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SUGGESTIONS FOR THE CONTROL OF TOMATO MOSAIC AND STREAK
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What the Mosaic and Streak Diseases of Tomato Are, and What They Do

Mosaic is the common leaf-mottle trouble which affects both greenhouse and field tomato crops. It mottles leaves, accounts for the "fern leaf" appearance, weakens plants, and reduces yields 30% or more. Other names for the disease are "fern leaf" and "calico"; mosaic is the preferred designation.

Streak is the destructive "winter-blight" which causes premature death of greenhouse plants. Blighted foliage, brown or black streaked stems, and angular black spots on leaves are symptoms. Fruits of severely diseased plants become blotched, misshapen culls.

Tomato mosaic and tomato streak are both virus diseases, and they are related. Mosaic of tomato and mosaic of tobacco are caused by the same virus. This virus is easily transferable from one host plant to the other and in both host plants produces similar mottle symptoms. Tomato Streak is a mixture of this tomato (or tobacco) mosaic virus and a potato virus. Therefore, a plant which has "Streak" has two diseases at the same time. That is why mosaic weakens but streak kills.

Important Facts About Streak and Mosaic Which Must be Understood and Met in Order to Achieve Control

FACTS ABOUT BOTH

1. Both are incurable. Control can only be accomplished by prevention.
2. Both are extremely infectious. They can be carried from plant to plant by simply touching one plant, then another. Mechanical transfer during the processes of transplanting, pruning and pollinating is more important than occasional transfer by insects.
3. Both are occasionally seed borne.
4. Control by varietal selection has not been achieved; no worthwhile resistant variety of tomato has been found.

FACTS ABOUT MOSAIC

1. Tomato and tobacco mosaic are the same.
2. The most common source of mosaic in tomato plantings is tobacco. Tobacco in any form, including "chewing," "smoking," and even tobacco which has been "toasted," is a menace to tomato plants. The mosaic virus will live in dried tobacco leaves for years. The user gets the virus on his fingers--an invisible trace is enough--and thence to the plant. Spitting is also a hazard, especially in tomato seed beds.
3. Tomato plants during all stages of active growth are susceptible to infection from tobacco or from diseased tomato plants and weeds related to tomato.
4. Experiments have shown that if one pint of mosaic diseased tomato plant juice were poured into and mixed with one hundred and twenty-five thousand gallons of clean water, and a small flat glass rod were dipped into this mixture and gently rubbed on one leaf each of 100 young tomato plants, eighty out of every hundred of these are likely to develop mosaic. That's how infectious it is.
5. Other sources of mosaic are:
 - a. Old plants left about the greenhouses or farm.
 - b. Soil recently used for tomatoes and still containing tomato plant debris.
 - c. Ornamental pepper plants with mottled leaves (greenhouse).
 - d. Weeds related to tomato such as black nightshade, ground cherry, and jimson weed or thorn apple.

FACTS ABOUT STREAK

1. Tomato mosaic and a potato virus together produce streak.
2. A plant which first has the mosaic virus, and later receives the potato virus, will develop streak. Likewise a plant may receive the potato virus first and the mosaic later, then develop streak.
3. A young tomato plant having streak is a menace to its neighbors since the disease is easily transferred by touch (mechanically) from plant to plant. In this case, both viruses are transmitted together.
4. Any commercial potato plant regardless of whether it appears healthy may contain and is likely to contain the virus which combines with mosaic and causes streak.
5. Juice from any part of the potato plant is dangerous to tomatoes.

SUGGESTED POINTS BY WHICH CONTROL CAN BE ACCOMPLISHED

Introductory statement:

From the above one might conclude that control of such infectious diseases is impossible. This is not the case. In greenhouses where these diseases are being studied, accidental infections are prevented by certain precautions which will be mentioned. The basis of control must be extreme cleanliness.

1. Seeds must be the best obtainable. Cheap seeds selected from general run plants may be the starting point of mosaic. This is especially true if they are planted shortly after they are harvested.
2. The use of tobacco about or near seed beds or during potting, transplanting, or pruning operations should be absolutely prohibited. Moreover, smoking by employees and visitors should be prohibited in tomato greenhouses.
3. Tobacco users working with plants must wash their hands thoroughly in "strong-soapy" warm water before working with seeds or plants. Likewise, all employees should wash their hands before working with tomatoes even if they do not use tobacco. Careful washing will eliminate sources of infection. After washing, the hands should be dried on a clean or freshly boiled towel. This procedure will remove the virus from the hands.
4. Women who handle potatoes, cut them for cooking, etc., should use precautions as above before working with tomato plants.
5. All potato plants and potato debris should be kept away from greenhouses and fields where tomatoes are grown. Using potatoes in greenhouses for poison baits is a frequent source of trouble.
6. If certain plants in a seed bed are off-color, or mottled, or definitely mosaic diseased, be careful to avoid touching them. Leave them until after transplanting the clean plants. Destroy them later. Transplant or set only the disease-free plants. When hallocks or other plant containers are used, those containers in which yellowed or mottled plants are observed should be removed without touching the plants.
7. Under greenhouse conditions where some form of hand pollination (as with stick) is necessary, be careful not to carry the disease from plant to plant with a stick or cloth-wrapped stick. It is not practical to have a different stick for each plant, but it is practical to have several sticks and proceed as follows.
 - a. Use certain sticks on the best plants.
 - b. Other sticks for second best.

- c. Other sticks for suspicious or diseased plants. After pollination is finished, boil all the sticks and cloths. Since sticks can be boiled and thereby completely sterilized, we recommend the use of sticks in preference to shaking the plants with hands or fingers.
 - 8. It is possible to remove young diseased plants from greenhouse or field plantings if extreme care is used
 - a. Not to infect other plants while so doing.
 - b. To clean hands, etc., afterwards.
 - 9. During pruning operations, pinching out laterals to grow plants to a single stem, etc., great care must be exercised. Prune the best plants first. In the case of doubtful plants, it is suggested that pruning be done with a knife instead of pinching with fingers and that the knife be sterilized after each plant. To sterilize knife, dip it into a glass containing 1 part formalin to 3 parts water.
- Moreover, even in the case of supposedly clean plants, the hands should be washed frequently in strong soapy water during pruning operations.
- 10. Fumigation of the greenhouse at regular intervals to control insects is an important practice. The harmful insects are thus not only prevented from devitalizing the plants, but they are also eliminated from being possible carriers of diseases.

None of the above suggestions involve additional expense; they do involve additional trouble. In considering whether these precautions are worthwhile, remember that under Oregon conditions, mosaic-streak combinations may, and all too often do, account for complete losses of tomato crops both in the greenhouse and in the field.