

## LUCERNE-GROWING IN THE AUCKLAND DISTRICT.

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**DURING** the past few years a marked increase in lucerne acreage in the Auckland district has taken place. Whereas in 1929 a total of 2,667 acres was devoted to this crop, the acreage in 1935 had risen to 5,248. Of these totals, North Auckland had 210 acres in 1929 and 429 in 1935, while the acreages for South Auckland in the corresponding years were 2,457 and 4,819. These figures suggest that, so far as North Auckland is concerned, the crop is relatively unimportant at the present time. The reasons for this may be summarized as follows :-

(1) In the north the soils for the most part consist of stiff clays, which remain wet during winter months and dry out hard in the summer. They do not permit of free root-penetration, and consequently are not suitable for lucerne. In some districts there are restricted areas of basic volcanic soils sufficiently free to be favourable for lucerne growth. Such soils grow good crops, giving up to six cuts per annum over a period of three or four years, and occasionally longer, before they are invaded by paspalum and weeds.

(2) Crops are frequently affected by stem rot (*Sclerotinia* sp.), which rapidly spreads through the field, especially -where cultivation of the stand is practised.

(3) In view of the high rainfall and the uncertainty of weather conditions, harvesting for hay is seldom done satisfactorily. Too many crops are spoiled through being treated as ordinary pasture-hay instead of being allowed to cure in cocks. Consequently, the lucerne-hay crop is usually a mass of dry stalks devoid of leafage, and, as such, has little feed-value.

(4) The soils of the north where lucerne thrives are also well-suited for paspalum, which many successful farmers consider superior to lucerne. Furthermore, the clay soils can also be induced to grow good paspalum. Consequently, when it is remembered that paspalum does not present the same problems of management, establishment, and renewal, it will be readily appreciated why the northern farmer shows preference for this grass.

In the north there are restricted areas where lucerne does well. In such localities it proves quite useful in providing green feed, especially where paspalum is not well established. Likewise, on poultry-farms and small farmlets run in conjunction with orchards an area of lucerne is often grown to provide green feed during summer months, while silver-beet, kale, or chou moellier are used in the winter.

In the South Auckland district lucerne is more favourably regarded, rainfall, while not so high as that in the north, ranges about 50 in. per annum. Paspalum also thrives, particularly in the Bay of Plenty. It is in the types of soil that South Auckland districts show greatest variation from the north. Whereas stiff clays are dominant in the north, pumice types are most commonly encountered in South Auckland. Practically the whole Bay of Plenty district, extending from the coast on

the north to Taupo on the south, and much of the Waikato consists of free pumice soils, while just south of Auckland fairly free basic volcanic soils are to be found. Areas of peat, unsuitable for lucerne, are also scattered throughout these districts.

On the open soils lucerne establishes well, and the free nature of the subsoil permits of good root-penetration. Excessive wetness in winter and summer baking are practically unknown. Experience with the crop has shown that four or five good cuts per annum can be expected on well-managed fields. As in the north, there are parts of the Bay of Plenty where paspalum in association with perennial rye-grass and white clover is to be preferred to lucerne. Generally speaking, these areas are of high fertility where soil-moisture during summer is adequate for maximum paspalum-yield. There are other areas in this district, however, where the upper levels of the soil are far too dry in summer for high production from paspalum. On such soils lucerne, with its deeper root-penetration, proves more suitable. It is not claimed that all these soils yield heavy crops. Some are far too low in fertility to do so, but their returns in lucerne are much greater than they would be in paspalum. There has been a pronounced increase in the acreage of lucerne in the Bay of Plenty, and this has also applied in parts of the Waikato, particularly in the counties of Matamata, Piako, and Waipa.

#### CULTIVATION.

On many farms the initial ploughing is delayed until late in the spring, after which disking, harrowing, and rolling follow at short intervals just prior to sowing down. This type of preparation leaves much to be desired, and many of the failures in establishment could be traced to hurried and inefficient cultivation. A good fine seed-bed does not result from hurried work. Ploughing should be done in the winter, and further working with disks and harrows should be completed in mid-spring. Such working gives reasonably good fineness, after which a roller can be used freely to obtain good consolidation. Where a roller is not available, use is occasionally made of stock to tramp the proposed lucerne field after the cultivation has been completed.

#### RATE OF SEEDING.

Where seed is being broadcast it is customary to sow from 20 lb. to 25 lb. of seed an acre, and occasionally seedings range up to 30 lb. per acre. If drilled, the usual sowing is from 16 lb. to 18 lb. per acre. With these heavier sowings good strikes are obtained, but there is a tendency to overcrowding. Tillering is restricted, weakened plants are common, and frequently there is fairly high plant mortality in the first year or two. The object underlying heavy seeding is to smother weeds, but measures to eliminate weeds prior to sowing would give better results. This could be accomplished by somewhat later sowings following continued cultivation to destroy seedling weeds as they appear. Under this method of preparation suitable seedings would be provided by 18 lb. to 20 lb. an acre broadcast and 14 lb. to 15 lb. an acre in 7 in. drills.

#### METHOD OF SOWING.

The usual practice in the Bay of Plenty is to broadcast seed through a top-dresser, the seed being previously mixed with carbonate of lime or a mixture of superphosphate and lime in equal proportions.

