

Field Reports: Growers generate grower-relevant data.

Monosilicic acid impact on nutrient mobilization in frost-damaged citrus trees:



A grower experienced frost damage in his citrus orchard and administered Dune monosilicic acid (1 mL/gal), Lumina amino acid fertilizer (15 mL/gal), and calcium acetate (15 mL/gal) to try to reestablish canopy quality.

Non-destructive leaf measurements were taken using a CID-710s Field Spectrometer. The canopy of frost-damaged citrus trees was scanned at three vertical positions within the tree canopy (top, middle, and low zones) and at three time points after damage. Various metrics related to plant nutrition and restoration of canopy health were analyzed.

Day 0 is the condition of the canopy before any treatment.

Day 5 is the condition five days after first treatment with Dune.

Day 10 is the condition five days after second treatment with Dune and an application each of Lumina and calcium acetate.

Observations:

Leaf spectrometer measurements showed large changes in nutrient indexes and other metrics of canopy health across the 10 day time interval. Calcium Index mobilization and stabilization throughout the canopy, including the frost-damaged areas (Figure 1). The Phosphorous Index also increased over time at all levels in the canopy (Figure 2). The Nitrogen Index increased in the lower canopy and stabilized across canopy layers (Figure 3). Green Chlorophyll Index increased across all canopy layers indicating a rise in chlorophyll content (Figure 4).

Collectively, the data suggests that Dune, Lumina and calcium acetate applications may have helped to initiate rapid nutrient and water translocation to both damaged and undamaged tissues very soon after treatment, particularly with immobile elements like calcium and boron. Page 2 presents additional data collected, including the Anthocyanin Reflectance Index (indicating new growth), Water Band Index (indicating water translocation), Greenness Index, and Boron and Sulfur Indexes. For a complete grower report on all data collected, contact info@impello.com.

Green Chlorophyll Index

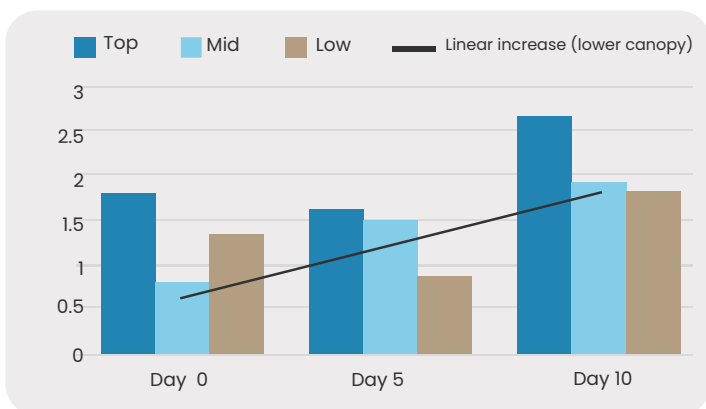


Figure 4. Green Chlorophyll Index. Dune treatment appears to improve the chlorophyll content over time.

Calcium Index

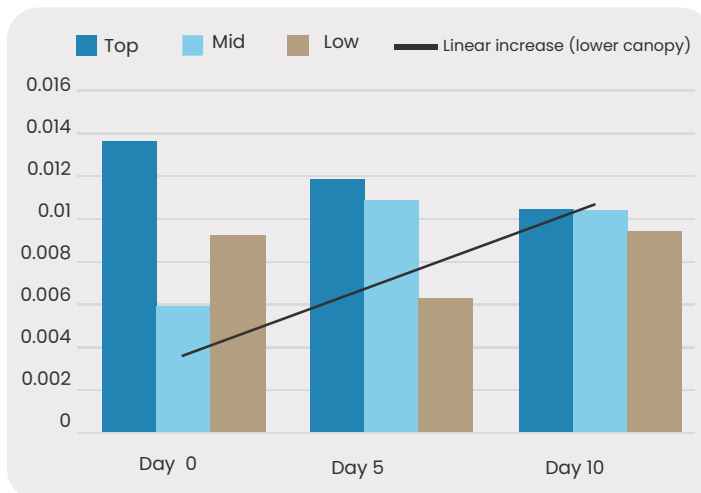


Figure 1. Calcium Index. Treatment appears to facilitate the distribution of calcium evenly throughout the canopy over time, stabilizing the index.

