

Utilizing Dips: Clean Up Incoming Plant Material

DIPPING SAVES TIME AND MONEY FOR GROWERS!

Effective dips can significantly reduce the need for multiple applications of chemical pesticides later in the crop cycle.

Bringing in outside plant material also brings in unwanted pests and pathogens. Many unrooted cuttings, plugs, liners, and bare-root plant material from domestic or off-shore suppliers contain low level insect populations. Whiteflies, thrips, fungus gnats and aphids may arrive unnoticed until later in production when populations can suddenly explode. Incoming plant material may also carry root diseases that require early preventive measures.

Dips are compatible with a program that uses predatory mites and predatory or parasitic insects as components of a pest management strategy. These biological control agents (BCAs) are successful when the pest population is low. By dipping incoming plant materials, BCAs have a head start in keeping pest populations in check. Use of the BioWorks products below eliminates 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 may be desirable to apply a drench as opposed to dipping.

BioWorks Dipping Products:

- **BotaniGard® 22WP or Mycotrol® WPO** - WSDA Approved
(NOTE: Do not use BotaniGard ES or Mycotrol ESO)
- **NemaShield®**
- **ON-Gard®** - OMRI Listed
- **RootShield® PLUS+ WP or RootShield® WP** - both OMRI Listed



Rates for Dipping

Note that there are two rate charts: One is for unrooted cuttings (URC) and bare-root plants (no medium surrounding the roots), and the second is for plugs, liners or other young plants that are potted in a growing medium that surrounds the roots.

Unrooted Cuttings (URC) and Bare-root Plants:

Products*	Metric Rate	US Rate
BotaniGard 22WP OR Mycotrol WPO	2.5 grams / liter	1.5 oz / 5 gallons
NemaShield	1 million / liter	19 million / 5 gallons
ON-Gard	2.5 ml / liter	1.6 fl oz / 5 gallons
RootShield WP OR RootShield PLUS+ WP**	2.5 grams / liter	1.5 oz / 5 gallons

Plugs, Liners or Other Plant Material Growing in a Potting Medium:

Products*	Metric Rate	US Rate
BotaniGard 22WP OR Mycotrol WPO	2.5 grams / liter	1.5 oz / 5 gallons
NemaShield	1 million / liter	19 million / 5 gallons
ON-Gard	2.5 ml / liter	1.6 fl oz / 5 gallons
RootShield WP** OR RootShield PLUS+ WP**	0.4 grams / liter	0.25 oz / 5 gallons
	0.6 grams / liter	0.4 oz / 5 gallons

*Products can be mixed together or used individually

**Select either RootShield WP or RootShield PLUS+ WP

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 at least 5 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 at least 5 seconds. Ensure that all surfaces are wet. Allow plants to dry before watering.

Dipping Guidelines

- The person(s) preparing the dip 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. Cuttings can be stuck within the REI period providing handlers wear appropriate PPE (do not have to wear a respirator).
- Clean and disinfect the dipping tank and equipment before preparing a new dip suspension.
- Prepare fresh dip solutions daily. NemaShield nematodes and BotaniGard spores will not survive in dip solutions overnight.
- Prepare a new dip suspension regularly to avoid the buildup of pathogens. (Vineland Research and Innovation Center in Canada has shown that disease transmission from *Erwinia (Pectobacterium)* is unlikely.)¹
- 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.
- Phytotoxicity is not expected, however, it is prudent to conduct a test by dipping a small number of plants before going full scale. 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/wilted cuttings or transplants.
 - After dipping, place plants on an incline to allow excess dip solution to drain from plants.
 - Dip and drain in an area protected from high temperatures and sunlight.
 - Do not place dipped cuttings back in baggies where evaporation will be impeded.
 - 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.



¹Buitenhuis, R., Poleatewich, A., Jandricic, M. and Brownbridge, M. 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.

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