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MAZZARD AND MAHALEB ROOTSTOCKS FOR CHERRIES

G. H. HOWE

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BULLETIN NO. 544

MAZZARD AND MAHALEB ROOTSTOCKS FOR CHERRIES

G. H. HOWE

ABSTRACT

Cultivated fruit trees are unions of two plants. Stock and cion affect each other in many ways and the fruit grower has much at stake in the choice of stocks. Only by experiments can the best stock for a fruit be determined.

This Station has carried on such experiments, and reports have been issued giving the results of work with grapes, apples, and plums. This bulletin discusses the results of growing three groups of cherries on Mazzard and Mahaleb, the two rootstocks commonly used in New York.

Two trees of each of 40 varieties of sweet, sour, and Duke cherries, budded on Mazzard and Mahaleb, are under test. The orchard is on the Station grounds at Geneva, New York. The trees have been cared for in the ordinary manner in respect to culture, pruning, and spraying. The results cover 14 seasons.

The experiment shows that Mazzard is the better stock on which to grow all three groups of cherries. At the end of 14 years nearly all of the trees on Mazzard stock are alive and vigorous, while less than half of those on Mahaleb are living and most of these are lacking in vigor. Sweet and Duke cherries and most sour cherries bloom earlier on Mahaleb stock, but the time of maturity and the size of the fruit varies little or not at all on the two stocks. Trees on Mazzard, because much larger, are much more productive.

INTRODUCTION

All cultivated fruit trees are unions of two plants. This two-part plant is necessary because in no other way can varieties be propagated true to name. The consorting parts are called, as all fruit men know, "stock" and "cion." At once, then, the reciprocal relations of stock and cion become of prime importance to fruit grower and nurseryman. The nurseryman's first consideration in the choice of stocks is the ready production of salable trees. The stocks best suited to his purposes, therefore, must be those which can be easily and cheaply grown, readily budded or grafted, and those which are

healthy and hardy. Fortunately, in most cases, the stocks which nurserymen have used have been satisfactory in producing vigorous, healthy, long-lived trees in the orchard. Nevertheless, it is often the case that the stock which is best adapted to the nurseryman's purposes does not produce the most satisfactory tree for the fruit grower.

Now, stock and cion affect each other for better or worse, and the fruit grower has much at stake in the selection of stocks upon which his trees are grown. Trees of the same variety budded on different stocks and grown for two years in the nursery may be uniform in size and vigor, yet after a few years in the orchard noticeable differences appear. All of the conditions under which a stock is grown—soil, climate, and care—exert a profound influence upon its growth. Experience must determine, therefore, what stocks respond most satisfactorily under given conditions for the different fruits.

The stock, it is now agreed, affects the cion in several ways. It may modify the size of the cion. It may produce a hardier tree to withstand the rigors of a severe climate. Productiveness may be increased or decreased. The healthfulness and length of life of a tree is affected by the stock. The size, quality, color, and maturity of the fruit may be influenced by the stock.

One sees at once that the influence which the stock has on the cion is of considerable importance to the fruit grower and that he should have some voice in the choice of stocks. As nurserymen and fruit growers do not always agree as to the best stock upon which to bud the several species of fruits, experiment stations in several states are attempting to determine the best stocks for the fruit industry upon which, obviously, the nursery industry depends. This Station has attempted to carry on a series of such experiments for New York.

Work with stocks for fruits at this Station has been carried on with four fruits, reports on three of which have been issued. The behavior of varieties of grapes grafted on three different stocks compared with the same sorts on their own roots was reported in Bulletin No. 355.[1] An experiment carried on for ten years in which leading New York apples were set on three stocks in three widely separated orchards was discussed in Bulletin No. 406.[2] After ten years' trial, Bulletin No. 498[2] was issued in which the results of growing 15 varieties of plums, representing 7 species, on 6 stocks, representing 6 species, were discussed. The bulletin in hand is a report on the work with two stocks for cherries.

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[1]No longer available.

[2]Available in "Popular" edition only.

