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The Making of New Grassland

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Leafy Indigenous Strains of Grasses

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step towards better pastures on our inferior lands. Timothy, cocksfoot, foxtail, ryegrass, permanent late red clover, etc., are all types that exist wild, and are better grazing plants than the cultivated ones. One gets permanent red amongst the late red. Personally, if I had a drier climate, I would grow much of my own seed, but our high rainfall makes it very difficult.

I have twice saved my own cocksfoot seed, and have now a seven-year-old pasture sown with home-saved cocksfoot which is very good. The seed was from a field sown in 1914 with New Zealand cocksfoot, and the present cocksfoot in it is very permanent-looking, and is a nice leafy type. I have more hope of good results from selected strains from old pastures than from artificially cross-bred plants. Of course different districts would require different strains, and I imagine that as many strains of a grass would be required as there are strains of sheep, to suit different localities.

Here then is a very wide field for research. A good deal has been done already by enterprising seedsmen and farmers, and by Research Stations, such as Aberystwyth and the Scotch Station. Professor Stapledon's work seems to run on very useful and practical lines. We are fortunate in having many public-spirited and enterprising seedsmen who are doing good work in producing and marketing selected strains, and who can be relied on not to ruin a good plant, as has been done in the past. Much has been done, but far more remains to do, as the selection of indigenous strains is still in its infancy.

When one compares the pastures of twenty years ago with now one sees a great advance. The good land seems about as good as one can hope for, and it is in plants suitable for inferior land that the room for research lies.

Manurial and cultivation matters seem to be about fully elucidated, and the remaining weak link is the plant itself, and its suitability for the different areas and jobs.

LEAFY INDIGENOUS STRAINS OF GRASSES

BY M. JONES

Imperial Chemical Industries

THE need of securing high production from grassland over a number of years is bound up with the nutritive value of the produce and the persistency of the plants. The recent work on the nutritive value of leaf and of stem in plants has shown that leaf is far richer than stem in the useful constituents. It therefore behoves us to consider leafiness as well as persistency in our pasture plants, but luckily the two factors

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(leafiness and persistency) go together in this case, and, what is still further luck, the plants which have these two useful characteristics are the ones that will give the maximum yield of produce over a number of years, provided the raw materials by way of plant food are supplied to them in the soil.

The use of the proper strains of the grasses and clovers therefore is essential before any success can be expected from seeding down grassland.

During recent years great strides have been made by the plant breeders in the breeding and selecting of more suitable strains of herbage plants, and in the near future the farmer may refer to breeds in his seeds just as he does now to breeds in his live stock.

The making of a pasture does not end, however, with the selection of the seeds mixture, as the proportion and production of any component of the seeds mixture is dependent on the treatment meted out to it during the following years. For instance, I have seen a field sown out uniformly with the same mixture give on one part a sward with 90 per cent. grass at the end of the second year, whilst the other part gave a sward nearly 90 per cent. clover at the same time, and this was all due to the different management. Similarly, the proportion of the various strains of grasses is governed by the management, and a very important factor that the farmer has to contend with is that the more persistent the species or strain the slower it is in establishing itself, and also in attaining to maximum production.

In order to make a permanent pasture, therefore, the production during the first year should be placed as a secondary consideration to persistency. When this point was first realized a general advice given to farmers was to leave out altogether the quick-developing plants, as they were found to compete with the slow-developing plants for the available plant food. This competition not only retarded the full establishment of the more permanent plants, but usually ruined their chances of survival. However, an appreciable loss of winter and early spring keep was sustained during the first two years by not sowing the quick-maturing species. It has now been found that this winter and spring keep need not be sacrificed, as the competitive effect of the quick-maturing grasses can be eliminated by combining the use of two controlling factors—viz.

- (a) Grazing the sward at regular intervals, so as to prevent the rapid-developing plants from attaining their full size, and
- (b) Supplying the plant population with a sufficiency of food to supply the needs of the biggest plants as well as the smallest.

It has been found that the size of the roots of a plant during its vegetative development is closely correlated with the size attained by the aerial part. Therefore by preventing the aerial part from attaining its full size the shading effect above ground is done away with, and also the root system is prevented from getting unduly large, so as to be

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able to absorb an undue proportion of the plant food available in the soil. This controlling, in practice, resolves itself to grazing the young sward lightly at intervals of about a month. Where the seeds are sown under a nurse crop the first grazing should be taken as soon as the corn is cleared, but where the seeds mixture has been sown without a cover-crop the first grazing should be done from ten to twelve weeks after sowing.

An important point to remember in the establishment of permanent pastures is that we are dealing not with annual plants but with perennials, and we wish to encourage those perennials that grow for eight to nine months of the year rather than those which grow for four months only. This necessitates supplementing the natural supplies of plant food in the soil towards both ends of the growing period in respect of the nitrogenous constituents—*i.e.* supplying a spring dressing and an autumn dressing in a readily available form.

As the animals prefer a mixture of grasses and clovers to grasses alone, an attempt should be made to establish and retain a proper balance of clovers to grasses in new grassland. For the first year it is comparatively easy to have a high clover content, as red clover, which is a short-lived plant, can hold its own against the grasses. From the third year onwards, however, we have to rely on the white clover for keeping up the leguminous population of a sward. The white clovers, it is true, vary within wide limits in regard to type, and even persistency, but as a class their general characteristics may be summed up by saying that they are very persistent but have a prostrate habit of growth, and are comparatively late in commencing active growth.

These two features—late and prostrate—put the white clover at a disadvantage in the competition with the grasses, and particularly so if the manurial ingredient phosphate, to which it so readily responds, is available only to a very limited extent. There are indications that though phosphates in a comparatively insoluble form, such as basic slag, may be applied in heavy doses during the “dead” period (December and January), the application of a readily soluble form, during May and June—the time when clover grows actively—still gives the clover a marked stimulus, and this stimulus will be reflected in the composition of the pasture in subsequent years.

Indeed, so pronounced are the effects of management of grazing, together with time and nature of manuring, during the establishment of a new pasture, that the character of the sward in five years' time has been made or marred, even though the right seeds mixture has been selected, and those seeds sown at the optimum rate of seeding.