



BioWorks®

DIVISION OF BIOFIRST GROUP



ABOVE AND BEYOND IS WHERE WE BEGIN

UNITED STATES



UTILIZING DIPS: CLEAN UP INCOMING PLANT MATERIAL

Dipping saves time and money for growers, getting crops off to a clean start

Bringing in outside plant material often brings in unwanted pests and pathogens. Many unrooted cuttings, plugs, liners, and bare-root plant material from domestic or off-shore suppliers arrive with low numbers of pests such as whiteflies, thrips, spider mites, fungus gnats and aphids. These frequently go unnoticed until later in production when populations can suddenly explode. Incoming plant material may also carry root diseases that require early preventive measures. This is where dipping can help.¹

Dips are compatible with programs that use predatory mites and predatory or parasitic insects as components of an Integrated Pest Management strategy. These biological control agents (BCAs) are successful when pest populations are low. By dipping incoming plant materials, BCAs have a head start in keeping pest populations in check. Use of the BioWorks products below reduces risks of pesticide residues that interfere with BCA feeding, growth or reproduction.

By using dips, many cuttings or trays can be quickly treated, reducing the overall volume of pest control product(s) used. For trays that appear stressed or suspect for disease, it is advisable to apply a drench as opposed to dipping.

Did You Know?

Effective dips set biocontrol programs up for success and can significantly reduce the need for pesticide applications later in the crop cycle.

DIP PROCESS

- + Dip vegetative or hardwood cuttings prior to planting into rooting substrate. Place unrooted cuttings in a mesh bag, immersion tray with lid, or loose in the tank. Ensure that the cuttings are not packed too tightly to promote maximum surface area coverage. Immerse the cuttings completely, gently moving the tray, bag, or plants around in the suspension/solution for 10-30 seconds to ensure all surfaces are completely wet. Verify that there are no dry surface areas. After dipping vegetative cuttings, keep them cool and shaded. Avoid exposing dipped cuttings to full sun, high temperature, or other stress.
- + Immerse trays of plugs, liners, or other young potted plants completely into the dip suspension and gently move around for 10-30 seconds. Ensure that all surfaces are wet. Allow plants to dry before watering.



DIPPING GUIDELINES

- + The person(s) preparing the dip suspension/solution and applicator(s) doing the dips, should wear full PPE recommended for the product(s) being used, including an appropriate respirator. When dipping with multiple inputs, follow the strictest PPE product guidelines. After dipping, cuttings can be handled after the REI period has expired.
- + Clean and disinfect the dipping tank and equipment before preparing a new dip suspension.
- + Prepare fresh dip solutions daily. RootShield® spores, PRINCIPLE® spores and NemaShield® nematodes will not survive in dip solutions overnight.
- + Prepare a new dip suspension regularly to avoid the buildup of pathogens.
- + Use cool water (60-70 °F or 15-21 °C) when making up suspensions, keep out of direct sunlight, and agitate regularly to maintain spores/nematodes in suspension. Maintain cool water temperatures throughout the dipping process.

Did You Know?

In research on cutting dips against whiteflies, Vineland Research and Innovation Center in Canada has shown that transmission of *Erwinia* (*Pectobacterium*) from infected to healthy poinsettia cuttings is highly unlikely.²



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DIPPING GUIDELINES

- + Phytotoxicity is not expected, however, it is advisable to conduct a test by dipping a small number of plants before dipping all plants. Do not use dips if there is any sign of phytotoxicity. To avoid phytotoxicity from dipping:
 - + Avoid dipping sensitive plants such as African violet, tender ferns, etc.
 - + Do not dip stressed or wilted plant material.
 - + Dip and drain in an area protected from high temperatures and sunlight.
 - + Plant material should be allowed to dry immediately after dipping. Do not place where evaporation will be hindered.
 - + If cuttings cannot be stuck same day, place cuttings in a cooler and stick as soon as possible.
- + Do not apply left-over dip solution to plant material. Left-over solution should be disposed of on site or at an approved waste disposal facility.

DIPPING RATES

PRODUCTS	CROPS	RATE...	REI (HOURS) AFTER DIPPING
PRINCIPLE WP®	Unrooted and rooted cuttings; vegetables, fruits, herbs, ornamentals	0.25-0.5 oz/gallon	4
EpiShieldO®	All crops	2.7 ml/gallon	0
Cintro™	Unrooted cuttings	0.5% v/v = 18.9 mL / gallon	12
SuffOil-X*****	Unrooted cuttings, foliage of rooted plants, and transplant dips	0.1 - 0.5% v/v = 3.8 - 18.9 mL / gallon	4
NemaShield®	All crops	5 million/gallon	0
ON-Gard®	All crops pre-plant root dip	1% v/v = 1.28 fl oz/gallon	0
PERpose® Plus	Plugs, liners, plants in growing media	1/3 fl oz/gal. 1:300	0
RootShield® PLUS* WP or RootShield WP**	Unrooted cuttings, bare-root plants; vegetables, fruits, ornamentals	0.3 oz/gallon	4
RootShield PLUS* WP	Plugs, liners, plants in growing media	0.08 oz/gallon	4
RootShield WP	Plugs, liners, plants in growing media	0.05 oz/gallon	4

*Products can be mixed together or used individually. DO NOT mix PERpose Plus with any other products.

**Select either RootShield WP or RootShield PLUS* WP

***Visit our [rate calculator](#) to calculate rates for your specific application.

****SuffOil-X can only be used as a dip in US states with a 2(ee) label. Visit the [SuffOil-X](#) page on our website for a list of approved states.

¹Buitenhuis, R, M Brownbridge, A Brommit, T Saito, G Murphy. 2016. How to start with a clean crop: Biopesticide dips reduce populations of Bemisia tabaci (Hemiptera: Aleyrodidae) on greenhouse poinsettia propagative cuttings. Insects 7 (48); <https://doi.org/10.3390/insects7040048>

²Buitenhuis, R, A Poleatewich, M Jandricic, M Brownbridge. 2020. Risk of spreading soft rot through cutting dips against whiteflies in greenhouse-grown poinsettia. Plant Disease 104 (8); <https://doi.org/10.1094/PDIS-12-19-2632-RE>

Refer to product labels for complete application details. Always read and follow label directions. Additional technical information is available at bioworksinc.com, or contact our Technical Support Team at expert@bioworksinc.com



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BIOWORKS

100 Rawson Road • Suite 205

Victor, NY 14564

expert@bioworksinc.com

bioworksinc.com • 800.877.9443