Where the areas are very small they are often hand-sown. In a few instances an ordinary grain drill is used, but, in view of the fact that little cropping is practised, few drills are available. Fortunately, lucerne establishes well when broadcasted on Bay of Plenty soils. In the Waikato, however, drilling of the seed appears to be essential to success: the usual practice in this district is to sow about 16 lb. seed per acre, drilling half the seed in one direction and the rest across the first sowing. Broadcast stands in the Waikato are often unsatisfactory the second year after establishment.

#### INOCULATION OF SEED.

There is little doubt of the necessity to inoculate lucerne in South Auckland districts. Numerous instances of failure resulting from sowing untreated seed could be quoted. Since the introduction of the Department of Agriculture's culture for treating seed, this material has almost entirely superseded other cultures and the soil-method of introducing bacteria. In view of the fact that stem rot (*Sclerotinia* sp.) causes widespread damage on many lucerne-fields in South Auckland, it is always dangerous to use soil as the means of inoculating a further lucerne area. This is being appreciated by the farming community, and has led to a definite preference for the inoculating cultures.

#### MANURING.

The usual practice is to sow from 5 cwt. to 1 ton of carbonate of lime an acre a week or so before seed-sowing. This is followed by 3 cwt. to 5 cwt. of superphosphate an acre either just prior to or immediately following the sowing of seed. A good proportion of farmers sow the superphosphate mixed with lime together with the seed. The manurial practices appear to be quite sound, although a more general sowing of lime at not less than 1 ton per acre would be regarded as sounder practice. Lucerne definitely requires a non-acid condition, and lime, in sufficient quantity, can provide this condition in the soil.

#### TIME OF SOWING.

Lucerne is sown in both spring and autumn. Spring sowings are much more popular, as considerable difficulty in getting good establishment is experienced with autumn sowings. With spring sowings it is not uncommon to find areas being laid down from mid-September to mid-December. Most of the crops, however, are sown during the first fortnight in November. The very early-sown crops are usually smothered by spring weeds, and seldom show satisfactory results. Where it is known that spring weed-competition is likely to be a problem, early cultivation and further continued cultivation into December is certainly the best procedure to adopt in an endeavour to rid the land of weeds. Where consolidation is good there is seldom any difficulty in obtaining good strikes from December sowings.

Autumn sowings cannot be recommended: heavy plant mortality occurs, and the farmer usually finds that he has to resow the field in the following spring.

### CROP CULTIVATION.

In the management of a lucerne-field consideration has to be given to the problems affecting each particular area. In some fields annual weeds are the chief problem.' In others, twitchy grasses present difficulties, while in still others disease demands attention. It is obvious that such variation in problems demands similar variation in method of attack, and yet it is not uncommon to find lucerne suffering from all the above drawbacks on as many different farms receiving the same treatment. Let us consider mechanical treatment. Not uncommonly, lucerne-fields are well cultivated and manured in August. If the chief problem happens to be annual weeds, this proves satisfactory. If, however, Indian doobj has to be contended with, such treatment merely rejuvenates it. Harrowing under these circumstances should have been delayed until January, when the hot dry weather assists in eradicating the weed. Where disease has invaded the field, any harrowing merely spreads it through the crop and hastens the destruction of the stand. Partly for this reason Waikato farmers, and a proportion of Bay of Plenty growers also, have discontinued harrowing and cultivating lucerne. In order to maintain vigour in the crop they rely on liberal phosphatic manuring.

### GRAZING.

Generally speaking, grazing of lucerne should not be carried out, although there are times, when feed shortages, pressure of farm-work, or shortage of labour make it difficult to avoid. Apart from the danger to stock, considerable damage can be done to the lucerne if unduly punished. Where it is known that lucerne will be grazed, the crowns can be protected if the previous cut is taken somewhat higher than usual. A fairly stiff stubble is thus produced, and is sufficient to keep stock away from the crowns for some little time.

Apart, however, from the damage to the lucerne-plant, stock-tramping brings about surface consolidation, which leads to invasion by grass and weeds, and often results in a marked reduction in yield.

Summarized, then, the position of lucerne in the Auckland District may be stated as follows :-

(1) In North Auckland the soil types and rainfall make paspalum-growing generally a more certain means of providing feed than does lucerne-growing.

(2) In South Auckland the soils and climatic conditions are suitable for the crop. Parts of the Bay of Plenty, however, are more adapted to paspalum than they are to lucerne.

(3) Success with the crop depends upon thorough cultivation, good consolidation, and spring sowings.

(4) In the Waikato drilling of the seed is essential to success.

(5) On all soils in the Auckland district inoculation of the seed or soil is necessary. The cultures obtainable from the Department of Agriculture are highly effective for this purpose.

(6) Liberal liming and manuring with phosphatic fertilizers is always desirable, especially at establishment.

(7) **Grazing** of lucerne is not desirable : it leads to grass and weed invasion.

(8) Cultivation should be regulated to suit the particular crop. Where stem rot is prevalent liberal manuring should replace any form of cultivation.

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DISCUSSION.

(Follows next paper.)

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