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.

2. **What was accomplished under these goals or objectives?**

What were the major activities?

Objective 1. Tests were established at the Dean Lee Research Station near Alexandria, LA and Macon Ridge Research Station near Winnsboro, LA. Three soft red winter wheat varieties varying in resistance (Delta grow 1800: moderately resistant, Progeny Chad: moderately susceptible, and Delta grow 3500: susceptible) to *Fusarium graminearum* were planted (12/3/24) and five fungicide treatments were applied at early anthesis and compared to a non-sprayed treatment. The experimental design was consistent with the FHB Integrated Management Coordinated Project protocol.

Objective 2. Tests were established at the Dean Lee Research Station near Alexandria, LA; Doyle Chambers Research Station near Baton Rouge, LA; and Macon Ridge Research Station near Winnsboro, LA. A soft red winter wheat Delta Grow 3500 (susceptible to *F. graminearum*) was planted (12/3/24) and fungicide treatments consistent with the FHB Integrated Management Coordinated Project were applied and compared to a non-sprayed treatment.

All tests were inoculated twice with *F. graminearum* infested corn (1 gm/sq ft) prior to anthesis. Fungicide applications and data collection were implemented according to the FHB Integrated Management Coordinated Project protocol.

What were the significant results?

Dean Lee Research Station

Objective 1: Scab disease severity was moderate. Scab index for the fungicide treatments did not differ from the non-treated inoculated treatment within varieties. However, Sphaerex had a higher yield than Miravis Ace and Prosaro Pro in Delta Grow 3500 and in Chad. Delta Grow 1800 was more resistant to scab than Delta Grow 3500 and Chad. At the time of this report samples are being processed for DON analysis.

Treatment[1]	Rate (fl oz/A)	Appl Code[2]	Incidence FHB	Severity FHB	SCAB INDEX	Test wt Lb/bu	YIELD BU/A

Delta Grow 3500 Non-Treated Inoculated	-	-	50.9 abc	40.1 ab	19.8 abc	36.4 e	48.4
Delta Grow 3500 Non-Treated Non-Inoculated	-	-	52.8 abc	48.4 a	25.0 a	46.5 d	49.0
Delta Grow 3500 Prosaro	6.5	A	54.1 abc	44.5 ab	23.1 ab	50.6 cd	53.2
Delta Grow 3500 Miravis Ace	13.7	A	50.9 abc	37.7 abc	18.9 abc	51.4 bcd	48.2
Delta Grow 3500 Prosaro Pro	10.3	A	49.4 abc	44.3 ab	21.7 ab	51.4 bcd	48.5
Delta Grow 3500 Sphaerex	7.3	A	54.7 abc	42.6 ab	23.3 ab	50.6 cd	59.6
Progeny CHAD Non-Treated Inoculated	-	-	64.1 a	30.5 bcd	19.0 abc	49.6 d	51.2
Progeny CHAD Non-Treated Non-Inoculated	-	-	59.4 ab	30.6 bcd	17.8 abc	50.3 cd	50.1
Progeny CHAD Prosaro	6.5	A	51.9 abc	31.2 bcd	15.7 abc	51.4 bcd	55.9
Progeny CHAD Miravis Ace	13.7	A	53.1 abc	26.3 cde	13.9 a-d	51.9 bc	48.2
Progeny CHAD Prosaro Pro	10.3	A	45.0 abc	24.2 de	10.8 b-d	51.8 bc	48.3
Progeny CHAD Sphaerex	7.3	A	38.4 abc	25.3 cde	9.5 c-f	51.8 bc	58.6
Delta Grow 1800 Non-Treated Inoculated	-	-	44.1 abc	18.9 ef	7.9 def	52.9 ab	60.4
Delta Grow 1800 Non-Treated Non-Inoculated	-	-	37.8 abc	16.4 f	5.9 ef	53.6 a	50.8
Delta Grow 1800 Prosaro	6.5	A	32.5 bc	15.2 f	4.8 f	54.0 a	63.2
Delta Grow 1800 Miravis Ace	13.7	A	40.0 abc	15.8 f	6.3 ef	54.6 a	59.0
Delta Grow 1800 Prosaro Pro	10.3	A	31.6 c	15.7 f	4.9 f	54.2 a	56.4
Delta Grow 1800 Sphaerex	7.3	A	37.8 abc	16.1 f	6.1 ef	53.8 a	56.3
LSD P=0.10			13.7	4.5 - 10.8	2.9 - 8.6		10.1

Objective 2: Scab incidence and severity was moderately high. The scab index was lower than the non-treated in wheat treated with Sphaerex, Miravis Ace followed by Prosaro Pro, and Mirivas Ace followed by tebuconazole. The test was not harvested due to poor nonuniform stands. At the time of this report samples are being processed for DON analysis.

