

Cherry Rootstocks in Pennsylvania

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The cultivated sweet cherry is not native to America, but was introduced into this country from its home in southern Europe by the early settlers. The birds became very fond of the fruit and soon spread fruits and seeds over the countryside and wild trees became common along fence rows and borders of woods. These wild trees of the sweet cherry, which is of the species, *Prunus avium*, are often known as "mazzards", both in this country and in Europe.

The sour cherry was also introduced into this country from Europe, evidently at a later date. It has not established itself in this country as the sweet cherry has, and old or wild trees are almost impossible to find. It is of a different species than the sweet cherry, being known as *Prunus cerasus*.

In the early days of the country, cultivated varieties of cherries, were budded or grafted on mazzard seedlings or on wild trees dug up from the fence rows. Many of these trees now a century or more in age are still standing around farmsteads and suburban homes.

Mahaleb Introduced

About 1860 the business of growing rootstocks for export to America began to develop, and the European species, *Prunus mahaleb*, was introduced as a dwarfing stock for cherries. This species grows on hillsides in warm, dry localities in southern Europe. Its small, black

fruits, while not edible according to human standards, are quite acceptable to birds; and the species is now escaping from cultivation in the vicinity of nurseries. It makes a smaller, slower-growing tree than the sweet cherry, but quite large trees are sometimes found.

The mahaleb cherry made better growth in the nursery than mazzard seedlings and was soon grown almost exclusively. Mahaleb stocks make very good one-year trees and bud easily, while the imported mazzards are frequently weak. Furthermore, the mazzard seedlings are often practically defoliated from the effects of leaf spot by the middle of the summer, while the mahaleb, being almost immune to this disease, continue to grow and are in excellent condition for budding.

However, after cherry trees had been grown on mahaleb stocks for some years, various troubles developed. The trees were smaller and less vigorous than those on mazzard, and many of them died at earlier ages. In the course of time agricultural experiment stations made comparisons between the mazzard and the mahaleb cherries when used as stocks. Probably the best known of these tests were reported in 1927 by Dr. George Howe of the New York Agricultural Experiment Station. After a fifteen-year trial it was found that, with sweet, sour, and Duke cherries, the mazzard stocks gave a higher rate of survival and larger and more productive trees than the mahaleb.

Cherry Acclimatization

After its introduction into America the sweet cherry went through a period of adjustment to new conditions, and the hardier strains more adapted to this country were the ones to survive. For instance, among the mountains of central Pennsylvania many seedlings of the sweet cherry are thriving in fence rows and on farmsteads where the named varieties, which originated in regions of a milder climate, are killed by the cold winters. The mahaleb cherry is now evidently going through a similar type of adjustment. While many of the trees in this country are small and weak, a few individuals have attained an age and size comparable to those attained by the sweet cherry.

Cherry Rootstock Tests

With such an idea in mind, Mr. Guy E. Yerkes, then of the United States Department of Agriculture, proposed an experiment in the use of both foreign and domestic sources of mazzard and mahaleb stocks for sweet and sour cherries. The Pennsylvania State College was one of the co-operating stations in this work. In 1929 an orchard was set out with three varieties of sweet and two of sour cherries on stocks from several sources. The mazzard stocks came from two old trees growing in eastern United States, two from sources on the Pacific Coast, and one from abroad. The Mahaleb stocks came from seedlings of an old tree growing in Maryland and from three foreign sources. In most cases trees on mazzard stocks alternated with trees on mahaleb stocks down each row. The block remained until 1944, when the surviving

trees were cut out, weighed and measured.

Sweet Cherry Varieties

Unfortunately, the site of the orchard proved to be very frosty, and only one commercial crop was borne in fifteen years. Two of the three varieties of sweet cherry, Black Tartarian and Windsor, were dead from winter injury within five years. Of eleven replacements of dead or weak trees made in the year after the planting, nine were of trees on mahaleb roots. Eleven out of 17 trees of Schmidt on mazzard roots, and 8 out of 11 on mahaleb roots survived until the block was taken out. The trees on mazzard roots averaged much larger in size than those on mahaleb.

Sour Cherry Varieties

Two varieties of sour cherry, Montmorency and Saint Medard, were used in this experiment. Losses of trees in



These mazzard trees are twenty years old. They have withstood temperatures as low as -25° F., and are quite resistant to leaf spot. They are being grown for a hardy source of seeds for stock trees.

this group were negligible. With the Montmorency, mazzard stocks from sources in Virginia, Maryland, California, and from abroad all produced satisfactory trees. Mahaleb stocks from two foreign sources produced very poor trees, while the stocks from the seeds of the tree in Maryland and from one of the foreign sources produced trees equal to those on the mazzard stocks with which they were compared. With Saint Medard, the two mahaleb stocks used made better trees than the mazzards with which they were compared. One foreign source of mahalebs produced poor trees when worked to Montmorency, but good trees when worked to Saint Medard.

Conclusions

The results of the orchard trial would lead to the conclusion that the sources of cherry stocks are very important in the performance of the trees grown upon them. With sour cherries good sources of mahaleb seed may produce better trees than some of the mazzard stocks. The variety of the cherry must also be considered. A stock doing well with one variety of cherry does not necessarily do well with all other varieties. With sweet cherries the weight of evidence is still in favor of mazzard stocks as compared to mahaleb, but it is possible that better strains of mahaleb may some day give us satisfactory stocks for this species also.



The Behavior of Several Apple Varieties on Malling Rootstocks

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A fruit tree is made up of two parts, namely the desired variety forming the trunk and branches, and the rootstock supplying the root system. As a rule in the past apple seedlings raised from seeds of commercial varieties have been widely used as rootstocks for orchard trees. Trees grown on these seedling rootstocks will reach large size and may not come into bearing as early as de-

sired. Such trees may also present problems in pruning, spraying and harvesting. With the trend to greater mechanization of all orchard operations, trees of smaller size than those on seedling rootstocks may be more desirable.

To meet this need, especially that of size control and earlier bearing, rootstocks for apples have been selected that offer promise. Most prominent among such size-controlling rootstocks