Phosphorus Index

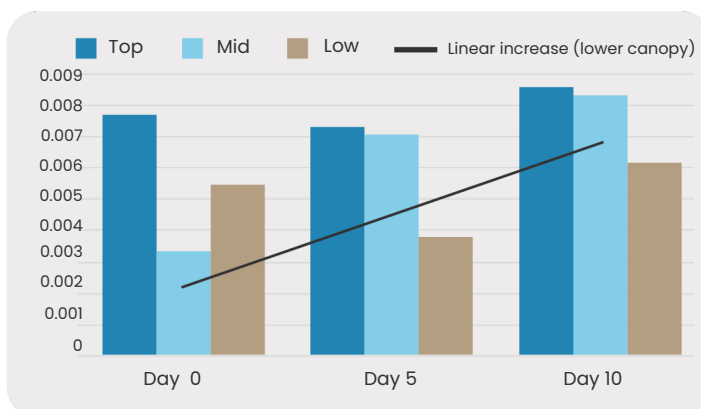


Figure 2. Phosphorous Index. Treatment appears to facilitate the increase and distribution of phosphorus throughout the canopy.

Nitrogen Index

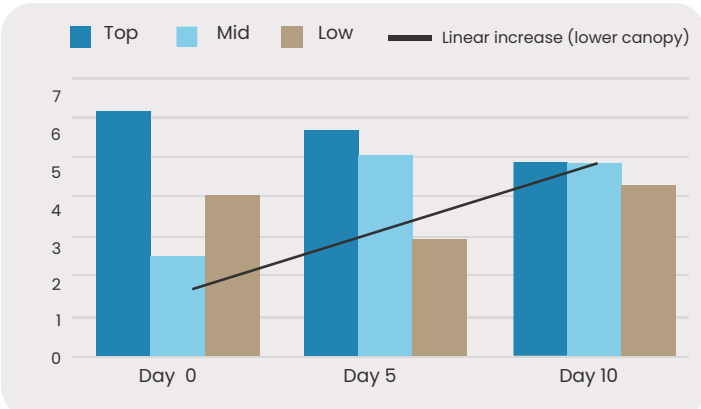


Figure 3. Nitrogen Index. Treatment appears to increase lower canopy N and stabilize N across canopy positions.

Extended Data Insights: Leaf Spectrometer Results

Boron Index

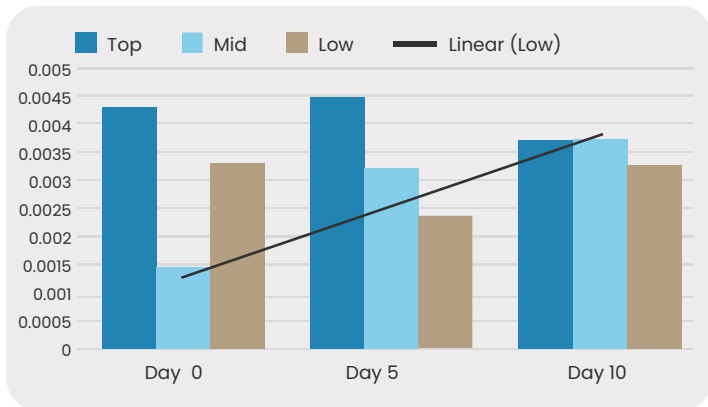


Figure 5. Boron Index. Dune treatment appears to improve stabilization of boron over time.

The Greenness Index

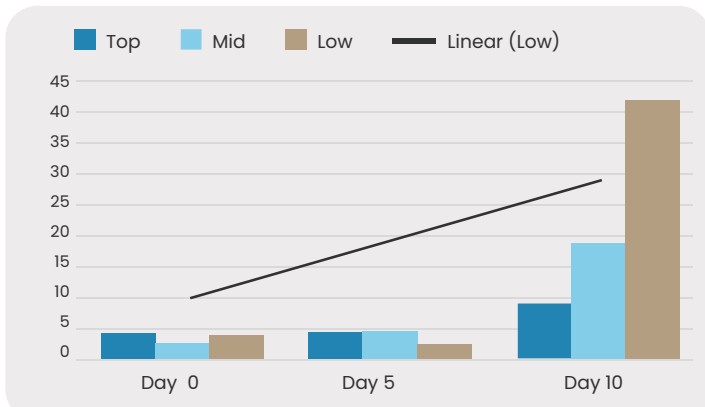


Figure 6. The Greenness Index. Treatment of Dune significantly improved the Greenness index on the lower leaf measurements.

