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HEALTHY ORNAMENTAL PLANT PRODUCTION METHODS TO REDUCE CHEMICAL INPUTS

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DOES A HEALTHY PLANT ACTUALLY RESIST PESTS AND DISEASE?

- Yes & No
- Ambrosia Beetles – SOMETIMES!
- Emerald Ash Borers – DEPENDS!
- Powdery Mildew – NO!
- Fire Blight – NO!
- *Phytophthora* Root Rot – RARELY!

WHY DO SOME PLANTS GET SICK AND OTHERS DO NOT?

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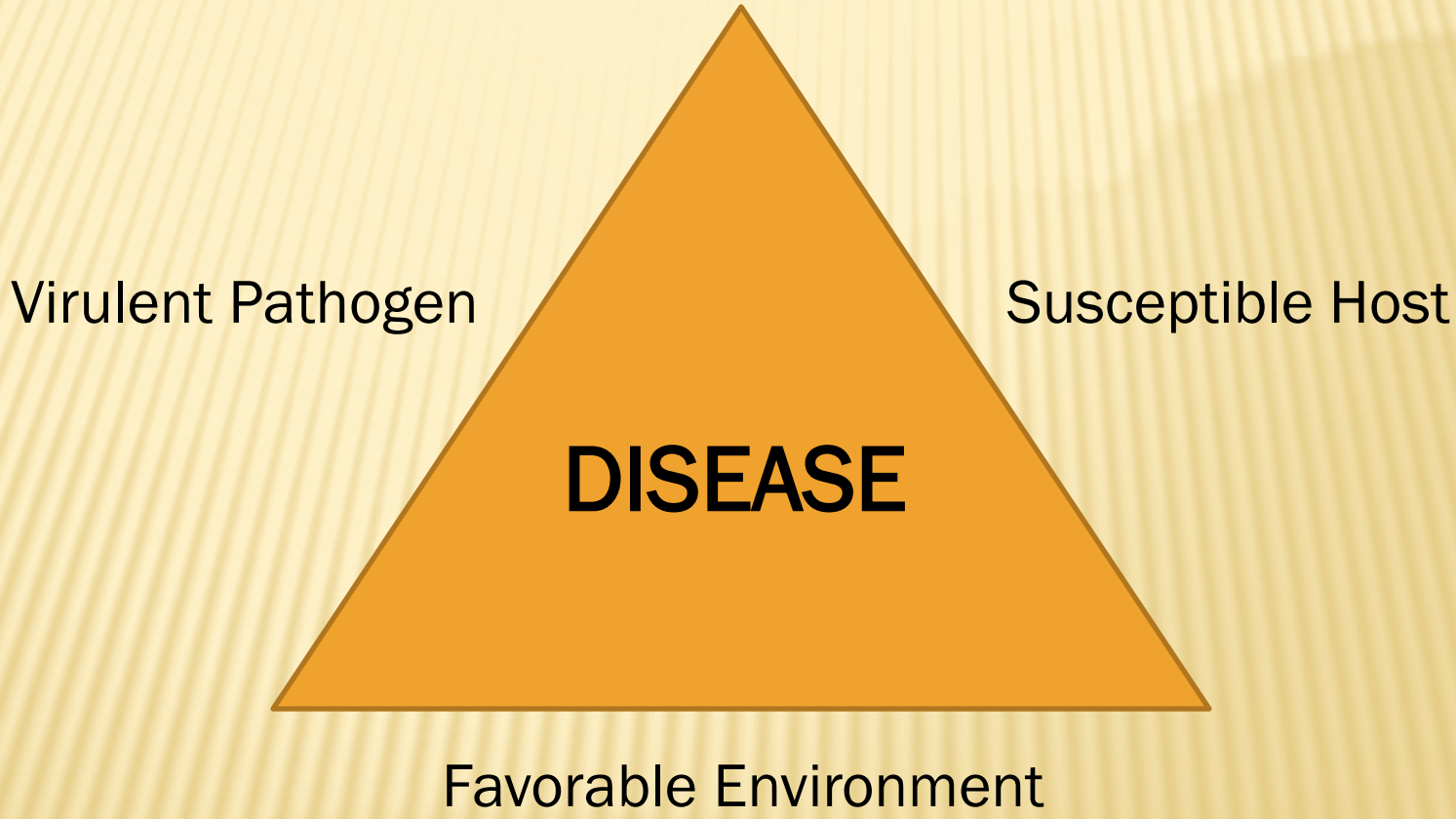
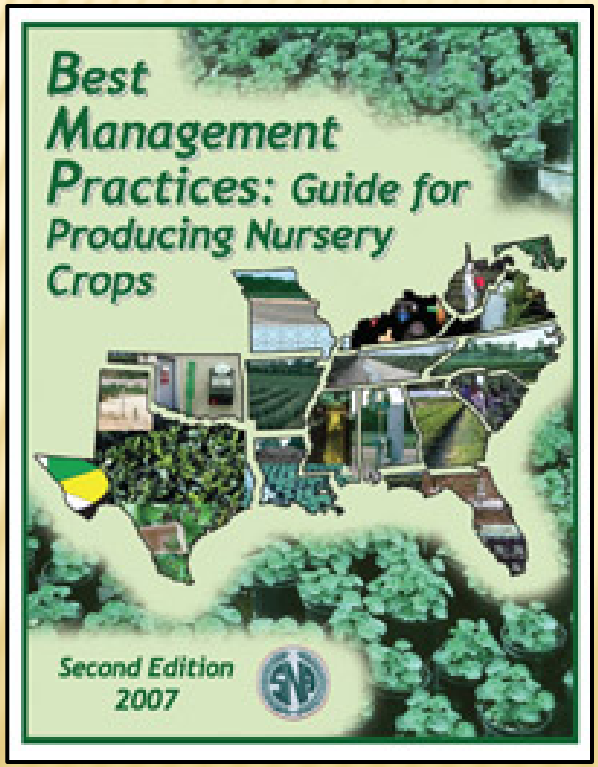
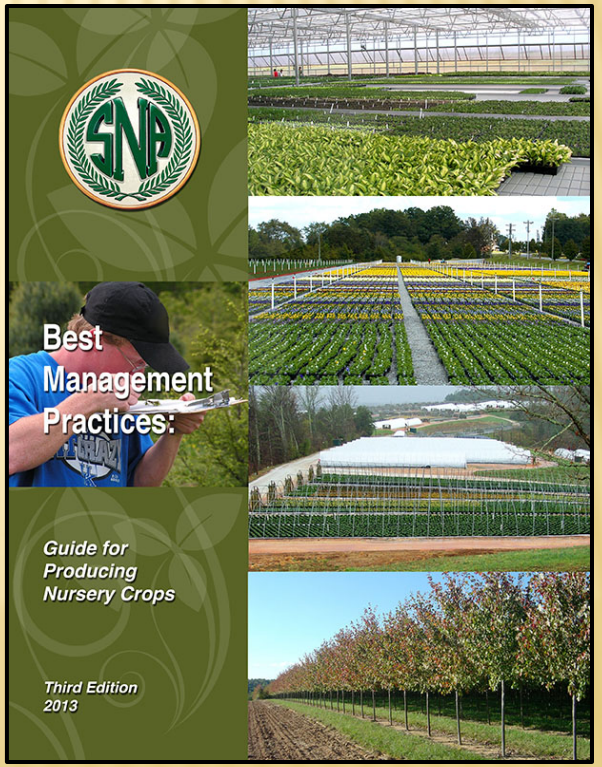


