



Martin-Gatton
College of Agriculture, Food and Environment
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Plant Pathology Fact Sheet

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Cleaning & Disinfecting Hand Tools & Planting Supplies

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IMPORTANCE

Dirty tools, containers, and surfaces come as no surprise to small commercial growers and residential growers (FIGURE 1). Rinsing with water to remove obvious soil or plant residues is a common practice. However, this type of basic cleaning can fail to remove microscopic plant pathogens that can remain on surfaces. Tools, containers, shoes, and surfaces should also be disinfected to remove fungal, bacterial, and viral plant pathogens to prevent transmission to healthy plants. Some readily available products can either clean items or disinfect, while others can both clean and disinfect. The following details the cleaning and disinfecting methods suggested for growers with small acreages and residential gardeners. [Note: Guidelines for cleaning and disinfecting surfaces and equipment in large commercial production settings are more stringent; producers should consult *Cleaning and Sanitizing Commercial Greenhouse Surfaces* (PPFS-GH-07) for recommendations.]



FIGURE 1. POTS (A) AND TROWELS (B) OFTEN BECOME COVERED WITH SOIL; PRUNERS (C) MAY BECOME COVERED IN PLANT SAP OR PLANT DEBRIS DURING USE. THESE ITEMS SHOULD BE CLEANED AND SANITIZED TO REMOVE POTENTIAL PATHOGENS.

PRODUCTS FOR CLEANING

Cleaning products, such as soaps and detergents, help remove loose organic matter. This partial list includes some of the common products suitable for cleaning. When cleaning tools and supplies, it is helpful to use brushes, scrubbing pads, and paper towels to aid in the removal of dirt and plant debris.

- Dish detergent
- Liquid soap, hand soap
- Household cleaner
- Bathroom cleaner
- Brush or broom
- Towels



FIGURE 2. EXAMPLES OF SOME COMMONLY AVAILABLE PRODUCTS THAT CAN BE USED FOR CLEANING HAND TOOLS AND SUPPLIES.

PRODUCTS FOR DISINFECTION

Disinfectants/sanitizers are products that have anti-microbial activity and can kill disease-causing microorganisms. Microscopic organisms can be transmitted on tools and surfaces, even after rinsing or washing. Disinfectant products may also be labeled as antimicrobials or sanitizers. This partial list is a sample of commonly available products that can be used to disinfect hand tools and surfaces.



FIGURE 3. EXAMPLES OF SOME COMMONLY AVAILABLE PRODUCTS THAT CAN BE USED FOR DISINFECTING HAND TOOLS AND SUPPLIES.

Products that can be used to both clean and disinfect are noted with an asterisk (*).

- Rubbing alcohol or alcohol prep pads (available as 70% solution, do not dilute)
- Bleach (Mix 9 parts water with 1 part bleach to produce a 10% solution)
- Trisodium phosphate, TSP (Mix 9 parts water with 1 part TSP powder to produce a 10% solution)
- Hand sanitizer
- Household cleaner, such as Lysol™ Concentrate Disinfectant*
- Antimicrobial bathroom cleaner, such as Scrubbing Bubbles™*

PROCEDURE FOR CLEANING & DISINFECTING

STEP 1: Cleaning

Clean and scrub to remove organic matter, which can inhibit the disinfection process. Begin with a water rinse and then follow up with a soapy wash. Rinse surfaces after washing to remove residues.

FIGURE 4. BRUSHES ARE HELPFUL FOR SCRUBBING SOIL AND DEBRIS FROM HAND TOOLS, SUCH AS PRUNERS AND TROWELS.



STEP 2: Disinfecting

Methods for disinfection include soaking (FIGURE 5A), dipping (FIGURE 5B), and spraying (FIGURE 5C). Exposure time is the length of time the product needs to remain in contact with the surface to kill or inactivate pathogens. Most products, including household cleaners (Lysol™), rubbing alcohol (70%) and TSP (10%) require a 3- to 5-minute soak to effectively sanitize (inactivate pathogens). Note that bleach is the most effective disinfectant and can kill surface microorganisms within 30 seconds.

Both bleach and TSP are corrosive to metal tools and can be harmful if inhaled; thus, they are not recommended as a first choice for disinfection. Never mix bleach with other cleaning products, as a toxic gas can be produced. Hand tools with wooden parts are often more difficult to disinfect than those made of plastic, metal, or fiberglass.



FIGURE 5. SUPPLIES, SUCH AS POTS, CAN BE SOAKED IN A DISINFECTANT SOLUTION (A). PRUNERS, SCISSORS, AND TROWELS CAN BE DIPPED IN DISINFECTANT; BE SURE ENTIRE CUTTING SURFACES ARE COMPLETELY SUBMERGED IN THE SOLUTION (B). SOME DISINFECTANT PRODUCTS CAN BE APPLIED BY SPRAYING (C).

STEP 3: Rinse & Dry

A thorough rinse (FIGURE 6) can remove residues, as well as products such as bleach, that may corrode tools and metal surfaces. Allow tools to dry completely before storing (FIGURE 7). Some tools may benefit from oiling before storage.



FIGURE 6. TOOLS, POTS, AND OTHER SUPPLIES SHOULD BE RINSED WITH CLEAN WATER AFTER DISINFECTING. **FIGURE 7.** POTS AND TOOLS SHOULD BE COMPLETELY DRY BEFORE STORING. WHILE POTS CAN BE SET OUT TO AIR-DRY, METAL TOOLS SHOULD BE DRIED COMPLETELY WITH PAPER TOWELS TO PREVENT RUST.

ADDITIONAL RESOURCES

- Cleaning and Sanitizing Commercial Greenhouse Surfaces (PPFS-GH-07) <https://plantpathology.ca.uky.edu/files/ppfs-gh-07.pdf>
- Fruit, Orchard, and Vineyard Sanitation (PPFS-GEN-05) <https://plantpathology.ca.uky.edu/files/ppfs-gen-05.pdf>
- Greenhouse Sanitation (PPFS-GH-04) - <https://plantpathology.ca.uky.edu/files/ppfs-gh-04.pdf>
- Landscape Sanitation (PPFS-GEN-04) <https://plantpathology.ca.uky.edu/files/ppfs-gen-04.pdf>

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Disclaimer

Other products not listed in this publication may be appropriate and provide adequate cleaning and/or disinfection. Inclusion in this document does not confer endorsement of the product or brand.

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Photos: University of Kentucky - Kimberly Leonberger (Figures 1 to 5, 7) and Cheryl Kaiser (Figure 6)

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