PEACH ROSETTE, AN INFECTION MOSAIC

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HISTORY OF THE DISEASE

According to Smith, peach rosette was first noted in Georgia in 1881. By 1891 this disease had been reported from 22 counties in Georgia, from South Carolina, and from Kansas. Rosette was also reported as occurring on plums in Georgia and Kansas, and on almonds in Kansas.

Since 1903, reports of the presence of rosette have come to the Plant Disease Survey, of the United States Department of Agriculture, from 19 counties in Georgia, 1 county in Alabama, 5 counties in South Carolina, 4 counties in Tennessee, 1 county in West Virginia, 19 counties in Missouri, and 2 counties in Oklahoma. These records indicate that for the past 40 years rosette has taken its toll of trees, and that it has spread over a considerable area.

IDENTITY OF THE DISEASE

In 1890-91, Smith conducted experiments in middle Georgia in which he showed that peach rosette is an infectious disease. Of 125 seedling peach trees into which he inserted buds from a rosetted peach tree, 121 developed rosette.

In June, 1891, Smith inoculated 37 Elberta peach trees with buds from a rosetted Kelsey plum. Two trees developed rosette and died in August, 1892. The other inoculated trees remained healthy. As a result of this experiment Smith said:

The small per cent of cases to unions makes it necessary to repeat this experiment before it can be stated positively that the plum disease is identical with that of the peach and transmissible to it, as seems very probable from its appearance.

In June, 1891, Smith inoculated 104 Marianna plum trees by inserting buds from rosetted peach trees. After 16 months not a single case of rosette had developed on the Marianna plums, so he concluded:

There is, therefore, good reason to believe that the Marianna plum is not subject to this disease.

In June, 1891, 12 Marianna plum trees were inoculated by Smith with buds from a rosetted Kelsey plum. On final examination in November, 1892, the Marianna plums showed no signs of rosette.

The presence of rosette in orchards at the Georgia Experiment Station, and in a number of commercial orchards in various sections of the State led to further study of this disease by the writer, beginning in 1919. As data presented by Smith indicated that fungi and microscopic bacteria were not the cause of rosette, the writer did not attempt to repeat this phase of the work.

1 Accepted for publication Aug. 18, 1922.
3 SMITH, Erwin F. THE PEACH ROSETTE. In Jour. Mycol. v. 6, p. 147-148, pl. 8-13. 1891.
EXPERIMENT I.—In the spring of 1919, rosette appeared on one side of a six-year-old seedling peach tree in an experimental orchard at the station. The other side of this tree appeared normal throughout the summer of 1919. During this time buds from healthy peach, plum, and apricot trees were inserted into the new growth of the normal appearing branches. The plum buds failed to unite with the peach stock. The peach and apricot buds united with the peach stock, but remained dormant throughout the summer. In the spring of 1920, the branches of the seedling peach which showed rosette in 1919, did not produce leaves, and examination showed that they were dead. The branches which appeared normal in 1919 produced rosetted growth in the spring of 1920. The peach and apricot buds inserted in 1919 produced typical rosetted shoots showing that the causal entity had passed from the diseased peach stock to the buds. The apricot buds produced shoots from two to three inches in length and the leaves had the mottled appearance of a mosaic disease. The mottled appearance was not so striking on the peach leaves. The shortened internodal growth, together with mottling of the leaves of some hosts and the absence of microscopic bacteria, put peach rosette in the class of virus or mosaic diseases. This experiment indicated that both the peach and the apricot are hosts for rosette.

PEACH TO PEACH

EXPERIMENT 2.—On June 10, 1919, buds from a healthy Elberta peach tree about 20 years of age were put in the new growth of two seedling peach trees about two years of age to serve as controls. On the same date buds from rosetted shoots of the seedling peach described in experiment 1 were put in the new growth of two peach seedlings the same age as the controls. On August 29, 1919, it was observed that the Elberta buds on the control trees had grown into healthy shoots. In one of the inoculated trees a diseased bud had developed rosettes characteristic of this disease. In the other inoculated peach seedling the bud had remained dormant, but the buds of the stock immediately below the point of inoculation had developed typical rosettes. In May, 1920, it was observed that the two control trees were healthy and growing vigorously, while the inoculated trees had become completely rosetted (Pl. 1, A).

