

due to faulty butting of the sheaf in harvesting. An attempt has been made in Australia to overcome this by stripping the seed before cutting the crop, thus avoiding the tangling of the seed bolls, which drag the sheaves about and makes them uneven. An attempt to strip part of one of our seed areas with a rye-grass beater stripper was unsuccessful, due to insufficient clearance.

A quantity of sinox (sodium dinitro-ortho-cresylate) ordered from America failed to arrive. The small amount on hand was used on linen-flax crops and fully confirmed the previous year's results—that is, that excellent control of fat-hen, wireweed, &c., can be secured, but that further work is required to determine the best time and rate of application.

*Linseed*.—An increase area of the disease-resistant, high-quality type, Rio, was grown at the Division, and an acre of New Zealand Commercial at Canterbury Agricultural College. Supplies of these are to be built up so that pure stocks will be available for the linseed-oil industry if required.

*Lucerne*.—Favourable reports have been received regarding the behaviour under field conditions of the first pedigree strain, Strain B, and an increase area of approximately 10 acres has been sown at Canterbury Agricultural College. Further observations have been recorded on the behaviour of the spreading species, *M. glutinosa*, and selections are to be made this year for the development of a mass selected strain.

*Potatoes*.—Breeding-work has perforce been restricted, but the most promising lines obtained from crosses between commercial varieties and various South American species are being tested further.

*Mangels, Carrots, Chicory, and Coriander*.—Small areas of reselected stocks of Yellow Globe mangels, of Holmes Improved carrot, of chicory, and of coriander were grown for seed-production.

*Rye-grass and Red Clover*.—On behalf of the Grasslands Division, Palmerston North, 4½ acres of Italian rye-grass and 2 acres of short-rotation rye-grass were grown for seed, and an area of Broad Red clover established for seed-production next year.

#### BOTANY DIVISION, WELLINGTON

Director: Dr. H. H. ALLAN

Some fifteen hundred specimens have been examined, several new weeds being recorded and extensions of range noted.

Considerable additions to the herbarium have been made from areas visited by the staff. Of major importance is a set of marine algæ, the result of many years' work, presented by Mr. W. A. Scarfe. Other noteworthy accessions are sets of Chatham Island seaweeds (presented by Mr. R. Gilpin), of seaweeds from Tauranga Harbour (presented by Mr. M. Hodgkins, and accompanied by notes on seasonal occurrence throughout the year), and representatives of the florulas of the Mount Arthur and Upper Awatere areas.

#### SEAWEED UTILIZATION

*Agar*.—A firm holding a license to manufacture agar has carried out preliminary work and is assembling plant necessary to deal with 1 ton of dry seaweed per week. Agar produced in small quantities in their pilot plant is of very good colour and appearance; it has a low ash content (0.9 per cent. on dry weight in sample analysed by the Dominion Laboratory), is satisfactory for use in culture media, and has a higher gel strength than the Japanese agar customarily used. *Pterocladia lucida* and *P. capillacea*, with agar contents of 40.4 per cent. and 35.2 per cent. of dry weight of weed respectively, were the best of the species submitted to the Dominion Laboratory for analysis. Between June and December, 1942, the Internal Marketing Division purchased 11 tons of dry weed (mostly *P. lucida*). The greater part of the Auckland coast was surveyed during the year, the occurrence of *Pterocladia* studied, and instruction given to collectors. Data accumulated indicate that beds can be picked in rotation without suffering permanent depletion. Spore production for the establishment of new plants is being investigated.

*Carrageen*.—Further samples of New Zealand carrageen (*Gigartina* spp.) were sent to the High Commissioner, London, and to British, American, and Australian firms. The most promising as a substitute for Irish moss is *G. decipiens*. The high arsenic content (20 p.p.m. of As<sub>2</sub>O<sub>3</sub> on dry weight) of the fresh weed reduces on bleaching to 2-4 p.p.m. The only other kind favourably received was a broad-leaf form from Stewart Island, of which some half a ton has been ordered for trial by a Sydney firm interested in the manufacture of toothpaste. Its performance is stated to be quite satisfactory, and the cost, though higher than that from other sources, could be reduced if material were graded by suppliers. In view of the urgent need for an Irish moss substitute and the large quantities of quick-growing *Gigartinas* on our coasts, investigations are being continued.

*Alginates*.—Samples of brown seaweeds collected for analyses by the Dominion Laboratory yield from 1 per cent. to 24 per cent. of their dry weight of alginic acid. Those with highest yield are all common on the coast and large enough to be easily gathered.

#### MEDICINAL PLANTS

The results of research work have been applied to field practice as soon as they have been completed. General advice has also been given as required to the Department of Agriculture.

*Digitalis purpurea* (Foxglove).—The results to date of experiments carried out in conjunction with the Department of Agriculture Station at Wallaceville are: Rosette leaves are equal in quality to stem leaves from flowering plants; a significant drop in glucoside content occurs as the flowering stalk elongates, and again when seed begins