

Though this substance has been experimented with as an insecticide against wireworms, woolly aphis, and as a glasshouse fumigant, it had never, until the present occasion, been used as an acaricide. The results of the experiment have been extremely satisfactory so far, in that the dichloroethyl ether has been found to be highly toxic to the common cheese-mite, *Tyroglyphus siro*, even at extremely low concentrations. For example, a concentration of 0.046 lb. per 1,000 cubic feet of air space gave 100 per cent. kill of the mites after twenty-four hours' exposure at 70° F. and 80 per cent. relative humidity. It was also found that timber such as shelving, crating, &c., which comes in contact with cheese, if treated with dichloroethyl ether, gives a very definite measure of protection to the cheese.

Another point considered is the effect of the acaricide on the cheese itself. A cheese kept for six weeks in an atmosphere saturated with dichloroethyl-ether vapour presented no foreign flavour in the interior of the cheese and only a slight off-flavour in the rind. Other cheeses were exposed to the vapour for shorter periods and no foreign flavour could be detected.

This work is being extended in order to procure more detailed and conclusive data.

LINEN FLAX

An investigation was carried out into certain physical factors that influence the presence of the mite, *Tyroglyphus farinae*, on flax-seed. Experiments indicated that (apart from effects on germination) if seed moisture is the factor determining the presence of mites, then the seed should not be stored under cool, but under higher, temperatures.

DAMAGED PASTURE

An Australian species of fly, *Metoponia rubriceps*, was found breeding in large numbers in damaged pasture at Opotiki. Though this type of insect is not generally found to be injurious, observations in Australia reveal that the larvæ of *M. rubriceps* insert their mouth parts into, and apparently draw nourishment from, the roots of certain pasture plants.

GRASS-GRUBS (ODONTIA SPP.)

A comprehensive investigation has been inaugurated into the grass-grub problem in New Zealand. The biology, ecology, and systematics of the species are being studied as a preliminary to developing means of control by cultural methods (if possible), and by parasites. So far the only parasites in New Zealand are certain species of tachinid flies, but steps have been taken to ascertain what species of Australian parasites, of types not present in New Zealand, could be of service in the solution of the problem.

GRASSLANDS DIVISION, PALMERSTON NORTH

Director: Mr. E. BRUCE LEVY

Despite shortage of labour and technical assistance and dearth of specialist supervision, the work of the Station has been well maintained. The season has been difficult owing to an early cold and dry winter followed by excessive wet during the late winter and spring and an exceedingly dry summer that has persisted up to the time of writing. The one redeeming feature has been the excellent harvesting weather for all grass and clover seeds and the good yields obtained.

PLANT-BREEDING

The use of pedigree strains of pasture species is fundamental in any attempt to increase the efficiency of pastoral production. The aim of the Grasslands Division is to supply high-producing bred strains of the more commonly used pasture species, and further, by hybridization, to evolve entirely new types by combining the desirable characters of different strains or even of different species. Pedigree strains of perennial rye-grass, Italian rye-grass, white clover, and red clover are now available to farmers, and next season seed will be available of a new type of rye-grass, known as H1 rye-grass, evolved by hybridization between perennial and Italian rye-grass.

The plant-breeding programme has been maintained as far as possible with perennial rye-grass, Italian rye-grass, H1 rye-grass, Western Wolth's rye-grass, cocksfoot, timothy, white clover, and red clover.

Perennial Rye-grass.—Breeding is being continued with this species, some 8,500 single plants from controlled pollinations being studied in the field. Thirty-seven bushels of nucleus-stock seed have been obtained at Palmerston North for increase, and 78 bushels from the area at the Agronomy Division. The investigations into the possibility of breeding a strain of rye-grass less susceptible to the blind-seed disease than the standard strains are being continued. From crosses made between resistant and susceptible plants it appears that resistance and susceptibility to the disease are inherited characters. The majority of the resistant plants so far obtained are, however, not of the best agronomic type, and breeding is being continued to ascertain the possibility of combining desirable agronomic type with resistance to the disease. This season approximately one hundred plants have been artificially inoculated with the blind-seed-disease organism, and forty-two further crosses have been made.

Italian Rye-grass.—The nucleus-stock area at Palmerston North has produced 17 bushels of seed, and the area at the Agronomy Division 68 bushels. Breeding is being continued with this species, and some 3,800 plants from controlled pollinations have been studied in the field. A new glasshouse isolation to provide a nucleus-seed supply has been made. Reports from trials in Great Britain indicate that pedigree Italian is markedly superior to any other lines of Italian rye-grass included in their trials.

Short-rotation or H1 Rye-grass.—Twenty bushels of nucleus-stock seed have been harvested this year at Palmerston North, and 104 bushels at the Agronomy Division. It has been decided to release this new type of rye-grass under certification, and next year mother seed will become available to farmers.