PEACH TO APRICOT TO PEACH

EXPERIMENT 3.—On August 15, 1919, two buds from a rosetted twig of the peach tree described in experiment 1 were put into the new growth of a healthy Royal apricot, which was in its second year of growth. The peach buds remained dormant until the spring of 1920 when they developed into rosetted shoots. The lateral buds on the apricot branch below the point of inoculation also developed weak shoots, but the leaves did not have the typical rosetted appearance. The internodal growth, although longer than that of the rosetted peach shoot (Pl. 2, A), was much less than that of healthy apricot trees growing near. Plate 2, B, shows the stunted growth of this Royal apricot 12 months after inoculation with peach rosette. While the growth is not typical of rosette as
it appears in the peach, the shortened internodal growth, and the mottling of the leaves indicate that the causal entity had been transferred from the peach to the apricot.

On September 2, 1920, two buds were taken from the rosetted Royal apricot and inserted in a peach seedling, growing in a pot in the greenhouse. These buds remained dormant until April, 1921, when they began to develop mottled leaves. The new growth of the peach seedling developed typical rosettes (Pl. 1, B). Both the potted rosetted peach seedling and the rosetted Royal apricot tree died during the summer of 1921.

Experiment 3 shows that the causal entity of rosette may be transferred from peach to apricot, and from apricot to peach, proving that apricot and peach rosette are identical as far as causal entity is concerned, but somewhat different in external manifestations of the disease.

STUNTING OF APRICOT GROWTH BY ROSETTE

EXPERIMENT 4.—In the spring of 1920 another case of natural infection of peach rosette (Pl. 3, A) developed in a 6-year-old seedling peach tree growing in the same orchard about 150 feet from the rosetted seedling described in experiment 1.

On June 19, 1920, buds from this second rosetted seedling peach were inserted into a branch of a one-year-old Moorpark apricot about a foot above the ground. By August 20, 1920, both of the peach buds had grown into rosetted shoots (Pl. 5, B), but the stock showed symptoms of rosette only in the growth immediately below the inserted peach buds, where the apricot leaves became mottled. An apricot limb adjoining the one which was inoculated, made a growth of 4 feet and 4 inches during the summer of 1920, and bore normal green leaves. There was no growth of lateral buds. On April 11, 1921, the lateral as well as the terminal buds on all the apricot branches had produced mottled, greenish yellow leaves, in marked contrast to the normal green leaves of the near-by healthy apricot. This indicated that the causal entity of rosette had spread throughout the apricot tree. During the summer of 1921 this Moorpark apricot tree grew very slowly, the maximum growth of any one branch being 5 inches. During the same time the near-by healthy apricot tree made a growth of 4 feet and 9 inches. Plate 3, B (taken in the fall of 1921) shows the inoculated apricot tree with a background, at the left, in contrast to the healthy apricot tree at the right. An indication of the stunting effect of rosette is shown by the inoculated tree in which the maximum vertical growth of 4 feet and 4 inches made during the summer of 1920 represents normal growth; while the maximum horizontal growth, 5 inches, represents development made during the summer of 1921 under the retarding influence of rosette.