A HEALTHY PLANT IS NOT IMMUNE TO DISEASES OR INSECTS, …GENERALLY

- It comes down to **Best Management Practices**





SOURCES OF CHEMICALS IN THE NURSERY

- Insecticides
- Herbicides
- Fungicides
- Miticides
- Fertilizers (including organic)
- Plant Growth Regulators (PGR)
- Chemical Additives and Surfactants
- Others?

HEALTHY PLANT PRODUCTION PRACTICES – THE STEPS

- Propagation
  - Sexual (seeds) and Asexual methods.
- Containers
  - Substrates, irrigation, nutrition, winterization, etc.
- Field
  - Site selection, soil type, weed control, etc.

PROPAGATION METHODS - SEEDS

- Begin with healthy, ripe, local*, seed
- Understand the seed germination process and requirements
- Be prepared to irrigate (greenhouse & field)
- Avoid temperature extremes
- Avoid soil crusting, especially for small seeded ornamentals
- Water drainage and air flow is important.

PROPAGATION METHODS – ASEXUAL

- Asexual propagation – **sanitation is King!**
- Clean stock is critical!
- Sanitize pruners and knife regularly
- Sanitize cutting bench, trays, pots, etc.
- Be aware of airflow, drainage, humidity, light and other factors that may contribute to propagation success or disease
- Refer to the literature for specific directions.


Home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CONTAINER PRODUCTION METHODS

- Plant and water needs
  - Quality, source, amount, irrigation design, etc.
- Nutrients and salts
  - …"salinity may predispose susceptible chile pepper plants to infection by *Phtophthora capsici*." – S. Sanogo, NMSU, 2004.
- Substrates
  - Quality, pH, bulk density, drainage, physical properties, long term storage, weedy, etc.


