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ZINC TREATMENTS FOR LITTLE LEAF

by

O. T. McWhorter
Extension Horticulturist

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ZINC TREATMENTS FOR LITTLE LEAF

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A disorder of fruit trees, commonly called "Little Leaf," causes partial dying back or death to deciduous fruit trees in the orchard area at The Dalles in Wasco County, Oregon. To a less extent this trouble is found in parts of Umatilla, Union and other eastern Oregon counties. The trouble is serious in many cherry plantings and also occurs on peach, apricot, prune, pear, and apple trees.

Symptoms

In severe cases the foliage of fruit trees affected with "Little Leaf" is dwarfed, pale yellow in color, often clustered, and leaves sometimes fail to form at all. The leaf veins retain various degrees of green color while the leaf areas between the veins tend to whiten, varying from light shades of green to a creamy yellow. Twigs and limbs of affected trees are dwarfed, the trees become devitalized, and often die within two or three years.

The described characteristics must not be confused with mottle leaf and other disorders of cherry trees or with "X disease" of the peach.

Some Zinc Treatments Correct "Little Leaf" Disorders

"Little Leaf" disorders affecting stone fruits have been corrected in Oregon by zinc sprays, zinc tacks, and zinc injections. It has been relieved in apple and pear trees by zinc injections. The first successful treatments were made in Oregon in 1933. California reports that zinc treatments have been used with success since 1927. Disorders of fruit trees which respond to or are corrected by zinc treatments are now regarded as "Little Leaf" or "Rosette."

Zinc Dusts were not at all beneficial in their limited trials at The Dalles. They are not recommended.

Soil Treatment Not Recommended: Extensive soil treatments with zinc have not been made at The Dalles, because reports from California indicate detrimental effects from accumulations in the soils from continued treatments.

Zinc Sprays Beneficial: Zinc sulphate sprays have been uniformly beneficial in correcting "Little Leaf" disorder when such sprays have been used either as a dormant or as a foliage spray on young or bearing stone fruit trees at The Dalles.

Zinc Treatments a Remedy When Used in Time: Zinc treatments cannot be expected to bring about recovery of neglected trees which have been allowed to go untreated until "Little Leaf" has ruined their usefulness. Treatment of affected trees with zinc should start when "Little Leaf" symptoms first show. Young trees affected with "Little Leaf" do not often recover of their own accord. Affected trees should, therefore, be sprayed with zinc preparations the first season that "Little Leaf" appears. The treatment should be repeated every year if necessary to keep the "Little Leaf" under control.

Trees usually begin to show improvement within three to four weeks after zinc sprays are given to the foliage.

Directions for Using Zinc Sprays on Stone Fruits

(1) For Bearing Stone Fruit Trees Affected with "Little Leaf"

Spray with a solution of 50 pounds of zinc sulphate in 100 gallons of water just before the buds swell and break open. Spraying after the buds have burst may result in injury to the opening buds. Use the zinc sprays alone. More information is needed before zinc sulphate can be recommended in combination with other sprays. The spraying of fruit trees with zinc sulphate solution after the fruit is set may result in injury to the fruit. When "Little Leaf" is severe these zinc sprays do not effect a permanent cure and must, therefore, be repeated yearly in severely affected orchards.

(2) Sprays for Young Trees Affected with "Little Leaf"

(a) Same as for aged trees when spraying is done during the dormant period. The dormant zinc sulphate spray is not as effective as is a foliage spray, but possibility of foliage or fruit burning is avoided by their use.

(b) Foliage Spray: The zinc sulphate foliage spray has been very successful for correcting "Little Leaf" disorders for a given season. These foliage sprays have been quite effective when they were given about 30 days after foliage first appeared. In experiments they were quite effective when applied in May and early June. They are effective to a less degree when they are used in mid and late summer.

Formula for Foliage Sprays

Dissolve 20 to 25 pounds of zinc sulphate in 100 gallons of water. Add $\frac{1}{3}$ pound of hydrated lime for each pound of zinc sulphate used. The hydrated lime should be soaked in water for several hours and thoroughly dissolved into milk of lime before it is added. Spray thoroughly the foliage of the trees.

Avoiding Foliage and Fruit Damage: Occasionally foliage burning occurred when zinc sprays were used. There has been no severe burning when lime has been used in the spray or when the sprays were applied early in the morning or late in the afternoon. Avoid spraying the foliage during the middle

of a hot day. Young trees carrying fruit have had the fruit damaged by foliage sprays, especially when rain occurred shortly after the spray application.

(3) Zinc Sulphate and Boron Sprays*

When zinc sulphate and boron were mixed and used as a foliage spray for correcting "Little Leaf" disorders at The Dalles, one treatment in the late spring was effective experimentally for three years; while with zinc sulphate spray alone "Little Leaf" appeared again within a year.

In the experiments there was foliage burn and burning of fruit on bearing trees when rains followed shortly after the zinc-boron spray was applied.

Making Zinc-Boron Foliage Spray

Use 20 to 25 pounds of zinc sulphate in 100 gallons of water plus 6 pounds of boric acid crystals. Start dissolving boric acid crystals 24 hours ahead of time needed. Add the boric solution last. Any grower who chooses to use the zinc-boron solution should know that foliage burn can and does occur when rains follow spray applications.

