

SUNFLOWER RUST AND FUNGICIDES

2009 NSA SUMMER SEMINAR

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Outline

- ▣ Rust
- ▣ Fungicide trials in 2008
- ▣ Early occurrence in 2008, 2009
- ▣ How do we manage this disease in '09

Introduction - Rust



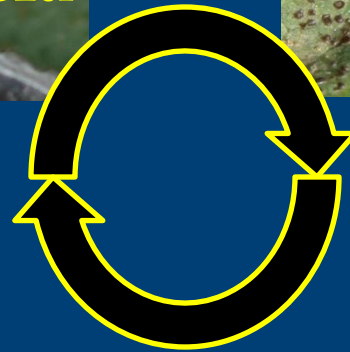
Aecia



Uredia



Pycnia



Telia



Basiospores

Introduction - Rust

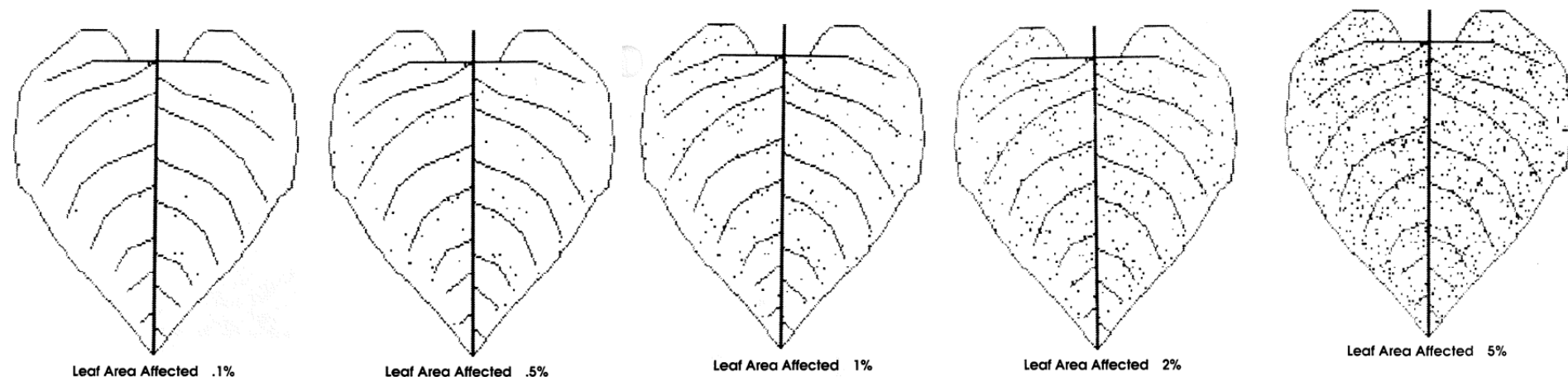
- ▣ *Puccinia helianthi*
- ▣ Increasing frequency
- ▣ Conditions favoring rust
 - Free moisture i.e. dew
 - Temps 55-85 favorable
- ▣ Disease cycle every 10-14 days
- ▣ Severity
 - Time of onset & Environment
- ▣ 'Typical' onset = relatively late
- ▣ 2008 = early in ND
- ▣ 2009 = earlier in ND and NE



Fungicides

Introduction - Fungicides

- ▣ Action threshold = 3% pustule coverage on upper four leaves (Folicur) –Shtienberg 1995
- ▣ Currently available chemicals
 - QoI (Headline, Quadris)
 - Triazoles (Folicur)



Fungicide and Timing Trials 2008

- ▣ Evaluate fungicides efficacy
 - Fungicide Trials
- ▣ Evaluate optimum timing
 - Timing Trials

- ▣ Carrington and Langdon REC's
 - Inoculated (Race 336) and irrigated
- ▣ Casselton - CHS
 - Inoculated
- ▣ Multiple disease evaluations – Rust severity diagrams
 - AUDPC = way to measure disease over time
- ▣ Yield

Fungicide Trials

- ▣ Core fungicides
 - Headline 9 fl oz
 - Quadris 9 fl oz
 - Proline 5.7 fl oz
 - Prosaro 6.5 fl oz
 - Prosaro 8.2 fl oz
 - Tebuzol 4 fl oz
(Folicur generic)
- ▣ Others included
 - 2 Experimental
 - Quash 8 fl oz
 - Headline 6 fl oz
- ▣ Applications at R5.2-R5.9