Water Band Index

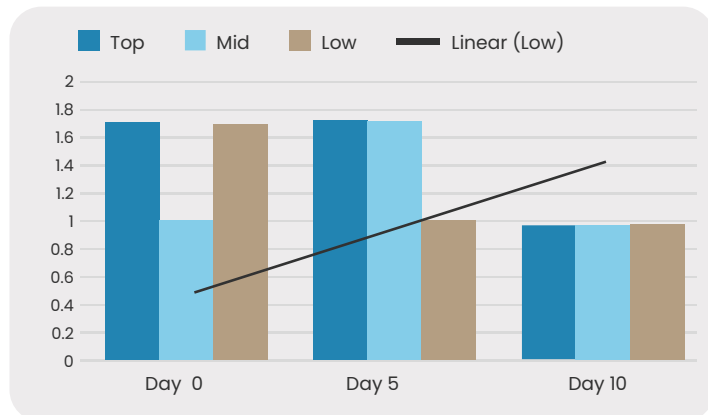


Figure 7. Water Band Index. Treatment appears to stabilize the Water Band Index at all three measurement zones.

Triangular Vegetation Index

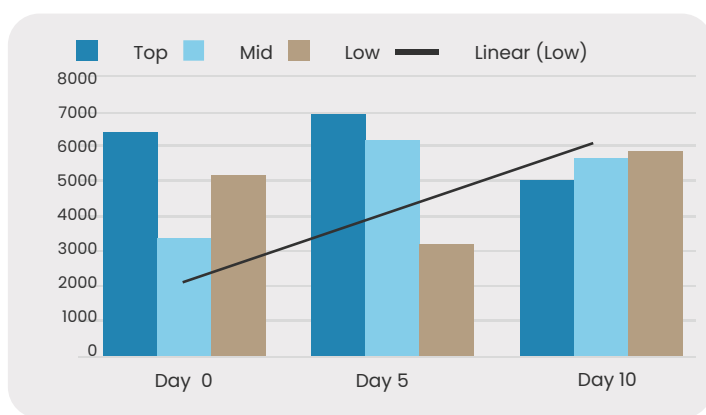


Figure 8. Triangular Vegetation Index. Treatment appears to stabilize the Triangular Vegetation Index.

Sulfur Index

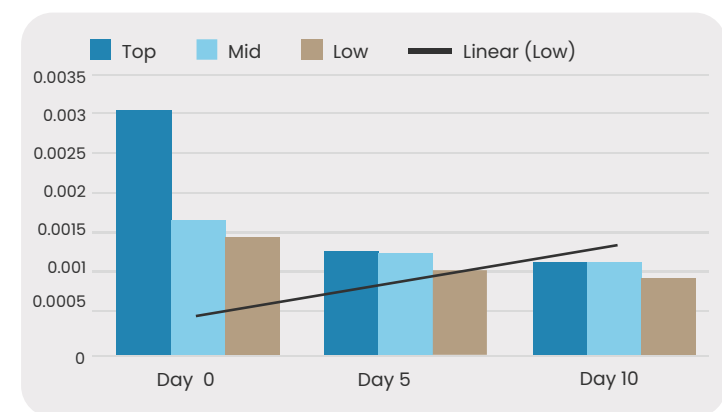


Figure 9. Sulfur Index. After the first application of Dune, sulfur levels began to stabilize and remained consistent by the third measurement.

Anthocyanin Reflectance Index

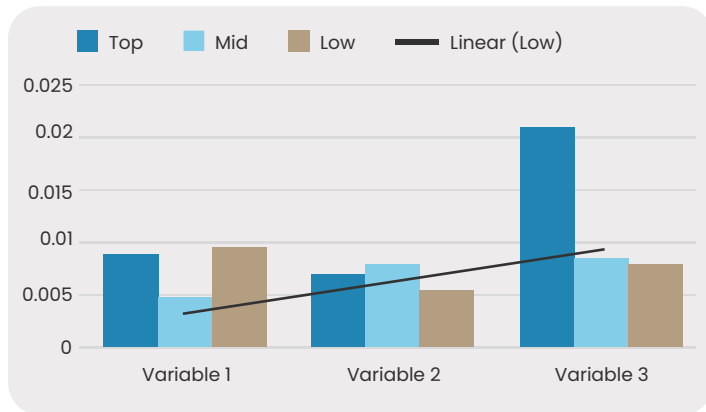


Figure 10. Anthocyanin Reflectance Index. Growth stabilizes in the mid and low zones, while a significant increase is observed in the top of the canopy.