

ARBORJET METHODOLOGY: ASSAYING NEW SYSTEMIC FORMULATIONS FOR TRUNK INJECTION AND MICRO-INFUSION TECHNOLOGIES.

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Poster Abstract

Arborjet, Inc. screens new systemic formulations for compatibility with delivery devices and tree transport tissues. Formulation analyses conducted include pH., viscosity (i.e., flow characteristics), flammability, behavior at temperature extremes, compatibility with other formulations and shelf life. Internal components of the Arborjet VIPER device(s) are exposed to new formulations at concentration for a prolonged period and evaluated for corrosion, abrasion and swelling. Laboratory bioassays are conducted using a number of tree species, including *Acer platanoides*, *Pinus strobus* and *Tsuga canadensis*, to evaluate trunk treatments. Five cm caliper, 3 m tall trees are cut and placed in 190 liter aerated hydroponics system, and placed in a controlled environment under 400 watt metal-halide grow lights. Evaluations include efficacy of delivery, uptake and distribution of active. Distribution of injected or infused formulations is modeled using fluorescent dyes. Analysis of distribution is performed using UV light. Differential distribution within the system is evaluated based upon branch:stem ratios. Further evaluations include foliar phytotoxicity and formulation residue evaluated using

HPLC, ELISA techniques or by bioassay. Following initial laboratory screening, promising formulations are incorporated into field trials to further evaluate performance and efficacy.

Methods illustrated include:

A. Formulations

1. pH
2. viscosity
3. temperature range
4. compatibility
5. shelf-life
6. components
7. ignition
8. abrasion and/or corrosion

B. Bioassay

1. ease of application into tree transport tissues
2. uptake and distribution through stem and canopy
3. phytotoxicity of foliar tissues
4. efficacy: plant health response or insect mortality