

hardy *Pyrus baccata* with pollen from many of the hardiest and best sorts of apples grown in Ontario. Many hundreds of such crosses were made, and later many hundreds of seedlings from the first generation were raised. Almost all of these proved perfectly hardy under the severe tests they were submitted to in the North-West, and their fruit, though small, was found admirable for jelly-making. Second crosses were made using cultivated varieties, and from these and other crosses trees have been grown that apparently are hardy and which have yielded fruit of fair size and in some cases of excellent quality.

Of the many lines of experimentation now being carried on in apple breeding and testing by the Dominion Horticulturist, the following may be cited: (1) The testing of varieties as to hardiness, prolificness, flavour of fruit, etc., when grown in widely distant points throughout the Dominion. (2) The testing of seedlings from seed of between 400 and 500 named varieties growing in our orchards at Ottawa. This means that only one parent of these seedlings is known, natural pollination having taken place from other trees in the orchard, many of which furnish apples of the best flavour and quality. Many of these seedlings have fruited and the results are surprisingly good. Over 70 per cent. have been found of marketable size and of good quality. (3) Cross-breeding experiments have been conducted for the past 12 years, more particularly with the view of obtaining hardy, vigorous trees producing an apple of good flavour and of long-keeping quality. Only a few of the trees so produced have as yet fruited, but the prospects of success are excellent. (4) Individualism in apple trees is being investigated. For 15 years the yields from the trees under experiment have been recorded, and as a result it has been noted that a marked variation as regards prolificness exists between trees of the same variety and age and grown under the same conditions. Some trees have yielded from two to four times as much as others. Scions have been taken from these heavier yielding trees and top grafted to learn if this individuality can be perpetuated.

In all sorts of small fruits and vegetables testing is carried on at Ottawa and on the branch farms. As a result we are in a position to advise as to the best varieties suitable for growth in the different parts of Canada.

Cover crops for orchards have long been under experiment, for protecting the roots of trees in winter and adding humus and plant food when ploughed under. For the most part these crops have been legumes or nitrogen-gatherers (clover, vetches, beans, etc.), but some others, such as rape and rye, have been included. The system of orchard management which comprises the use of cover crops with clean culture is now widely adopted; it appears to be the most economic and effective