Project FY22-IM-007: Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana

---

1. What are the major goals and objectives of the research project?

Objective 1. Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON in all major grain classes, with emphasis on new combination fungicides, Prosaro Pro and Sphaerex.

Objective 2. Compare the efficacy of Prosaro Pro and Sphaerex to that of Prosaro, and Miravis Ace. Trial establishment, plots dimensions, and general management will be as described under Obj. 1. Plots of a single susceptible cultivar will be planted in a randomized complete block, with 4-6 replicate blocks, and subjected to at least nine fungicide treatments (Table 2).

Table 2. The following fungicide treatments will be randomly assigned to experimental units (wheat)

Trt[a]	Product	Rate/Acre (fl oz)	Timing
1	Untreated check	...	...
2	Prosaro	6.5	Feekes 10.5.1 (early anthesis)
3	Caramba	13.5	Feekes 10.5.1 (early anthesis)
4	Miravis Ace	13.7	Feekes 10.5.1 (early anthesis)
5	Prosaro Pro	10.3	Feekes 10.5.1 (early anthesis)
6	Sphaerex	7.3	Feekes 10.5.1 (early anthesis)
7	Miravis Ace fb Prosaro Pro	13.7/10.3	Early anthesis/4-6 days after early anthesis
8	Miravis Ace fb Sphaerex	13.7/7.3	Early anthesis/4-6 days after early anthesis
9	Miravis Ace fb Tebuconazole	13.7/4	Early anthesis/4-6 days after early anthesi
10.	Prosaro	8.2	early anthesis

[a]All treatments will be applied with NIS @ 0.125 v/v.

2. What was accomplished under these goals or objectives? *(For each major goal/objective, address these three items below.)*

What were the major activities?

Trials were established to address Objective 1 at the Dean Lee (DLRS) near Alexandria and Macon Ridge (MRRS) near Winnsboro Research Stations. Three varieties (Delta Grow 1800: scab resistant, Progeny Chad: scab moderately resistant, Dyna-Gro Blanton: scab susceptible). Four fungicide treatments and two non-treated consistent with the protocol outlined in the integrated management coordinated project were implemented.

To address Objective 2, trials were planted using scab susceptible varieties Blanton or Plantation at the Doyle Chambers (DCRS) near Baton Rouge, DLRS, and MMRS. Treatments were applied consistent with the uniform fungicide coordinated project.

All trials were inoculated (1 gm/sq ft) with *Fusarium graminearum* infested corn seed prior to heading. The trials at the MRRS were misted. Scab data has been collected and processed according to the coordinated project protocol. Grain samples have been sent to the lab for DON analyses and FDK.

The trial at the DCRS was not harvested due to inclement weather.

What were the significant results?

Scab incidence and severity was low at all locations. Results with preliminary data tables are presented for each location and trial. FDK, DON, and seed quality ratings were not available at the time of this report.

DEAN LEE RESEARCH AND EXTENSION CENTER

FUNGICIDE X VARIETY

Chad: Scab index ranged from 0.93-1.56. Yields didn't differ among treatments.
Delta Grow 1800: Scab index ranged from 0.01-0.65. Yields did not differ among treatments.
Blanton: Scab index ranged from 0.65-2.15. Yields did not differ among treatments.

