

Caterpillars – The threat

- Plant health
- Site conditions
- Abundance of pest
- Client Concerns
- Regulatory Concerns

Pesticides for Caterpillars

Biologicals

- *Bacillus thuringiensis* (BT)
- Spinosad (Conserve, Fertilome etc)

Insect Growth Regulators

- Diflubenzuron = Dimilin
- Fenoxycarb = Precision
- Tebufenozide = Confirm
- Pyriproxifen = Distance
- Neem, Azadirachtin

Pyrethroids- Rescue Treatments

- Bifenthrin (Talstar)
- Cyfluthrin (Decathalon)
- Deltamethrin (Deltagard)
- Fluvalinate (Mavrik)
- Lambda -Cyhalothrin (Scimitar, Battle)
- Permethrin (Astro, Spectracide)

Oldies but goodies...

- Carbaryl (Sevin)
- Acephate (Orthene)

Tips For Bagworms, Fall Webworms and other large caterpillars

- Most pesticides kill caterpillars that are <1" long
- Spinosad kills largest stages, Pyrethroids are second best
- Pyrethroids are contact insecticides and useful for killing FWW blown out of webs.

Caterpillar Pests-

How much injury do they inflict?

- Types- Exposed, Concealed
- Abundance – Solitary, or Gregarious?
- Host Range – What do they eat?
- Number of Generations /Year
- Abundance of Natural Enemies

Concealed Defoliators

- Mimosa webworm
- Fall webworm
- Eastern tent caterpillar
- Bagworm
- Leaf crumpler

Mimosa Webworm Damage



Close-up of webbed branch



Webs and Frass of Mimosa Webworm Caterpillar



Mimosa Webworm Caterpillar (Late Stage)



Overwintering Stage (Pupa)



