



Evaluation of Foliar Fungicides for Control of Early Leaf Spot in Oklahoma in 2023

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Overview

- Levels of early leafspot were very low in the 2023 growing season.
- Early leaf spot was observed very early in the growing season in the lower canopy of all experimental plots. However, the high temperatures experienced in 2023 did not favor the development of the disease to the upper canopy, not even in the untreated check.
- No Sclerotinia blight or southern blight was observed in the plots in 2023.
- The reduced fungicide program with Lucento, applied 75 days after planting, resulted in the highest yield (5,612 pounds per acre) of all three experiments.

Methods for Conducting Field Experiments

Three field trials were conducted at the Caddo Research Station near Fort Cobb to quantify the effect of foliar fungicide on early leaf spot (ELS) severity (%), defoliation (%) and yield (lbs/A). The soil is classified as a Binger fine sandy loam and was previously cropped with peanuts. Granular fertilizer at 11-52-0 lbs/A of NPK was incorporated into the soil before planting on May 8 with the same process conducted for the fertilizer 0-0-60 lbs/A of NPK on May 11. The herbicide Valor SX 51WDG at 2 oz/A was applied preemergence at peanut planting on May 17. The experimental design was a randomized complete block with four blocks separated by a 5-ft-wide fallow buffer. Each plot consisted of four 25-ft-long rows spaced 36" apart. The peanut cultivar Olé, a Spanish market type susceptible to ELS, was planted on May 17. Fungicides were broadcast through flat-fan nozzles (8002vk) spaced 18" apart with a CO₂-pressurized wheelbarrow sprayer. The sprayer was calibrated to deliver 20 gal/A at 40 psi. All treatments were applied with Induce at 0.25% v/v.

Fungicide applications for experiments 1 and 2 (Tables 1 and 2) were conducted based on a 17-day calendar program. The fungicide sprays were conducted on July 13, July 31, Aug. 16, and Sept. 1 for experiment 1 and on July 13, July 31, Aug. 16, Sept. 1, and Sept. 18 for experiment 2. Fungicide applications for experiment 3 were conducted according to the recommendation of the decision support system called Leaf Spot Advisor, which runs on the Mesonet Oklahoma web page. Leaf Spot Advisor aims to help peanut growers make better

informed decisions regarding fungicide applications based on weather conditions experienced in the state. In experiment 3, fungicide applications were conducted on July 13, Aug. 16, and Sept. 18. All data were taken from the two center rows, including yield. ELS severity (% leaf with disease symptoms) and defoliation (%) were estimated for the whole plot on Sept. 30. The two center rows were dug and inverted on Oct. 6, windrowed for four days and harvested with a combine. Pods were dried and cleaned before taking weights (lbs/A). The data collected were subjected to mixed model analysis of variance, and means were separated by Fisher's Least Significant Difference Test, which was indicated by a significant ($P = 0.05$) treatment effect.

Summary of Field Conditions

The rainfall during the cropping period (May 17 to Oct. 10) totaled 1.62" for May, 6.68" for June, 5.24" for July, 0.6" for August, 1.54" for September and 0.15" for October. Minimum, average and maximum air temperatures for May (17-31), June, July, August, September, October (1-10) were 59.2, 66, 70, 69, 64 and 53.2 °F; 68.5, 76.5, 81.3, 82.3, 75.5 and 66.9 °F; and 78.9, 88, 93, 96, 89 and 81.9 °F, respectively. The rainfall totals during the 2023 peanut season were above normal (30-year average) in June and July but below normal in August, September and October. The average daily temperatures were normal (30-year average) from May to October. The frequent rainfalls experienced in May, June and July favored the early development of early leaf spot (*Passalora arachidicola*) in all three experiments. The disease was noticed in all plots during the first fungicide application on July 13. However, the high temperatures experienced in July, August and September, combined with the below-average rainfalls in August and September, stopped the development of the disease, which did not progress to the upper canopy of the peanut plants, not even in the untreated plots. No southern blight (*Agroathelia rolfsii*) or Sclerotinia blight (*Sclerotinia minor*) were observed in the plots during the experiments.