			4-17	4-17	4-24	4-17		
Treatment[1]	**Rate (fl oz/A)**	**Appl Code**[2]	**Bac**[3]	**SR**[4]	**FHB 0-9**	**SCAB INDEX**	**Test Weight**	**YLD (Bu/A)**
Chad Non-Treated Inoculated			0.0 -	0.0 c	1.5 de	1.56 abc	53.48 a	60.4 abc
Chad Non-Treated Not Inoculated			0.0 -	0.0 c	1.7 cd	1.39 a-d	53.45 a	58.2 abc
Chad Prosaro	6.5	A	0.0 -	0.0 c	1.2 def	1.47 abc	53.85 a	65.7 a
Chad Miravis Ace	13.7	A	0.0 -	0.0 c	0.7 fg	0.93 b-f	53.90 a	65.1 a
Chad Prosaro Pro	10.3	A	0.0 -	0.0 c	1.0 ef	1.13 b-f	54.35 a	62.6 ab
Chad Spharex	7.3	A	0.0 -	0.0 c	1.2 def	1.13 b-f	54.10 a	60.2 abc
Delta Grow 1800 Non-Treated Inoculated			18.8 -	0.0 c	0.4 g	0.65 e-h	57.53 a	53.6 c
Delta Grow 1800 Non-Treated Not Inoculated			30.0 -	0.0 c	0.7 fg	0.50 fgh	57.53 a	59.0 abc
Delta Grow 1800 Prosaro	6.5	A	21.3 -	0.0 c	0.7 fg	0.34 gh	57.63 a	53.1 c
Delta Grow 1800 Miravis Ace	13.7	A	17.5 -	0.0 c	0.4 g	0.23 hi	58.35 a	55.2 bc
Delta Grow 1800 Prosaro Pro	10.3	A	20.0 -	0.0 c	0.4 g	0.01 i	57.85 a	53.4 c
Delta Grow 1800 Spharex	7.3	A	16.3 -	0.0 c	0.7 fg	0.04 i	57.38 a	51.9 cd
Banton Non-Treated Inoculated			22.5 -	38.8 ab	4.7 a	1.77 ab	0.00 c	37.8 e
Banton Non-Treated Not Inoculated			27.5 -	38.8 ab	4.2 a	2.15 a	13.78 b	40.2 e
Banton Prosaro	6.5	A	20.0 -	40.0 a	2.4 bc	1.32 a-e	56.33 a	40.2 e
Banton Miravis Ace	13.7	A	17.5 -	28.8 b	1.0 ef	0.68 d-h	57.93 a	43.4 de
Banton Prosaro Pro	10.3	A	28.8 -	40.0 a	2.5 b	0.65 d-h	56.50 a	41.2 e
Banton Spharex	7.3	A	25.0 -	36.3 ab	2.2 bc	0.90 c-g	56.88 a	41.9 e
LSD P=0.10			23.65	10.06	0.53-1.06	0.22-0.95	7.7	8.7

[1]Treatments have NIS (0.125% v/v).
[2]Application timing: A=early anthesis.
[3]Bacterial streak.

[4]Stripe rust.

FUNGICIDE SCREENING

FHB 0-9 ratings and the FHB index for all fungicide treatments were lower than the non-treated. Yields (bu/A) ranged from 38.2 (Sphaerex 7.3 fl oz/A) to 52.7 (Miravis Ace 13.7 fl oz).

Date			**4-17**	**4-26**	**4-16**	**4-16**	**4-16**		
Treatment[1]	**Rate**	**Appl Code**[2]	**% SR**	**FHB 0-9**	**Incidence FHB**	**Severity FHB**	**SCAB INDEX**	**TEST WEIGHT**	**YIELD (bu/A)**
Non-treated			36.3 -	5.2 a	17.6 -	14.9	2.6 -	55.73 e	45.0 -
Prosaro	6.5 fl oz/a	A	30.0 -	2.5 bcd	6.5 -	9.9	0.6 -	57.83 bc	41.1 -
Caramba	13.5 fl oz/a	A	28.8 -	2.9 b	10.3 -	10.3	1.3 -	57.10 d	48.0 -
Miravis Ace	13.7 fl oz/a	A	16.3 -	1.7 de	9.3 -	9.6	0.9-	58.65 a	52.7 -
Prosoaro Pro	10.3 fl oz/a	A	26.3 -	1.8 cde	4.0 -	8.1	0.4-	57.93 b	46.8 -
Sphaerex	7.3 fl oz/a	A	36.3 -	2.7 bc	5.8 -	8.1	0.5-	57.28 cd	38.2 -
Miravis Ace Prosaro Pro	13.7 fl oz/a 10.3 fl oz/a	A B	26.3 -	1.5 e	4.7 -	5.7	0.6-	59.10 a	51.8 -
Miravis Ace Sphaerex	13.7 fl oz/a 7.3 fl oz/a	A B	27.5 -	1.2 e	5.7 -	7.5	0.4-	58.83 a	45.8 -
Miravis Ace Tebuconazole	13.7 fl oz/a 4 fl oz/a	A B	18.8 -	1.7 de	6.7 -	8.3	0.6-	58.78 a	50.4 -
Prosaro	8.2 fl oz/a	A	30.0 -	2.7 bc	4.9 -	15.3	0.7-	57.73 bc	43.3 -
LSD P=.10			23.10	0.79 – 1.32	5.4-9.7	4.8-5.9	0.5-0.7	0.586	8.66
Standard Deviation			19.18	1.50t	0.26t	0.69t	0.19t	0.487	7.19
CV			69.42	17.23t	29.3t	21.8t	17.16t	0.84	15.52