Mimosa Webworm Adult



Fall Webworm



Fall webworm caterpillar



Adult Fall Webworm



Adult and Egg Mass of Fall Webworm



Eastern Tent Caterpillar



Webs on Trees



Close-up of Eastern Tent Caterpillar



Egg Mass of Eastern Tent Caterpillar



Web on Tree in Spring



Bagworm injury



Bagworm

Thyridopteryx ephemeraeformis



Early Instar Bagworm



Early Instar Bagworm



Female Bagworm



Male Bagworm







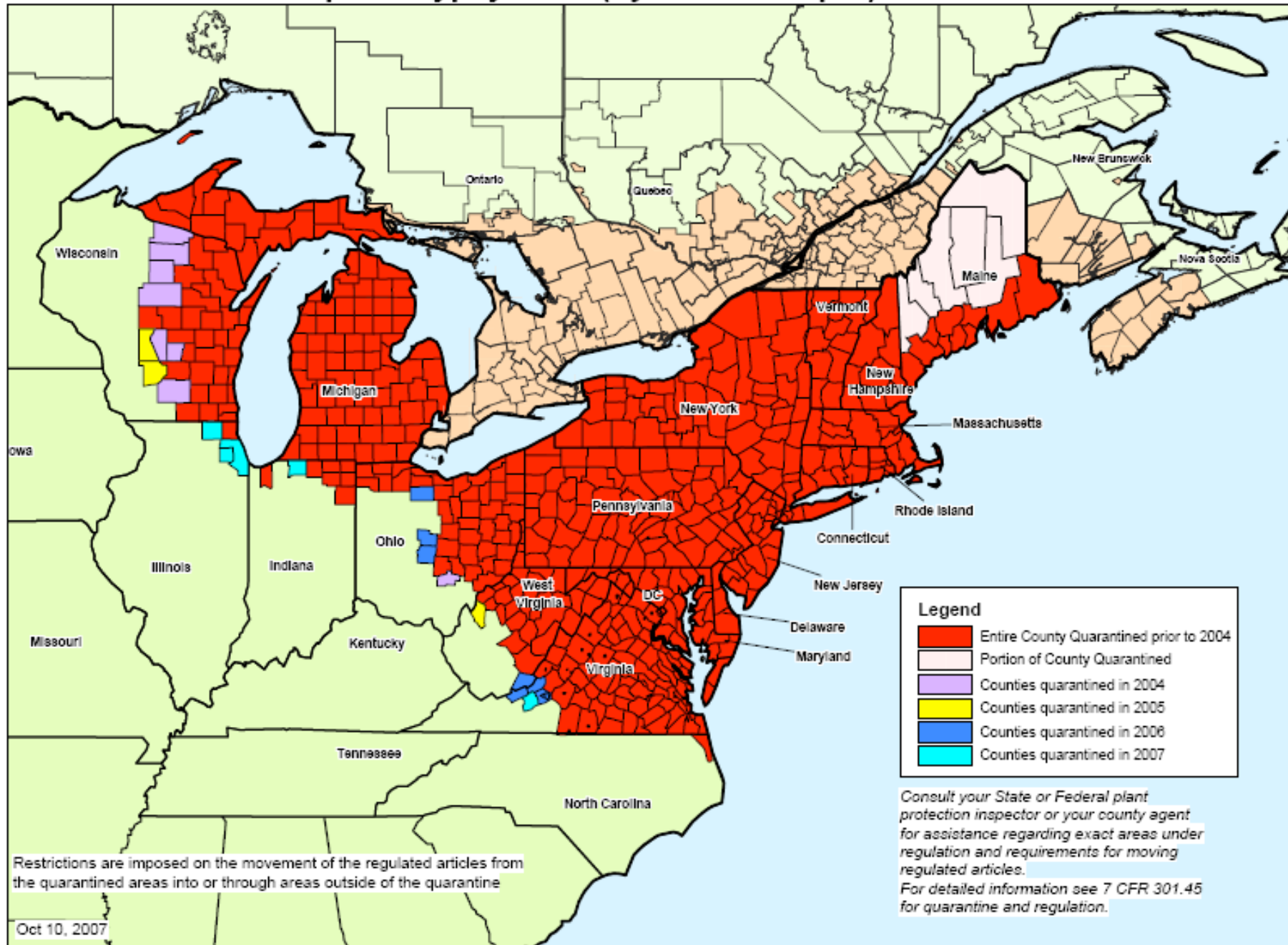
Leaf Crumpler on Cottoneaster



Exposed Defoliators

- Gypsy moth
- Forest tent caterpillar
- Orange striped oakworm
- Yellow necked caterpillar
- Walnut caterpillar
- Loopers, spring and fall canker worms

European Gypsy Moth (*Lymantria dispar*) Quarantine



When are forests defoliated?

- Defoliation starts in May and continues into early June
- A second set of new leaves come out in July



Gypsy Moth Caterpillars



- Older caterpillars have distinct color markings on their backs
- Five pairs of blue dots are followed by 6 pairs of red dots

Gypsy Moth Threat

- Caterpillars eat everything but the leaf midrib
- 11 sq. ft. of foliage consumed by each caterpillar
- Eggs laid in groups of 50-1500
- Caterpillars hatching from 100 egg masses will consume over 3 acres of foliage
- During pest outbreaks each tree can have more than 200 egg masses



Gypsy Moth Nuisance

- After defoliation, caterpillars wander long distances searching for food and places to make pupae
- Caterpillars crawl across lawns, and can cover the sides of houses.



Trees Most at Risk to Gypsy Moth

Aspen

Apples and crabapples

Birches

Blue spruce

American beech

Basswood

Hawthorn

Hazelnut

Linden

Oaks

Poplar

Sweet gum

Serviceberry

Mountain ash

Witch hazel

White pine

Adult Egg Laying

- White female moths emerge from brown pupae and lay large hidden egg masses
- Often found on trees, house siding, firewood and under car bumpers
- Sheer number insects can be nuisance during outbreak



Second Instar Gypsy Moth Caterpillars

- After landing on new trees they feed and go through several molts



Empty Gypsy Moth Caterpillar Skin

- Skins are found during heavy infestations
- First 3 instars feed day and night in tree canopy



- Later stage caterpillars feed on leaves only at night
- Caterpillars crawl to the base of trees before daybreak to hide from birds



Gypsy Moth Pupa And Larval Skin

- In June caterpillars stop feeding and wander to protected place to change into pupae
- Brown pupae can be found anywhere



Adult Female (White) and Male (Brown) Moth

- Emergence from pupae about 4 weeks (~July)
- Males able to fly to find mates
- Males fly upwind to find scent of mates
- Scent called “sex pheromone”



More Forest Tent Caterpillars



Eastern Tent Caterpillar



Catalpa Worms



Yellownecked Caterpillar



Walnut Caterpillar *Datana integerrima*



Massing Behavior of Walnut Caterpillar



Orange Striped Oakworm; *Anisota senatoria*



Loopers, Spring, and Fall Cankerworms



<http://www.entm.purdue.edu/entomology/ext/targets/HN/HN-28/HN-28.pdf>

Conspicuous caterpillars of interest

- Showy caterpillars can cause client concern
- Defoliation is insignificant
- Stinging caterpillars

Common conspicuous caterpillars

- Non-stinging
 - Hickory horned devil
 - Luna moth
 - Swallowtails
 - Monarch
- Stinging
 - Saddleback
 - IO

