

# Canterbury Chamber of Commerce

*Agricultural Bulletin*

## CHOICE OF PASTURE PLANTS, No. 2

(To Replace Bulletin No. 3 which is out of Print)

*Prepared by Canterbury Agricultural College, Lincoln*

BULLETIN

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Bulletin No. 3 named "Choice of Grass Seed," which was written more than five years ago, detailed the information then available about the strains of the common grasses. It pointed out that within each species of grass, such as Ryegrass or Cocksfoot, there were numerous types of plants which varied greatly in their economic characters. Some were permanent and others temporary, some early and others late, some leafy and others running chiefly to seed, and so on.

Emphasis was laid on the advantages that would accrue to the farmer if the best types of each variety could be selected and bred into a strain and supplied to the market in place of the mixture of good and bad types commonly used. It was shown that such specially bred strains were not available since recognition of strains was too recent for the selections to have been made, but that a certain kind of natural selection had been going on under ordinary farming conditions. For instance, in old ryegrass pastures all the temporary types would have perished and so the permanent types would have been selected. An instance was given of two plots of Ryegrass, one sown with seed harvested from an old pasture in which 97 per cent. of the plants survived after three years, the other sown with ordinary commercial seed in which only 10 per cent. survived. Also, in Cocksfoot grown under grazing conditions the poor leafed types would have been crowded out and so the leafy and persistent types would have been selected. Thus the final recommendations of the Bulletin were reached, namely, that for permanent grazing pastures, seed harvested from old pastures is more suitable than ordinary commercial seed or than imported seed.

This conclusion is confirmed by a recent report (1934) of the Imperial Economic Committee on Grassland seeds which states: "For man-made pastures, and especially for permanent pastures of any country or region, those herbage seeds will be most suitable which are saved from selected old pastures in that region. In default of local supplies the most suitable seeds will be those grown in a country or region in which the soil, the climate, and also the usage conditions most nearly approximate to those where the seed is to be grown for pasture, and the degree of suitability will depend on the degree in which this triple approximation is attained."

Under New Zealand conditions the same statement will hold. In purchasing seed it is essential for best results to buy suitable seed produced from districts where conditions are similar to those under which the seed is to be sown.

### Type of Pastures

In the establishment of any pasture and in maintaining it in a state of high production a number of factors must be taken into consideration, namely, preparation of the seed bed, liming and fertilising, choice of pasture plants, grazing management, and maintenance of fertility by periodical topdressing and liming. Each of these factors requires attention if the greatest benefit is to be obtained from the pasture.

Choice of pasture plants is the factor to be discussed here. Temporary pastures may consist of a quick establishing grass, such as Italian Ryegrass, which is a high producer in the first year, and then dies out. It may have in addition one of the temporary strains of Red Clover to prolong the life of the pasture for another year. Such a pasture has a useful place in wheat growing districts.

For pastures of three years' duration and longer a different combination of grasses and clovers is necessary. The longer the pasture is intended to remain down the more persistent must be the strains of seed in the mixture for the particular conditions of soil, climate, and grazing treatment. Thus we may need on wet dairying land a dominant ryegrass-white clover pasture with a proportion of timothy, foxtail, alsike, and red clover; on good grazing land, a dominant ryegrass, white clover pasture with a proportion of timothy, cocksfoot, and red clover; on lighter grazing land a ryegrass, cocksfoot, red clover, white clover pasture; on the lightest grazing land a dominant cocksfoot pasture with ryegrass, red and white clover to assist. Other low producing grasses and clovers may be needed if the fertility level is low.

In all cases it is particularly desirable to sow mixtures of grasses and clovers rather than to rely on one grass or one grass and clovers. These mixtures provide abundant, nutritious, and well distributed forage for the grazing animal. There is no need for complicated mixtures of many species, some of which are quite unsuited to the conditions.

### Strains of Grass and Clover

a. **Imported:** Bulletin No. 3 made it clear that there are different strains within each species. It has also been demonstrated that ordinary imported seed is mainly derived from the strains that are high seed producers but are incapable of producing good grazing for permanent pastures. Imported seed of ryegrass and cocksfoot is therefore stained so that a farmer may recognise these strains at sight. The importation of pasture seeds has decreased considerably during the last few years, but in certain seasons considerable quantities are imported.

During the six years 1928-33 the following quantities of some of the important pasture seeds were brought in to New Zealand:

Red Clover—239 tons—enough to sow about 134,000 acres.  
White Clover—215 tons—enough to sow about 240,800 acres.  
Ryegrass—307 tons—enough to sow about 24,000 acres.  
Cocksfoot—692 tons—enough to sow about 165,000 acres.

