

Choosing a Disinfectant for Tools and Surfaces in Horticultural Operations



Disinfecting tools and surfaces is one good way to limit the spread of disease-causing pathogens to healthy plant materials in greenhouses, nurseries, and farms, as well as gardens and landscapes. Disinfecting and sterilizing tools and surfaces does not guarantee you will not have plant diseases, but including these practices in your day to day routine can have a big impact on how often disease outbreaks happen and how severe they are. It limits the size of the disease outbreak when it first happens and provides a better opportunity to manage the disease successfully in other ways.

Growers, landscape managers, and gardeners should clean their tools and work surfaces (including floors) with a surface disinfectant. Surface disinfectants are substances that kill or reduce the growth of disease-causing microorganisms. Numerous types of products can be used to disinfect tools and surfaces.

Here are some of the things to look for in a disinfectant:

1. Fast action
2. Control of many different pathogens
3. Ability to work on surfaces that may have soil, peat, or plant material present
4. User safety
5. Non-corrosive
6. Convenient to use
7. Affordable

Each disinfectant has advantages and disadvantages that should be considered before one is selected. **Table 1** offers help in choosing a disinfectant to disinfect horticultural tools and surfaces. It includes a list of the common types of disinfectants, the pros and cons of each, recommendations on how to use them, and where you can buy them.

No matter which disinfectant you choose, the most important thing is to **use it**. To get the best results, disinfect tools each time you move to a different plant. A helpful tip is to have several tools that you can alternate between plants. While you are using one, the other can be soaking in the disinfectant.

Reference

Denny, G.C. & G.E. Vallad. 2009. "Disinfection of Horticultural Tools." UF-IFAS Extension Publication *ENH 1121*.

Table 1. Disinfectants for tools and surfaces in horticultural operations.

	Products	Pros	Cons	How to use	Where to buy
Quaternary ammonium salts	Green-Shield Physhan 20 Triathlon	Very effective Stable (solution lasts for longer period) Not corrosive	Little residual activity Not as effective if mixed with hard water or organic matter	Follow label directions	Horticulture supply vendors (Hummert, Grower Supply, etc.)
Hydrogen dioxides	ZeroTol Oxidate	Less toxic More biodegradable Some products recognized as "organic"	Corrosive Effective on only a limited number of pathogens Life span of solution is short	Follow label directions	Horticulture supply vendors (Hummert, Grower Supply, etc.)
Chlorine bleach		Inexpensive Effective	Corrosive Fumes can be harmful Short life span of bleach solution (after 2 hours, solution's effectiveness is reduced by about half), requires fresh batches immediately before disinfecting tools Not as effective against viruses	10% bleach solution (1 part bleach : 9 parts water) 30-minute soak Rinse with water after soak	Grocery and hardware stores and home improvement centers
Alcohol	Ethanol Isopropyl (rubbing) alcohol	Immediately effective (no soaking) Can be used as wipe No need to rinse	Flammable	Wipe or dip tool in 70% to 100% alcohol	Grocery stores and pharmacies
Trisodium phosphates	TSP	Inexpensive	Very corrosive	10% solution (1 part TSP : 9 parts water)	Hardware stores and home improvement centers (used to clean surfaces for painting)
Pine oil products	Original Pine-Sol	Not corrosive	Not as effective	25% solution (1 part pine oil : 3 parts water)	Grocery and hardware stores and home improvement centers
Household & commercial disinfectants	Lysol Listerine EndBacII Steriphene II	Easy to find Usually not corrosive	Little research on effectiveness of products against plant pathogens Relatively expensive	Full strength spray or dip depending on the product	Grocery and hardware stores, home improvement centers, janitorial supply companies

Adapted from Denny & Vallad, 2009 Publication #ENH1121.

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Information Sheet 1955 (POD-12-19)

By **Geoffrey C. Denny**, PhD, Assistant Extension Professor, Plant and Soil Sciences.

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Produced by Agricultural Communications.

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Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director