PEACH TO CULTIVATED PLUM

EXPERIMENT 5.—On August 6, 1919, a bud from a healthy Blue Damson plum was placed in the trunk of a healthy peach seedling which came up in the spring of 1919. This plum bud made a few inches of growth during the summer of 1919, and in the summer of 1920, made a growth of more than 2 feet. Neither the plum branch nor the peach stock showed any symptoms of disease up to June 19, 1920, when two buds from the rosetted peach tree described in experiment 4, were inserted in
the Damson plum branch. The diseased peach buds started growth within two weeks, producing typical rosetted shoots, but with somewhat larger leaves and more internodal growth than did similar rosetted buds on the diseased peach stock from which the buds were taken. During the summer of 1920, the plum buds just below the place where the peach buds were inserted, developed small rosettes of mottled leaves (Pl. 4, A) indicating that the causal entity had passed from the diseased peach buds into the healthy Damson plum branch. None of the branches of the peach stock on which the plum was budded showed symptoms of rosette during the summer of 1920. The growth of the peach stock was so vigorous that a small copper wire, by which a label had been attached to the trunk in 1919, became embedded in the tissues of the stock, a few inches above the point where the Damson plum bud was inserted. In the spring of 1921, rosette developed in all growth of the Damson plum branch, and in all branches of the peach stock which grew from the trunk at points below where the copper wire was embedded in the tissues. None of these rosetted branches set fruit, though a few produced weak blossoms. All of the branches which grew from the trunk above where the wire was embedded produced normal leaves and blossoms which set numerous fruits. By July, 1921, the leaves on this tree began to wither, and by August 20 the tree was practically dead (Pl. 4, B). No symptoms of rosette appeared on the tree above the embedded wire, and the leaves and fruits shriveled and clung to these branches for some time after the tree was dead. The fact that no symptoms of rosette appeared above the embedded wire supplies additional data as to the tissues through which the causal entity progresses, and is being further investigated.

In this experiment rosette was transferred from the peach to the plum, and back to the peach, indicating that peach and plum rosette are identical.

Rosette has also been transferred from peach to Red June plum by means of infected buds.

PEACH TO WILD PLUM TO PEACH

EXPERIMENT 6.—On September 22, 1920, buds from a rosetted Mayflower peach, 7 years old, which developed as a natural infection in one of the station orchards in the spring of 1920, were put in two wild Chickasaw plum trees, growing in a fence row on the station. These buds remained dormant until the spring of 1921, when both the peach buds and the plum stock developed rosetted shoots. The inoculated plums (Pl. 4, C) grew more slowly than the surrounding healthy plum trees during the summer of 1921. The appearance of the rosetted wild plum is not so striking as that of a rosetted peach, because the plum is naturally of dwarfed growth. The wild plum, being of no economic importance, grows in waste places without coming under the close observation of man; therefore one or more rosetted wild plum trees might easily be an unobserved source of infestation to surrounding orchards.

On May 23, 1921, buds from the rosetted wild Chickasaw plum were inserted in the new growth of a 2-year-old seedling peach. During the summer one of these plum buds produced a rosetted shoot about an inch in length, but no symptoms of rosette appeared in the peach stock up to the time it was defoliated by frost. In the spring of 1922 this
peach seedling showed rosette in all new growth (Pl. 5, A). Peach seedlings into which healthy plum buds were inserted in 1921 showed no symptoms of rosette in the new growth of 1922.

This indicates that the casual entity of rosette may readily be transmitted from peach to wild plum, and from wild plum to peach.

Rosette has also been transmitted from the wild Chickasaw plum to the Red June plum by means of infected buds.

PLUM TO PEACH

EXPERIMENT 7.—A natural infection of a Maynard plum developed in an orchard on the station in the spring of 1920. By June 15, 1920, most of the lateral buds had grown into rosetted shoots from 1 to 3 inches long; and by August, 1920, this tree (Pl. 6, B) had made very little new growth as compared with a near-by healthy plum tree (Pl. 6, A). On June 18, 1920, buds from this rosetted plum tree were put into a healthy seedling peach tree in its second season's growth. Buds from a healthy plum were put into another peach seedling to serve as a control. On August 18, 1920, it was observed that some of the rosetted Maynard plum buds put into the peach seedling had produced shoots several inches long. Below the point where the diseased buds were inserted the peach buds had developed rosetted shoots (Pl. 6, C). The disease continued to spread in this peach seedling during the rest of the season of 1920, and when new growth started in the spring of 1921 this tree showed rosette in all parts. It died before midsummer. One of the control buds produced normal leaves (Pl. 7, A) and the peach stock on which it was growing was alive and healthy in the fall of 1921 when it was removed to make room for other experimental work.

This experiment indicates that rosette originating in the cultivated plum may be transmitted to the peach.

