

to form; leaf collected under different weather conditions or at different times of the day shows no difference in potency; the activity of the leaf decreases rapidly after being kept more than twelve hours; drying at temperatures of 180° C. or over destroys the active principle; the bulk of the glucosides is contained in the blade, and the petiole may be discarded, incidentally hastening drying. Autumn sowings in the field yield a satisfactory crop and eliminate much handling of young plants. Yields of dry leaf per acre have much exceeded figures recorded for overseas crops.

Atropa belladonna (*Deadly Nightshade*).—Some eight hundred plants have been harvested individually for selection of high-yielding plants. These are to be propagated from rootstocks in the winter. Chemical tests show a wide range of potency in individual plants. Second-year growth from over-wintered rootstocks will yield two crops of leaves this season, but both will be lighter than the single first-year crop. Root tests showed 0.4 per cent. of total alkaloids (B.P. requirement is 0.4). Wilt disease is giving much trouble.

Datura stramonium (*Thorn-apple*).—About three hundred and fifty plants have been harvested individually for selection of high-yielding strains. Twenty-eight plants were selected after chemical tests and hand-pollinated. Seed has also been saved from the high-yielding plants for multiplication on a commercial scale. The "Wellington" type, multiplied from a wild plant and found to be highly productive in the experimental-plots, has made excellent growth on the Agriculture Department's area at Hastings. This strain is proving more satisfactory in every way than the English type for large-scale plantings. As the plant matures, the alkaloid content rises rapidly.

Hyoscyamus niger (*Henbane*).—The strains on trial have proved very susceptible to virus disease. Contrary to overseas advice, open-field sowings have proved very satisfactory, and the plants show lower incidence of disease than glasshouse-raised plants. Under somewhat droughty conditions this season at Hastings the plants have flourished. All chemical tests on the biennial type have given satisfactory results, while the annual type, though much freer from disease, is low in potency.

Papaver somniferum.—All three types used made excellent growth. The white-flowered Indian variety, planted out early in the spring, was badly damaged by wind, and needs close planting. A red-flowered variety from seed collected from a local wild plant made good growth but yields small capsules. The purple-flowered variety averaged from 5 ft. to 6 ft. in height, each plant bearing from six to eight large capsules. The results of chemical tests are not yet available. Sufficient material was saved from the tall variety to carry out a pilot extraction. Sixty pounds of seed were saved. Open-field sowing proved entirely satisfactory.

Digitalis lanata.—This continues to do excellently and seed stocks are now sufficient for a trial on a commercial scale. Selection work is in hand. Tests so far show about 0.75 per cent. glucosides on a dry-weight basis (overseas results give figures of from 0.8 per cent. to 1.0 per cent.).

Other Medicinals.—*Mentha piperita* var. *citrata* has grown prolifically and came into full flower in the second season of growth. Harvesting for extraction of oil has been completed. *Datura metel* suffered a severe attack of mosaic disease, but field sowings have shown less infection than glasshouse-raised plants. Other species of *Datura* are also under test. The growth of castor-oil plants (*Ricinus communis*) has been satisfactory; yields of 300 lb. of beans per acre have been obtained, with an oil of satisfactory quality. Satisfactory yields of oil have been obtained from the seeds of coriander and fennel. Other medicinals, including species of *Ephedra*, *Barosma*, and *Glycyrrhiza*, are still in the preliminary stages of trial.

RUBBER PLANTS

Taraxacum kok-saghyz (*Russian Dandelion*).—Seed has been handed over to the Department of Agriculture for preliminary field trials in selected areas in both Islands, and a larger area will be autumn-sown for seed-production. Surface-sown seed germinates excellently, and deep sowing is to be avoided. Plants from seed sown late in November began to come into flower within eight weeks. By mid-February they showed flat rosettes of leaves 8 in. to 10 in. across and are flowering freely. Rubber-content tests will be made at two-monthly intervals. Selection work will be undertaken.

Sonchus littoralis (*Native Sowthistle*).—Of numerous species of plants tested, this proved the only likely source of rubber. Cultivated plants have produced large roots, which are under test.

The present results of inquiries concerning the Moreton Bay fig (*Ficus macrophylla*) and Assam rubber (*Ficus elastica*) suggest that there are not likely to be sufficient trees available in New Zealand to make them a practical source of rubber within a reasonable time.

FIBRE PLANTS

Phormium.—The experimental plots tabulated in the last annual report are in good condition and have been kept under observation. No results can be expected until a four-year period of growth has elapsed. The area of *P. colensoi* × *tenax* has grown well and will be tested next season. Large-scale trials of close-planted phormium, using both swamp and selected strains, have been arranged. Additions continue to be made to the area devoted to observation of individual plants of promise. Some fibre tests have been made, and it is hoped that arrangements can be made for detailed work on this aspect.

Hemp.—The harvest from the seed plot promises to be good. One and a half acres of Hungarian hemp have been cut for fibre tests. Several small batches have been water-retted, and a large-scale trial has been arranged for at one of the linen-flax factories. A scheme for more extended and detailed work will be put into practice next season.