

Pecan Disease Management

2016 Beginner's Pecan Production Course

Jason Brock

Dept. of Plant Pathology

University of Georgia – Tifton



extension.uga.edu | 1-800-ASK-UGA1



Pecan Diseases

- Bacterial leaf spot
- Downy spot
- Zonate leaf spot
- Downy spot
- Powdery mildew
- Anthracnose
- Phytophthora shuck rot
- Nematodes
- Bunch disease
- Crown gall
- Scab
- Many other minor diseases



Pecan Diseases

- ~~Bacterial leaf spot~~
- ~~Downy spot~~
- ~~Zonate leaf spot~~
- ~~Downy spot~~
- ~~Powdery mildew~~
- ~~Anthracnose~~
- ~~Phytophthora shuck rot~~
- ~~Nematodes~~
- ~~Bunch disease~~
- ~~Crown gall~~
- Scab
- ~~Many other minor diseases~~



Pecan Scan

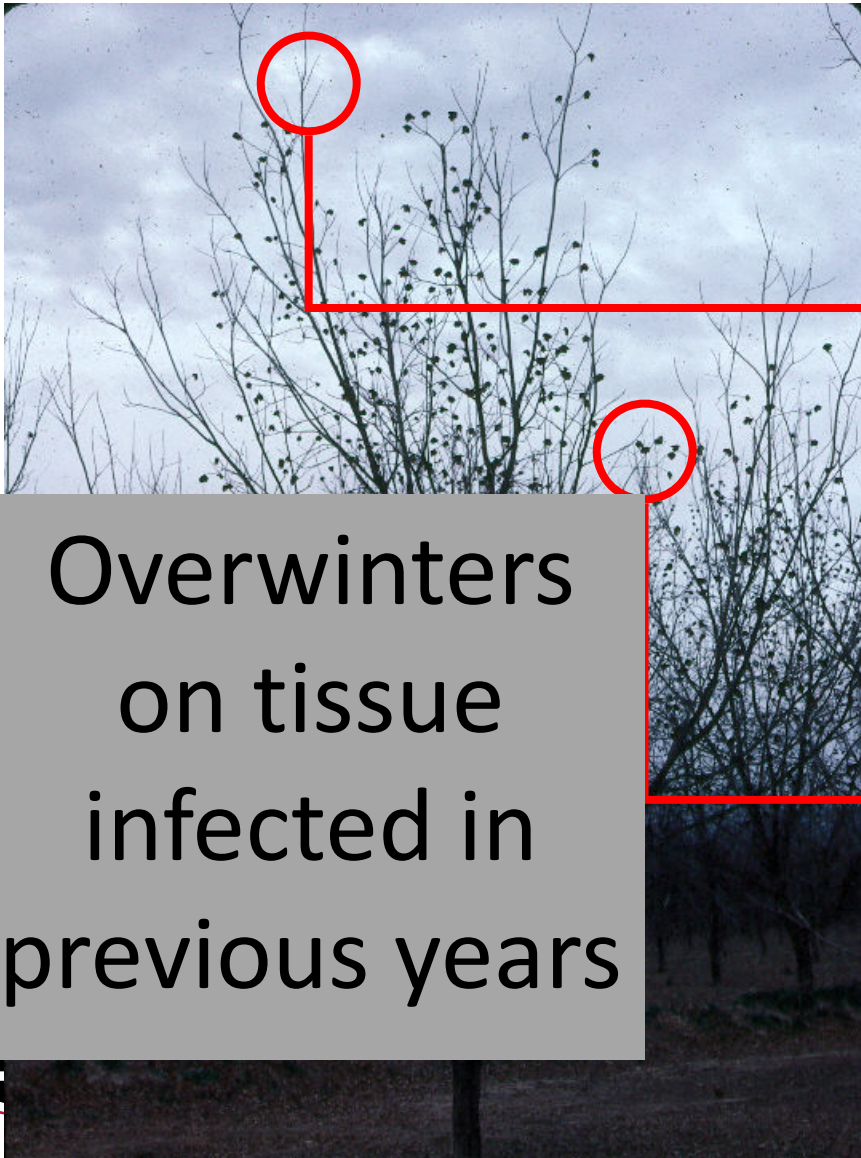
- Caused by the fungus *Fusicladium effusum*
- a known problem since 1888
- the driving force in pecan disease management



