

WORK AT THE CAWTHRON INSTITUTE.

(1) *Soil Survey of Tobacco Lands*.—Owing to the calling-up of staff for the armed forces, it was found necessary to curtail and then finally suspend the soil surveys which were in hand. In the early part of the season soil mapping was continued at Lower Moutere, and a preliminary examination was made of Takaka soils with a view to carrying out a detailed soil survey of the Takaka district in relation to tobacco culture. The preliminary survey of Takaka showed that the area of light soils was largely restricted to the alluvial land of the river, much of which was subject to flood. Soil and tobacco maps covering Motueka, Riwaka, and the Motueka and Dovedale valleys have been prepared.

During the past season it was not possible to check up on the exact distribution of tobacco, but the following summary shows the approximate position as compared with the 1940–41 season :—

District.								Acreage, 1940–41.	Acreage, 1941–42.
Motueka and Riwaka	..	..	..	..	..	..	..	1,690	1,794
Motueka River valley	..	..	..	..	..	..	..	428	505
Dovedale-Thorpe	..	..	..	..	..	..	..	275	201
Stanley Brook, Tapawera, Motupiko	..	..	..	..	..	..	..	241	231
Wakefield sector	..	..	..	..	..	..	..	178	282
Orinoco Valley	..	..	..	..	..	..	..	52	32
Upper Moutere sector	..	..	..	..	..	..	..	71	60
								2,935	3,105

(2) *Sand-drown or Magnesium Deficiency*.—In the past season, five experimental areas located at Thorpe, Umukuri, and Graham Valley were established to examine influence of ground dolomite and ground magnesite in the control of magnesium deficiency.

On only one area (at Thorpe) was sand-drown definitely seen during the season, and on this experimental area all magnesium treatments gave satisfactory control of the trouble. On the other experimental areas, although no symptoms of sand-drown developed, the magnesium-treated areas showed a darker green in the leaves of the tobacco plants.

(3) *Moisture Uptake of Tobacco*.—A comparison of United States of America and New Zealand samples shows a surprisingly rapid increase of moisture uptake for tobacco samples when the humidity rises above 70 per cent. American samples gave slightly higher figures at 100 per cent. humidity, but at lower percentage humidities New Zealand samples gave rather bigger figures for moisture uptake than the American samples.

(4) *Chemical Composition of Cured Leaf*.—A large number of samples of cured leaf of varying type and origin has been analysed for sugar, nitrogen, and mineral content. Where the fertilizer applications ranged from 600 lb. to 1,200 lb. per acre the analytical data showed little difference in total reducing sugars or nitrogen content for tobacco samples under the different treatments. Total ash, lime, magnesia, and potash content were highest with the largest dressing of fertilizer.

A series of ten samples of North and South Carolina and of Virginian leaf comprising cutter leaf and lug grade, on analysis showed that the cutter grades were appreciably higher in glucose contents and often higher in fructose than the other types of leaf. The top cutter grades were also high in sucrose. Nitrogen content was relatively low in these grades. The sugar-nitrogen ratio clearly demarcated the cutter grades from the leaf and lug grades. These two latter grades showed an average of 2 per cent. nitrogen, against 1.45 per cent. for cutters, and were low in reducing sugars. Good samples of New Zealand leaf compare favourably in chemical composition with corresponding American samples.

Examination of Nelson samples of cured leaf for sugars, nitrogen, and minerals has shown that very great differences occur in the composition of tobacco leaf. It has been shown previously that tobacco leaf of high grade has a high reducing sugar content and a relatively low nitrogen content. There is new evidence that relatively high sugar content is also associated with high-quality tobacco. New Zealand leaf compares favourably with corresponding American leaf in these constituents. In so far as the mineral composition of New Zealand leaf is concerned, it appears to have a higher ash content than is considered desirable by American authorities. While some New Zealand leaf fall within the limits shown by American samples, many are considerably higher in ash.

(5) *Disease Survey*.—During the early part of the season, visits were paid to nurserymen growing commercial tobacco seedlings on behalf of the companies. The incidence of damping-off fungi was carefully watched, and assistance was afforded nurserymen in their control measures.

On the whole, mosaic has not been severe this year, though several exceptions, particularly in the Motueka-Riwaka area, were noticed. Foot-rot under field conditions was seen in several areas at different times during this season. This trouble generally follows the occurrence of damping-off or foot-rot of the *Sclerotinia* type in the seedling beds. Isolated cases of wilt were noticed in the Upper Motueka Valley.

(6) *Tobacco Seed Germination Tests*.—Eighteen lines of seed have been tested at the request of different manufacturers.

With a view to accelerating the germination of lines of tobacco seed, tests were carried out on the value of intermittent heat and of cold pre-treatment before incubation. Intermittent heat gave very satisfactory results, and increased the germination of a poor line of seed from 59 per cent. to 93 per cent. by the fourteenth day. Cold pre-treatment from one to three weeks gave somewhat similar results in improving the germination of immature seed.

TIMBER PROTECTION RESEARCH.

Timber Protection Research Committee.—Mr. L. E. Brooker (Chairman), Mr. R. L. Andrew, Mr. F. R. Callaghan, Dr. G. H. Cunningham, Mr. R. L. McPhail, Dr. D. Miller, Mr. E. H. Walden, Mr. N. A. Marris, Mr. A. F. Clark (Secretary).

The following is an account of the work which has been carried out during the year :—

DOMINION LABORATORY.

During the year the Laboratory carried out such chemical work as was required by the Timber Protection Research Committee. Many samples of wood were examined to ascertain the depth of penetration of certain copper compounds.