

then these strains are undoubtedly worth the extra money; but if soil conditions alone govern their persistence, then the Canterbury or Southern seed is a far better proposition at the price, provided always that the germination capacity of each is more or less the same. For all short-rotation pastures Canterbury or Southern rye-grass at the above prices should undoubtedly be used, but there are certain indications that for truly permanent pastures Sandon or Hawke's Bay rye-grass is preferable, although we have very little definite experimental work to support this recommendation.

In England the indigenous (Native) forms of perennial rye-grass are looked upon as being superior to any of the other nationalities. This indigenous form is a close dense one which bears, proportionately to seed-heads, a great number of barren shoots—*i.e.*, shoots that do not run up to form seed-heads. Practically all the other forms are not dense and tufted, and nearly all their shoots run up into seed-heads. Thus with these is produced a mass of seed-heads and virtually no "bottom." Whether or not the Hawke's Bay and Sandon rye-grass is after the style of the indigenous forms of England only research work can prove, but undoubtedly such is the type we require in New Zealand for our truly permanent pastures.

Cocksfoot.—There are four more or less distinct strains of cocksfoot available to the New Zealand farmer—Akaroa, Canterbury Plains, North Island, and Danish. The Akaroa cocksfoot is of old repute, and undoubtedly it is a good strain, but of later years the seed has been comparatively light, and the germination is often low for cocksfoot. The small seed, however, seems to be a definite character of this strain, for Stapleton* records from his harvest of cocksfoot grown from Akaroa seed that a thousand seeds of this strain weighed 0.95 grains, as against 1.30 grains for a thousand seeds from a crop of Danish origin. Stapleton's experiments on our Akaroa cocksfoot are extremely interesting and important. Akaroa cocksfoot agrees in nearly all details with the indigenous cocksfoot of England, which the English farmer looks upon as the best cocksfoot he can procure. Akaroa cocksfoot is like it in two essential respects—firstly in its dense bottom growth, and secondly in its resistance to frost injury. Danish cocksfoot in Stapleton's trials was more open in the bottom and was extremely subject to frost injury. This is extremely important to farmers in the South Island or in districts subject to heavy frosts. Danish cocksfoot, in view of its big seed, its usually high germination, and its comparative cheapness, is very tempting to use. With regard to the other cocksfoot strains in New Zealand the writer has no information to offer, except that when buying Canterbury Plains seed the purchaser should see that the proportion of perennial rye-grass in it is not unduly high.

Crested Dogstail.—There are two main districts in New Zealand producing crested dogstail—southern Otago and Southland, and Sandon. To any farmer who is afraid of introducing Californian thistle on to his place the use of Sandon seed is strongly recommended. The respective merits of the two strains have not been worked out.

* Preliminary Investigations with Herbage-plants, *Welsh Plant-breeding Station, University College of Wales, Aberystwyth*, Series H No. 1, 1922.