

Sixteen years ago only 10 bushels of each of the rye-grasses and 100 lb. of each of the clover selections were available for growing on, but last year official figures show that 9,000 bushels of the rye-grasses and 8,000 lb. of the clovers were available for distribution to the seed trade as nucleus stocks.

A high percentage of the following certified seed (marked with asterisk) has originated from the Division's nucleus selections distributed over the past sixteen years:

*Perennial rye-grass	1,015,804 bushels.
*Italian rye-grass	178,941 bushels.
*Short-rotation rye-grass	174,443 bushels.
Cocksfoot	469,317 lb.
Brown-top	563,939 lb.
*Timothy	6,725 lb.
*White clover	3,182,936 lb.
*Montgomery red clover	519,344 lb.
*Cow-grass	303,607 lb.
Subterranean clover	34,337 lb.

Seed Certification Tests.—The number of samples tested in field plots this year totalled 8,994, a slight decrease on last year's figure of 9,056.

Plant Introduction.—Many new species have been obtained from overseas through the services of the Botany Division. All these are being grown and studied at Palmerston North and other localities wherever possible—e.g., coastal sand country at Himintangi, and at Te Awa in conjunction with the soil conservation experiments.

Pasture Plants in Relation to Soil Acidity.—Following a general experiment conducted in pots, in which a wide range of pasture plants were grown in soil at various acidities, the following points are at present undergoing further study:—

- (1) White Clover: (a) Twenty different strains are being grown on plots of different acidity to see whether a special strain could be developed for acid soils: (b) a pot experiment is being conducted to check whether clover plants can change the reaction of a soil by their growth.
- (2) Seed Germination and Establishment: A wide range of pasture species and strains have been sown in plots at different acidities to see what measures can be taken to establish desirable species under acid soil conditions.

PASTURE ECOLOGY

Influence of Clovers and Fertilizers on Pasture Growth and Composition.—The effect of clovers on pasture growth is more striking and impressive as the age of the plots increases. In the absence of adequate nitrogen—artificial or natural—no response to lime, phosphate, or potash has been recorded. On the other hand, in the presence of ample nitrogen, striking responses to phosphate have been measured.

An extreme range of pasture compositions and growths of grasses and clovers has resulted from various manurial treatments. The outstanding features of this trial are the widely differing responses to the various forms of artificial nitrogen.

Establishment of Clovers.—The effect of grazing and the resulting intensity of light reaching the clovers has greatly influenced the establishment of clovers in a mixed sward. More light means more clovers, especially where quick-growing grasses are sown with clover on highly fertile soils. The suppressing effect of the quick-growing grasses is more marked on white than on red clover. New trials have been laid down this autumn to extend the scope of the investigations.

Earthworms.—A study of earthworm habits and feeding shows correlation between weight of worms and herbage yield per unit area. Total worm weight per acre is about equal to weight of total sheep carried. Soil fertility appears to influence the species of worms present, and trials have been commenced to measure food ingestion of worms.

Pasture Management.—These trials demonstrate the possibility of producing pasturage at seasons commensurate with the needs of the grazing animal.