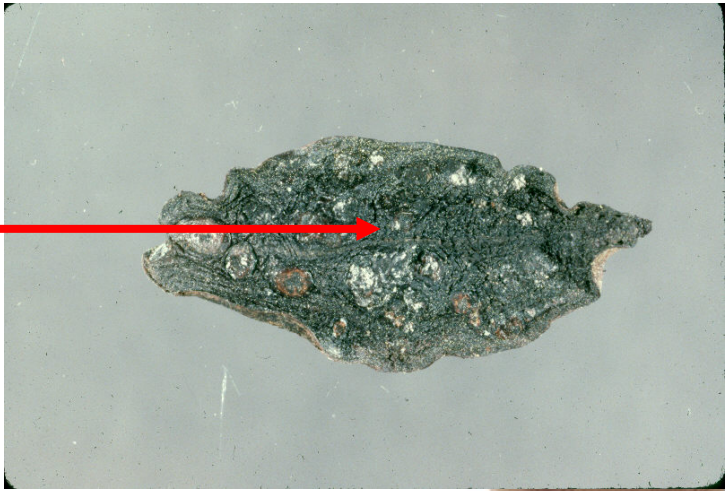
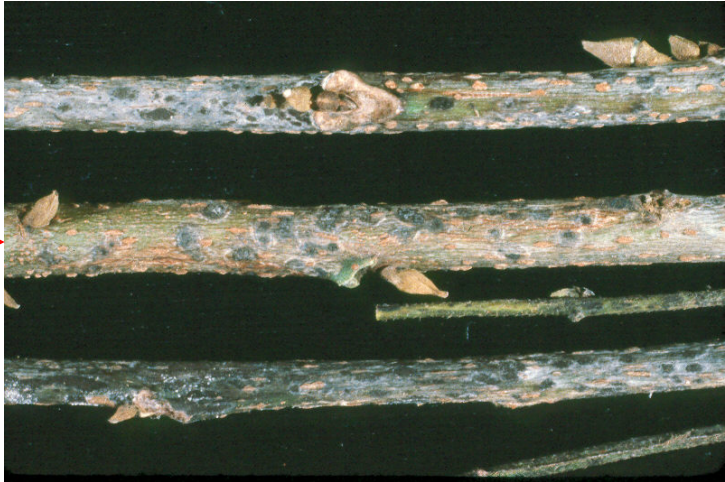
extension.uga.edu | 1-800-ASK-UGA1



Pecan Scan



Overwinters
on tissue
infected in
previous years



Pecan Scan

- Temperature range: 50-95 °F
- 12 hours of wetness required?
 - Reported to occur within 4-6 hours
- Combined effects of duration of wetness & temperature not fully understood.



Pecan Scab

- Rain frequency is more important than total rainfall.
- Heavy rain at any time of day favors scab.
- Light evening rain that keeps trees wet all night lead to more scab than rainfall ending early enough to allow trees to dry.



Pecan Scab Symptoms

On current-season twigs

- Infected in the rapid growth stage
- Lesions are elongated
- Dieback is uncommon except in very susceptible cultivars
- Will serve as inoculum source in following years



Pecan Scab Symptoms

On immature, expanding leaves

- black spots (1-5 mm)
- appear velvety or rough when sporulating
- More common on lower surface
- Upper & lower lesions do not always match.



Pecan Scab Symptoms

- Leaves are most susceptible
7 – 21 days after bud break
- New leaves & shoot elongation
for ~ 90 days
- March – April – May



