made for this change in composition over the years and provided density and growth seemed satisfactory, pastures were not considered deteriorated because of a change in composition.

Four classifications of pasture quality were recognised:

1. Not yet Fully Developed—pastures under four years old or which were sown on the burn and were in paddocks which contained a lot of scrub and fallen debris. It is likely that these latter paddocks can produce a good bulk of feed, but utilisation is likely to be poor. On average, pastures in this group can be considered about 60 per cent. as productive as those of group 2.

2. Highly Productive—pastures producing at more than 60 per cent. of their potential as limited by soil type and rainfall.

3. Mildly Deteriorated—pasture where growth had dropped below 60 per cent. of the estimated potential.

4. Severely Deteriorated—pasture where growth had dropped below 30 per cent. of the estimated potential.

In Table 1, the area of pasture falling in each of these categories is shown, together with the percentage of the total area in each group.

**Potential for Pasture Production**

On the basis that underdeveloped land (Table 1 above), has reached 60 per cent. of its potential, mildly deteriorated land is producing at 60 per cent. of its potential, and severely deteriorated land is producing at 30 per cent. of its potential, we can calculate that stocking rate could be increased by something over 50 per cent. if all pasture were improved to the standard of the present highly productive paddocks.

<table>
<thead>
<tr>
<th></th>
<th>Under-developed</th>
<th>Highly Productive</th>
<th>Mildly Deteriorated</th>
<th>Severely Deteriorated</th>
<th>Total</th>
<th>Area Cuttable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total (acres)</strong></td>
<td>6,426</td>
<td>8,359</td>
<td>5,779</td>
<td>2,314</td>
<td>22,878</td>
<td>6,975</td>
</tr>
<tr>
<td><strong>Per cent.</strong></td>
<td>28.1</td>
<td>36.5</td>
<td>25.3</td>
<td>10.1</td>
<td>100</td>
<td>30.5</td>
</tr>
</tbody>
</table>

170
Present stocking rate, as already mentioned is 3.15 acres per L.B.U. Developing the poorer paddocks to the stage already achieved on the top third of the pastures could increase this to just under two acres per L.B.U. and this increase in stocking rate could be brought about without new innovations. An increase in fodder conservation could be expected to permit a further increase in stocking rate.

FACTORS AFFECTING PASTURE QUALITY

Some of the causes of pasture deterioration are obvious (for example fertiliser deficiencies, undergrazing) but many other causes have contributed in a number of cases.

In the following section some of the practices which jointly go to make up pasture management are detailed and their possible effects on deterioration and production are discussed.

1. Grazing Rotation

Of the 100 farms, 87 practiced some type of rotational grazing and only 13 had all paddocks other than hay paddocks open to stock for the whole of the year. However the method of rotation varied through all stages from a strict daily change over the whole 12 months to having the farm in two halves and grazing each section for one week in every two.

Some idea of practices at different seasons of the year is given below:

Autumn

Commence winter rotation system 22
Open all farm to grazing 16
Close most of farm for two to six weeks and feed hay heavily 62

This third method is recommended as one which gives young pastures a chance to become established before a grazing rotation is commenced. Most farmers made good use of a paddock of perennials and fed hay heavily at this time, giving annual pastures a chance to become established.

Winter-Spring

Time Between Grazing in Rotation:
Spelled for one week 6
Spelled for 2 to 3 weeks 73
Spelled for 4 or more weeks 13
Open all of the time 13

Two factors may be varied, namely the time a paddock is open to grazing and the time it is shut up between grazings.

Practices vary very widely, the most common being to have a paddock open for two to four days, and closed for two to three weeks between grazings.

The practice of spelling paddocks for more than four weeks cannot be recommended as it tends to encourage a dominance of poorer grasses and capeweed.

Summer

Continue a paddock rotation 29
Open all of farm 71

When cows were dry in late summer—early autumn, most farmers left all paddocks open to grazing, often being unable to confine the herd because of water shortages. Others grazed out dry feed in one paddock at a time, starting with paddocks intended for cultivation and sowing to early oats.