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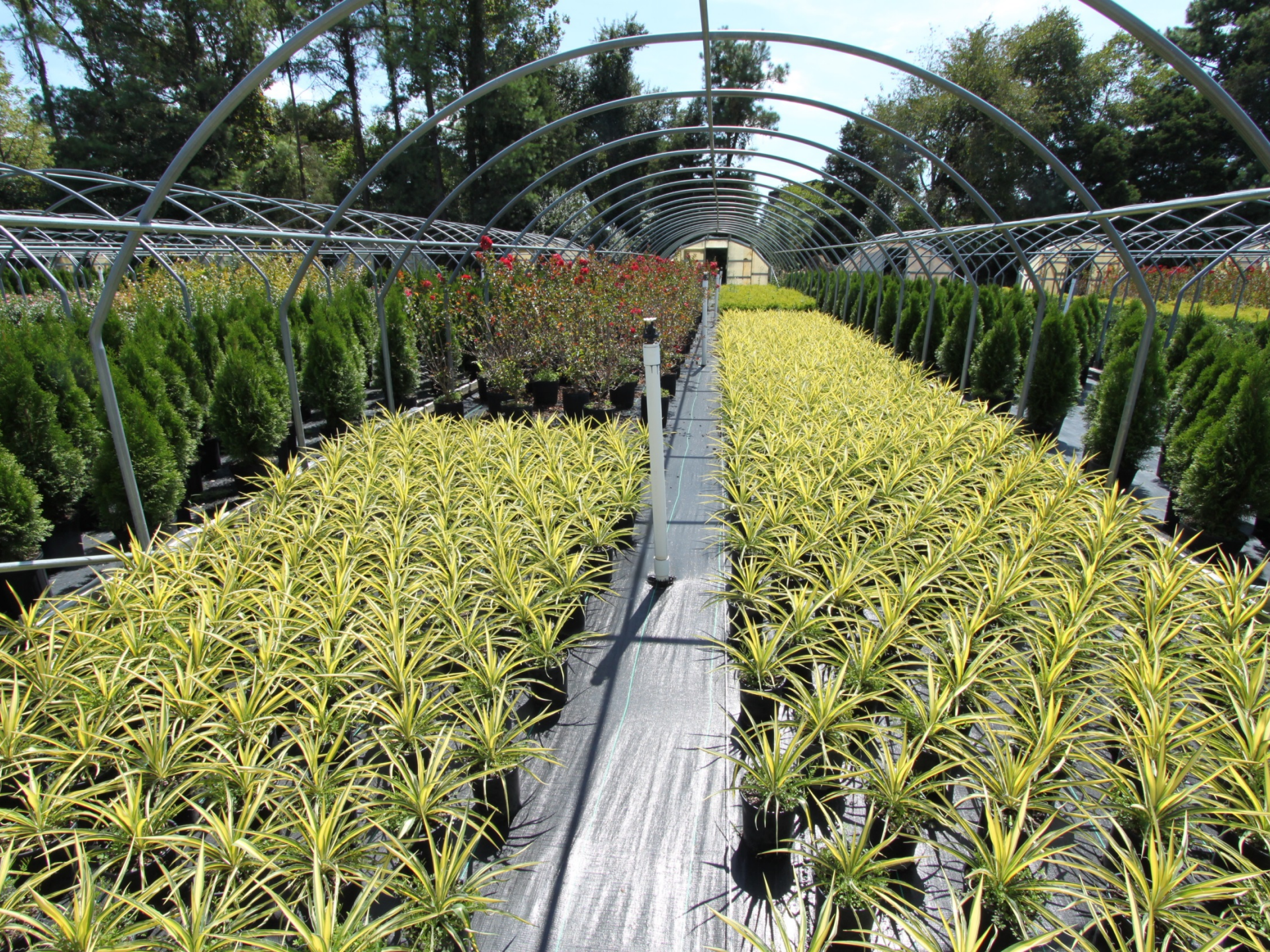
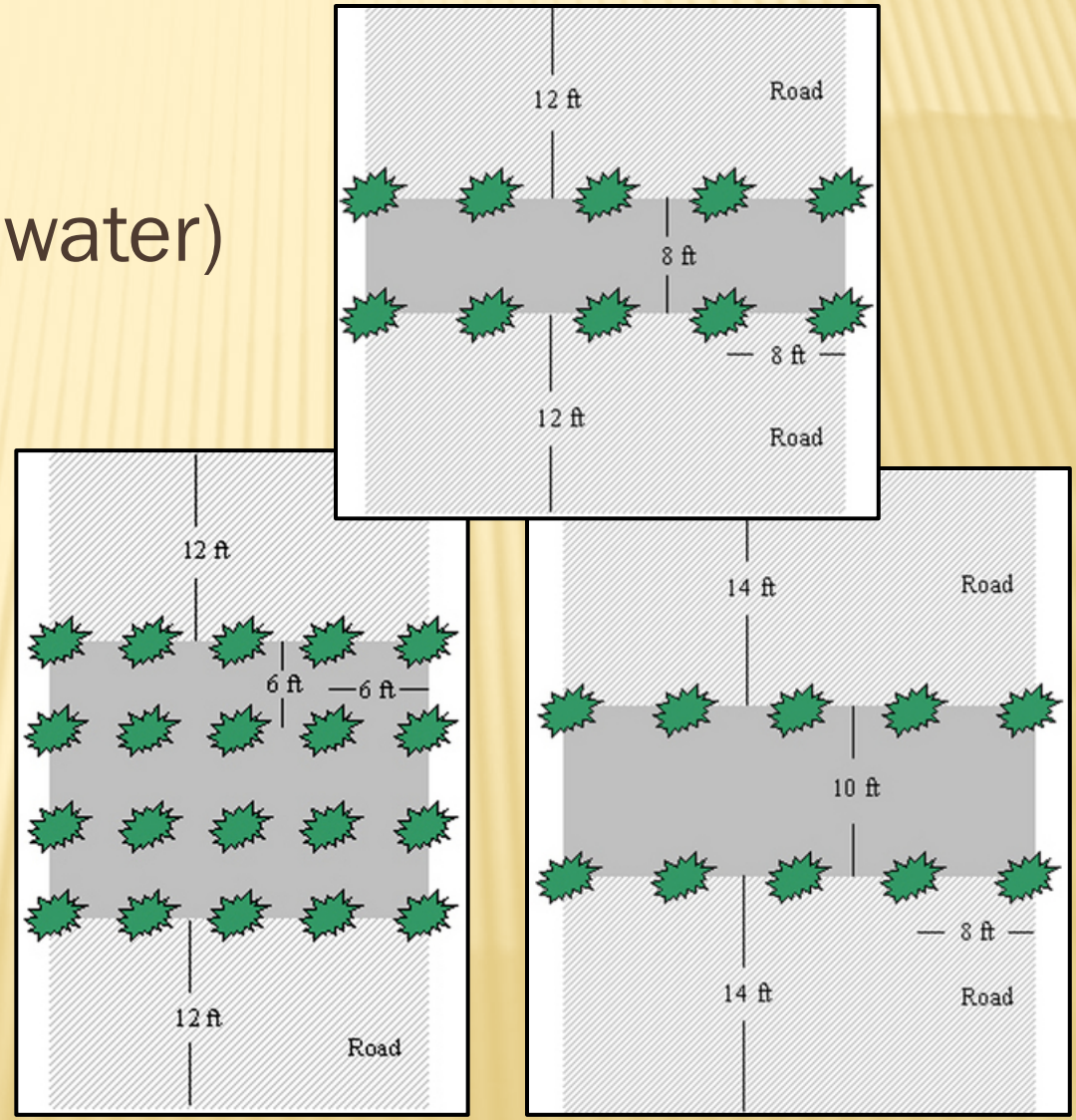