THE EXPERIMENT

As a part of the plan to discover the best stocks for fruits in New York, work with Mazzard and Mahaleb stocks for cherries was begun in the spring of 1912, so that the results of the experiments now cover 14 seasons. Forty varieties of sweet, sour, and Duke cherries are under test, two trees of each variety having been budded on Mazzard and two on Mahaleb stocks. The orchard is situated at the base of a gentle eastern slope, 1½ miles west of Seneca Lake and 120 feet above the surface of that body of water. The care given the orchard is the same as is commonly given to cherry orchards. The varieties in the experiment were budded on the seedlings of the two stocks in the summer of 1910. All of the trees in the experiment were set in the orchard in April, 1912.

DESCRIPTION OF THE STOCKS

The stocks under test, Mazzard (*Prunus avium*) and Mahaleb (*Prunus mahaleb*), were imported from France as seedlings. These two species are readily distinguished by their flowers, fruit, leaves, and trees. Particularly are they identified by the shape and size of the trees and the character of the foliage. This is fortunate, as it is these characters alone which the nurseryman and fruit grower usually observe in the nursery row and on suckers about orchard plants. The flavor and odor of the bark from tree and root is a valuable distinguishing mark between Mazzard and Mahaleb roots. It is desirable, however, to give a complete description of the characters of the trees of both stocks so as to form a clear conception of the plant from which the stock is grown and for its identification as well.

MAZZARD (*Prunus Avium*)

This stock, thru its cultivated varieties, is everywhere known in temperate climates as the Sweet Cherry, *Prunus avium*. In the wild state it is variously called Mazzard, Bird, Wild, Crab, and Gean. The species is not as hardy as Mahaleb, or the Sour Cherry, *Prunus cerasus*, yet it is found growing spontaneously along fences, lanes, roadsides, and in open pastures in all mid-temperate regions. Mazzard trees are long-lived, large, vigorous, upright-spreading, reaching a height of from 30 to 40 feet, with stocky trunks measuring a foot or more in diameter, and thick, stout branches. The foliage is large and similar to that of the cultivated sweet cherry with which all are

familiar. The fruits of Mazzard are usually small and have a thin, dry flesh, and a very unpalatable flavor, yet there are trees to be found whose fruits rival the product of cultivated sweet cherries.

Prunus avium had its original home in southern and central Europe and in western Asia. It thrives best on moderately dry, calcareous soils, preferring warm, sunny exposures on gravelly hillsides. This species suckers from the roots little or not at all and, therefore, is particularly well adapted as a stock. In the nursery the plants are raised from pits and at present, like most other rootstocks, the young seedlings are imported to this country from France. It is expected, however, that an embargo will be effective in 1930 which will prohibit the introduction of all seedlings from Europe for use as stocks. This will mean that American nurserymen must raise their own seedlings, and tests are already under way at this Station to find out what kinds of seedlings of *Prunus avium* will make the best stocks.

One-year-old trees of Mazzard are strong and vigorous, but their growth the second season scarcely keeps up in the same proportion as that made the first year, and the foliage is often attacked by fungi.

MAHALEB (*Prunus Mahaleb*)

Mahaleb grows spotaneously in all central and southern Europe and eastward thru Asia and Caucasia and Turkestan. It is a shallow-rooted plant and is said to prefer rocky or gravelly sunny slopes. In eastern North America it is a common escape from cultivation. It is of no importance to fruit growers for its fruit, but it has long been valued as a stock upon which to work cultivated varieties of cherries.

This stock is readily distinguished in the nursery by its leaves which are small, curved, and dark glossy green. The tree is small and slender, upright-spreading and, while vigorous, is often scarcely more than a bush. The wood of Mahaleb is strongly perfumed. The fruits, borne on racemes, are very small, at first dark green, gradually changing to yellow, then red, and finally, when fully ripe, becoming glossy black and are so hard, bitter, and astringent as to be inedible.

Mahaleb stocks are grown as seedlings, altho they also may be propagated from root cuttings. Two-year-old trees in the nursery are larger and more uniform than Mazzard trees of the same age,

but they grow more slowly after a few years and are less vigorous and shorter lived.