Results from Experiment 1 – Lucento Fungicide Program

All treatments reduced the severity of early leaf spot ($F = 20.2$; $P < 0.01$) and plant defoliation ($F = 20.1$; $P < 0.01$) compared to the untreated check (Table 1). All the treatments with Lucento provided the best disease control compared with others without Lucento. Interestingly, the reduced fungicide program with Lucento applied 75 days after planting resulted in the highest yield (5,612 lbs/A). The effect of the fungicide treatments on yield was statistically significantly different from the untreated control ($F = 2.2$; $P = 0.049$). The yield increase in the plots compared with the untreated check ranged from 94 to 653 lbs/A. None of the treatments caused phytotoxicity symptoms.

Results from Experiment 2 – Priaxor and Provysol Fungicide Program

All treatments reduced early leaf spot severity ($F = 24.6$; $P < 0.01$) and plant defoliation ($F = 20.4$; $P < 0.01$) compared to the untreated check. However, the effect of the fungicide treatments on yield was not significantly different from the untreated control ($F = 2.2$; $P = 0.13$). All treatments increased yield (290.4 to 406.5 lbs/A) compared to the untreated check. None of the treatments caused phytotoxicity symptoms.

Results from Experiment 3 – Fungicide Sprays Based on the Leaf Spot Advisor (Mesonet)

Results shown in Table 3 indicate that all treatments reduced early leaf spot ($F = 24.6$; $P < 0.01$) and plant defoliation ($F = 20.4$; $P < 0.01$) compared to the untreated check. However, the effect of the fungicide treatments on yield was not significantly different from the untreated control ($F = 2.2$; $P = 0.13$). The lowest disease severity and defoliation levels were observed in treatment 4 (Miravis + Elatus as the second application). In contrast, the highest yield return was observed in treatment 5 (Topguard as the second application). All treatments increased yield by 7.2 to 486.4 lbs/A compared to the untreated check. None of the treatments caused phytotoxicity symptoms.

Acknowledgments

Field trials were conducted during the 2023 peanut growing season to evaluate the efficacy of different fungicide programs to manage leaf spot diseases on Spanish market-type peanuts (cultivar OLé). The trials were possible because of the excellent cooperation established with Bobby Weidenmaier and the Caddo Research Station staff. A special thanks to the Oklahoma Peanut Commission and the National Peanut Board for funding to support this research. FMC and BASF provided additional funding for the trials.

Table 1. Evaluation of Lucento fungicide programs for control of early leaf spot in Oklahoma in 2023

Treatment ¹ : Product, rate, timing ²	Early leaf spot (%) 30 Sep ³	Defoliation (%) 30 Sep ⁴	Yield (lbs./A) ⁵
Untreated check	35.00 a	31.20 a	4,959 d
Lucento 5.5 fl. oz. (2, 4) Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (3)	3.75 bc	3.25 c	5,612 a
Adastrio 8 fl. oz. (2, 4) Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (3)	9.00 b	11.00 b	5,372 abc
Lucento 5.5 fl. oz. (2, 4) Headline 12 fl. oz. (3)	3.00 bc	3.50 c	5,300 abcd
Lucento 5.5 fl. oz. (2, 4) Abound 18.5 fl. oz.	2.50 bc	2.75 c	5,053 cd
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (1, 3) Lucento 5.5 fl. oz. (2, 4)	1.50 c	1.37 c	5,467 ab
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (1) Lucento 5.5 fl. oz. (2, 4) Headline 12 fl. oz. (3)	1.50 c	1.75 c	5,351 abcd
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (1) Lucento 5.5 fl. oz. (2, 4) Abound 18.5 fl. oz. (3)	1.75 c	2.00 c	5,460 ab
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (2) Abound 18.5 fl. oz. (3, 4)	8.25 bc	4.75 bc	5,184 bcd
LSD (P = 0.05) ⁶	6.97	6.25	398.47
¹ Treatments 1 - 9 were applied with Induce @ 0.25% v/v. ² Timing corresponds to the spray dates of 1=13 Jul, 2=31 Jul, 3=16 Aug, 4=1 Sep. ^{3,4,5} Values in a column followed by the same letter are not significant according to Fisher's least significant difference test at P=0.05. ⁶ Least significant difference.			

