

What is a Disinfectant or Sanitizer?

Since mushroom growers often refer to disinfectants and sanitizers interchangeably, which is understandable, let's clarify some terms.



According to Webster, *disinfect* is to cleanse so as to destroy or prevent the growth of disease carrying microorganisms. Therefore a *disinfectant* is an agent, such as heat, irradiation or chemical that disinfects by destroying, neutralizing or inhibiting the growth of disease-carrying microorganisms.

EPA further defines *disinfectants* as products that are used on hard inanimate surfaces and objects to destroy or irreversibly inactivate fungi and bacteria but not necessarily their spores. Disinfectant products are divided into two major types: hospital and general use. Hospital type disinfectants are the most critical to infection control and are used on medical instruments, floors, walls, bed linens and other surfaces. General disinfectants are the major source of products used in households, swimming pools and water purifiers.

Sanitize is to make sanitary, as by cleaning or disinfecting and to be *sanitary* is to be free from elements such as filth or pathogens that endanger (mushroom) health. *Sanitizers* are used to reduce, but not necessarily eliminate, microorganisms from the inanimate environment to levels considered safe as determined by public health codes or regulations. Sanitizers include food contact and nonfood contact products. Sanitizing rinses for surfaces such as dishes and cooking utensils, as well as equipment and utensils found in dairies, food-processing plants and eating and drinking establishments comprise the food contact sanitizers. These products are important because

they are used on sites where consumable food products are placed and stored. Nonfood contact surface sanitizers include air-handling equipment, spawning and casing equipment, bedboards, trays, floors, walls and breezeways.

Antiseptics and Germicides are used to prevent infection and decay by inhibiting the growth of microorganisms. Because these products are used in or on living humans or animals, they are considered drugs and are thus approved and regulated by the Food and Drug Administration (FDA). Germicidal products are generally more closely regulated and are not commonly used around mushroom farms.

Disinfectants and sanitizers will be used interchangeably in this article.

Food safety and tolerance for disinfectants or sanitizers

To keep the mushroom farm healthy we use disinfectants to sanitize and disinfect areas around which the mushrooms are grown, harvested and packaged. Notice that this terminology alludes to the "cleaning of" not "control of" pathogens. Pesticides are the chemicals or biological agents used to control the growth and development of pathogens that directly attack the mushroom's spawn growth or fruiting bodies.

Often we take for granted the use of certain chemicals as common practice around a mushroom farm. Certainly we are well educated on the registration, use and safety of pesticides on a farm, however, disinfectants and sanitizers are often used without much consideration to food or worker safety. Growers need to remember that all chemicals (including disinfectants and sanitizers) have an EPA registration number and require growers to follow the details of the product's label. Some of these disinfectants and sanitizers are registered for Food Contact Surfaces (FCS) and can be used around the crop at their allowable concentrations. However, some are only registered for General Sanitation (GS) and cannot be used in anyway if the chemical can contact the mushrooms, compost or casing. Contact that is unintentional is not allowable. Inadvertent movement of these products can potentially create minute amounts of residues on the mushrooms.

The objective of disinfecting is to kill both spores and mycelium of mushroom pathogens, like *Trichoderma* and *Verticillium*, as well as human pathogens that are a potential food safety issue. In addition, the disinfecting of the farm after



and between crops is to kill mushroom spores and mycelial fragments for control of virus disease, not often found on the white button mushrooms, but a potentially serious problem for Portabella and Phase III tunnel farms. It is known that mushroom viruses can be carried back into the process via surviving mushroom spores and mycelium. Some products (chlorine or some oxidizing chemical), approved for direct application because there is zero residue, are used to reduce bacterial populations on the mushrooms.

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