Timing Trials

- ▣ Two Fungicides
 - Headline 9 fl oz
 - Tebuzol 4 fl oz
(Folicur generic)
- ▣ Five Timings
 - Untreated
 - R3.5-R4
 - Approx R5.2-R5.5
 - R6.0 +
 - All three timings

Fungicide Efficacy Trial: Carrington 2008

Treatment	Disease severity (according to upper 4 leaves using severity diagrams)					Yield (lb/A)
	R3.5	R5	R7	R9	AUDPC	
Untreated Control	0 a	2.6 a	9.9 a	13.6 a	270 a	2284
Proline @ 5.7 fl oz	0 a	0.4 c	0.5 c	0.7 d	17 cd	2469
Prosaro @ 6.5 fl oz	0 a	0.4 c	0.5 c	1.1 cd	20 cd	2268
Prosaro @ 8.2 fl oz	0 a	0.4 c	0.4 c	0.5 d	15 d	2678
Tebuzol @ 4.0 fl oz	0 a	0.4 c	0.7 c	0.8 d	20 cd	2482
Headline @ 9.0 fl oz	0 a	0.7 bc	2.2 c	3.3 c	64 c	2469
Quadris @ 9.0 fl oz	0 a	1.2 b	4.6 b	8.5 b	141 b	2340
Quash 2.0 DC @ 8.0 fl oz	0 a	0.8 bc	1.2 c	1.7 cd	38 cd	2681
LSD	0	0.8	2.1	2.5	47.6	ns

Fungicide application made at R5.2-R5.5:

Disease severity approximately 1-2% at time of applications

Fungicide Efficacy Trial: Carrington 2008

Treatment	Percent disease severity (upper 4 leaves, according to diagrams)					Yield
	R3.5	R5	R7	R9	AUDPC	(lb/A)
Untreated Control	0 a	1.8 ab	8.7 a	16.5 a	264 a	1501 a
R3.5: 1 wk before dis	0 a	0.8 bc	4.1 b	13.9 a	169 b	1720 ab
R5.2: Approx 1-2% sev	0 a	0.8 bc	1.3 c	3.6 bc	54 c	1899 b
R6+ : Approx 7% sev	0 a	2.7 a	6.0 b	4.6 b	150 b	1440 a
R3 + R5.2 + R6.0	0 a	0.4 c	0.4 c	0.9 c	17 c	1941 b
LSD	0	1	2.4	3.4	64	306

All Fungicide Applications were 9 oz Headline

What we learned

- ▣ Fungicide Trials
 - ▣ All chemicals reduced disease
- ▣ Timing Trials
 - Headline most effective in early stages of epidemic:
 - ▣ 0-2% severity on upper four leaves
 - Tebuzol (Folicur and other generics) most effective after disease onset
 - ▣ Likely more forgiving in high disease environments
 - Tebuzol, Proline, Prosaro, Quash tended to group together

http://www.sunflowernsa.com/research/research-workshop/documents/Markell_Rust_09.pdf

Last Year

- ▣ Early rust in multiple parts of the state
- ▣ One field by Mohall was watched very closely
- ▣ Aecia appeared in late June, uredia in early July
- ▣ Field sprayed twice, left one strip untreated

Mohall, early-mid July



Aecia on cotyledon



Aecia close up



Uredia and aecia on lower leaf



End of season, untreated section



By season's end

- ▣ Severity in upper leaves of untreated section of field was 56%
 - Looked like wilt, black and dead
- ▣ Estimated yield was 200 lb/ A
- ▣ Unmarketable quality

- ▣ Rest of field sprayed twice
 - Headline (R1) and Folicur (R5.1)
- ▣ Yield was approximately 1400 lb/ A

This year

- ▣ Rust uredia in commercial fields as of last Friday (June 19)
- ▣ 4 leaf stage

What do we recommend?

- ▣ Don't panic, but scout
- ▣ Don't mix fungicide with herbicide
- ▣ Present now
 - You may need to protect now if disease is severe, otherwise wait until more leaves are out
- ▣ Shows up soon, try to wait until R1 to spray, then R5 (use thresholds for guidance)
- ▣ Shows up later, use thresholds (target R5.2 if possible)
 - 3% Folicur, 1% Headline or Quadris
- ▣ Keep an eye of weather and spread

Thank You



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