Where paddocks contain some perennials it seems desirable to practice a form of rotation and let the pasture freshen up between grazings.

It can also be advantageous to close a paddock of perennials for use after the break of the season, and some farmers did this.

No association could be found between the type of grazing practiced and production per acre. This suggests that with the relatively low utilisation of pasture at present achieved, the system of grazing is not important.

2. Fertiliser Usage

The area surveyed is one where phosphate deficiency is universal, and no legume growth can be obtained without some topdressing with phosphates.

Copper and zinc are also deficient whilst potash deficiency has been recognised on sandier soils and hay paddocks for a number of years.

It is common practice to fertilise in autumn with “a bag of super” — this may be plain super or may contain trace elements or potash. A few farmers topdress parts of the farm — particularly hay paddocks — again in early spring.
Use of superphosphate seems fairly adequate on old land, as shown below.

<table>
<thead>
<tr>
<th>Super used Per Acre Per year—</th>
<th>No. of Farms.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Land.</td>
<td></td>
</tr>
<tr>
<td>Less than 150 lb.</td>
<td>16</td>
</tr>
<tr>
<td>151-170 lb.</td>
<td>32</td>
</tr>
<tr>
<td>171-190 lb.</td>
<td>41</td>
</tr>
<tr>
<td>More than 190 lb.</td>
<td>9</td>
</tr>
</tbody>
</table>

No farmer used less than 100 lb. per acre as an average dressing except in isolated years. It is believed that not less than 150 lb. per year should be put on old land so that possibly sixteen farmers were using less than they should.

However on new land there was considerable evidence that much higher rates, in the order of 4 to 5 cwt. per year in the year of establishment of pasture on virgin country would have given an economic return. Few farmers used enough super in the first and second years of establishment and phosphate deficiency symptoms were common on new sowings.

**Copper and Zinc**

The widespread acceptance of copper as a necessary trace element is demonstrated by the fact that only one farmer out of 100 had not used copper over the whole farm at least once in the last six years.

The one exception had never used it on about half of the farm on country down to pasture for four years. A few farmers used copper every second year and several had not applied it for up to six years, chiefly, one felt, because their system of keeping records was not adequate. Seven farmers used 1 to 2 lb. blue-stone every year instead of the more usual 5 to 7 lb. every four or five years.

Zinc had been used in adequate amounts by 91 of the 100 farmers but there were nine farms where at least some paddocks had never received an application of zinc. Although on old pasture land there may have been a gradual build up of zinc as an impurity in the super and dramatic effects cannot be expected under these conditions, its use on all paddocks at least once seems desirable.

**Potash**

Potash is undoubtedly the most widespread and serious deficiency at present on the farms surveyed and many farmers are disinclined or unable to use as much as is recommended because of its high cost per ton and the fairly heavy rates needed on many paddocks.

Of the 100 farms in the survey, 43 used potash to good advantage. That is, old land received a maintenance 30 lb. annually or at least in most years, and paddocks regularly cut for hay received heavier rates. A further 36 farmers used some potash, but not enough to overcome
the deficiency, and 25 farmers had used none at all in the past three years.

It is obvious that potash deficiency has been one of the main reasons for a deterioration in pastures, particularly in hay paddocks. Numerous instances can be seen of paddocks cut for hay annually for 10 or more years and which have never received potash. These carry very poor pastures and may have changed in composition to such an extent that they would not respond without reseeding at the same time.

It is now recommended that maintenance potash be used annually on all but very heavy soils or pasture less than four year old, to prevent a serious decline in pasture composition.

Other Fertilisers

Seventeen farmers had tried molybdenum on at least half of the farm, but in no case was a definite response observed.

Two had tried manganese, which is known to give a response in oat crops in patches, and one of these claimed a response in ryegrass.

Fourteen had tried lime but the only responses claimed were on more-than-usually acid soils, or where species such as lucerne and white clover were being grown.

3. Grazing Intensity

It is well known that heavy grazing encourages clovers, whilst more lax grazing encourages grasses and weed.

