

So you have a greenhouse, now what?

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Agenda

- ▶ Goals
- ▶ Seasonal Growing
- ▶ Propagation Techniques
- ▶ Basic Growing Supplies
- ▶ Managing Pests
- ▶ Water Quality
- ▶ Maintenance
- ▶ Equipment
- ▶ Vendors



So you have a greenhouse...

- ▶ Now what?
- ▶ Teaching?
- ▶ Fundraising?
- ▶ Research?
- ▶ Production?
- ▶ Student Projects?
- ▶ Contests?
- ▶ All of the above???



Seasonal Growing

▶ Fall/Winter

- ▶ Poinsettias
- ▶ Christmas Cactus
- ▶ Chrysanthemums
- ▶ Vegetable Transplants
- ▶ Bedding
 - ▶ Cyclamen
 - ▶ Pansies
 - ▶ Snapdragons
 - ▶ Petunias
 - ▶ Dianthus
- ▶ Perennials

▶ Spring/Summer

- ▶ Herbs
- ▶ Vegetables
- ▶ Geraniums
- ▶ Bedding
 - ▶ Zinnas
 - ▶ Marigolds
 - ▶ Impatiens
 - ▶ Vinca
 - ▶ Begonias
- ▶ Ferns
- ▶ Cacti/Succulents

Seeds vs. Cuttings/Plugs

▶ Seeds

- ▶ Inexpensive
- ▶ Offer more varieties
- ▶ Time consuming
- ▶ Germination problems
- ▶ Specialized growing environment



▶ Cuttings/Plugs

- ▶ Expensive
- ▶ Must book in advance
- ▶ Consistent growth



Booking Product

- ▶ **Spring Plants**
 - ▶ Order in September for a January ship
- ▶ **Poinsettias/Christmas Cactus**
 - ▶ Order in February for August ship
- ▶ **Seeds**
 - ▶ Order early if you want specific varieties
- ▶ **Cuttings**
 - ▶ Order 4 months in advance of your ship date
- ▶ Plant Peddler, Ball Seed, Van Holken, North Carolina Farms, Park Seed



\$\$\$ Making Plants

- ▶ Boston Ferns
- ▶ Coleus
- ▶ Sweet Potato Vine
- ▶ Pothos Ivy
- ▶ Tomatoes
- ▶ Peppers
- ▶ Herbs (Basil!)
- ▶ Poinsettias
- ▶ Christmas Cacti
- ▶ Native and Adapted Plants
- ▶ Hanging Basket
- ▶ Succulents (Aloe)
- ▶ Roses (Self Propagated)
- ▶ Wandering Jew
- ▶ Lantana
- ▶ Mexican Heather
- ▶ Caladiums
- ▶ Bluebonnets
- ▶ Airplane Plants
- ▶ Local Interests

**DO NOT GIVE
ANYTHING
AWAY TO THE
GENERAL
PUBLIC FOR
FREE!**

Propagation Techniques

- ▶ Cuttings - Intermediate
- ▶ Grafting - Advanced
- ▶ Seed - Student Friendly
- ▶ Division - Student Friendly
- ▶ Layering - Advanced



Basic Growing Supplies

- ▶ Growing Media
 - ▶ Sunshine, Metro Mix, Pro Mix
 - ▶ Perlite ,Vermiculite, Rice Hulls
 - ▶ Use what you can get easily
 - ▶ Usually Home Depot/Lowes bagged soils are NOT GOOD growing medias
- ▶ Fertilizer
 - ▶ Use a quality greenhouse fertilizer such as Peter's, Jacks, or Scotts
 - ▶ Understand your water when making a selection
 - ▶ Do not use Miracle Grow
- ▶ Pots
 - ▶ Use new pots or sanitized pots
 - ▶ When choosing round pots look for thin wall azalea style pots
 - ▶ Try to keep your pots consistent
 - ▶ 3.5" Square Pot
 - ▶ 10" Hanging Basket
 - ▶ 6.5" Azalea Pot

Weeds!

- ▶ Manually remove
- ▶ Round Up
- ▶ Pramitol
- ▶ Esplanade 200
- ▶ Pre Emergent granules (Preen, Amaze, Halt, Prodiamine)
- ▶ Newspaper/Cardboard as a barrier



Insects

- ▶ Yellow and Blue Sticky Cards
- ▶ Use Lady Bugs and Parasitic Wasps
- ▶ Get rid of infected plants
- ▶ Use water to loosen and remove insects
- ▶ Insecticides:
 - ▶ Insecticidal Soap - M-Pede
 - ▶ Tame/Orthene followed by Preclude Aerosols
 - ▶ Tristar, Safari, Talstar, or Marathon
- ▶ Vegetables
 - ▶ PDF available online
- ▶ Talk with your suppliers
- ▶ Switch Modes of Action if needed



Fungal Diseases

- ▶ Manage moisture and air flow in the greenhouse
- ▶ Water in the mornings
- ▶ Allow plants to dry slightly between watering
- ▶ Water the soil not the leaves
 - ▶ Drip Irrigation
- ▶ Fungicides
 - ▶ Actinovate
 - ▶ Banrot
 - ▶ Zerotol
 - ▶ 3336
- ▶ Use as a drench and follow the directions