COMPARISON OF MAZZARD AND MAHALEB STOCKS

Mahaleb seems to have been used as a stock for cherries in France much earlier than Mazzard. In America it did not come into use until after the middle of the Nineteenth Century, while Mazzard was in use much earlier. At first Mahaleb was largely used as a dwarfing stock. Later, however, this stock almost superseded Mazzard as a stock for all varieties of sweet and sour cherries. A decade ago probably 95 per cent of all cherries grown in this country were budded on Mahaleb. The reason is this: It is much easier to grow cherry trees on Mahaleb stock in the nursery than on Mazzard, and a better looking tree can be delivered to the fruit grower when grown on Mahaleb. The first few years after planting, varieties budded on Mahaleb start off rather better than the same sorts budded on Mazzard. Subsequently, however, the growth and vigor of varieties on the two stocks is reversed.

Why is it easier in the nursery to grow cherries on Mahaleb than on Mazzard stock? Sweet cherries are difficult to grow at best. They are capricious as to soil, climate, cultivation, and pruning, as well as being susceptible to diseases and insects, and Mazzard stock has the faults of the species to which it belongs. Mahaleb is adapted to a greater diversity of soils, is hardier to either heat or cold, is less susceptible to insect injuries, and is less apt to be infested with the shot-hole fungus.

VARIETIES OF CHERRIES IN THE TEST

The 40 varieties of cherries used in the experiment, representing the two species *Prunus avium* and *Prunus cerasus* and Dukes, hybrids between these species, are as follows:

Sweet Cherries (*Prunus avium*)

Black Eagle	Knight
Black Tartarian	Lyons
Coe	Napoleon
Downer	Republican
Early Purple	Rockport
Elton	Schmidt
Governor Wood	Windsor
Ida	Yellow Spanish
Kirtland	

Sour Cherries (*Prunus cerasus*)

Brusseler Braune	George Glass
Carnation	Montmorency
Chase	Northwest
Double Natte	Ostheim
Dyehouse	Short-Stem Montmorency
Early Richmond	Sklanka
English Morello	Suda

Duke Cherries (*Prunus avium* x *Prunus cerasus*)

Abbesse d'Oignies	May Duke
Belle Magnifique	Olivet
Empress Eugenie	Reine Hortense
Late Duke	Royal Duke
Louis Philippe	

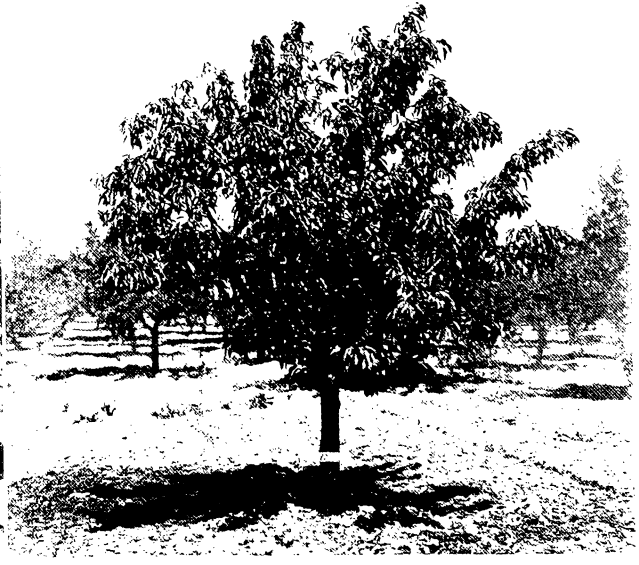
CULTURAL NOTES

Two trees of each variety on each stock were planted side by side in rows running north and south across the orchard. Buds for each of the 40 kinds were taken from a single tree of each of the several sorts growing on the Station grounds and budded on the respective stocks in the summer of 1910. The trees were set in the orchard in April, 1912. There were a few resets the following spring, but the new trees were of the same age. When the trees were set, the tallest ones were cut back to about 4 feet from the ground, but for the most part the majority were not headed back. Low side branches were removed when necessary. In subsequent prunings, the trees were lightly pruned, being thinned out a little and extra long branches headed back. Clean culture followed by a cover crop has been the practice for caring for the orchard. The trees have been sprayed with the usual spraying formulae for cherries.

The chief criteria of the relative merits of Mazzard and Mahaleb rootstocks for cherries are: The length of life of the tree; the size and vigor of the tree; and the yield and maturity of the fruit.