Leaf Scab Damage

- Reduced photosynthesis
- Leaf retention in the fall
- Source of inoculum

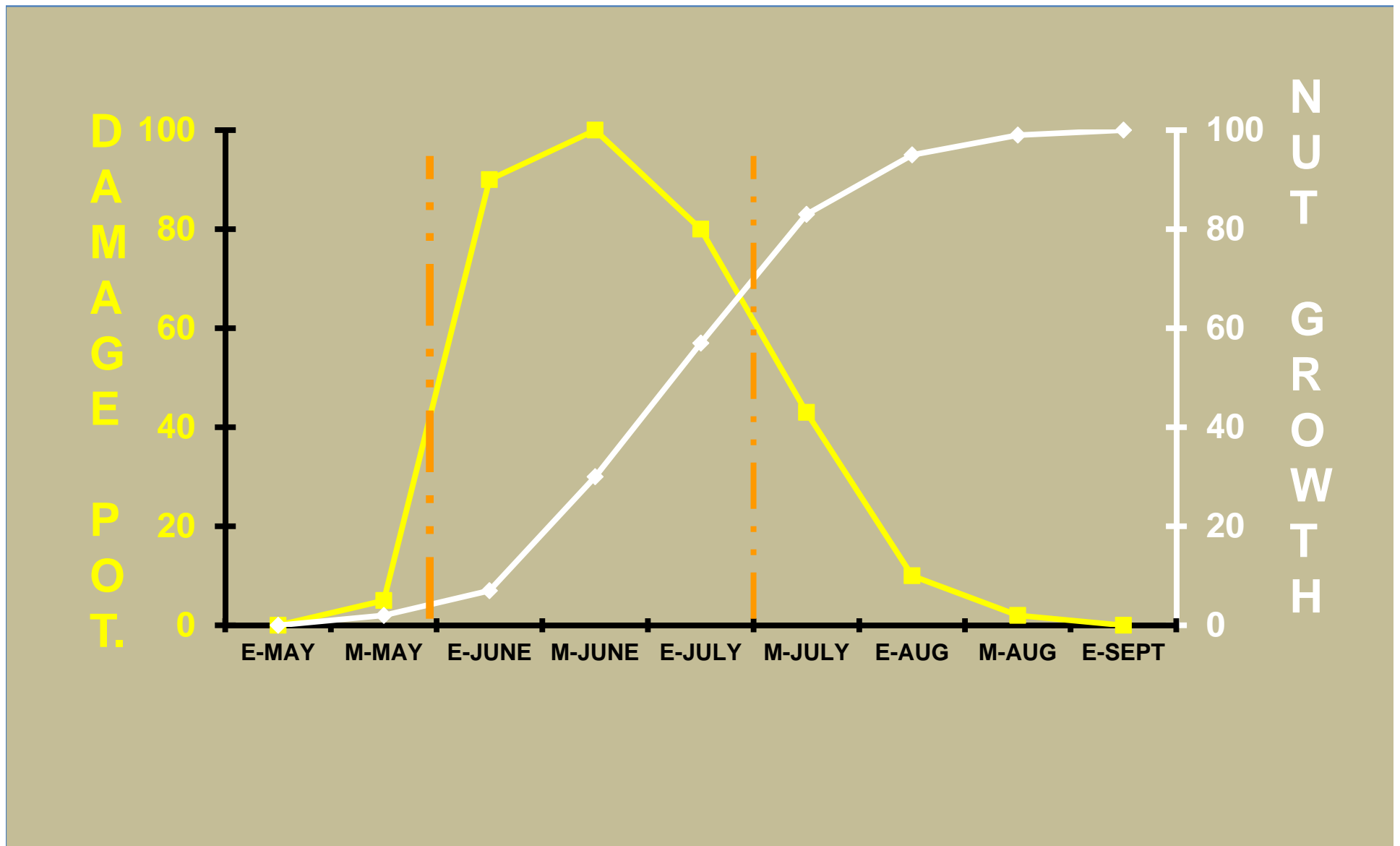
Pecan Scab Symptoms

On shucks

- lesions are circular (2-8 mm)
- Once the shell hardens, subsequent infection is apparently more cosmetic than damaging.



Nut Growth & Damage Potential



Pecan Scab Symptoms

- Early infections
 - tremendous yield and crop quality reductions
- Late infections
 - less damaging to both yield and quality.
- Critical period = early June - mid August



Pecan Scab Symptoms



Pecan Scab Symptoms



Pecan Disease Management



Pecan Disease Management

- Resistant Cultivars
 - Scab has multiple races
 - Most economical and practical measure
 - Host resistance is not always durable
 - Cultivar recommendations are available.