PEACH TO MARIANNA PLUM

EXPERIMENT 8.—On June 18, 1920, buds from the rosetted peach seedling described in experiment 4 were put into a healthy Marianna plum branch, near the base of the tree. One bud started growth within two weeks and produced a rosetted shoot (Pl. 7, B) with larger leaves and longer internodal growth than rosetted shoots on peach stocks. No signs of rosette appeared on the Marianna stock during the summer of 1920. After becoming dormant in the fall of 1920, this Marianna plum was transplanted to a large pot and placed in the greenhouse. In the spring of 1921 the peach shoot developed rosetted leaves, but continued to grow throughout the summer. The Marianna plum stock developed normal leaves on all of its branches, which grew rapidly throughout the summer. This Marianna plum (Pl. 7, C) had been under observation in the greenhouse during the winter, and up to May 1, 1922, it showed no symptoms of rosette. The rosetted peach shoot continued to grow slowly. When rosetted peach buds were put into a susceptible host, as peach, apricot, or ordinary cultivated plums, they died within 12 months. On the resistant Marianna plum stock the rosetted peach bud grew into a shoot which at the time this paper was written had lived for 22 months. This indicated that the resistant stock exerted a marked influence on the virulence of the causal entity of rosette in the peach scion.
PLUM TO MARIANNA PLUM

Experiment 9.—On June 18, 1920, buds from the rosetted Maynard plum described in experiment 7 were put into a Marianna plum branch, near the base of the tree. By September 18, 1920, one of the diseased buds had produced a rosetted shoot 8 inches in length with three branches from 3 to 5 inches in length (Pl. 8, A). This rosetted Maynard plum branch made considerably more growth on the Marianna stock than similar buds made on the susceptible Maynard stock, but the growth was decidedly rosetted and the leaves were mottled yellowish green. The Marianna stock grew vigorously throughout the summer of 1920 and showed no external symptoms of rosette.

Buds from a healthy Mayflower peach tree were put into the new growth of the Marianna stock on which the rosetted Maynard plum shoot was growing on September 18, 1920. These peach buds remained dormant until the spring of 1921, when two buds grew into healthy peach shoots. The Marianna plum branches and the Mayflower peach shoots made a vigorous growth during the summer of 1921, which showed no symptoms of rosette. The Maynard plum shoot made some growth during the summer of 1921, but at all times it had the characteristic symptoms of rosette. In the spring of 1922 the Marianna plum stock and the two Mayflower peach shoots (Pl. 8, B) developed normal leaves in contrast to the rosetted Maynard plum branch.

This experiment gave additional evidence that the Marianna plum is not susceptible to rosette. It also indicated that the causal entity of rosette does not pass from a host, such as the Maynard plum, through the tissues of the resistant Marianna plum stock to another susceptible host, as the Mayflower peach.

PEACH TO MAZZARD CHERRY

Experiment 10.—On June 19, 1920, buds from the rosetted peach tree described in experiment 4 were put into a healthy Mazzard cherry seedling about 1 year of age. On the same date buds from a healthy Elberta peach tree were put into a near-by Mazzard cherry tree of the same age to serve as a control. One of the rosetted buds united with the cherry stock and made a very feeble growth of rosetted leaves. The healthy buds united with the cherry stock but remained dormant. During the summer of 1920 the inoculated cherry stock grew slowly as compared with the control tree. The leaves of the inoculated tree became yellowish green and the new growth was small and in tufts similar to rosettes of peach leaves. The inoculated cherry stock developed leaves from both lateral and terminal buds in the spring of 1921, giving the new growth a decidedly rosetted appearance, especially at the tips of the branches. The control cherry stock produced vigorous new growth from the terminal buds. Very little growth was made by the diseased cherry tree during the summer of 1921, as shown by the smaller and more rolled leaves compared to those of the healthy control tree. The healthy Mazzard cherry control tree matured its buds and became dormant during the fall of 1921, while the diseased cherry tree attempted to make new growth from the terminal buds throughout the winter. By April 25, 1922, the inoculated tree (Pl. 9, A) was much stunted and had the appearance of being in an advanced stage of rosette, while the control
tree (Pl. 9, B) showed no symptoms of rosette and had made a vigorous growth.

