

(d) *Hyoscyamus niger*.—The annual type tested satisfactorily when harvested at an advanced stage. The biennial type suffered badly from virus.

(e) *Papaver somniferum*.—The Indian type is frost-tender and very subject to bolting if planted late in the spring. Total alkaloid content, 0.28 per cent. The Chinese type is frost-hardy, can be autumn-sown, and overwintered if the soil is well drained. The yield was about 1 ton of capsules per acre, and the total alkaloid content from 0.35 per cent. to 0.52 per cent.

(f) *Ricinus communis*.—Yields of good-quality castor-oil have been obtained, varying between 43 per cent. and 57 per cent.

(g) *Mentha piperita*.—The strain grown yielded 0.72 per cent. of peppermint-oil, deficient in esters and menthol.

The analyses quoted were carried out by the Dominion Laboratory on samples harvested by the Division.

VEGETABLE-SEED PRODUCTION

(a) *Beetroot*.—Seed glomerules were vernalized for fifty-five, forty-five, thirty-five, twenty-five, and fifteen days. These were sown simultaneously with untreated glomerules on 1st October, 1943. At Waiwhetu, Lower Hutt, the percentages of seeders in the different treatments counted on 1st March were 50, 75, 57, 66, 40, and control 10 respectively. At an area near Blenheim the percentages were 92, 44, 56, no test, 12, and control 5 respectively. Methods for a more satisfactory control of moisture during vernalization are being studied.

Beetroot plants in the cotyledon stage were treated for forty and twenty days at 3° C. in nursery flats and planted out with untreated controls. There was a heavy mortality in the forty-day treatments, and these were discarded. The twenty-day treatments yielded 100 per cent. seeders, and the control series none. The bulb development in the majority of the trials was excellent.

(b) *Cabbage*.—Seed and plants (at the cotyledon stage) of four varieties were pretreated before sowing. Only one type responded to the plant treatment. Results: Forty-day treatment, 30 per cent. seeders; twenty days, 15 per cent.; ten days, 13 per cent.; control, nil.

(c) *Lettuce*.—Seed of a cabbage type was vernalized for twenty days at 50° C. Results: The Waiwhetu plot was attacked by soft-rot and no results were obtained. At Blenheim the treated group were in full flower (at the date of examination) and uniform in development; of the controls, 50 per cent. were in the hearting stage, the remainder unevenly developed in the flowering stage.

RUSSIAN DANDELION

Four plots were established in co-operation with the Department of Agriculture and the Cawthron Institute. The plots were planted with seedlings from seed sown in mid-November (this proving rather late). The results for rubber content at the end of the first growing season were: Hastings, 1.5 per cent. (of green weight); Nelson, 1.6 and 1.8; Waiwhetu, 2.4. One half of the Nelson plot received 300 lb. per acre of superphosphate, the other half 500 lb. of "tomato" fertilizer. This plot produced the heaviest yield, estimated at 245 lb. and 279 lb. of rubber per acre. Growth on the other trials at various places in New Zealand was too poor for significant results to be obtained. A good harvest of seed has been obtained, especially from the Waiwhetu plots. Only one small area was successfully established from direct sowings. Failure in other plots appears to be due to a combination of causes: too deep burial of seed, poor water-retaining capacity of soil, dry weather immediately after sowing. Solution of the difficulties involved in direct sowings is crucial to the development of Russian dandelion areas.

TEASEL

Some fifty thousand heads were harvested from the small trial area. Samples were reported on as being of good quality. It has been demonstrated that teasel of satisfactory quality of the different sizes required by the trade can be grown without difficulty in New Zealand.

TUSSOCK-GRASSLAND

The experimental areas selected at Molesworth, Tekapo, and Te Akatarewa are now rabbit-proof fenced. Vegetational survey of the Molesworth plot has been completed, and is in progress on the remainder. A further area near Dansey's Pass is projected. Transect and quadrat studies will be made, as well as experimental sowings of native species and from the material obtained overseas. The Pisa Flat experimental area and the "Cockayne" plots on the Dunstan Range were examined and reported on to the Department of Agriculture. A joint programme for further work is being arranged. In the Pisa Flat area certain exotic grasses show distinct promise. On the Dunstan plots the growth of tall oat-grass, yarrow, *Poa pratensis*, zig-zag clover, and Chewing's fescue is noteworthy, as is the decline in the cover of lucerne.

EROSION

An examination of the Onetapu desert area gave evidence that the erosion there is mainly natural, due to the action of strong wind on the light volcanic ash cover. Large areas on the western side of the divide between Ruapehu and Ngauruhoe are affected by vigorous wind and water erosion, in part accentuated by tracks made by man and animals. The almost completely barren area now covers some 10 square miles and is expanding. Work is in progress on slipped areas in the Orongorongo and adjacent areas. Some streams on the western side of the Tararua Range have been traversed, with a view to selecting a drainage area for intensive study. Work on the experimental tussock-grassland areas is proceeding.