These figures show that the areas which are being sown with imported seed are still considerable and the use of these imported seeds will result in most cases in poor permanent pasture unless they have some special qualifications such as for instance, Montgomeryshire Red Clover.

b. **Regional Strains:** These strains, because they are usually harvested in definite districts or regions are frequently called regional strains. Some strains of Cocksfoot, perennial ryegrass, and white clover, growing in certain districts in New Zealand have had a local, and in the case of Akaroa Cocksfoot and wild white clover, an overseas reputation for many years. Regional strains in the past have often lost their identity owing to some lack of control in the sale of seed and also the indiscriminate growing of commercial seed in those districts. The control necessary to protect such regional strains is now supplied by the Certification Schemes operated by the Department of Agriculture.

The method of naming the regional strains after the district in which they were first isolated, e.g., Akaroa Cocksfoot, Hawke's Bay Ryegrass, proved somewhat unfortunate since it suggested that equally valuable strains could not be produced anywhere but in the district. These names have therefore been abandoned in official



nomenclature and the words "New Zealand Certified Cocksfoot," "New Zealand Certified Perennial Ryegrass," and "New Zealand certified Wild White Clover," etc. have been substituted. It would be advantageous if in addition to the official description of the name of the district where the seed is grown was always included, so that growers can obtain suitable seed grown on land under conditions similar to their own.

#### Cocksfoot—Certified Seeds.

Although no specially bred strain of grass is yet on the market, one of considerable promise, College Cocksfoot (Strain C23) has been under trial for several years, and seed is being multiplied for distribution.

It has been known for many years that the Cocksfoot grown on Banks Peninsula, commonly known as Akaroa, is a much better grazing strain than Danish and other imported strains. This Akaroa seed has been sown down for seed production on many areas of the Canterbury plains. Such seed from the plains as well as that from the peninsula, produces the desirable type of grazing cocksfoot. Other areas on the plains have been sown down with imported seed and such seed harvested from these areas will produce inferior grazing pastures. Under the Government certification scheme seed direct from Banks Peninsula and that from areas on the plains sown with Akaroa seed will be certified as New Zealand certified cocksfoot provided it attains certain standards when grown under pasture tests. The Akaroa type of cocksfoot, whether grown on the peninsula or on the plains, is the only commercial strain which should be sown for grazing purposes.

#### White Clover

New Zealand wild white clover has had for many years a good reputation on the English market, but sometimes disappointing results have followed the use of what has been misnamed New

Zealand wild white. This is due to the fact that much white clover harvested from stubble fields—the so-called "stubble white"—which is short-lived clover, has been sold as wild white. "Wild White," as under the Government certification scheme, is the white clover which comes off old pastures on the heavier types of soil, and is a true perennial and a high producer. The stubble white, although it may be wild, is in many cases a short-lived type and is not certified as wild white. The seed from the areas on which the wild white clover is growing may be certified as New Zealand Certified Wild White Clover Type I, and New Zealand Certified Wild White Clover Type II, according to their behaviour under test.

#### Perennial Ryegrass

As with cocksfoot and white clover, certain districts or growers within districts have a reputation for good strains of perennial ryegrass. Most of these strains have come from pastures which have been grazed for many years. Usually it is only the true perennial that persists under such conditions, and wherever these conditions exist good strains of perennial ryegrass are to be found. In the arable districts where pastures remain down for three to six years or so, and where Italian is often included in the mixture a hybrid type of ryegrass develops. This has been shown to be very much inferior in persistency and production of pasture over long periods to ryegrass harvested from old pastures. Though the hybrid ryegrass may produce well in the first year, for one year grazing the Italian is better. For permanent or even three to six year pastures the true perennial ryegrass should be used. There is no doubt that it is not so palatable as Italian or the hybrid type, but the sowing of a good mixture of other grasses and clovers and good grazing management will go a long way to overcome this.

#### Red Clover

The ordinary red clover growing in New Zealand is the so-called broad red. It is a short lived plant under grazing conditions, but gives much valuable feed while it lasts. It cannot be depended on to remain in a productive condition in permanent pasture unless reseeding occurs.

For permanent pasture the Montgomeryshire red clover and Cornish marl red clover are two strains which have proved their ability to persist under grazing conditions on average wheat land for at least five years (see Bulletin No. 41). These clovers are more dense in the crown, have smaller leaves, and are later to start growth in the spring than is the New Zealand broad red. Owing to their late growth they have been called "one-cut clovers" in England, because it is not possible to cut a full crop of hay and a crop of seed in the same year unless conditions are very favourable. However, on good land this has been done in New Zealand, and it may well be that New Zealand with its longer growing season will allow the two cuts. In any case they are desirable types of red clover to sow in permanent grazing pastures, but the broad red should be used for temporary grazing pastures and for hay.

#### Summary

It is evident that the greatest care and attention should be given to the choice of pasture plants for both temporary and permanent pastures. For temporary pasture the rapid growing high producing but short lived species should be used. For permanent pastures more persistent species in well-balanced mixtures should be used. Within these species those strains which are most suitable to the soil, climate, and grazing management should be chosen.

Copies of this Bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.