Wisconsin Field Crops Pathology Fungicide Test and Disease Management Summary

2024

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Trial 1: Evaluation of in-furrow and foliar fungicides for control of tar spot of dent corn in Arlington, Wisconsin, 2024 - Experiment #1

DENT CORN (*Zea mays* 'CP3899VT2P/RIB')
Tar spot; *Phyllachora maydis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'CP3899VT2P/RIB' was planted 1 May, behind corn, no-till, in a field consisting of a Plano silt loam soil (2 to 6% slopes). The trial was arranged in a randomized complete block design with four replications. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and 11 fungicide programs. Some treatments applied at R1 were mixed with the non-ionic surfactant, Induce 90SL, at 0.125% or 0.25% v/v. Foliar fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10 ft boom calibrated to deliver 20 GPA at 40 psi. At-plant application equipment was calibrated to deliver 5 GPA at 16 psi. Treatments were applied at plant on 1 May, at plant followed by R1 on 19 Jul, or R1 alone. Natural sources of pathogen inoculum were relied upon for disease. Tar spot severity was rated at late R5 on 17 Sep. Tar spot was visually assessed by estimating average severity (% stroma on ear leaf) per plot with the aid of standardized area diagrams. Yield (corrected to 15.5% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Lower levels of tar spot were observed in this trial due to late disease development. Applications of Regev HBX at R1, Xyway at-plant followed by Veltyma at R1, Veltyma at R1, Delaro complete at R1, and Topguard EQ at R1 had significantly lower tar spot severity compared to the non-treated check (Table 1). There were no significant differences in canopy greening, stalk rot severity, and yield among all treatments. Phytotoxicity was not observed for any treatment.

Table 1. Canopy greening, stalk rot severity, tar spot severity, and yield for dent corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)	Canopy Greening (%)[z]	Stalk Rot Severity (%)[y]	Tar Spot Severity (%)[x,w]	Yield (bu/A)
Non-treated control	37.5	50.0	2.6 a	259.5
Xyway LFR 15.2 fl oz (FurrowJet at-plant)	40.0	30.0	1.7 ab	251.9
Regev HBX 8.5 fl oz (R1) + SAUS70 4.0 fl oz (R1)[v]	32.5	27.5	1.2 a-c	258.7
Xyway LFR 15.2 fl oz (FurrowJet at-plant) Miravis Neo 2.5SE 13.7 fl oz (R1)[v]	40.0	40.0	1.1 a-c	253.9
Adastrio 4.0SC 8.0 fl oz (R1)[v]	35.0	27.5	1.1 a-c	252.3
SAUS70 4.0 fl oz (R1)[v]	37.5	47.5	1.0 a-c	253.1
Lucento 4.17SC 5.0 fl oz (R1)[v]	42.5	32.5	0.9 a-c	256.9
Topguard EQ 4.29SC 5.0 fl oz (R1)[v]	45.0	25.0	0.5 b-d	251.3
Delaro Complete 3.83SC 8.0 fl oz (R1)[u]	37.5	22.5	0.5 b-d	253.9
Veltyma 3.34SC 7.0 fl oz (R1)[v]	41.3	25.0	0.4 cd	243.1
Xyway LFR 15.2 fl oz (FurrowJet at-plant) Veltyma 3.34SC 7.0 fl oz (R1)[v]	42.5	37.5	0.3 cd	262.8
Regev HBX 8.5 fl oz (R1)[v]	37.5	30.0	0.2 d	241.1
P-value	ns[t]	ns	0.04	ns

[z] Canopy greening effect determined by rating the percentage green foliage still present in each plot at black layer.
[y]Stalk rot severity was rated by the stalk push test on 10 plants per plot and converted to a percentage of snapped stalks.
[x]Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[w]Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05).
[v]Induce 90% SL (Non-ionic surfactant) at 0.25% v/v was added to fungicide treatments.
[u]Induce 90% SL (Non-ionic surfactant) at 0.125% v/v was added to fungicide treatments.
[t]ns= not significant (α=0.05).

