Managing Sunflower Rust in Early Onset Epidemics with Fungicides: 2010

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Outline

- Management of Sunflower Rust - normal
- Fungicide Trials 2010
- Results
- Future work

Management of Rust

- Typical onset
  - 2008 and 2009 Trials
  - Single application at 1-3% severity on upper four leaves (R5.2-5.5)
- What happens in early onset?
  - Mohall 2008

2010 and 2011 Objective

- Determine most efficacious fungicide timing(s) when rust appears in early vegetative stages (early onset)

Materials and Methods

- Five locations:
  - Langdon Research and Extension Center
  - Carrington Research and Extension Center
  - Cenex Harvest States – SE North Dakota
  - Vision Research Park – NW North Dakota
  - Nebraska Panhandle Research and Extension Center

- Randomized Complete Block Design (RCBD)
- Confection Sunflower Seed – 4 row plots

- Treatment rows inoculated with Race 336
  - -Inoculated at ~V6-V10 (Simulate *early* onset)
  - -VRP – no inoculation, natural infection

Fungicide – Treatment List

- Timing Treatments

  Headline @ 6.0 fl oz

  Folicur @ 4.0 fl oz (Grandin Location)

  - Singularly
  - Sequentially
  - Timings: V8-V12, R1, R5.2-R5.5

- Fungicide Programs

  -Applied at R1 and R5.2-5.5, respectively

  Folicur @ 4.0 fl oz, Propulse @ 10.3 fl oz

  Headline @ 6.0 fl oz, Experimental

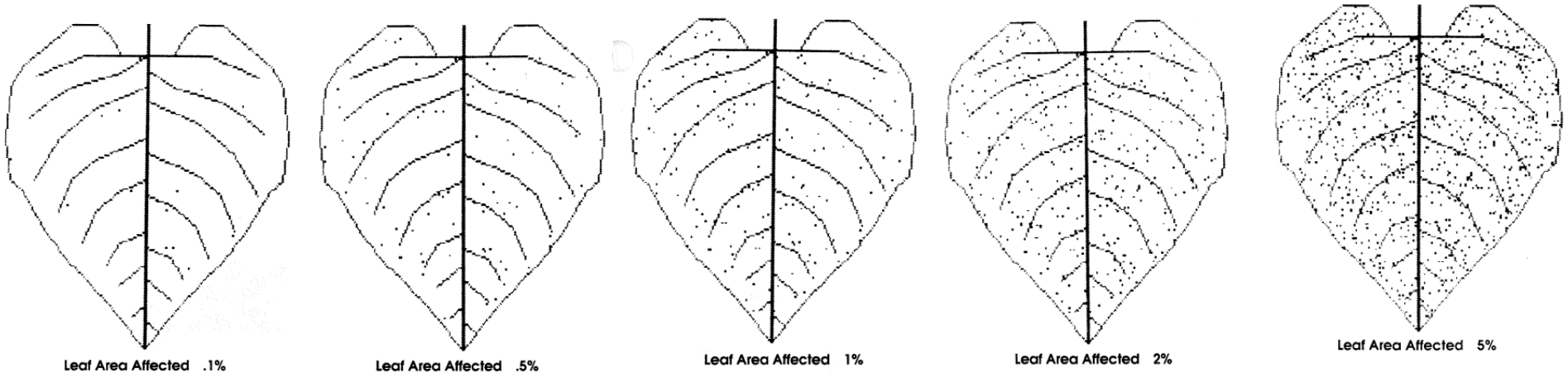
  Vertisan @ 20.0 fl oz, Picoxystrobin @ 9.0 fl oz

  Headline @ 6.0 fl oz, Quash @ 3.0 fl oz

  Tilt @ 4.0 fl oz, Quadris @ 6.2 fl oz

Evaluation and Data Collecting

- Multiple Disease Ratings
  -Upper four-fully expanded leaves
  -Ten randomly selected plants



- AUDPC (Area Under Disease Progress Curve)
- Yield

Gulya et al., 1990

Results

Location	Year	# of Trts	Rust Detected	Disease Pressure	Yield Limiting Factors
Langdon	2010	13	7-July	Intermediate	
Carrington	2010	12	7-July	Intermediate	Sunflower Midge
Grandin	2010	23	16-July	Low	High Winds
Mohall	2010	10	28-July	High	
Scottsbluff	2010				

