IMPROVING THE EFFICIENCY OF TRUNK-INJECTED COMPOUNDS IN TREES – WHAT’S NEW?

- Inject only healthy trees or slightly affected by the pest
- Remember that injection relies on healthy and functional tree xylem to distribute the compound
- Inject trees preventively if you know that the pest is in your neighborhood or in nearby county

Conduct trunk injections at warm temperatures on either a sunny or a rainy day

Know your pest (1): foliar insects or pathogens are more difficult to control since the injected compound needs to travel longer and to a larger distance to accumulate and be effective.

Know your pest (2, 3): it is easier to protect the tree from the pest that attacks trunk than the roots. Downward transport and accumulation of injected compound is usually not abundant.

Know your tree’s xylem anatomy - it is easier to inject hardwood versus softwood.

Inject at low relative air humidity – RH. High vapor pressure deficit – VPD, securing good transpiration

Secure uniform distribution of injected compound in the canopy by using optimal number of injection ports for specific trunk diameter

Use injection devices that secure delivery of correct compound dose into the tree and do not expose tree cambium to the compound solution (cambium closes injection ports).

Know your product for injection - use only products formulated for injection and dose it only according to the label on the pack.

Soil has to be warm enough for good injection (>45ºF) and contain good water supply for trees to transpire well.

1. KNOW THE SOIL - PLANT - ATMOSPHERE CONTINUUM

2. KNOW YOUR INJECTION TECHNOLOGY AND THE PEST LIFECYCLE
- Needle-insertion injection tools (shorter time for port closure)
- Drill-based injection tools (more time for port closure)
- Water volume of injection and the number of ports per tree (influence uniformity of distribution in the crown)
- Develop injection time schedule for season-long pest control

3. KNOW THE PROPERTIES OF YOUR COMPOUND AND SOLUTION FOR INJECTION
- Formulation must be designed for tree injection
- High water solubility - better mobility in tree
- Low Organic carbon-water partitioning coefficient - faster mobility in tree
- PH 7 of injection solution is best (similar to tree sap)