Black Eagle on Mazzard

Plate I



Black Eagle on Mahaleb

Black Tartarian on Mazzard

Plate II

Black Tartarian on Mahaleb

Early Purple on Mazzard

Early Purple on Mahaleb

Plate III

Republican on Mazzard

Plate IV

Republican on Mahaleb

Abbesse d'Oignies on Mazzard

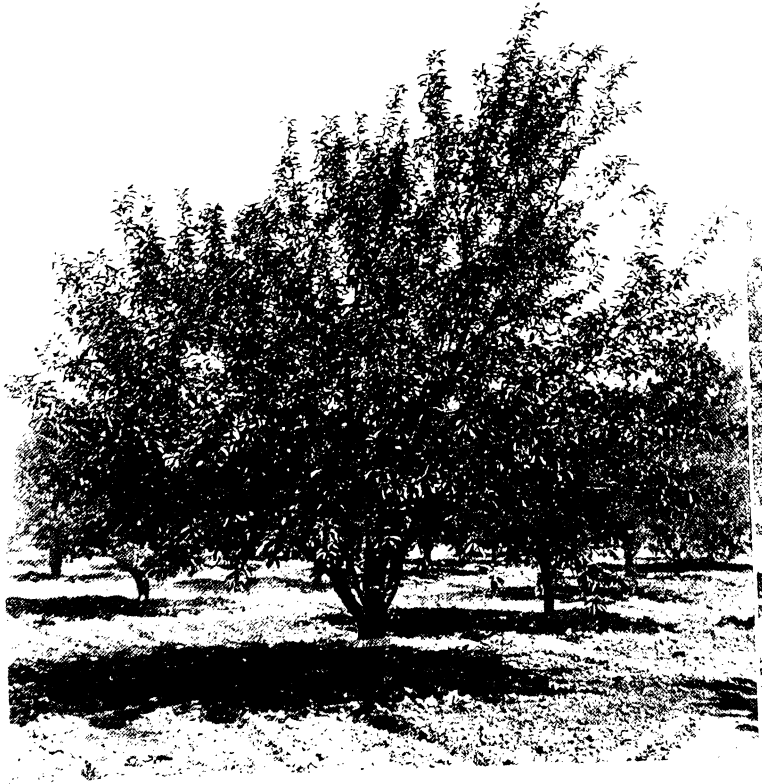
Plate V

Abbesse d'Oignies on Mahaleb

Brusseler Braune on Mazzard

Plate VI

Brusseler Braune on Mahaleb



Carnation on Mazzard

Plate VII

Carnation on Mahaleb

EARLY RICHMOND ON MAZZARD

PLATE VIII

EARLY RICHMOND ON MAHALEB

INFLUENCE OF MAZZARD AND MAHALEB ROOTSTOCKS ON CHERRIES

The results of the experiment have been summarized for two seven-year periods, covering the 14 years during which the experiment has been under way.

FIRST SEVEN-YEAR PERIOD

Out of a total of 34 trees, comprising 17 kinds of sweet cherries, on Mazzard roots, all were living and all were vigorous and normally large trees in 1919. Of the 34 trees on Mahaleb stock, 9 were dead,

TABLE 1.—CONDITION OF 17 VARIETIES OF SWEET CHERRIES ON MAZZARD AND MAHALEB STOCKS DURING THE FIRST 7-YEAR PERIOD ENDING IN 1919.

VARIETY	MAZZARD								MAHALEB							
	Number of trees living, 1919	Average diam. in inches, 1919	Size of head			Condition			Number of trees living, 1919	Average diam. in inches, 1919	Size of head			Condition		
			Large	Medium	Small	Vigorous	Weak	Dying			Large	Medium	Small	Vigorous	Weak	Dying
Black Eagle	2	4	*	–	–	*	–	–	1	3	–	–	*	*	–	–
Black Tartarian	2	5	*	–	–	*	–	–	2	4	–	*	–	*	–	–
Coe	2	6	*	–	–	*	–	–	2	4	–	–	*	*	–	–
Downer	2	5	*	–	–	*	–	–	2	4	–	–	*	–	*	–
Early Purple	2	4	*	–	–	*	–	–	2	4	–	*	–	*	–	–
Elton	2	4	*	–	–	*	–	–	2	3	–	*	–	*	–	–
Governor Wood	2	3	*	–	–	*	–	–	2	3	–	*	–	*	–	–
Ida	2	5	*	–	–	*	–	–	2	5	*	–	–	*	–	–
Kirtland	2	4	*	–	–	*	–	–	2	3	–	*	–	*	–	–
Knight	2	5	*	–	–	*	–	–	1	5	*	–	–	*	–	–
Lyons	2	5	*	–	–	*	–	–	2	4	*	–	–	*	–	–
Napoleon	2	3	*	–	–	*	–	–	2	4	*	–	–	*	–	–
Republican	2	5	*	–	–	*	–	–	2	3	–	*	–	*	–	–
Rockport	2	4	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Schmidt	2	5	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Windsor	2	3	*	–	–	*	–	–	1	2	–	*	–	*	–	–
Yellow Spanish	2	4	*	–	–	*	–	–	0	–	–	–	–	–	–	–