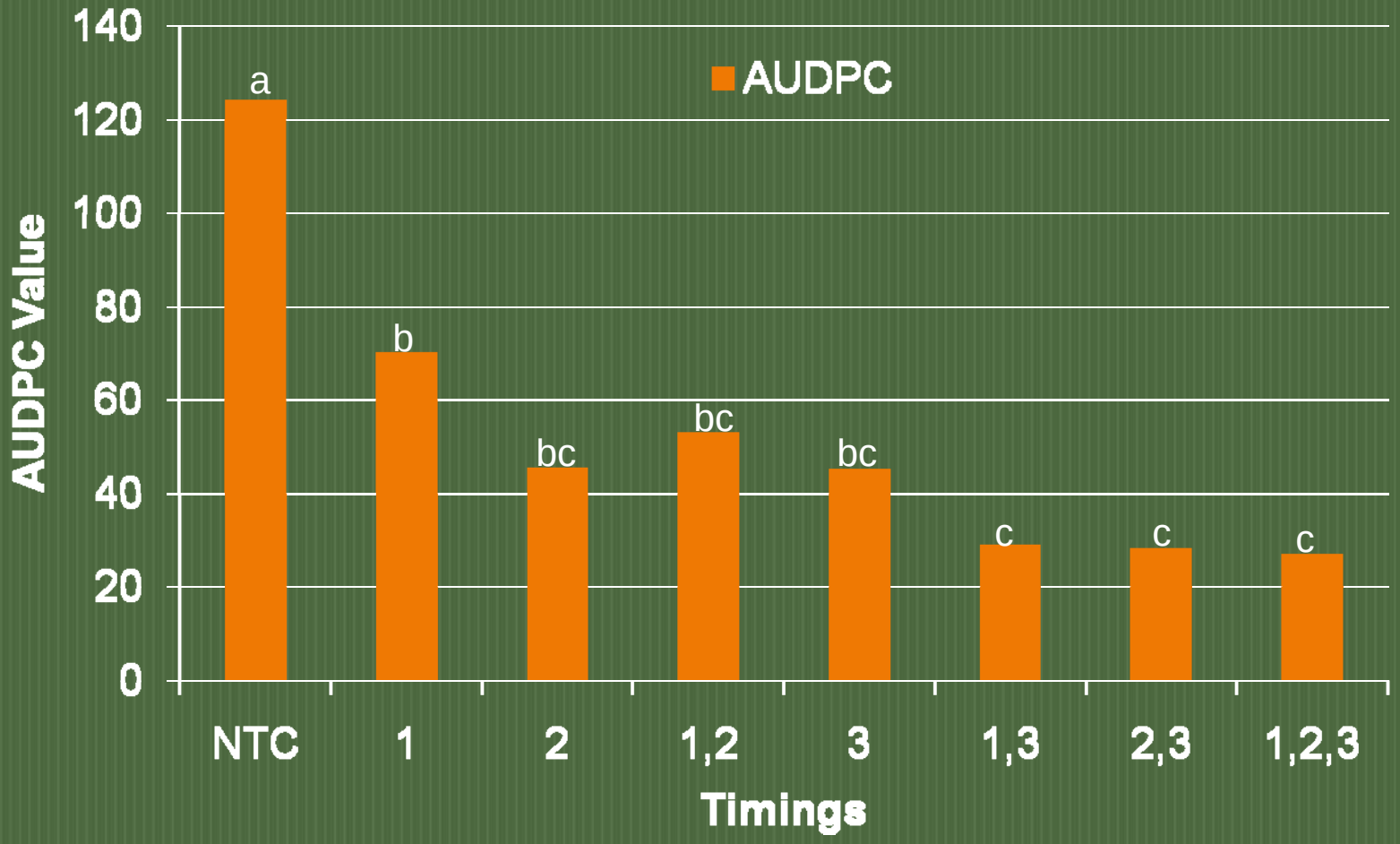
Results - CHS

AUDPC Values

Timing	Headline	Folicur
V8-V12	42.86 a	50.64 a
R1	36.02 a ?	6.17 b
R5.2-5.5	14.33 b	13.99 b
V8-V12, R1	15.43 b	8.40 b
V8-V12, R5.2-5.5	14.59 b	10.44 b
R1, R5.2-5.5	7.43 b	6.25 b
V8-V12, R1, R5.2-5.5	7.65 b	5.25 b
LSD $p \leq 0.05$	14.97	14.97

*Non-treated control = 60.68

Results – CREC - Headline



Timing 1 = V8-V12 Timing 2 = R1 Timing 3 = R5.2-R5.5

Results – Spraying Programs

AUDPC Values

Program	CREC	Grandin	LREC
Non-treated control	124.02 a	80.01 a	97.11 a
Folicur, Propulse	25.27 b	6.17 c	34.14 d
Headline, Confidential	26.07 b	7.56 c	53.68 cd
Vertisan, Picoxystrobin	40.11 b	26.94 b	62.72 bc
Headline, Quash	36.17 b	6.73 c	51.03 cd
Tilt, Quadris	X	10.61 c	49.23 cd
Headline, Headline	28.03 b	7.43 c	77.19 ab
Folicur, Folicur	X	6.25 c	X
LSD $_{p \leq 0.05}$	42.04	10.91	20.52

Summary

- Disease pressure – not as high as hoped
- Single V8-V12 application did not make a difference (based on 2010 disease progression)
- Most important application is R5
- Spraying programs reduce disease regardless of combination

Future Research

- 1st Part: Fungicide Trials

  -2011 repeat early onset

- 2nd Part: Assess pathogen diversity for 2007-2009 ND isolates

- 3rd Part: Screen germplasm for resistance

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