[1]Treatments have NIS (0.125% v/v).
[2]Application timing: A=early anthesis, B=5 days after A timing.

MACON RIDGE RESEARCH STATION

FUNGICIDE X VARIETY

Blanton: Scab index ranged from 0.18-0.4. Yields did not differ among treatments.

Chad: Scab index ranged from 0.06-0.74. Yields were highest in the non-treated inoculated, Miravis Ace, and Prosaro Pro treatments.

Delta Grow 1800: Scab index ranged from 0.14-0.55. Yields varied among treatments. Lowest yield occurred in the non-treated inoculated wheat.

Treatment[1]	Rate	Appl Code[2]	Incidence FHB	Severity FHB	SCAB INDEX	YIELD BU/A
Blanton Non-Treated Inoculated			7.77-	3.9-	0.33-	48.9 bcd
Blanton Non-Treated Not Inoculated			6.19-	2.9-	0.18-	49.2 bcd
Blanton Prosaro	6.5 fl oz/A	A	9.55-	4.1-	0.40-	51.4 abc
Blanton Miravis Ace	13.7 fl oz/A	A	8.33-	4.1-	0.40-	48.4 cd
Blanton Prosaro Pro	10.3 fl oz/A	A	6.61-	2.6-	0.21-	49.2 bcd
Blanton Sphaerex	7.3 fl oz/A	A	6.65-	2.7-	0.32-	50.0 abc
Chad Non-Treated Inoculated			4.28-	1.4-	0.06-	53.5 a
Chad Non-Treated Not Inoculated			7.83-	4.1-	0.42-	49.4 bc
Chad Prosaro	6.5 fl oz/A	A	4.40-	1.6-	0.08-	52.1 abc
Chad Miravis Ace	13.7 fl oz/A	A	9.57-	4.5-	0.54-	53.4 a
Chad Prosaro Pro	10.3 fl oz/A	A	13.23-	4.5-	0.68-	53.6 a
Chad Sphaerex	7.3 fl oz/A	A	10.73-	5.7-	0.74-	49.0 bcd
Delta Grow 1800 Non-Treated Inoculated			9.89-	5.1-	0.55-	45.3 d
Delta Grow 1800 Non-Treated Not Inoculated			5.24-	2.2-	0.14-	48.3
Delta Grow 1800 Prosaro	6.5 fl oz/A	A	7.66-	3.1-	0.27-	52.9 ab
Delta Grow 1800 Miravis Ace	13.7 fl oz/A	A	8.58-	3.6-	0.39-	52.8 ab
Delta Grow 1800 Prosaro Pro	10.3 fl oz/A	A	8.25-	4.2-	0.54-	52.8 ab
Delta Grow 1800 Sphaerex	7.3 fl oz/A	A	6.25-	3.6-	0.24-	48.7 cd
LSD P= .10			3.688 – 5.848	1.8699 – 2.9284	0.344520 – 0.517236	4.02
Standard Deviation			0.194t	0.2120t	1.878210t	3.39
CV			20.81t	32.98t	56.84t	6.69

[1]Treatments have NIS (0.125% v/v).
[2]Application timing: A=early anthesis.

FUNGICIDE SCREENING

Scab index ranged from 0.12-1.47. Yields varied among treatments with some fungicide treatments preserving more yield compared to the non-treated.