while the 25 remaining were vigorous with the exception of 2 which were weak. Only 7 of these 25 trees, however, were as large as the trees on Mazzard roots.

TABLE 2.—CONDITION OF 14 VARIETIES OF SOUR CHERRIES ON MAZZARD AND MAHALEB STOCKS DURING THE FIRST 7-YEAR PERIOD ENDING IN 1919.

VARIETY	MAZZARD								MAHALEB							
	Number of trees living, 1919	Average diam. in inches, 1919	Size of head			Condition			Number of trees living, in 1919	Average diam. in inches, 1919	Size of head			Condition		
			Large	Medium	Small	Vigorous	Weak	Dying			Large	Medium	Small	Vigorous	Weak	Dying
Brusseler Braune	2	4	*	–	–	*	–	–	1	4	*	–	–	*	–	–
Carnation	1	4	*	–	–	*	–	–	2	4	*	–	–	*	–	–
Chase	2	4	*	–	–	*	–	–	2	4	*	–	–	*	–	–
Double Natte	2	4	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Dyehouse	2	5	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Early Richmond	2	4	–	*	–	*	–	–	2	3	–	*	–	*	–	–
English Morello	2	2	–	*	–	*	–	–	2	2	–	*	–	*	–	–
George Glass	2	3	–	*	–	*	–	–	1	4	*	–	–	*	–	–
Mont-morency	2	3	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Northwest	2	3	*	–	–	*	–	–	2	3	*	–	–	*	–	–
Ostheim	2	3	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Short-Stem Mont-morency	2	3	*	–	–	*	–	–	2	2	–	*	–	*	–	–
Sklanka	2	3	*	–	–	*	–	–	2	4	*	–	–	*	–	–
Suda	2	3	–	*	–	*	–	–	0	–	–	–	–	–	–	–

From a total of 28 trees, comprising 14 kinds of sour cherries, on Mazzard stock, all but 1 tree were living in 1919, and all were vigorous trees of normal size. Of the 28 trees on Mahaleb stock, 12 were dead, while the 16 remaining trees were vigorous and 10 of them were as large as the sour cherries on Mazzard roots.

Out of a total of 18 trees of 9 sorts of Duke cherries on Mazzard roots, all but 1 were alive at the end of seven years. All were vigorous and of normal size. Of the 18 trees on Mahaleb stock, 15 were alive and vigorous and most of them were as large as the trees on Mazzard stock.

DISCUSSION OF FIRST SEVEN-YEAR PERIOD

The evidence shows that a larger number of trees of three groups of cherries on Mazzard and Mahaleb roots, all possessing equal size

and vigor when planted, were living and in normal health and vigor at the end of seven years on Mazzard roots than on Mahaleb roots. It is especially significant that varieties of sweet cherries on Mazzard

TABLE 3.—CONDITION OF 9 VARIETIES OF DUKE CHERRIES ON MAZZARD AND MAHALEB STOCKS DURING THE FIRST 7-YEAR PERIOD ENDING IN 1919.

