

weeds such as redroot (*Amaranthus retroflexus*) and willow weed (*Polygonum persicaria*) grow and seed in the crop.

The growth of weed seedlings in the following spring makes the growing of a second crop difficult, and it should be remembered that it is the summer crop which is important. Indeed the two weeds named have become so troublesome that it is now difficult on many properties to grow even a first crop of turnips. The more pasture renewal that is done, and the higher the soil fertility is, the more troublesome do these weeds become. There are, indeed, pre-emergence weed control measures, which will be described later, but these measures are difficult and depend on obtaining the right weather at the time of sowing.

White-fleshed turnips are the crop most easily smothered by these weeds, and where these are troublesome a change could well be made to a crop better able to cope with competition. Chou moellier is the first obvious choice, but even this crop often succumbs to competition from vigorous weeds like redroot.

Maize, however, is very rarely defeated by weeds, and even if there is a chance of this, there are relatively foolproof post-emergence methods of weed control applicable to maize crops. Maize also does extremely well under the high fertility conditions where weeds are most troublesome. Further, since maize is a heavy yielder, smaller areas need to be grown, a condition which well suits the farm where a fair amount of pasture renewal has already been done. Yet a further advantage is that maize is sown at the end of October, a month later than turnips or chou moellier. This means that there is still plenty of time to sow maize after it has become obvious that a previously sown crop of turnips or chou moellier has failed.

For the sheep farmer in the north zone the requirements are more complicated. First and foremost, a crop is required on which ewes may safely be flushed and tail-end lambs fattened in a facial eczema outbreak. Secondly, a crop is helpful (though not essential) for wintering cattle and carrying hoggets safely through autumn. Unfortunately, the eczema period extends beyond the time when resowing of pasture is successfully done. At present most sheep farmers compromise by taking their chances with eczema and providing a winter crop only in occasional seasons. It is felt that a cropping rotation of as little as 3 per cent of the farm area would provide relative immunity from facial eczema for ewes and lambs, minimise hogget losses, and help winter cattle as well as provide for pasture renewal.

Eczema-safe feed must be a leafy crop able to smother out all traces of ryegrass, and lamb-fattening food must be palatable.

## FORAGE CROPPING IN MATAMATA COUNTY

The weeds which make cropping difficult on dairy farms are not generally as troublesome on sheep farms. A suggested rotation actually now used by a few farmers is as follows:

A paddock is ploughed each September and sown to thousand-headed kale or chou moellier. This is used for flushing ewes during an outbreak of facial eczema, but if not required then, it can be kept for wintering cattle and hoggets.

If chou moellier is chosen, it can be used also to help fatten lambs, whereas thousand-headed kale, being relatively unpalatable, is not suited to this. Facial eczema, however, may make it necessary to feed the crop heavily to ewes in autumn, in which case there would be better winter recovery from thousand-headed kale, which is consequently thought the better crop.

The crop is cleaned up by cattle in June and July, and the paddock sown to a catch crop in September, which is fed before regrassing in March. The catch crop should provide the lamb-fattening food, and it may be chou moellier.

If the above routine were adopted, each paddock ploughed would be out of grass about 18 months and provide two crops—a winter and a summer one—sharing the cost of pasture renewal. Two paddocks would thus be under the plough each summer, one producing its first crop for autumn and winter feeding and the other its second for summer fattening feed.

In the south zone, it will be remembered, summers are relatively favourable, but winters are long. Dairy farmers here need a crop to help them through winter, and the growing of such a crop is indeed almost universal. Swedes and chou moellier are admirably suitable. The problem of weed competition with the growing crop is of little consequence here, where crops are in fact easily grown. Swedes in particular yield much more heavily than elsewhere in the county.

In this region of cooler and moister summers pastures can be sown in spring following the winter crop of swedes or chou moellier. Most farmers agree, however, that though spring sowings of pasture are reasonably successful, autumn sowings are usually a little better. They also believe that though a summer crop is not essential, it is still a help and is worth while for the slight extra expense. Turnips are the usual choice for the summer crop, with chou moellier a fairly close second.

As an alternative to the above rotation some farmers in autumn sow oats or ryecorn, which is grazed in winter and then allowed to recover for spring and summer use before ploughing and

resowing pasture in autumn. The lower cost of such a system is offset by the lower yields.

The requirements of sheep farmers in the south zone are much the same as those of the north zone. Eczema-safe feed and winter feed are necessary. Requirements differ, however, in that the feed deficiency in winter is much greater. Most sheep farmers here winter cattle on swedes, but there is little attempt to provide crops for the period of facial eczema danger.

The rotation suggested for sheep farms in the north zone could advantageously be applied here. However, larger areas would need to be cropped than in the north because of the severe winters. Chou moellier could be used in preference to thousand-headed kale, for, as large areas are sown, autumn feeding would be light and recovery better.

Alternatively, the suggested rotation could be applied on a small scale, with the growing of a swede crop exclusively for winter use. In this region pastures can be resown quite successfully in spring if a summer catch crop is not desired.

### Individual Crops

The crop species mentioned are the only ones which are extensively used in Matamata County. Some species which are a feature of other districts are seldom if ever seen here. Rape is never grown in the Matamata district, because it cannot be relied on to ripen under the humid conditions. Lupins are low yielding by local standards and very prone to fail because of stem rot diseases. Millet is grown to a very limited extent on dairy farms where a quick catch crop is required, but the yield is disappointing in an area where soil fertility will grow better crops. Carrots, mangels, fodder beet, and sugar beet are never grown as forage crops for cattle or sheep, though they are occasionally grown for wintering pigs. The labour required for growing these crops on a large scale is not available.

### Green-feed Crops

Green-feed crops of oats and ryecorn have been mentioned briefly above. These crops are used to some extent at the south end of the district, in place of swedes, but their main use is for sowing in areas where resowing of pasture has been delayed beyond the end of April.

### Turnips

White-fleshed turnips are the most favoured crop for all purposes. Apart from susceptibility to weed invasion, turnips are easily and cheaply grown and easily fed. Cows milk well on them and there is little waste when they are fed off. As well as being used for summer feed turnips are often established as late as the end of March