Under our conditions of seasonal pasture growth it is unusual to find paddocks with too much cover in mid-winter when feed is at its shortest. Undergrazing can occur in the autumn and early winter in a year when a favourable early opening causes an autumn flush of feed. When this happens capeweed in particular tends to dominate.

Undergrazing regularly occurs in the spring, particularly on farms where few paddocks are level enough to be closed for conservation. This in turn usually leads to a surplus of summer dry feed which is of poor quality and is not palatable to the stock. If this cover is not removed before the opening autumn rains, a poor establishment of subterranean clover follows and pasture deterioration has commenced.

It is believed that this undergrazing was one of the more important causes of the mild deterioration that had occurred in scrubby paddocks too uneven to mow. The only long term way of preventing this condition is to make more paddocks cuttable, to conserve more hay and then to build up the stocking rate.

4. Cultivation and Reseeding

The survey showed that cultivation of paddocks was carried out for one of three purposes.

- To level paddocks.
- Often in association with levelling to plant oats for early winter feed.

With a little more effort this paddock could be made suitable for cutting. Unless cut or grazed more closely it will soon deteriorate.
All this cultivation was done in summer when paddocks feed was dry. Such cultivation seems to stimulate subterranean clover germination and few farmers consider it necessary to reseed with pasture species. There was evidence however that a few pounds of Wimmera ryegrass at this time was well worthwhile.

- To destroy weeds before reseeding.

The Department of Agriculture recommends ploughing after germination to destroy specific weeds, and reseeding (with or without prior cropping) for paddocks which have deteriorated beyond the stage where correct fertilising and closer attention to grazing can bring about a quick improvement. This practice however has not proved popular because farmers often prefer to spend surplus money on new clearing and because attempts in the past have failed, probably because of insufficient attention to seed bed preparation.

Only nine farmers had used a plough within the past three years in an endeavour to kill weeds before reseeding. A further 15 had done some reseeding after discing or in the year following a crop. An additional 18 had broadcast either clover or ryegrass with oats before the rains, in an endeavour to improve a pasture mixture.

On most of these 42 farms where some reseeding had been done the area was small and there was no definite pattern of pasture reseeding. On the other hand 58 per cent of farmers surveyed had done no reseeding of old pasture paddocks at all in the past three years.

It appears desirable at least to oversow with subterranean clover or Wimmera ryegrass in many paddocks. This can often be done when oats is sown before the rains. In other paddocks where deterioration is more severe mouldboard ploughing and reseeding offer the best prospects of pasture improvement.

Reseeding, often in association with improved fertilising, appears to have a great scope for improving pasture density and composition. At present this is almost completely neglected by most farmers.

5. Control of Insect Pests and Mites

Red mite and lucerne flea are still the most common serious pests damaging pastures but probably have little permanent effect on pasture composition. Control by spraying was rare, and less common than a decade ago. It appears that there is some revival in interest with the availability of systemic sprays.

Other pests—cockchafers, subterranean clover weevils and rootknot nematodes—are regularly present but the damage done has not been estimated. Except in isolated instances it appears to be slight.

6. Plant Diseases

No serious plant diseases, which could be expected to be a major factor in causing pasture deterioration, were noted.

FACTORS CONTRIBUTING TO HIGH OUTPUT PER ACRE

As was shown in the second article of the series stocking rate and fat per acre were positively associated. It was further shown that the herds with highest production per cow were obtaining highest production per acre. This is an important finding and suggests that, under our present stage of development, fat per cow should not be sacrificed in an endeavour to obtain higher fat per acre as stocking rate is increased.

Another positive association was that between fodder conservation and stocking rate. The 20 per cent of farms with the least fodder conservation had a stocking rate of 3.55 acres per L.B.U. compared with 2.81 acres per L.B.U. for the 20 per cent of herds with the greatest fodder conservation.

Breed of cow does not appear to be influencing stocking rate and, in fact farmers with Friesians are carrying more per 100 acres than are farmers with Jerseys. This is believed to be in part because it is the more highly developed farms which are carrying Friesians.
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