FIELD PRODUCTION METHODS

- Site selection
  - Soil type, soil pH, available nutrients, drainage, etc.
- Block design
  - Slope, rows, plant species, end sellable size, etc.
- Fertilizer
  - Refer to soil test, know the plant species, correct application timing, fertilizer placement, etc.
- Weed Control

BLOCK DESIGN – FACTORS TO CONSIDER

- Slope
- Drainage (air and water)
- Goal plant size
- Plant species
- Soil



SOILS IN TENNESSEE

Good Soils for Field Nursery Production	Bad (Challenging) Soils for Field Nursery Production
Allen loam	Bodine cherty silt loam
Cumberland silt loam	Bruno loamy sand
Etowah silt loam	Dunning silty clay loam
Hartsells loam	Elkins silt loam
Huntington silt loam	Gullied land
Jefferson loam	Guthrie silt loam
Minvale silt loam	Lawrence silt loam
Mountview silt loam	Melvin silt loam
Sequatchie loam	Ramsey loam
Staser sandy loam	Rock land
Waynesboro loam	Talbott silt loam

Source: Mark E. Halcomb

FERTILIZER

- More is not always better
- Soil test (field) or leachate test (containers)
- Late February and June are the optimum times to side dress Nitrogen.
- For granular fertilizer, do not apply after Aug. 1
- For liquid fertilizer, do not apply after Sep. 15
- Do not over fertilize.
  - Over fertilizing apples and pears = Fireblight!

WEED MANAGEMENT METHODS

- Physical Control
  - Cultivating
  - Mowing
  - Mulching
  - Hand weeding
  - Weed free media
  - Cover crops
  - Controlled burns
  - Goats
  - … But are only these methods realistic?

WEED MANAGEMENT METHODS

- Chemical Control
  - Pre-emergent herbicides
  - Post emergent herbicides
  - Fumigants

USING CHEMICALS TO REDUCE CHEMICALS

- Pre-emergent herbicides
  - Reduce trips through the nursery
  - Reduce total amount of post emergent herbicide per acre
  - Reduce pressure for herbicide resistance
  - Save time!

MAKING YOUR PRE-EMERGENT HERBICIDE LAST

- Start with clean bare soil or media
- Select the right herbicide for the right weed
  - Grasses and/or broadleaves
- Select the right herbicide for the right scenario
  - Plant species, season, herbicide rotation
- Need rain or irrigation to activate
- **MUST** be applied before weeds germinate

Finale damage


No Cultivar,
Azadon o Fumigar
Chemicos que
Mata Hierba

NEW PESTS AND PROBLEMS TO RECOGNIZE

- Bean Plataspid (aka. Kudzu Bug)
- Spotted Wing Drosophila
- Flowering Dogwood Fly
- Brown Marmorated Stink Bug
- Thousand Cankers Disease
- Hemlock Wooly Adelgid
- Wooly Hackberry Aphid
- Crapemyrtle Scale
- Daylily Leaf Miner


Kudzu Bug

Flowering Dogwood Fly &
Spotted Wing Drosophila

Brown Marmorated Stink Bug

http://pubs.ext.vt.edu/2902/2902-1100/2902-1100.html

http://njaes.rutgers.edu/images/photos/stinkbug/adult-female-full.jpg

cesanjoaquin.ucanr.edu

Thousand Cankers Disease

http://www.nyis.info/index.php?action=invasive_detail&id=24


Japanese
Maple Scale

http://www.tullahomanews.com/?p=18554

Wooly Hackberry Aphid

nfrec.ifas.ufl.edu

Crapemyrtle Scale

http://citybugs.tamu.edu/2010/05/10/scale/

Daylily Leaf Miner

http://www.amerinursery.com/article-7705.aspx

QUESTIONS