A Method of Controlling the Chestnut Blight on Partially Resistant Species and Hybrids of Castanea

By ARTHUR HARMOUNT GRAVES
Connecticut Agricultural Experiment Station, New Haven
and
Division of Forest Pathology, U.S.D.A. Plant Industry Station,
Beltsville, Maryland

This method has been in use since 1937 on our chestnut plantations, and has been so remarkably successful that we believe all chestnut growers should be thoroughly acquainted with it.

Whenever chestnut trees are attacked by the blight fungus, suckers arise below the lesion, and if the lesion is at or near the base of the tree, as often happens, these suckers grow from the base of the tree, i.e. at the root collar. It is then a simple matter to cut out the diseased bark of the lesion with a sharp knife, paint over the wound, and graft the tip of one or more of these suckers **above** the lesion, into the healthy bark. Of course the sucker must be long enough to reach the healthy part of the bark above the lesion. It is measured roughly by the eye and then cut off at a proper length, usually a little longer than seems necessary. The tip is then sharpened into two beveled surfaces coming up to a thin sharp transverse edge like a long wedge. (Fig. 1a.) The tip edge must be very sharp in order to push up easily between the bark and wood. Now, or rather, before trimming the sucker, in the healthy bark above the blight lesion cut an inverted T, making the cut into the bark as far as the wood and then cut a gradual slope from the sur-

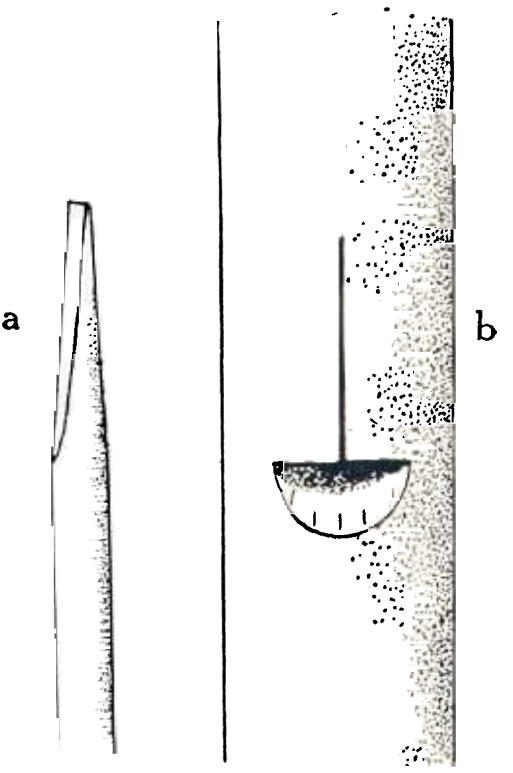

Fig. 1

face of the bark down to the horizontal part of the inverted T. Next, lift the bark gently from the wood above the horizontal cut and insert the end of the sucker. If the sucker, or scion, is slightly longer than

Figure 2. Showing inarching method of controlling the chestnut blight. a. Chinese-Japanese hybrid chestnut, 13 years old, infected toward base with Chinese type of blight, i.e. in outer bark only. Right: sucker inarched in spring of 1946; left, inarched spring of 1950. (The black figure resembling an arrow, about half way up, is accidental, being a cluster of labels.) b. Grafted tree (the large tree of Japanese-American chestnut on Japanese stock); graft made in 1937 where finger is pointing; left: inarch of 1947, itself inarched near base in 1950; right, inarch of 1949. c. Japanese-American hybrid chestnut with principal inarch made in 1943; other later inarchings showing in part. All photos by Louis Buhle, Brooklyn Botanic Garden, and loaned courtesy of the Garden.

the upper end of the cut, it can be bent outward at the same time that the scion is being inserted and thus a spring is secured making it easier to force the scion up between bark and wood. I should add that if the lesion is not at the base of the tree, suckers usually arise just below it in any case, and these can be inarched in the same way as the basal shoots.

The next step is to bind together the parts being grafted, winding strong, cotton string firmly around the cut with its scion enclosed, covering practically all of the vertical cut of the inverted T. Finally, melted paraffin—not too hot—is applied to the union, every part being carefully covered in order to exclude air and thus prevent drying out. We use Clarke's melter which, with adjustment of the flame, will keep the paraffin at a temperature slightly above the melting point and thus will not get too hot. Grafting wax may also be used instead of paraffin. The best time to perform the operation in Connecticut is during April or early May.

Our first scions or inarches, grafted in 1937, are now 6 inches in diameter at ground level and constitute the main tree. If they become blighted, other suckers are inarched into them, and so on. The purpose of the inarching is to restore the communication between leaves and roots, which is so essential to the life and health of the tree, and which the diseased bark of the blight lesion interrupts, eventually causing girdling and death of the trunk or branch attacked. A series of these inarchings of different ages is shown herewith. (Fig. 2.) On our plantations we no longer dread the chestnut blight, since we can usually circumvent it by this method. However, with the American chestnut, because the fungus advances rapidly in this species, the girdling is often completed before the scions can take hold. Therefore, with that species or with the least resistant hybrids the method is often though not always ineffectual.

This method of grafting is not new. It is similar to bridge grafting and has been known and practiced for centuries. The only credit we can claim is for its application to the chestnut blight as a method of control.—Reprinted from 41st Annual Report of the Northern Nut Growers Association (1950 meeting.)