This experiment indicates that the causal entity of peach rosette may be transmitted to Mazzard cherry and may produce symptoms similar to but not exactly the same as rosette of the peach. In the case of the Mazzard cherry there is evidently some resistance to the causal entity of rosette, for the infected cherry tree was alive June 1, 1922 (when this paper was written), 23 months after showing symptoms of rosette. Rosette has also been transmitted to two additional Mazzard cherry trees by means of infected peach buds.

**WILD PLUM TO BITTER ALMOND**

**Experiment II.**—Through the courtesy of members of the California Agricultural Experiment Station, fresh seed of Bitter almond, and Texas Seedling almond were obtained and planted in the greenhouse on November 24, 1920. During April, 1921, some of the young almond trees were transplanted to the nursery. On May 23, 1921, buds from a rosetted wild Chickasaw plum (used in experiment 6) were put into two Bitter almond seedlings in the nursery. Three uninoculated trees of the same variety served as control. The plum buds united with the almond stocks and during the summer of 1921, one grew into a rosetted shoot about 6 inches long. Almond buds on the stock below the point where the rosette plum buds were inserted grew into small rosetted shoots which died during the winter. By May 24, 1922, the new growth of this inoculated tree was stunted (Pl. 10, A), and the leaves were yellowish green. The other inoculated tree had shown no marked symptoms of rosette at the time this paper was written. The adjoining uninoculated trees made a vigorous growth in the spring of 1922 and showed no symptoms of rosette.

This experiment indicates that the Bitter almond is susceptible to rosette.

**APRICOT TO BITTER ALMOND AND TEXAS SEEDLING ALMOND**

**Experiment 12.**—On April 18, 1921, buds from the rosetted Royal apricot of experiment 3 were put into one Bitter almond and one Texas Seedling almond growing in pots in the greenhouse. The buds united with the almond stocks, but made very little growth during the summer of 1921. Lateral buds on the two almond stocks, below the points of inoculation, developed small rosetted shoots indicating that the causal entity had been transferred from the rosetted apricot to both Bitter almond and Texas Seedling almond. Uninoculated almond trees of the two varieties growing in near-by pots remained healthy. In the spring of 1922 the inoculated trees became rosetted in all parts; the growth was stunted and the leaves were yellowish green. The uninoculated trees made a vigorous growth, however, and bore healthy green leaves.

This experiment proves that both the Bitter almond and the Texas Seedling almond are susceptible to rosette.

**ALMOND TO PEACH**

**Experiment 13.**—On February 2, 1922, buds were taken from the rosetted Bitter almond and Texas Seedling almond of experiment 12 and inserted in healthy peach seedlings growing in pots in the greenhouse.
One of the Bitter almond buds had produced a much branched shoot about 16 inches long by June 1, 1922, the leaves of which were more tufted in growth than those of healthy Bitter almonds. The peach shoots which grew from the stock below the point of inoculation had developed an upward rolling of their older leaves and most of the lateral buds had produced small rosettes of yellowish green leaves (Pl. 10, B).

The Texas Seedling almond buds remained dormant and up to June, 1922, the peach stock into which they were inserted had shown no symptoms of rosette. Peach seedlings budded to healthy almonds have remained healthy up to June 1, 1922.

This, together with the foregoing experiments, indicates that peach, apricot, plum, and almond are susceptible to rosette and that in all cases the causal entity is the same.

SOIL TRANSMISSION OF ROSETTE

EXPERIMENT 14.—Natural infection of rosette has been observed by the writer in Georgia on peach trees from 2 to 8 years of age. Where rosette develops in an orchard of young trees the question arises as to the advisability of setting a healthy tree in the place from which a diseased tree has been removed. It has been proved by Smith⁵ that infection may be produced through inoculation of peach roots, so it seemed advisable therefore to test soil transmission.

Two 6-year-old peach trees, which had developed rosette in the spring of 1919, were dug up September 5 of the same year and removed from the orchard. Early in January, 1920, a healthy 1-year-old peach tree on peach stock was set in each hole. No attempt was made to remove fragments of roots left from the resetted trees. The two transplanted trees made satisfactory growth during the summers of 1920 and 1921 showing no symptoms of rosette. This indicates that one may safely set a healthy tree in a place from which a rosetted tree has been removed.

