Sanitation and Disease Control in the Propagation Area

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INTRODUCTION

Many disease problems that occur in propagation are due to poor sanitation management. This results in increased diseases and a reduction in plant quality. Once a pathogen has penetrated into cutting, it is generally not economically feasible to exterminate it with chemical treatments. Hence, proper management of a sanitation program is an essential part of disease control.

SANITATION

The first part of a good sanitation program is to clean and disinfect the greenhouse when it is totally empty. This entails removal of any plant debris or media/soil left from the previous crop. Cleaning also includes removal of weeds that can also harbor insects. Next, the area is disinfected with bleach or a quaternary ammonium compound, i.e. Physan 20, Green Shield, or Consan Triple Action 20.

There are different types of greenhouse structures and different procedures to clean them. Cuttings are propagated in greenhouses covered with glass, polyethylene greenhouse film, or a polycarbonate structured sheet. Some of these greenhouses are built with wood or aluminum framing with concrete floors and/or raised benches. This type of house can be cleaned by sweeping or using a water hose to remove leftover debris. A pressure washer can be used to remove any algae buildup left on the walkways, benches, walls, or purlins. The greenhouse can then be disinfected with bleach or quaternary ammonium compound. Other types of greenhouses may have a floor made of gravel or another type of ground cover with no raised benches. A greenhouse with gravel can be cleaned with a rake. A blower can be used to remove small debris that is left behind after using a rake. Greenhouse floors with nongravel-type materials can then be cleaned with a push broom. A blower can also be used on the floor to remove any debris that is left behind. Disinfecting the floors can be done with quaternary ammonium compounds.

Cleaning equipment used in propagation is essential when producing a disease-free crop. If you propagate in previously used flats and trays, start by soaking them in a quaternary ammonium compound solution. One of the quickest ways to spread disease from one cutting to another is with the shears or knives used to take cuttings. Disease can be transmitted to thousands of cuttings before they are stuck if the cutting tools are not disinfected. This can be done by periodically soaking the cutting tools in a quaternary ammonium compound. An efficient way to do this is for each person to have two pair of shears and use one pair while the other is soaking. Flat fillers should also be cleaned in between long periods of use by spraying with a quaternary ammonium compound or bleach. Be sure to let the bleach dry before placing soil in the flat filler. Some nurseries place a wet burlap cloth over a batch of cuttings before they are stuck to prevent their drying out. The burlap can be disinfected using a quaternary ammonium compound and should be hung up to dry out overnight.

AVOIDING POOR MANAGEMENT IN PROPAGATION

Poor management of a propagation area can destroy a sound sanitation program. This includes unsound irrigation practices. Over watering, leaking valves, or poor drainage can cause root rot diseases to spread rapidly. Placing flats or pots in a low area that holds water can destroy a crop before the cuttings are rooted. Water hoses left on the ground will allow pathogens to enter the nozzle and then be spread on young cuttings.

SELECTING CUTTINGS

When selecting an area to gather cuttings, use only plants that are free of diseases and insects. Some nurseries use plants that are in early stages of production. These must be healthy plants in order to sell them in the future. Other nurseries maintain stock plant blocks that they keep extremely clean. Whether cuttings are gathered from a production area or a stock block, it is very important to use clean plant material. It is wasteful to disinfect a greenhouse and fill it with unhealthy cuttings.

PROPER CARE OF UNROOTED CUTTINGS

Proper care of young, unrooted cuttings, before and after they are stuck, is essential to producing a quality crop. When cuttings are being gathered they should be placed in a clean container and kept moist. After the cuttings are gathered they should be soaked in a mild fungicide, such as Captan. The cuttings should be placed in the propagation area as soon as possible. The cutting material can be covered with a moist, disinfected burlap cloth before they are stuck. Cuttings should not be left under the burlap cloth for an extended period of time. As they are being stuck it is important to make sure that cuttings are not inserted too deeply. After the cuttings are stuck, it is important to monitor the humidity levels in the propagation house, before the cuttings develop roots. If the foliage on an unrooted cutting gets dry and begins to wilt, the leaves will burn. Disease will thrive on decaying plant material in a propagation house with high relative humidity. It is impossible to manage diseases in a propagation house of unrooted cuttings, just by chemical applications—without also regulating temperature, light, and relative humidity level conditions.

PROPER CARE OF ROOTED CUTTINGS

In some situations, the first application of fertilizer and pinch are made in the propagation houses. Some nurseries grow cuttings in the propagation houses after they are rooted. It is important to continue a sanitation program after the cuttings are rooted. The greenhouse should be free of weeds. Weeds harbor insects that can transport diseases. Fungal gnats that thrive on greenhouses with an abundance of algae are a perfect example. Adult fungal gnats can spread diseases as they move from contaminated areas onto plants. To deduce the risk of diseases damaging your crop, a fungicide can be tank-mixed into a spray rotation. A general list of some common diseases, and a few of the chemicals that control them, are listed in Table 1.

Realistically, there are often times when all of us have too many projects going at one time. Often sanitation is one aspect of nursery management that can be overlooked. It is amazing how rapidly diseases can spread from one contamination point that was not properly cleaned or disinfected. Therefore, it is important to train all of your employees to follow a sanitation program. It should start in propagation

and be carried throughout the entire production cycle in the entire nursery.

Table 1. Management of common diseases — most common root rot and/or damping-off diseases and their chemical control.

Rhizoctonia	*Pythium*	*Phytophthora*
Banrot	Aliette	Aliette
Chipco 26019	Banrot	Captan
Cleary's 3336	Captan	Subdue
Domain	Subdue	
Terraclor		
Terraguard		

Cylindrocladium	*Fusarium*	*Thielaviopsis*
Chipco 26019	Banrot	Banrot
Cleary's 3336	Chipco 26019	Captan
Domain		Cleary's 3336
Terraguard		Domain
		Terraguard

Alternaria	*Botrytis*	*Anthracnose*
Daconil 2787	Captan	Cleary's 3336
Domain	Chipco 26019	Daconcil 2787
Terraguard	Cleary's 3336	Domain
	Daconil 2787	Duosan
	Domain	
	Duosan	
	Terraclor	