FUNGICIDE SCREENING

Treatment[1]	Rate (fl oz/A)	Appl Code[2]	Incidence FHB	Severity FHB	SCAB INDEX
Non-treated	-	-	68.1 -	65.1 -	44.4 -
Prosaro	6.5	A	58.8 -	57.0 -	33.6 -
Caramba	13.5	A	64.1 -	64.2 -	41.4 -
Miravis Ace	13.7	A	60.6 -	57.4 -	34.9 -
Prosaro Pro	10.3	A	68.8 -	59.7 -	41.3 -
Sphaerex	7.3	A	54.1 -	57.4 -	30.4 -
Miravis Ace Prosaro Pro	13.7 10.3	A B	55.9 -	55.6 -	31.9 -
Miravis Ace Sphaerex	13.7 7.3	A B	65.3 -	59.3 -	39.2 -
Miravis Ace Tebuconazole	13.7 4.0	A B	50.9 -	55.3 -	28.7 -
Prosaro	8.2	A	61.6 -	62.5 -	38.0 -
LSD P=0.10 Standard Deviation CV			15.2225 12.639 20.78	10.12303719 8.404998300 14.16	12.383723 10.28201 28.26

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

Doyle Chambers Research Station

Objective 1: Scab severity was low. Fungicide treatments did not result in lower disease based on the index ratings. Yields in fungicide treated wheat were not higher than the non-treated. Samples have been collected and are being processed for DON analysis at the time of this report.

Treatment[1]	Rate (fl oz/A)	Appl [2]	INC FHB	SEV FHB	FHB INDEX	TW (lb/bu)	Yield (bu/A)
Check	-	-	27.5 ab	13.3 -	3.5 ab	49.3 -	31.0 -
Prosaro	6.5	A	22.8 b	11.0 -	2.3 ab	37.5 -	28.9 -
Caramba	13.5	A	30.6 ab	12.5 -	3.3 ab	49.6 -	32.5 -
Miravis Ace	13.7	A	20.0 b	11.0 -	2.1 b	50.5 -	35.8 -
Prosaro Pro	10.3	A	22.5 b	12.7 -	2.6 ab	49.5 -	31.5 -
Sphaerex	7.3	A	24.7 b	10.9 -	2.6 ab	50.3 -	35.1 -
Miravis Ace Prosaro Pro	13.7 10.3	A B	21.6 b	11.4 -	2.3 ab	50.4 -	35.1 -
Miravis Ace Sphaerex	13.7 7.3	A B	18.4 b	12.4 -	2.1 b	49.8 -	33.1 -
Miravis Ace Tebuconazole	13.7 4.0	A B	25.9 ab	12.0 -	2.9 ab	50.4 -	28.9 -

Prosaro	8.2	A	41.2 a	13.2 -	4.8 a	50.3 -	29.8 -
LSD P=0.10 Standard Deviation CV			10.658 8.837 34.94	3.282 2.722 22.550	1.242- 1.672 0.122216t 21.25t	9.601 7.971 16.35	7.51 6.24 19.39

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

Macon Ridge Research Station

Objective 1: Scab severity was low. Fungicides did not result in lower scab relative to the non-treated within varieties. Yields did not differ within varieties. Scab index ratings were not lower in the resistant variety (Delta Grow 1800) compared to the susceptible variety (Delta Grow 3500). This could be due to low disease severity. Samples are being processed for DON analysis at the time of this report.

