

## Pre- and Post-Hurricane Considerations<sup>1</sup>©

### Tom Yeager

Department of Environmental Horticulture, University of Florida, Gainesville, Florida 32611

### Eelco Tinga

Tinga Nursery, Castle Hayne, North Carolina 28429

### Ted Bilderback

Department of Horticultural Science, North Carolina State University, Raleigh North Carolina 27695

### Hugh Gramling

Tampa Bay Wholesale Growers, LAA, Seffner, Florida 33584

## INTRODUCTION

Andrew, Camille, Donna, and Hugo — these are not names of children next door, but hurricanes most of us remember. We remember their roar, and destruction; the pain and suffering they caused. In 1969, Camille left 256 dead and in 1960, 50 people perished in Donna's destruction ([www.nhc.noaa.gov/pastdead.html](http://www.nhc.noaa.gov/pastdead.html)), while in 1992 Andrew caused 30 billion dollars in damages ([www.nhc.noaa.gov/pastcost.html](http://www.nhc.noaa.gov/pastcost.html)). The southeast is vulnerable as shown by data from the National Hurricane Center ([www.nhc.noaa.gov/paststate.html](http://www.nhc.noaa.gov/paststate.html)). There has been a major hurricane direct hit in all-coastal southern states except Georgia and Maryland during 1900-1996 (Table 1). Because of the warm climate the southeast is densely populated and many nurseries are located in coastal regions. Thus, we must be prepared. This paper will outline pre- and post-hurricane considerations for nursery operations based on experience of the authors.

## GENERAL CONSIDERATIONS MORE THAN 6 MONTHS PRE-HURRICANE

Listed below are items that should be considered and planned for more than six months in advance of hurricane season. These items are not listed in order of importance.

- Construct buildings according to codes and regulations for hurricane wind loads. This is particularly important for chemical and fertilizer storage facilities.
- Schedule maintenance for equipment used during hurricanes, such as adding stabilizers to generator fuel.
- Develop an emergency contact list and keep numbers current. Some possible contacts might include: employees, insurance companies, hospitals, pharmacies, counselors and clergy, USDA Farm Service Agency, Natural Resources Conservation Service, Federal Emergency Management Agency, County Emergency Management Agency, university extension offices, power companies, plumbers, electricians,

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equipment dealers, trucking companies, allied supply companies, landfills, chemical spill companies, portable toilet companies, other nurseries, and suppliers of young plants.

- Stow valuable documents in a dry place. This would include papers such as: insurance policy, payroll, plant, pesticide and equipment inventory; nursery photographs, including buildings, equipment, and vehicles; and computer disks of valuable information.
- Obtain crop insurance. Federal loan assistance will not be available unless you have crop insurance.
- Develop a written plan of pre- and post-hurricane responsibilities and job descriptions for personnel. Include in the plan procedures for irrigating without electrical power, ventilating or covering greenhouses, and clean-up including a prioritized list of most valuable plants or procedure for deciding which plants are important to save. This plan should also include where items such as generators are stowed that will be needed prior to a hurricane, as well as where items such as computers are stowed during the hurricane.
- Conduct safety and first aid training.
- Evaluate effectiveness of past plans and determine pre- and post-hurricane preparedness changes needed for the future.

#### **GENERAL CONSIDERATIONS TWO TO SIX MONTHS PRIOR TO HURRICANE SEASON**

- Perform general repairs of buildings to secure loose components.
- Clean ditches and grade areas for drainage.
- Prune permanent trees to reduce wind resistance.
- Obtain items such as: weather radios, plumbing supplies, batteries, tools, lumber, nails, tarps, ropes, shade cloth, greenhouse parts and covers, fuel storage with manual hand pumps, substrate components, portable lights, and batteries.
- Provide for potable water storage.
- Tie down portable buildings.
- Determine capacity, phase, portability, and quantity of electrical generators needed and provide for rapid connection with disconnect to main power.
- Obtain first aid supplies.

**Table 1.** Major hurricane direct hits in U. S. during 1900 – 1996<sup>2</sup>.

Alabama	5	Maryland	0
Florida	24	North Carolina	11
Georgia	0	South Carolina	4
Louisiana	12	Texas	15
Mississippi	6	Virginia	1

<sup>2</sup>Source: National Hurricane Center.