Table 2. Efficacy of Priaxor and Provysol fungicides to manage early leaf spot in peanuts in 2023

Treatment ¹ : Product, rate, timing ²	Early leaf spot (%) 30 Sep ³	Defoliation (%) 30 Sep ⁴	Yield (lbs./A) ⁵
Untreated check	35.0 a	31.2 a	4,959
Bravo 24 fl. oz. (1, 5) Priaxor 8 fl. oz. (2, 4) Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (3)	4.0 b	3.2 b	5,365
ABravo 24 fl. oz. (1, 5) Priaxor 8 fl. oz. (2, 4) Folicur 7.2 fl. oz. + Provysol 3 fl. oz. (3)	2.7 b	3.7 b	5,416
Bravo 24 fl. oz. (1, 5) Priaxor 8 fl. oz. (2, 4) Folicur 7.2 fl. oz. + Provysol 5 fl. oz. (3)	3.7 b	2.7 b	5,249
LSD (P = 0.05) ⁶	8.0	7.9	ns
¹ Treatments 1 - 5 were applied with Induce @ 0.25% v/v. ² Timing corresponds to the spray dates of 1 = 13 Jul, 2=31 Jul, 3 = 16 Aug, 4 = 1 Sep, 5 = 18 Sep. ^{3,4,5} Values in a column followed by the same letter are not significant according to Fisher's least significant difference test at P = 0.05. ⁶ Least significant difference.			

Table 3. Evaluation of foliar fungicides for control of early leaf spot in Oklahoma in 2023 based on the Leaf Spot Advisor (Mesonet)

Treatment ¹ : Product, rate, timing ²	Early leaf spot (%) 30 Sep ³	Defoliation (%) 30 Sep ⁴	Yield (lbs./A) ⁵
Untreated check	35.00 a	31.25 a	4,959
Bravo 24 fl. oz. (1) Elatus 7.3 fl. oz. (2) Bravo 6F 24 fl. oz. + Folicur 7.2 fl. oz. (3)	9.25 cd	9.75 b	4,966
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (1, 3) Headline 12 fl. oz. (2)	4.50 de	6.75 bc	5,278
Bravo 24 fl. oz. + Alto 5.5 fl. oz (1) Elatus 7.3 fl. oz. + Miravis 3.4 fl. oz. (2) Bravo 6F 24 fl. oz. + Folicur 7.2 fl. oz. (3)	2.00 e	1.25 c	5,191
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (1, 3) Topguard 8 fl. oz. (2)	8.50 cde	7.75 bc	5,445
Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (1, 3) Approach Prima 6.8 fl. oz. (2)	11.25 bc	10.00 b	5,191
Bravo 24 fl. oz. (1) Folicur 9 fl. oz. (2) Bravo 24 fl. oz. + Folicur 7.2 fl. oz. (3)	16.25 b	13.50 b	5,104
LSD (P = 0.05) ⁶	6.56	6.90	ns
¹ Treatments 1 - 7 were applied with Induce @ 0.25% v/v. ² Timing corresponds to the spray dates of 1–13 Jul, 2 = 16 Aug, 3 = 18 Sep. ^{3,4,5} Values in a column followed by the same letter are not significant according to Fisher's least significant difference test at P = 0.05. ⁶ Least significant difference.			

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