

STRAIN INVESTIGATION OF APPLE VARIETIES.

This work has been extended this year to include the varieties Jonathan and Granny Smith. Orchard instructors throughout the Dominion were requested to send in to the Station budwood of as many strains of the two varieties as they could locate. As a result much bud-material has been received and worked on stocks in the nursery.

The varieties now being investigated for possible strains comprise Cox's Orange Pippin, Sturmer, Delicious, Jonathan, and Granny Smith. Unfortunately, owing to the severe gale experienced in February, the first results of this work have been lost, the immature fruit being blown off the trees. Given favourable conditions, fruit of the first three varieties above-mentioned will be available for study next summer. It is hoped that among the many strains of Delicious now being grown at the Station a type may be discovered having a closed calycine sinus and consequently less susceptible to "Mouldy Core."

HAZELNUT CULTURE.

Trees of the species *Corylus maxima* grown in the Station nursery were planted out for trial three years ago in the following localities—viz., North Auckland, Auckland, Tauranga, Gisborne, Nelson, and Central Otago. The annual progress reports received last June showed that the trees were doing well in the two most northerly districts. Elsewhere, growth had been poor.

WALNUTS.

Twenty walnut-trees imported by Dr. Cunningham from Australia have been planted for trial on the boundaries of the Tiritea Area. These consist of the varieties Wilson's Wonder, Franquette, Freshford Gem, and Kelvin. With the exception of the last named, these varieties are reputed to be resistant to bacterial blight (*Pseudomonas juglandis*).

Tests are also being carried out to discover a successful method of budding walnuts. While they can be grafted with little difficulty, attempts at budding appear to have been universally attended with indifferent success. With a view to discovering a suitable technique, a number of seedling stocks in the Station nursery have been budded by different methods.

AREA OF ORCHARD AND NURSERY.

The orchard at the Plant Research Station (Tiritea Area), now covers $2\frac{1}{2}$ acres. Particulars of trees planted are as follows: Apple (stock trials), 219; apple (strain investigation), 116; pear, 18; peach, 19; apricot, 33; plum, 12; total: 417 trees. There is an additional area of approximately $\frac{1}{2}$ -acre occupied by the nursery.

STORM DAMAGE.

Being in an exposed position, the orchard experienced the full force of the gale which occurred on 2nd February. It has been necessary to stake about two hundred trees, where the root-hold was affected. All trees suffered injury to foliage, in many cases being almost completely stripped of leaves. Budded trees also incurred much damage through breakages.

The provision of adequate shelter for the orchard is an urgent necessity, without which the successful conduct of the rootstock trials and other investigations referred to in this report will be seriously jeopardized. The present shelter consists for the most part of a hedge about 8 ft. in height, which is totally inadequate for the purpose.

CHEMICAL SECTION.

B. W. DOAK, Chemist.

The work of the Section has been, in the main, along the lines of previous years. This has been the investigation of the chemical composition of herbage samples and the analyses of soil samples for plant nutrients. All work has been carried out in co-operation with other officers of the Station, and the samples have been drawn from definite experimental areas.

MARTON EXPERIMENTS.

Routine determinations of the dry matter percentages of the herbage from all mowings from all mowing-experiments have been carried out. In addition to this the analysis of herbage from some of these trials has been continued. Soil samples have been regularly taken from several experiments and the results of the analyses so far carried out show that some valuable information concerning lime and phosphate fertilizing is likely to be obtained.

EFFICIENCY OF GROUND LIMESTONE FROM VARIOUS SOURCES.

Unfortunately it has been impossible to devote much time to this project. The data, so far, show good correlation between efficiency and origin of the limestone—e.g., foraminiferal, shelly, &c. With very fine grinding the differences between the various limes diminishes fairly considerably, emphasizing the desirability of very fine grinding.

MANGELS.

An investigation of the dry matter and sugar content of several varieties of mangels was carried out on material supplied by the Agronomist. These samples showed that the dry matter and sugar of mangels under the conditions prevailing in this trial are considerably lower than the figures given by English investigators for the same varieties. This may be due largely to the difficulty of maturing mangels in this district.

HYDROCYANIC ACID (HCN) IN WHITE CLOVER.

Determinations of the HCN content of a large number of samples of white clover were carried out in co-operation with the Agrostologist. Although an investigation which had been carried out previously for a complete season to investigate the variation (time of day and day to day variation) in the HCN content had shown that the variation was not great, an exception to this was noted during the past season. Samples collected one morning were found to be considerably higher than those collected during the afternoon of the same day or during the morning or afternoon of succeeding days. No explanation can be given of the reason for this, but the observation again emphasizes the necessity for an adequate number of controls, and the determination of the HCN in a casual sample of white clover might lead to serious error if any attempt were made to indicate type by HCN determination.