Pecan Disease Management

- Cultural considerations
 - Plant more resistant cultivars
 - Increase cultivar diversity
 - Improve air flow
 - Spacing
 - Thinning
 - Pruning
 - Maintain tree health



Pecan Disease Management

- Fungicide Applications – producing trees
 - Bud break (early April) through shell hardening (mid August)
 - 7 to 11 sprays possible (15-20 not uncommon)
 - Air blast sprayers
 - Coverage will become the biggest challenge.
 - Tree size
 - Tree spacing
 - Sprayer operation



Pecan Disease Management

- Fungicide Applications – young trees
 - Benefits from air movement & sunlight
 - Fewer fungicide applications
 - Shorter protection window
 - Protect leaves & new growth



AU Pecan Spray Advisory

- **This service is provided to pecan growers by Dr. Tim Brenneman, Dept of Plant Pathology at the University of Georgia and AWIS Weather Services.**
- www.awis.com
 - Tab for “Pecan Weather”



Fungicide class	FRAC group	Common name	Trade name(s)	Resistance risk
MBCs (benzimidazoles)	1	thiophanate-methyl	Topsin M; T-methyl	high
QoIs (strobilurins)	11	azoxystrobin pyraclostrobin kresoxim-methyl trifloxystrobin	Abound, Quadris Top*, Quilt* Headline; Pristine*** Sovran Absolute*, Adamant*	high
DMIs (sterol inhibitors, triazoles)	3	propiconazole fenbuconazole metconazole difenoconazole tebuconazole	Orbit, Propimax, Bumper, Tilt Quilt* Enable Quash Quadris Top* Folicur, Tebuzol, Absolute*, Adamant*, Topsin XTR**	medium
Organotins	30	fentin hydroxide	SuperTin, Agri Tin	low to medium
Guanidines	U12	dodine	Elast (Syllit)	low to medium
Phosphonates (phosphites)	33	phosphorous acid and salts	Phostrol, ProPhyt, FungiPhite, Reliant, Fosphite, Kphite, Phiticide, Rampart, Topaz, Viathon****	low

1-3 years

≥ 10 years

* Formulated mixture of a DMI and a QoI
 ** Formulated mixture of a DMI and an MBC

*** Formulated mixture of an SDHI and a QoI
 **** Formulated mixture of a DMI and phosphite

Pecan Disease Management

- Fungicide Resistance Risk
 - Fungicide mode of action (FRAC group)
 - All fungicides have SOME risk
 - Some have higher risk based on MOA
 - Fungicide use
 - Cumulative amount of fungicide with the sample MOA
 - Rate of fungicide used



Pecan Disease Management

- Fungicide Resistance Management
 - Use formulated mixtures or tank mixes
 - Alternate different MOA
 - Maintain effective rates
 - Use low-risk fungicides when possible
 - Use when most effective



Fungicide class	FRAC group	Common name	Trade name(s)	Resistance risk
MBCs (benzimidazoles)	1	thiophanate-methyl		Use sparingly; strict limitations
QoIs (strobilurins)	11	azoxystrobin pyraclostrobin kresoxim-methyl trifloxystrobin		Best suited for foliar diseases Effective for diseases other than scab
DMIs (sterol inhibitors, triazoles)	3	propiconazole fenbuconazole metconazole difenoconazole tebuconazole		Combinations of 11 + 3 also excellent on nut scab Limitations on number of uses
Organotins	30	fentin hydroxide		Best suited for nut scab
Guanidines	U12	dodine		
Phosphonates (phosphites)	33	phosphorous acid and salts		3-4 applications; every other spray, starting on Apr/May



UGA
extension

Formulated mixture of a DMI and a QoI
Formulated mixture of a DMI and an MBC

extension.uga.edu

1-800-ASK-UGA1

*** Formulated mixture of an SDHI and a QoI
**** Formulated mixture of a DMI and phosphite

Pesticide Labels

- Label = information printed on or attached to the container



Spring
Crabgrass Preventer with eVade 375% Plus

ACTIVE INGREDIENTS:
Proflumicarb (2S,2S)-2-propyl 4-difluoromethyl-6-glyoxyacetimidate 3,775%
0.05% eVade (0.4%)

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

PRECAUTIONARY STATEMENTS
Hazardous to Humans and Domestic Animals

FIRST AID

ENVIRONMENTAL HAZARDS

STORAGE AND DISPOSAL

INSTRUCTIONS FOR USE

GENERAL DIRECTIONS

REGISTRATION NO. 101-1849-01

NET WEIGHT (4.0 L) 6000 g (1.32 US GAL)

DATE 08/10

18-0-5

GUARANTEED ANALYSIS

Total Nitrogen (N)	18.0%
18% Ammoniacal Nitrogen	
0.0% Other Nitrogen	
0.0% Slowly Available Water-Soluble Nitrogen*	
0.0% Water Insoluble Nitrogen**	
Soluble Phosphorus (P2O5)	0.0%