Treatment[1]	Rate	Appl Code[2]	Incidence	Severity	Index	YIELD BU/A
Non-treated			7.70	3.58	0.42	46.6 bc
Prosaro	6.5 fl oz/a	A	7.90	3.72	0.34	50.9 ab
Caramba	13.5 fl oz/a	A	11.65	6.27	1.39	46.0 c
Miravis Ace	13.7 fl oz/a	A	8.18	3.82	0.39	52.8 a
Prosaro Pro	10.3 fl oz/a	A	4.05	1.69	0.12	49.4 abc
Sphaerex	7.3 fl oz/a	A	11.74	6.91	1.47	46.9 bc
Miravis Ace Prosaro Pro	13.7 fl oz/a 10.3 fl oz/a	A B	4.80	2.29	0.16	53.6 a
Miravis Ace Sphaerex	13.7 fl oz/a 7.3 fl oz/a	A B	5.97	2.09	0.14	53.0 a
Miravis Ace Tebuconazole	13.7 fl oz/a 4.0 fl oz/a	A B	5.73	1.99	0.17	54.1 a
Prosaro	8.2 fl oz/a	A	7.78	3.70	1.06	44.7 c
LSD P= 0.10			3.656 – 5.352	2.60 – 3.89	1.01	4.84
Standard Deviation			0.197t	0.24t	0.84	4.02
CV			21.5t	38.43t	149.59	8.07

[1]All have NIS (0.125% v/v).
[2]Application timing: A=early anthesis, B=5 days after A timing.

DOYLE CHAMBERS RESEARCH STATION

FUNGICIDE SCREENING

Scab index ranged from 0.0 -0.24. The trial was not harvest due to extended inclement weather.

Treatment[1]	Rate	Appl [2]	4-16 INC FHB	4-16 SEV FHB	4-16 FHB INDEX
Check			1.39 -	7.00 -	0.11 ab
Prosaro	6.5 fl oz/a	A	1.83 -	14.13 -	0.24 a
Caramba	13.5 fl oz/a	A	1.11 -	3.50 -	0.05 abc
Miravis Ace	13.7 fl oz/a	A	1.83 -	11.88 -	0.22 a
Prosaro Pro	10.3 fl oz/a	A	1.33 -	20.25 -	0.22 a
Sphaerex	7.3 fl oz/a	A	0.94 -	14.25 -	0.11 ab
Miravis Ace Prosaro Pro	13.7 fl oz/a 10.3 fl oz/a	A B	0.00 -	0.00 -	0.00 c
Miravis Ace Sphaerex	13.7 fl oz/a 7.3 fl oz/a	A B	1.83 -	7.00 -	0.13 ab
Miravis Ace Tebuconazole	13.7 fl oz/a 4 fl oz/a	A B	0.24 -	1.75 -	0.01 bc
Prosaro	8.2 fl oz/a	A	0.53 -	3.50 -	0.02 bc
LSD P=0.10			1.26 – 1.38	13.84	0.12 – 0.20 1.39t
Standard Deviation			0.46t	11.496	84.18t
CV			37.23t	138.09	

[1]Treatments have NIS (0.125% v/v).
[2]Application timing: A=early anthesis, B=5 days after A timing.

List key outcomes or other achievements.

Despite low scab incidence and severity, resistant varieties had less scab and higher yields than susceptible varieties at the DLRS. This was not consistent with trials at MRRS and DCRS. Fungicide treatments varied in efficacy on scab across trials.

3. **What opportunities for training and professional development has the project provided?**Agents, producers, consultants, and other clientele were educated during parish production meetings, pesticide recertification, and a field day.

4. **How have the results been disseminated to communities of interest?**
Results from these trials have been disseminated during parish producer meetings, pesticide recertification meetings, field day, and at the APS Southern Division meeting. Information from these trials was disseminated via phone calls and email.

5. **What do you plan to do during the next reporting period to accomplish the goals and objectives?**
I plan to present this information to clientele at local, state, regional, and national meetings where appropriate. I will continue to conduct these trials at three different research stations. When possible, I will collaborate with county agents and producers to evaluate fungicides on-farm.