**GENERAL CONSIDERATIONS 1-2 DAYS PRIOR TO A HURRICANE**

- Irrigate plants and remove water from reservoirs.
- Remove plants from benches.
- Obtain cash because electronic fund transfers will not be possible after a hurricane.
- Fill fuel tanks and fill sprayers with water.
- Fill portable water containers.
- Print out payroll, plant inventory, fertilizer, and pesticide inventory.
- Charge batteries.

**GENERAL CONSIDERATIONS 24 HOURS PRIOR TO A HURRICANE**

- Secure items such as small portable trailers, substrate mixing equipment, and position portable generators.
- Dismantle irrigation risers; remove greenhouse plastic and shade cloth.
- Lay large plants down, especially plants likely to break and very valuable plants, with containers pointed toward the wind. This is particularly important for pot-in-pot plants.
- Place most valuable plants in protected place such as box trailer. Park box trailers side by side to resist turning over.
- Secure windows, doors, and greenhouse vents.
- Place tractors in fields.
- Stow computers.
- Turn off natural and propane gas, water, and electricity.

**GENERAL POST-HURRICANE CONSIDERATIONS**

- Notify customers about shipment status.
- Notify the power company.
- Notify insurance company and apply for other types of assistance. Accept an initial partial payment. Additional losses may become evident at a later date.
- Contact employees to inquire about their well being, their family's well being, and damage to personal property.
- Document damage with photographs.

**POST-HURRICANE CONSIDERATIONS: INFRASTRUCTURE**

- Prepare to irrigate by installing risers, repairing plumbing, or installing temporary plumbing.
- Un-secure doors and vents and re-build structures and/or replace shade and greenhouse covers. Plants previously in shade may sunburn if not shaded.
- Determine electrical conductivity (EC) of water in reservoirs. Reservoir water with EC greater than  $2.0 \text{ dS m}^{-1}$  should be diluted with fresh water.
- Check field soils for elevated EC levels.
- Evaluate changes in nursery infrastructure in preparation for future hurricanes. For example, now may be the time to convert some production areas from overhead to microirrigation.

## POST-HURRICANE CONSIDERATIONS — PLANTS

- Place salable or salvageable plants upright; prune and stake if needed.
- Remove plants from standing water. Inventory plants to account for lost, dead, and plants damaged too severely to recover. Insurance adjusters will need to inventory plants, so do not pile up plants to be discarded.
- Consider costs to dispose of plants or reshape and re-grow.
- Substrate EC levels may exceed  $2.0 \text{ dS}\cdot\text{m}^{-1}$  and require leaching.
- Fungicide applications may be needed to protect and minimize infestations of root and foliar disease occurrence.
- Check field-grown plants for flood damage. Flooding deprives roots of oxygen and often results in plant wilting even though ample moisture is present in soil.
- Purchase young plants to replace inventory losses.

## LONG-TERM CONSIDERATIONS

Long-term priorities should concentrate on the direction or focus of the nursery for the future. Now is the time to consider changes you have thought about in the past and would implement only if you had the opportunity to start over. Develop a business plan considering future markets. For example, you may change the predominant size of marketable plants or add additional cultivars to penetrate a newmarket, such as plants for water-conserving landscapes. You should also consider advancements in technology and make changes based on the most recent research-based information. Some questions to ask yourself include: Can low-volume irrigation be used? Are irrigation runoff recovery basins and systems for recycling water needed? Do fuel and pesticide storage and pesticide mix/load facilities comply with current guidelines? The university extension office in your county has numerous resources that can help you select and implement technological advancements appropriate for your nursery. Now is the time to make changes for a prosperous and rewarding future!

## LITERATURE CITED

**National Hurricane Center.** Tropical Prediction Center, Miami, Florida: <http://www.nhc.noaa.gov/>

## WEB SITES

**Hurricane and Natural Disaster Brochures:** <http://www.aoml.noaa.gov/general/lib/hurricbro.html>

**National Hurricane Center:** <http://www.nhc.noaa.gov/>

**National Weather Service:** <http://www.nws.noaa.gov/oh/index.html>

**National hurricane Division:** <http://www.aoml.noaa.gov/hrd/>

**Storm 2000:** <http://www.gopbi.com/weather/storm/>

**Central Florida Hurricane Center 2000:** <http://www.flhurricane.com/>

**Florida Hurricane Reports:** <http://iwin.nws.noaa.gov/iwin/fl/hurricane.html>

**Tampa Bay Weather Center:** <http://hurricane.weathercenter.com/>

**University of Florida Publications:** <http://edis.ifas.ufl.edu>