Pictorial guide to Caterpillars of Eastern Forests

http://www.npwrc.usgs.gov/resource/2000/cateast/cat_east.htm

Hickory Horned Devil



T.F. Billings Tex. For.
Service



J. Kuntsman, PBI-Gordon

Luna Moth



B. Keuhner



Cecropia Moth



Missouri Extension



B Keuhner

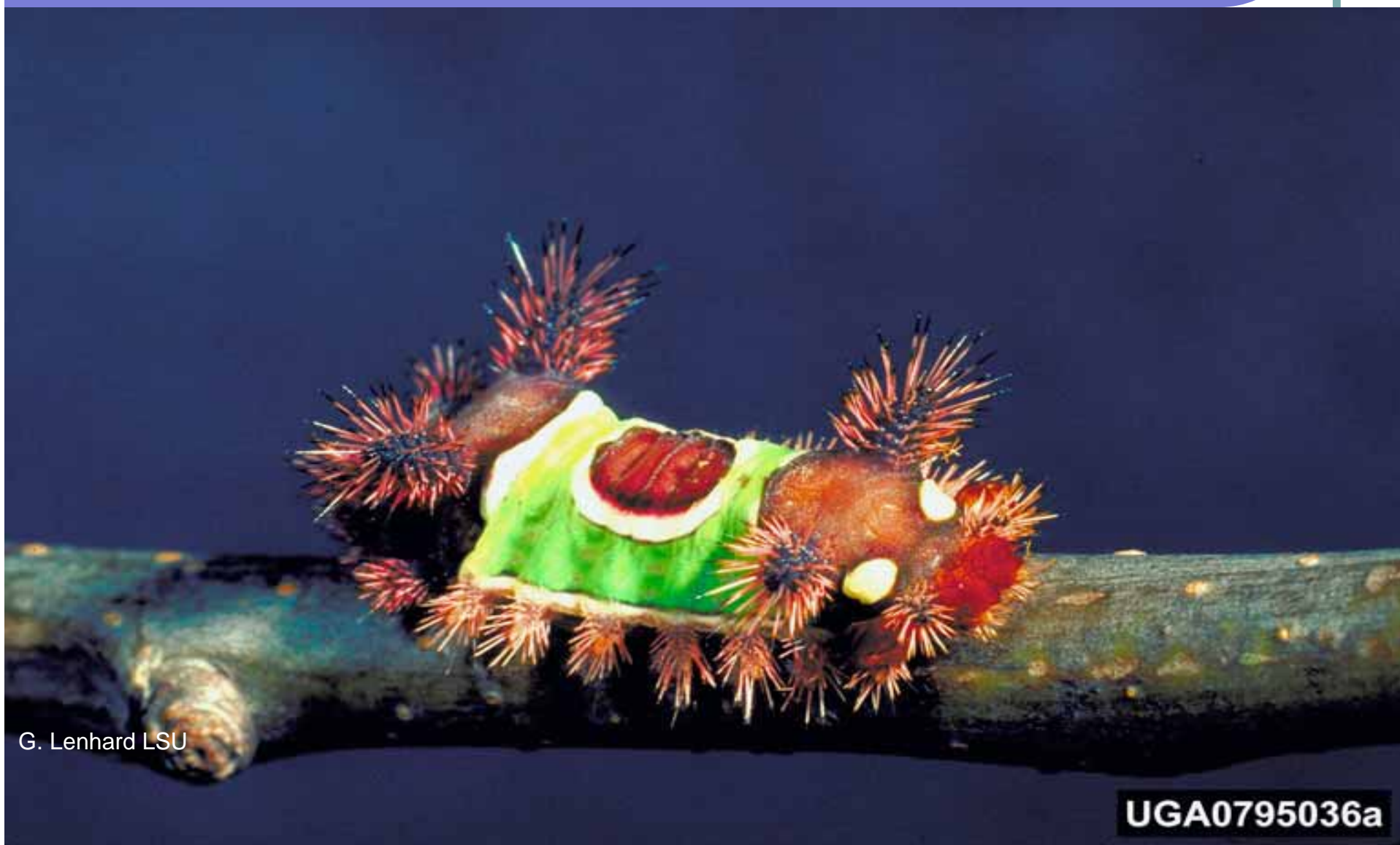
Mimicry and Caterpillars



©David L. Wagner and Valerie Giles
First 3 instars
Spicebush Swallowtail

csadof

Stinging Caterpillars- Saddleback



G. Lenhard LSU

UGA0795036a

Stinging Caterpillars- IO



R. Parker