



COMMON MISTAKES IN ANTHURIUM BLIGHT CONTROL PRACTICES An Aid to Anthurium Blight Management

Kelvin T. Sewake, Cooperative Extension Service
Andrew F. Kawabata, Cooperative Extension Service
Wayne T. Nishijima, Cooperative Extension Service
Tadashi Higaki, Beaumont Agricultural Research Center

Introduction

This paper describes some of the more common mistakes in blight control practices, based on field observations and communications with growers. It also provides recommendations to growers, based on current blight research information and University of Hawaii blight control recommendations as they appear in the Proceedings of the Second Anthurium Blight Conference, pages 7-9. The mistakes examined here include:

- Taking propagation material from harvested areas.
- Using a stock solution of chemical disinfectant for more than one day.
- Applying too much fertilizer to potted plants, causing root burn.
- Not controlling nematodes that feed on the roots.
- Incorrect pH of the medium.
- Inadequate drainage of water from rain or from irrigation.
- Replanting starting from the low end of the field.
- Roguing too infrequently.
- Irrigating in the late afternoon or evening.
- Not following all of the University of Hawaii blight control recommendations.

Taking Propagation Material From Harvested Areas

Although farmers presently face a crucial plant shortage, it is not advisable to use harvested plants for propagation material, whether it be top cuttings, gobo pieces, or for tissue culturing from infested fields. Wounds created by harvesting flowers increase the chance of plant infection. Worker movement through fields increases the chance of spread of infection. Thus, when these

plants are propagated and replanted, the new plants often have a high rate of infection. Although plants may appear healthy in the field, they may have blight without showing the symptoms of the disease. Until an indexing or blight detection method is developed for use on a large scale, which will help identify diseased plants and clean plants, propagating plants from production fields will be a high-risk method.

Recommendation: As much as possible, reserve and use tissue-cultured plants for vegetative propagation by establishing a mother block system. Use plants in this mother block for propagation only. Keep this block separated from the rest of the field plants and maintain strict sanitation procedures to exclude the disease from entering the block. Provide overhead covering to keep the plants from getting too much free water on the foliage, thereby preventing foliar spread should the disease somehow enter the block. Plant in pots to facilitate the removal of infected plants. Irrigate using a drip or subsurface system, not by overhead sprinkler. Identify plants in the mother block area and in the production field so that any blight found on a plant in the field can be retraced to its mother plant. The mother plant can then be tested for blight and discarded if found positive.

Note: Since a covered structure for the propagation area is among the current blight control recommendations by the University of Hawaii and is part of the special condition with the Hawaii Department of Agriculture Loan Division under the emergency loan program, you may be able to obtain a low-interest emergency loan for the covered propagation structure. Inquire about this possibility with the DOA loan officer in your area.

Using a Stock Solution of Chemical Disinfectant for More Than One Day

Some farmers have been routinely mixing a large volume of chemical disinfectant (Phyosan or equivalent) and drawing from this stock solution for a week or longer to disinfect tools and equipment. This is not a good idea; the effectiveness of chemicals generally decreases over time, because the chemical degrades once it is mixed with water. Most chemicals today do not have long residual activity. Although different chemicals degrade at different rates, it is not advisable to keep any mixed chemical stored for more than a day.

Recommendation: Mix a new batch of chemical disinfectant solution daily. Mix only enough for that day's use. Always use a clean container for mixing and storage.

Note: A question often asked by growers is how long the disinfectant solution can be used by the harvesters before it must be discarded and replaced with a fresh batch. There is no single answer to this question, since the frequency of changing the solution will depend on the number of cuts made and the amount of microorganisms present (in other words, how hard the chemical must work). But, under most field harvesting operations, it is a good idea to change the solution at least two to three times a day. Field workers can take the solution from the stock batch mixed for the day; they do not need to mix a new batch two or three times a day, every time they change their solution.

Applying Too Much Fertilizer to Potted Plants, Causing Root Burn

Many growers are starting to grow anthuriums in pots to try to control the blight. In doing so, some are still using the same amount of fertilizer as is recommended for cinder beds. Because the volume of medium is decreased per potted plant, the fertilizer rate normally used in the field is too high, causing root burn. The root burn stresses the plant, setting it back and making it more susceptible to the blight. Also, field workers may mistakenly identify clean plants as having systemic blight, due to the yellowing of the leaves, and rogue these plants out. This overfertilizing problem pertains to the use of both inorganic fertilizers and organic fertilizers, such as chicken manure.

Recommendation: Since research data do not exist on fertilization programs for potted anthurium plants, growers need to recalculate the

amounts of fertilizer to apply for potted anthuriums by considering the difference in volume of medium used in bed culture versus pot culture. Generally, less fertilizer will be required in pot culture. Also, keep in mind that fertilizer application in pots needs to be more precise than in bed culture since you do not have the large volume of medium that can somewhat buffer mistakes in application. Be careful to measure the amount for each pot accurately and to apply the fertilizer evenly toward the outer edge of the pot. This is where most root growth usually occurs. You will also decrease the chances of fertilizer burn from direct contact with the cane. Careful consideration must also be made for selection of medium, irrigation frequency and calcium application. Be aware that excessive fertilization may also reduce the pH of the medium much faster. A good fertilization program for potted anthurium is with a water-soluble fertilizer applied with the drip irrigation water.

