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BIO-REMEDY FIELD TEST: Postbloom Fruit Drop of Citrus

OBJECTIVE OF TRIAL: To determine if Polyorganic Technologies Bio-Remedy could reduce the incidence of *Colletotrichum acutatum* infection of flower petals and reduce early fruit drop from occurring. **CROP**: Late Season Navel Oranges in Bloom.

DISEASE INFORMATION: Postbloom fruit drop (PFD) is caused by the fungus *Colletotrichum acutatum*, it affects all cultivars of citrus, but the severity on a given cultivar varies according to the time of bloom and the amount of rainfall. Navel and Valencia oranges have experienced a higher severity of damage to date when wet weather has occurred during the bloom period.

Most spores of this fungus are produced directly on the surface of infected petals. Spores are dispersed by rain to healthy flowers where they infect and produce symptoms in 4-5 days. The fungus survives between bloom periods as resistant structures on the surface of leaves, buttons, and twigs. Flowers are susceptible from the button stage (with white tissue present) and when they are open and expanding, fruitlets do not develop and abscission of fruit occurs. (photos below)

MATERIALS AND METHODS: Bio-Remedy was added to a backpack sprayer at the rate of 125 grams per gallon with 3.0 liters of water and 0.8 liters of vegetable oil per gallon. Initial experiments were done spraying with vegetable oil at higher rates similar to those done in earlier studies on Sigatoka disease in banana but young citrus foliage appeared retain a high residue of oil on leaf surfaces a week after application so oil concentration was adjusted for later applications. Trees in bloom were selected for treatment and one half of the tree was sprayed with the Bio-Remedy oil suspension and later evaluated for disease development. Two heavy rain events occurred after application of Bio-Remedy and Oil to the trees in bloom which normally triggers disease development.

Unsprayed (Navel Orange) Sprayed

Control Bio-Remedy

Interior Bloom Control

Interior Bloom Bio-Remedy Treated

Unsprayed (Navel Orange) Sprayed

Control

Bio-Remedy

Young Tree Application

Control

Bio-Remedy

INITIAL RESULTS AND OBSERVATIONS: Initial observations on treated areas of citrus trees indicates that Bio-Remedy has the capacity to reduce PFD disease development on developing flowers (upper photos). Some areas in trees which were sprayed also had superior fruit set and more normal development of fruitlets in the preliminary tests (above photos). Normally flowers developing in the interior canopy develop more disease as foliage remains wetter and there is more inoculum on older leaf tissue in declining HLB infected trees.

Further testing on a slightly larger scale in Valencia Oranges could determine the extent to which Bio-Remedy can assist in a PFD disease control program. The Valencia trees will begin flowering in another few weeks and a number of trees could be sprayed and evaluated for disease development if we get some rain and wet weather during the bloom. The advantages of using Bio-Remedy in a disease program, is the product label indicates it can be sprayed a number of times during the active bloom. Fungicide applications are limited at 6 per season even if multiple rain events occur and are currently not working very well in controlling the disease. Current research papers have also been recently published showing strains of Bacillus, Streptomyces and Trichoderma have been effective in reducing PFD in field studies in Citrus which Bio-Remedy contains