GENERAL APPLICATION GUIDELINES

Rate	40% Product	80% Nitrogen	80% P2O5
Low	0.25	0.06	0.06
Medium	0.50	0.12	0.12
High	0.75	0.18	0.18

BEMU

LOVELAND

LOVELAND PRODUCTS, INC.
P.O. BOX 1000, GRANT, IN 47048-1000



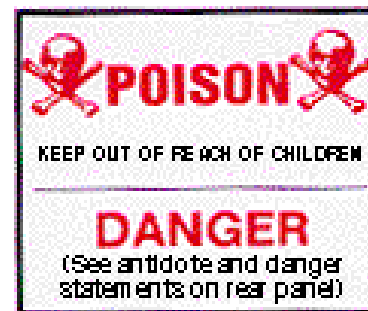
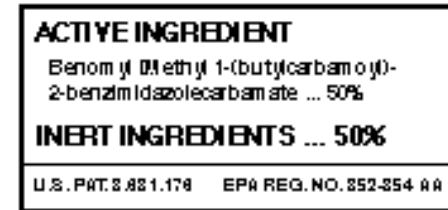
Pesticide Labels

- To the manufacturer, the label is a "license to sell."
- To the state or federal government, the label is a way to control the distribution, storage, sale, use, and disposal of the product.
- To the buyer or user, the label is a source of facts on how to use the product correctly and legally.
- To physicians, the label is a source of identification and information or proper treatment for poisoning cases.



Pesticide Labels

- Identifying information
 - pesticide's classification, names, contents, signal words, manufacturer's name and address, and the EPA registration
- Precautionary statements
 - environmental and other hazards, PPE, first aid treatments, ...



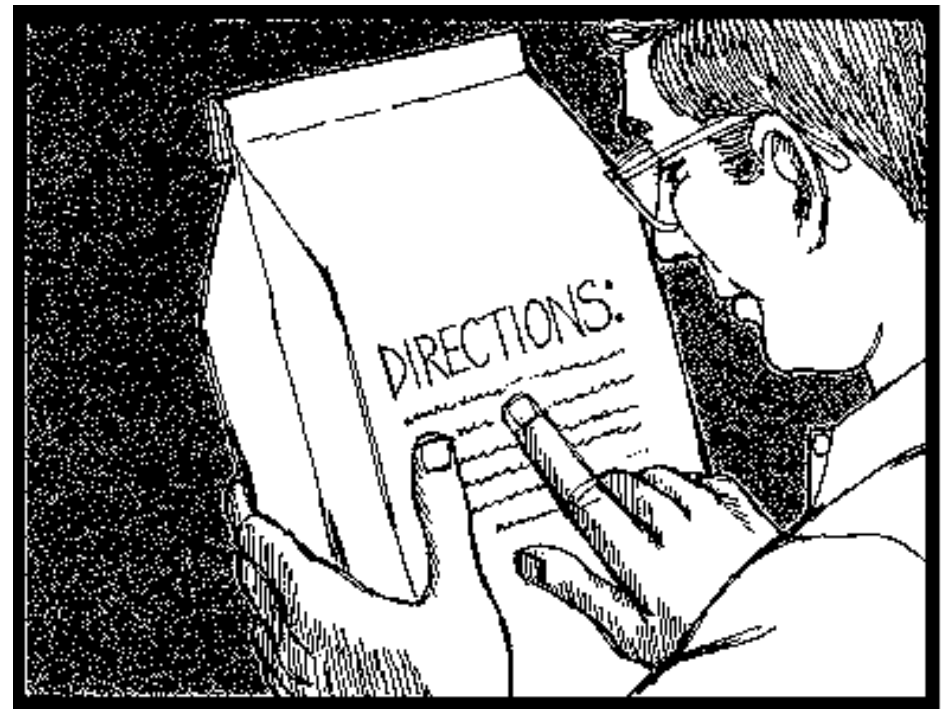
Pesticide Labels

- Directions for use
 - Where, how, when,
- Storage and disposal



Pesticide Labels

- The label is the law!
- Read before
 - Buying
 - Mixing & applying
 - Storing
 - Disposing



Take Home Messages

- Cultivar selections
- Scab is the major concern.
- Fungicide classes and resistance management