THE TRANSMISSION OF ROSETTE BY MEANS OF SAP FROM DISEASED TREES

In rosette of the several species of Prunus there is a shortening of internodal growth and in some cases mottling of the leaves similar to mosaic diseases of vegetable and field crops. Numerous inoculations have been made in various parts of susceptible species of Prunus using methods known to be successful in transmitting mosaic of other plants. In no case has rosette been produced by transfers of sap from rosetted to healthy trees, but experiments along this line are being continued. The results obtained thus far confirm data presented by Smith⁶ to the effect that under artificial conditions rosette is transmitted only when an organic union takes place between infected tissues, and tissues of a susceptible host. Thus in experiments conducted to date, rosette differs from other mosaics in the method of artificial transmission, indicating that the causal entity is somewhat different from that of other mosaics.

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⁴ Smith, Erwin F. ADDITIONAL NOTES ON PEACH ROSETTE. In Jour. Mycol., v. 7, p. 226-233. 1893.
⁵ Smith, Erwin F. THE PEACH ROSETTE. In Jour. Mycol., v. 6, p. 143-148, pl. 8-13. 1891.
NATURAL TRANSMISSION OF ROSETTE

The development of rosette in trees, often at a considerable distance from any known source of infection, indicates that winged insects or birds may be associated with natural transmission of this disease.

Various insects are found associated with rosetted trees, the most abundant being the black peach aphid, *Anuraphis persicae niger* Smith. Numerous tests have been made by removing insects, including several species of beetles and leafhoppers from various parts of rosetted trees, and caging them on healthy peach and plum trees. In no case has rosette developed. At various times throughout the growing season for the past two years, numerous black peach aphids have been transferred from rosetted peach and plum trees to healthy peach, plum, cherry, apricot, and wild plum trees growing in cages. The colonies of aphids increased rapidly in size showing that they were under favorable conditions. In no case did rosette develop as a result of these aphid transfers. These tests indicate that the causal entity of rosette is not readily transferred by the types of insects which are known to carry mosaic virus of other plants.

The writer is of the opinion that further study will disclose the fact that an animal, other than man, is responsible for the dissemination of the causal entity of rosette. Therefore observations along this line are being continued.

SUMMARY

The data obtained from the foregoing experiments verify the findings of Smith to the effect that rosette is readily transmitted from peach to peach by infected buds.

Rosette has also been transmitted to two varieties of apricots, two varieties of cultivated plums, one wild plum, one cherry, and two varieties of almonds by means of infected buds.

On some hosts rosette produces a mottling of the leaves similar to mosaics.

The Marianna plum is immune to rosette.

Limited tests indicate that rosette is not soil-transmitted.

Numerous attempts to transmit rosette by means of sap from diseased trees has proved unsuccessful.

In a large number of transfers of various types of insects from rosetted trees to healthy susceptible hosts, not a single case of rosette was transmitted.
PLATE 1

A.—A 2-year-old peach tree into which buds from a rosetted peach were inserted June 10, 1919. Note the appearance in May, 1920, with all growth rosetted.

B.—The peach seedling into which buds from a rosetted Royal apricot were inserted September 2, 1920. Note the appearance in the summer of 1921, with all growth rosetted.
Peach Rosette, an Infectious Mosaic

Journal of Agricultural Research

Washington, D.C.
Peach Rosette, an Infectious Mosaic

PLATE 2

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PLATE 2

A.—A Royal apricot tree into which buds from a rosetted peach were inserted August 15, 1919. Note the rosetted peach shoot, and the stunted growth of the apricot shoots, made in 1920.

B.—The Royal apricot tree inoculated with peach rosette August 15, 1919. Note the stunted appearance of the whole tree on September 2, 1920.
PLATE 3

A.—A 6-year-old peach tree which developed a natural infection of rosette in the spring of 1920. Note the rosetted growth on the left in comparison with the apparently normal growth of two limbs on the right. During the summer of 1920 this tree developed symptoms of rosette in all parts.