VARIETY	MAZZARD								MAHALEB							
	Number of trees living, 1919	Average diam. in inches, 1919	Size of head			Condition			Number of trees living, 1919	Average diam. in inches, 1919	Size of head			Condition		
			Large	Medium	Small	Vigorous	Weak	Dying			Large	Medium	Small	Vigorous	Weak	Dying
Abbesse d'Oignies	2	4	*	–	–	*	–	–	2	3	–	–	*	*	–	–
Belle Magnifique	1	2	*	–	–	*	–	–	2	3	*	–	–	*	–	–
Empress Eugenie	2	3	–	*	–	*	–	–	2	2	–	–	*	*	–	–
Late Duke	2	3	–	*	–	*	–	–	1	3	–	*	–	*	–	–
Louis Philippe	2	4	*	–	–	*	–	–	2	4	*	–	–	*	–	–
May Duke	2	3	–	*	–	*	–	–	1	4	–	*	–	*	–	–
Olivet	2	4	*	–	–	*	–	–	1	4	*	–	–	*	–	–
Reine Hortense	2	4	*	–	–	*	–	–	2	4	*	–	–	*	–	–
Royal Duke	2	3	*	–	–	*	–	–	2	3	*	–	–	*	–	–

were larger, more vigorous, and healthy. Probably this was due in part to the fact that better unions were made with this stock because of the closer relationship between Mazzard and cultivated sweet cherries.

SECOND SEVEN-YEAR PERIOD

Out of a total of 34 trees, comprising 17 kinds of sweet cherries, on Mazzard roots, 32 are living at the end of 14 years. All are vigorous and possess normally large bearing areas. Of the original 34 trees on Mahaleb stock, only 14 remain. Each is weak and eight will die within a year or two. Three are as large as the trees on Mazzard, but they are weak and lacking in vigor.

TABLE 4.—CONDITION OF 17 VARIETIES OF SWEET CHERRIES ON MAZZARD AND MAHALEB STOCKS DURING THE SECOND 7-YEAR PERIOD ENDING IN 1926.

VARIETY	MAZZARD								MAHALEB							
	Number of trees living, 1926	Average diam. in inches, 1926	Size of head			Condition			Number of trees living, 1926	Average diam. in inches, 1926	Size of head			Condition		
			Large	Medium	Small	Vigorous	Weak	Dying			Large	Medium	Small	Vigorous	Weak	Dying
Black Eagle	2	7	*	–	–	*	–	–	1	5	–	–	*	–	*	*
Black Tartarian	2	9	*	–	–	*	–	–	1	7	–	*	–	–	*	*
Coe	2	10	*	–	–	*	–	–	1	7	–	–	*	–	*	–
Downer	2	9	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Early Purple	2	8	*	–	–	*	–	–	2	7	–	*	–	–	*	*
Elton	2	7	–	*	–	*	–	–	1	7	–	*	–	–	*	–
Governor Wood	2	6	–	*	–	*	–	–	1	7	–	*	–	–	*	*
Ida	2	10	*	–	–	*	–	–	2	10	*	–	–	–	*	–
Kirtland	2	7	–	*	–	*	–	–	1	7	–	*	–	–	*	–
Knight	2	10	*	–	–	*	–	–	1	9	–	*	–	–	*	*
Lyons	2	9	*	–	–	*	–	–	1	7	–	*	–	–	*	*
Napoleon	2	6	*	–	–	*	–	–	1	8	*	–	–	–	*	–
Republican	2	9	*	–	–	*	–	–	1	7	–	*	–	–	*	*
Rockport	2	8	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Schmidt	1	10	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Windsor	2	7	–	*	–	*	–	–	0	–	–	–	–	–	–	–
Yellow Spanish	1	7	*	–	–	*	–	–	0	–	–	–	–	–	–	–

At the end of 14 years, only 1 of the 28 trees, comprising 14 varieties of sour cheries, on Mazzard stock, is dead. Each of the 27 which are living is large, vigorous, and healthy. But 12 of the original 28 trees on Mahaleb stock remain. Seven of these are as large and vigorous as the trees on Mazzard roots, while the other five are smaller and weak and four, in fact, are dying.

Out of a total of 18 trees of nine kinds of Duke cherries on Mazzard roots, all but 1 are alive at the end of 14 years. Each is vigorous and each possesses a bearing area of normal size. Eleven of the original 18 trees on Mahaleb roots are living. Two of these are dying and five others are weak. There are six which are as large as the trees on Mazzard stock, but three of the six are weak and lacking in vigor.

TABLE 5.—CONDITION OF 14 VARIETIES OF SOUR CHERRIES ON MAZZARD AND MAHALEB STOCKS DURING THE SECOND 7-YEAR PERIOD ENDING IN 1926.