Comments

To Dissolve Zinc Sulphate: Zinc sulphate is usually obtainable in the form of coarse salt. Pour the crystals into the water slowly and keep stirring. They dissolve readily. When zinc sulphate crystals are dumped into water the mass often solidifies.

To Dissolve Boric Acid Crystals: Start dissolving the boric acid crystals at least 24 hours before the time the solution is needed. Hang the crystals in a sack at the surface of the water in the container.

(4) Zinc Injections

Treatment is made by boring $3/8$ inch holes 4 to 5 inches apart and $1-3/4$ inches deep about the base of tree just below the ground line. Fill the holes with powdered zinc sulphate to within $1/2$ inch of the outside. The openings are then closed with grafting wax. This treatment should be made in the fall or very early winter. Recovery at The Dalles lasted about three years. It must then be repeated. Objections to this treatment are tediousness of application and the killing of wood about the treatment points. The openings provide an entrance for wood-rotting fungi. This method of treatment is not now recommended in California where it was first used and it is recommended for use in Oregon only in exceptional cases.

* Zinc-boron sprays were worked out by Schuster and McWhorter at The Dalles, Oregon, 1937-40.

(5) Zinc Tacks and Strips

Diamond-shaped glazier's tacks of pure zinc when properly spaced and driven into the tree trunks have corrected "Little Leaf" disorders on young cherry, peach and apricot trees, and recovery has lasted for a period of years. These tacks are not practical for aged trees. The tacks are placed spirally one inch apart about the tree trunk, using 20 to 30 tacks to the tree. Use a glazier's tack driver to set the tacks. The tacks should be driven through the bark into the sapwood without damaging the bark. The zinc tacks must be set vertically and must not cross the grain of the wood. By careful handling of the tack driver, diamond-shaped glazier's tacks can be driven in about half their length. Less than this depth the tacks are not apt to stick.

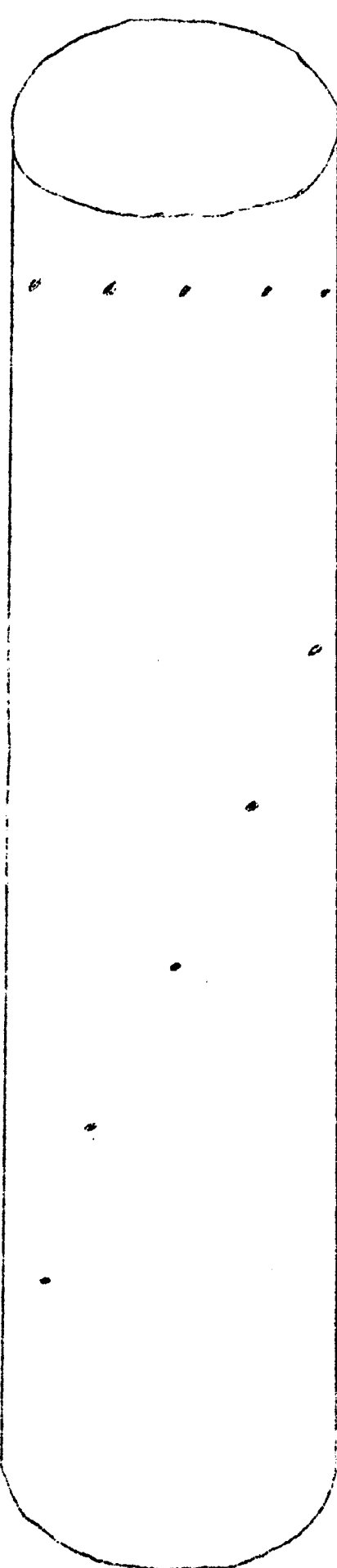
Zinc strips, driven vertically into older trees, have corrected "Little Leaf" disorders. The difficulty has been to drive the zinc strips into trees without damaging the bark and cambium layer. These strips must be an inch or more apart to prevent girdling damage to the tree or limb. A small area about the zinc strip is often killed or deadened.

Zinc Coated Nails Control "Little Leaf"--Galvanized shingle nails for small trees and zinc-coated roofing nails for larger trees were driven systematically into cherry, apricot, peach, pear, walnut, and prune trees at The Dalles and in Umatilla County. (See Diagram) The results have been an apparent lasting check on "Little Leaf" disorders on treated trees.

The use of zinc-coated nails for "Little Leaf" disorders appears to have advantages over spraying each season. Foliage sprays should be used on small trees. Nails driven in the trunks of very small trees can be damaging.

Placing Galvanized Nails

Tree trunk diameter and galvanized nail spacings are actual measurements.



← The wrong way. Galvanized nails placed in this manner may result in girdling the trees.

← The right way. Nails are 1 inch apart up and down the tree and one-half inch apart across the tree. A spiral is formed by continuing around the tree with the nail placements. 15 to 20 zinc-coated nails per tree trunk are considered sufficient for young trees. Remove the heads from the galvanized nails, drive nails about one-half way in. Driving them in flush with the bark usually results in bruised and damaged bark. 30 or 40 nails may be needed for a large tree.

Curative results from zinc nails driven into "Little Leaf" affected trees usually begin to show 6 to 8 months from the time they are placed. Spray should be given for immediate benefits and the nails placed for the benefits to follow later.