B.—To the left, with a background, the Moorpark apricot shown in Plate 5, B, which was inoculated with peach rosette, June 19, 1920. Note the stunted growth of this tree in the fall of 1921, in comparison with the healthy apricot tree, to the right, without a background.
Peach Rosette, an Infectious Mosaic

PLATE 4

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Washington, D. C.
PLATE 4

A.—The Blue Damson plum branch into which rosetted peach buds were inserted June 19, 1920. Note the rosetted and mottled plum leaves just below the rosetted peach shoots.

B.—The peach seedling which was infected with rosette through a Blue Damson plum branch inoculated with buds from a rosetted peach. The arrow at 'a', shows the point on the peach stock from which the plum branch grew from a healthy bud inserted in 1919. The arrow at 'b', shows the location of the embedded copper wire above which the causal entity of rosette did not go. Note the condition August 20, 1920, with the leaves and fruits shriveled and dying.

C.—One of the wild Chickasaw plum trees into which rosetted Mayflower peach buds were inserted September 22, 1920. Note the stunted growth and the rosetted condition of this plum tree on September 2, 1921.
PLATE 5

A.—A seedling peach into which buds from a rosetted wild Chickasaw plum were inserted May 23, 1921. Note the completely rosetted condition of the peach seedling in May, 1922.

B.—A Moorpark apricot into which buds from a rosetted peach were inserted June 19, 1920. Note the rosetted shoots produced by the peach buds at b, and the apparently healthy growth of the apricot.
Peach Rosette, an Infectious Mosaic

PLATE 5

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Peach Rosette, an Infectious Mosaic

PLATE 8

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A.—A healthy plum tree showing the vigorous growth made by August, 1920.
B.—The Maynard plum which developed rosette in the spring of 1920. Note the stunted growth and rosetted leaves which developed by August, 1920.
C.—The peach seedling into which rosetted Maynard plum buds were inserted June 18, 1920. Note the rosetted plum shoot which developed from one of the buds, and the rosetted peach shoots which developed as a result of inoculation with infected plum buds.
PLATE 7:

A.—The peach tree into which healthy plum buds were inserted June 18, 1929, to serve as a control. Note the healthy growth of the peach stock, and of one plum bud (indicated by the arrow).

B.—The Marianna plum tree into which buds from a rosetted peach seedling were inserted June 18, 1929. Note the rosetted shoot produced by one of the peach buds.

C.—The Marianna plum tree, shown in B, after another season's growth. Note the vigorous, healthy growth of the Marianna stock in contrast to the stunted growth of the peach shoot at a, with small rosettes at the tips of the branches.
Peach Rosette, an Infectious Mosaic

PLATE 7

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Washington, D. C.
PLATE 8

A.—The Marianna plum tree into which buds from the rosetted Maynard plum were inserted June 18, 1920. Note the vigorous growth of the Marianna branches in contrast to the rosetted shoot, at the right, produced by one Maynard bud after three months' growth.

B.—The Marianna plum stock (same as in A but from the opposite side of the tree), showing the healthy growth of the two Mayflower peach shoots at a, in contrast to the stunted, rosetted Maynard plum shoot at b.

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PLATE 9

A.—The Mazzard cherry stock into which buds from a rosetted peach seedling were inserted June 19, 1920. Note the stunted growth and rosettes of leaves.

B.—The Mazzard cherry stock of the same age as A, into which healthy Elberta buds were inserted as a control.
Peach Rosette, an Infectious Mosaic

PLATE 10

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PLATE 10

A.—Bitter almond seedlings growing in the nursery. Note the stunted growth of the tree to the left with a rosetted plum shoot near the base, on May 24, 1922. This tree was inoculated May 23, 1921, with infected wild Chickasaw plum buds. The uninoculated seedlings to the right are healthy, and growing vigorously.

B.—A seedling peach tree into which a bud from a rosetted Bitter almond was inserted February 2, 1922. Note the much branched and tufted growth of the almond shoot which developed from the diseased bud. All the peach shoots which have developed below the point of inoculation have upward rolled leaves, and the lateral and terminal buds have produced small rosettes of yellowish green leaves.