A system of monitoring the leaf tissues for nutrient levels may help you in determining a sound fertilizer program. The Cooperative Extension Service (CES) provides for tissue testing at a fee. Contact your local CES office for information and assistance.

Not Controlling Nematodes that Feed on the Roots

Many plants have been tested for blight only to find that the cause for the apparent systemic symptom (yellow leaves) was high populations of parasitic root nematode infection. In focusing on the blight problem, some growers are overlooking some basic cultural practices, such as applying a nematicide for nematode control. Keeping the plants in good health will help in their tolerance to many diseases, including anthurium bacterial blight.

Recommendation: Apply a registered nematicide (Nemacur or equivalent) regularly as recommended. (Always follow the label.) Take random tests throughout the year for presence or buildup of nematodes. Contact your local CES office for information and assistance.

Incorrect pH of the Medium

Another basic cultural problem is incorrect pH of the growing medium. Nutritional imbalances can be caused by pH levels that are either too high or too low. Thus, plant growth is slowed down and nutritional deficiency symptoms may eventually occur that appear similar to blight. Maintaining proper pH can be difficult in cinder, since it has practically no buffering capacity (the ability of the medium to resist changes in the pH level). Thus,

the pH often moves out of the optimum range without the grower's knowledge.

Recommendation: Monitor pH levels constantly and keep them between 5.5 and 7.0 for best growth. Testing pH levels can be done with a simple home pH test kit or by the CES at a fee.

Be aware that naturally occurring black cinder has a normal pH of about 8.0. In the case of high pH levels, gypsum may be useful in providing the calcium needed without increasing the pH level.

Inadequate Drainage of Water from Rain or from Irrigation

In nursery areas that are prone to waterlogging, the incidence of blight seems to be higher than in well drained areas. This could be due to movement of the blight organism with the movement of water, which accumulates in low spots. With pot culture, the drainage holes may be inadequate for proper drainage, allowing water to accumulate at the bottom; this may cause root problems that can increase a plant's susceptibility to the blight.

Recommendation: For bed culture, provide better drainage by increasing the height of the cinder beds and digging trenches to divert water flow out of the beds.

For pot culture, add more holes at the bottom of the pot, perforating the pot from the inside out to allow the water to be drawn out better. Raising pots off the ground also may help if the field is often wet.

Replanting Starting from the Low End of the Field

Since water flows downhill, it may carry bacteria down to plants at the low end of the field. If you replant clean plants at the low end first, they may be exposed to blight coming from infected fields higher up.

Recommendation: Replant areas starting from the highest point on a field with a slope. Replant in blocks, keeping a wide buffer zone between the clean replants and any diseased area. Be sure to follow all other proper replant sanitation procedures.

Roguing Too Infrequently

Roguing once a week may not be adequate to control the spread of the blight organism. Often, blight symptoms appear on plants soon after the field is monitored for blight. By the time the foliar symptoms occur, the inoculum level in and on the leaf is high. If the plant remains in the field for

several days before the next roguing operation, the chances are increased that the organism will be spread by rain, irrigation, or worker movement.

Recommendation: Do not leave systemically blighted plants or leaves with foliar symptoms in the field for any length of time. Remove infected plants or plant parts as frequently as possible to intercept the movement of the organism and thereby slow down its spread and prevent outbreaks. Follow recommended sanitation procedures.

Irrigating in the Late Afternoon or Evening

Because of the limited output from small waterlines for those on county water, irrigation has been done in the late afternoon or in the evening to supply large fields with sufficient water for optimum growth. This practice is not recommended, because the foliage stays wet for a long time throughout the night, allowing further spread of the blight. Also, at night the plants do not use the water efficiently, as there is no photosynthesis.

Recommendation: Try to water fields section by section during the day, preferably after workers have finished in the block. A good time to irrigate is when the plants need it most, between midmorning and midafternoon. Minimize irrigation during the late afternoon or night. If water output from the county system is inadequate to irrigate the entire farm within a day, tanks can be built to store water during the night to be pumped out during the day along with the water that comes from the county lines.

Not Following All of the University of Hawaii Blight Control Recommendations

Many growers still do not follow all of the blight control recommendations provided by the University of Hawaii. Growers use some of the procedures but neglect others for economic reasons or because of time constraints, labor shortages, or plant shortages. For example, a grower may be dipping cutting shears in a disinfectant solution after each cut and removing blighted leaves and whole plants properly but may be replanting fields using cuttings from production plants. The problem is that the cuttings may already be infected with blight.

Recommendation: It is essential that you follow *all* of the University of Hawaii blight control recommendations to the fullest extent; otherwise, the disease will not be controlled. As the previous examples of common mistakes show, omitting a single step in blight control practices

may cause the problem to remain or even worsen. Due to the nature of the disease, complete sanitation must be incorporated into the cultural practices of all commercial anthurium farms today.

Note: The Cooperative Extension Service has educational resource material on this subject in the form of printed publications and videotapes that growers can obtain by contacting their local CES office.

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