Treatment[1]	Rate (fl oz/A)	Appl Code[2]	Incidence FHB	Severity FHB	SCAB INDEX	YIELD BU/A
Delta Grow 3500 Non-Treated Inoculated	-	-	38.3 -	13.6 ab	5.5 a	64.2 -
Delta Grow 3500 Non-Treated Not Inoculated	-	-	17.9 -	11.0 ab	2.0 ab	61.8 -
Delta Grow 3500 Prosaro	6.5	A	32.5 -	15.3 a	5.2 ab	62.2 -
Delta Grow 3500 Miravis Ace	13.7	A	26.3 -	9.5 b	2.5 ab	59.5 -
Delta Grow 3500 Prosaro Pro	10.3	A	25.0 -	11.9 ab	3.0 ab	61.7 -
Delta Grow 3500 Spharex	7.3	A	28.8 -	11.6 ab	3.4 ab	61.9 -
Progeny CHAD Non-Treated Inoculated	-	-	26.7 -	11.1 ab	3.0 ab	64.8 -
Progeny CHAD Non-Treated Not Inoculated	-	-	35.0 -	13.7 ab	5.1 ab	69.0 -
Progeny CHAD Prosaro	6.5	A	27.5 -	10.6 ab	2.9 ab	69.5 -
Progeny CHAD Miravis Ace	13.7	A	37.1 -	12.2 ab	4.6 ab	70.3 -
Progeny CHAD Prosaro Pro	10.3	A	27.1 -	10.5 ab	2.9 ab	66.0 -
Progeny CHAD Spharex	7.3	A	25.0 -	12.9 ab	3.3 ab	71.8 -
Delta Grow 1800 Non-Treated Inoculated	-	-	18.3 -	9.0 b	1.6 b	65.3 -

Delta Grow 1800 Non-Treated Not Inoculated	-	-	17.1 -	11.1 ab	1.8 b	59.3 -
Delta Grow 1800 Prosaro	6.5	A	20.4 -	12.8 ab	2.6 ab	61.7 -
Delta Grow 1800 Miravis Ace	13.7	A	19.2 -	8.7 b	1.7 b	61.6 -
Delta Grow 1800 Prosaro Pro	10.3	A	35.4 -	10.2 ab	3.6 ab	67.2 -
Delta Grow 1800 Spharex	7.3	A	22.9 -	9.9 ab	2.3 ab	63.7 -
LSD P= 0.10 Standard Deviation CV			11.4 9.7 36.18	2.9 2.5 21.61	1.9 1.6 50.	10.8 9.1 14.12

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

Objective 2: Scab severity was low. The scab index in most fungicide treatments were lower than the non-treated. However yields were not higher in wheat treated with fungicides relative to the non-treated.

Treatment[1]	**Rate (fl oz/A)**	**Appl Code**[2]	**Incidence**	**Severity**	**Index**	**YIELD BU/A**
Non-treated	-	-	33.4 -	14.3 -	5.1 -	74.2 -
Prosaro	6.5	A	25.9 -	13.2 -	3.3 -	69.1 -
Caramba	13.5	A	32.5 -	12.8 -	4.1 -	83.1 -
Miravis Ace	13.7	A	22.2 -	10.7 -	2.5 -	71.7 -
Prosaro Pro	10.3	A	27.2 -	12.8 -	3.5 -	72.0 -
Sphaerex	7.3	A	21.6 -	11.0 -	2.4 -	68.6 -
Miravis Ace Prosaro Pro	13.7 10.3	A B	24.4 -	13.6 -	3.3 -	63.2 -
Miravis Ace Sphaerex	13.7 7.3	A B	24.7 -	12.5 -	3.0 -	59.9 -
Miravis Ace Tebuconazole	13.7 4.0	A B	23.1 -	14.2 -	3.4 -	64.1 -
Prosaro	8.2	A	28.4 -	16.4 -	4.7 -	61.4 -
		LSD P= 0.10	8.7535	3.494712947	1.01	1.675362
		Standard Deviation	7.2679	2.901605103	0.84	1.391026
		CV	27.59	22.06	39.42	28.1

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

List key outcomes or other achievements.

Genetic resistance (Delta Grow 1800) was effective for preventing scab severity to increase at Dean Lee, when compared to the susceptible variety (Delta Grow 3500). However, fungicides were variable in their performance relative to the non-treated. The scab index for some fungicide treated wheat was less than the non-treated, but not in most 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?

Collaborations with cooperators should remain the same. Trials will be conducted on three research stations and if possible, producer farms.