

Apple Rootstock Studies in Kansas*

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Apple rootstock studies have been conducted by the Department of Horticulture at the Kansas Agricultural Experiment Station since 1938. That year about 350 French Crab seedlings obtained from a Kansas nursery were planted about three feet apart in two rows six feet apart. The soil was a heavy loam underlaid with a gravelly clay subsoil. In 1939 another 250 seedlings were added to the plots. Many of the seedlings died during the first three seasons. Then on November 11, 1940, came the "Armistice Day freeze," when the temperature dropped from around 70° F. to near 0° F. within 24 hours. This being the first killing frost that fall, fruit plants were not hardened sufficiently. Only 62 trees survived, and these showed no evidence of damage when examined in the spring of 1941. The undamaged trees were numbered K₁ to K₆₂ and moved to a new site.

The "K-Series" has been propagated by layerage and by piece-root grafting. For various reasons such as incompatibility and susceptibility to diseases, many of the varieties have been discarded.

Several trees of each clone were topworked to Jonathan and Winesap in 1945. These varieties were grafted out on the scaffold branches 15 to 18 inches from the main trunk. Although French crab rootstocks are considered quite uniform, close observations of these stocks and the resulting topworked trees reveal the following variations:

Hardiness: Although all of the stocks had survived the 1940 fall freeze with-

out previous hardening, they were subjected to another rigorous test in January, 1947, when the temperature dropped to -32° F. Twelve of the 37 remaining stocks showed no damage, 18 very slight damage, and seven developed considerable blackheart. A report on the hardiness of these stocks was published in 1952.**

Strength: There is great variation in the development of the scaffold systems of the seedlings in the series. Some have strong leaders with scaffold branches coming out at almost right angles, while others have narrow crotches (Fig. 1). Those with wide-angled crotches seem to resist breakage more than narrow ones.

Pest Resistance: Some of the stocks seem resistant to fire blight while others are susceptible. A few of the stocks were severely damaged by fire blight during seasons favorable for the disease. A careful check during 1950 and 1951 when the disease was prevalent showed 22 resistant stocks, seven with slight damage, five with medium damage, and three severely damaged.

Stionic Effects:

Compatability: Several trees of each clone were topworked to Jonathan and others to Winesap in 1945. Cions were whip-grafted (with a few cleft grafts) onto the leader and scaffold branches. The cions took well on all stocks and made satisfactory growth the first two seasons. During the third and subsequent seasons, some of the stocks showed

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signs of growing faster in diameter than the cions, many made uniform unions, and only two grew more slowly than the cions. Some of the K-Series cions seem to have a marked invigorating effect on piece roots onto which they are grafted.

Dwarfing: Although the topworked trees are only nine years old, there is considerable evidence of dwarfing caused by some of the stocks. Six of the 37 stocks topworked to Jonathan and Winesap are much smaller than standard trees, nine are noticeably smaller, and the remainder are standard or above in size.

Drought Resistance: This factor is difficult to measure. Of the 600 original seedlings, many died from lack of moist-

ure during the first three seasons. Since 1940 Kansas has had several dry seasons, and the remaining rootstocks seem to have maintained normal vigor. This is true of both the topworked trees and those that have not been grafted but have grown to maturity.

The studies of these apple rootstocks are continuing and a series of cherry stocks is being added. Some of the apple stocks are being tested in Delaware, Iowa, Maine, Michigan, Nebraska, Oklahoma, Wisconsin, Wyoming, and in two stations in Canada. If these apple stocks have valuable characteristics that are lacking in present available stocks, the studies should serve a useful purpose.

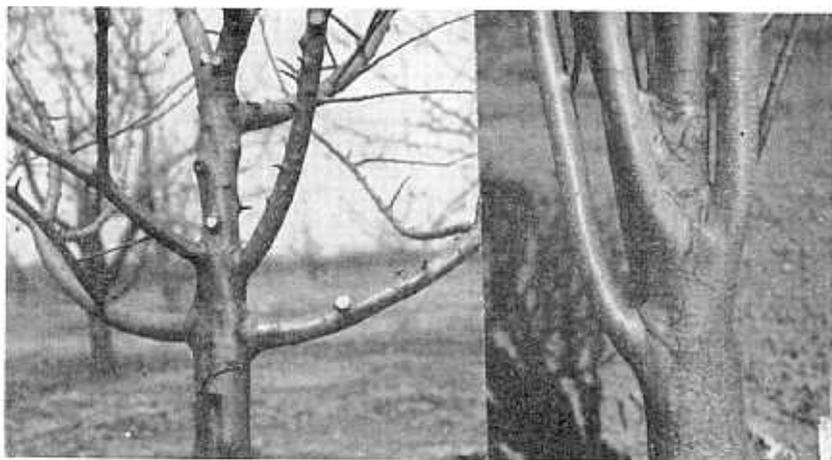


Fig. 1. Left, K1 showing wide-angled crotches; right, K17 with narrow crotches.

To the Editor:

For many years now I have amused myself by planting many new varieties of fruits for the purpose of testing their suitability to the hills of Western Pennsylvania near Pittsburgh, in the hope that I would now and then find some superior varieties which I would enjoy cultivating, multiplying and perhaps giving to my friends.

I want you to know that many an am-

ateur is taking advantage of the information contained in the **FRUIT VARIETIES AND HORTICULTURAL DIGEST**.

I look forward to the next edition as spring will soon be here and I have a few spots for new trees.

Sincerely,

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