VARIETY	MAZZARD								MAHALEB							
	Number of trees living, 1926	Average diam. in inches, 1926	Size of head			Condition			Number of trees living, 1926	Average diam. in inches, 1926	Size of head			Condition		
			Large	Medium	Small	Vigorous	Weak	Dying			Large	Medium	Small	Vigorous	Weak	Dying
Brusseler Braune	2	7	*	–	–	*	–	–	1	6	–	*	–	–	*	–
Carnation	1	9	*	–	–	*	–	–	2	7	–	*	–	–	*	*
Chase	2	8	*	–	–	*	–	–	2	7	*	–	–	*	–	–
D'ble Natte	2	8	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Dyehouse	2	7	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Early Richmond	2	6	*	–	–	*	–	–	1	5	–	–	*	–	*	*
English Morello	2	4	*	–	–	*	–	–	1	5	*	–	–	*	–	–
George Glass	2	7	*	–	–	*	–	–	1	8	*	–	–	*	–	–
Mont-morency	2	6	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Northwest	2	5	*	–	–	*	–	–	1	7	*	–	–	*	–	–
Ostheim	2	6	*	–	–	*	–	–	0	–	–	–	–	–	–	–
Short-Stem Mont-morency	2	6	*	–	–	*	–	–	1	5	–	*	–	–	*	*
Sklanka	2	6	*	–	–	*	–	–	2	6	*	–	–	*	–	–
Suda	2	4	*	–	–	*	–	–	0	–	–	–	–	–	–	–

DISCUSSION OF SECOND SEVEN-YEAR PERIOD

The results of growing cherries on Mazzard and Mahaleb rootstocks, found at the end of seven years, were strikingly borne out during the second seven-year period. At the end of 14 years nearly all of the trees of the three groups of cherries on Mazzard stock are alive. All are in full vigor and health. All possess normal size. Less than half of the trees on Mahaleb stock are living and many of these are lacking in vigor.

TABLE 6.—CONDITION OF 9 VARIETIES OF DUKE CHERRIES ON MAZZARD AND MAHALEB STOCKS DURING THE SECOND 7-YEAR PERIOD ENDING IN 1926.

VARIETY	MAZZARD								MAHALEB							
	Number of trees living, 1926	Average diam. in inches, 1926	Size of head			Condition			Number of trees living, 1926	Average diam. in inches, 1926	Size of head			Condition		
			Large	Medium	Small	Vigorous	Weak	Dying			Large	Medium	Small	Vigorous	Weak	Dying
Abbesse d'Oignies	2	9	*	–	–	*	–	–	2	6	–	–	*	–	*	*
Belle Magnifique	1	5	–	*	–	*	–	–	1	5	*	–	–	*	–	–
Empress Eugenie	2	5	–	*	–	*	–	–	1	4	–	*	–	*	–	–
Late Duke	2	5	–	*	–	*	–	–	0	–	–	–	–	–	–	–
Louis Philippe	2	8	*	–	–	*	–	–	2	7	–	*	–	*	–	–
May Duke	2	5	–	*	–	*	–	–	0	–	–	–	–	–	–	–
Olivet	2	7	*	–	–	*	–	–	1	7	*	–	–	–	*	–
Reine Hortense	2	6	*	–	–	*	–	–	2	6	*	–	–	–	*	–
Royal Duke	2	5	*	–	–	*	–	–	2	5	*	–	–	*	–	–

CONCLUSION

This experiment shows that of the two stocks now in use Mazzard is more satisfactory than Mahaleb for all varieties of cherries. Sour and Duke cherries thrive better on Mahaleb roots than sweet varieties, but these groups are less vigorous and shorter-lived than when grown on Mazzard stock. Neither stock has any influence on the time of coming into bearing of the trees. Sweet cherries and Dukes, as a rule, bloom earlier on Mahaleb than on Mazzard stock, but there is little difference in the time of maturity of the fruit on the two stocks. Sour cherries are variable in respect to time of bloom on the two stocks, but the fruit ripens at the same time. Size, vigor, and longevity of the tree are the only characters which are affected by the stock.

It remains now to determine whether there are not other species of cherries which will be more suitable for use as stocks than either Mazzard or Mahaleb. Possibly one of the sweet cherries from which seed can be readily obtained may prove a better stock for sweet sorts, or one of the sour cherries, such as the Morello, for sour varieties, than either Mazzard or Mahaleb which most nurserymen are now using.