Water Quality

- ▶ Most misunderstood and neglected horticulture management technique
- ▶ Test your water every 2 years
 - ▶ [Penn State Water Testing Lab](#)
- ▶ At a bare minimum know your pH
- ▶ Can fix problems with fertilizers or acid injection

Low Alkalinity Problems

- ▶ Ca & Mg deficiencies
- ▶ Sudden drop in substrate pH
- ▶ Minor nutrient toxicity
- ▶ Bigger problem in long-term crops



Plant Growth Regulators

- ▶ Keep plants uniform and internodes short
- ▶ Can help manage plant growth if your target sale date is far away
- ▶ B-Nine
 - ▶ Spray, very forgiving
- ▶ Bonzi
 - ▶ Spray or drench, not forgiving
- ▶ Florel
 - ▶ Spray, not forgiving, cheap
 - ▶ Flowers will abort for 6 weeks



Fan and Pads

- ▶ Clean your pads at least once a year and let them dry out for 24-48 hours
 - ▶ Knock off the algae and mineral deposits
 - ▶ Use Zerotox, Triathlon, Greenshield or barley straw to control algae
 - ▶ Do not use bleach or pool tabs!!!
 - ▶ If using coated pads the coating goes out and check the direction air flow direction printed on the pads
- ▶ Fans Service your fans at least twice a year
 - ▶ Tighten or change belts
 - ▶ Keep extra belts on hand - Do not store extra belts in your greenhouse because they will rot
 - ▶ Keep an extra motor on hand
 - ▶ Switch to direct drive fans when fans are replaced
- ▶ Horizontal Air Flow Fans :: HAF
 - ▶ Counterflow air
 - ▶ Slow speed air movement during set point and heating stages
- ▶ Sump Pump
 - ▶ Have an extra on hand for when the pumps fail



Glazing Materials

- ▶ Clean your glazing material inside and outside at least once a season
- ▶ Just like washing windows
- ▶ Dirt and dust will diminish your light levels
- ▶ Use soap and water or ReduClean
- ▶ Scrub with a brush on a pole or
- ▶ Rinse off well
- ▶ Patch holes in poly or replace based on useful life



Disinfecting

- ▶ Disinfect your greenhouse after each crop
- ▶ Allow the greenhouse to be empty each year for a couple of weeks so that you can clean really well
- ▶ Limits your chances of diseases and insect outbreaks
- ▶ Clean the irrigation system as well
 - ▶ Zerotol, Triathlon, or Simple Green Disinfectant
- ▶ Use a Foam Cannon or Ortho Dial and Spray
- ▶ Disinfect any pots that are going to be reused
- ▶ Clean your irrigation lines
 - ▶ Kleen-M-Up



Fertilizer Injectors

- ▶ Service your fertilizer injector once a year
- ▶ Send the unit to the company or fix yourself
- ▶ If the injector will not work soak it in a bucket of water for 24 hours
- ▶ Keep an extra injector on hand or a lower end kit
- ▶ You will need to have an RPZ backflow preventer installed before you injector
 - ▶ Must be inspected yearly by a licensed plumber that is certified in backflow preventers
- ▶ Dosmatic Injectors are recommended but Hog Slat sells a 1:128 version for under \$200

Irrigation Supplies



- ▶ Dramm
 - ▶ Red-Head Water Breaker
 - ▶ Color Storm No Kink Hoses
 - ▶ Heavy Duty Shut Off Valves
- ▶ Netafim
 - ▶ Filters
 - ▶ Pressure Compensating Drippers
 - ▶ Drip Line
 - ▶ Dripper Accessories Weights
 - ▶ Drip Stakes
- ▶ Check your dripper flow using a measuring cup

Chemical Application

- ▶ Dramm
 - ▶ Chemdose - \$2500
 - ▶ Apply chemical solution pot by pot (Drench)
 - ▶ MSO Sprayer - \$1000
 - ▶ Hydraulic sprayer
 - ▶ Mini Autofog - \$2500
 - ▶ Applies chemical solution in a fine mist
 - ▶ Controlled by a timer
- ▶ Pump Sprayers
 - ▶ Gilmour Professional Quality
 - ▶ Hand or Backpack
 - ▶ (4) Sprayer :: Disinfectant, Insecticide, Herbicide, and Fungicide
- ▶ Use spray tank cleaner!
 - ▶ Neutralize



Suppliers

- ▶ BWI
- ▶ BWI Grower Technical Sales
- ▶ Greenhouse MegaStore
- ▶ KBW Supply
- ▶ HogSlat
- ▶ Schaeffer Fans
- ▶ Dosmatic Injectors
- ▶ Dramm
- ▶ Netafim

The background features abstract, overlapping green geometric shapes in various shades, primarily on the right side of the slide. The shapes include triangles and polygons, creating a modern, layered effect. The colors range from light lime green to dark forest green.

Questions?

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