Trial 2: Evaluation of in-furrow fungicides for control of tar spot of dent corn in Arlington, Wisconsin, 2024-Experiment #2

DENT CORN (*Zea mays* 'CP3899VT2P/RIB')
Tar spot; *Phyllachora maydis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'CP3899VT2P/RIB' was planted 1 May, behind winter wheat, no-till, in a field consisting of a Joy silt loam soil (0 to 4% slopes). The trial was arranged in a randomized complete block design with four replications. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and six fungicide programs. At-plant application equipment was calibrated to deliver 5 GPA at 16 psi. Treatments were applied at plant on 1 May. Natural sources of pathogen inoculum were relied upon for disease. Tar spot severity was rated at late R5 on 17 Sep. Tar spot was visually assessed by estimating average severity (% stroma on ear leaf) per plot with the aid of standardized area diagrams. Yield (corrected to 15.5% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Lower levels of tar spot were observed in this trial due to late disease development. There were no significant differences in canopy greening, tar spot severity, and yield among all treatments (Table 2). Phytotoxicity was not observed for any treatment.

Table 2. Canopy greening, tar spot severity, and yield for dent corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)	Canopy Greening (%)[z]	Tar Spot Severity (%)[y]	Yield (bu/A)
Non-treated control	33.8	0.26	243.3
Zironar LFR 6.0 fl oz (In-furrow at-plant)	36.3	0.24	239.7
Zironar LFR 6.0 fl oz (FurrowJet at-plant) + Xyway LFR 15.2 fl oz (FurrowJet at-plant)	31.3	0.20	232.9
Xyway LFR 15.2 fl oz (FurrowJet at-plant)	31.3	0.30	232.1
Ethos Elite LFR 8.5 fl oz (FurrowJet at-plant) + Xyway LFR 15.2 fl oz (FurrowJet at-plant)	37.5	0.24	228.5
Zironar LFR 6.0 fl oz (In-furrow at-plant) + Ethos Elite LFR 8.5 fl oz (In-furrow at-plant)	31.3	0.20	216.8
Ethos Elite LFR 8.5 fl oz (In-furrow at-plant)	27.5	0.27	214.9
P-value	ns[x]	ns	ns

[z] Canopy greening effect determined by rating the percentage green foliage still present in each plot at black layer.
[y] Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[x] ns= not significant (α=0.05).

Trial 3: Evaluation of foliar fungicides for control of tar spot of dent corn in Arlington, Wisconsin, 2024- Experiment #3

DENT CORN (*Zea mays* 'CP3899VT2P/RIB')
Tar spot; *Phyllachora maydis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'CP3899VT2P/RIB' was chosen for this trial. Corn preceded this crop. Corn was planted (6 May) using a no-till program in a field consisting of a Plano silt loam soil (2 to 6% slopes). The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated check and 14 fungicide programs. Fungicide treatments applied at R1 and R3 were mixed with the non-ionic surfactant, Induce 90SL, at 0.125% v/v. Foliar fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10-ft boom calibrated to deliver 20 GPA at 40 psi. Treatments were applied at growth stages V12 on 15 Jul, R1 (silk) on 24 Jul, R3 (milk) on 14 Aug, or R1 followed by R3. Natural sources of pathogen inoculum were relied upon for disease. Tar spot severity was rated at late R5 on 17 Sep. Tar spot was visually assessed by estimating average severity (% stroma on ear leaf) per plot with the aid of standardized area diagrams. Yield (corrected to 15.5% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Late season development of tar spot led to low severity levels in this trial. All treatments had significantly lower tar spot severity compared to not treating, except Delaro Complete (8.0 fl oz) at V12, Delaro Complete (8.0 fl oz) at R1, Delaro Complete (10.0 fl oz) at R1, and Miravis Neo at R1 (Table 3). Miravis Neo, Delaro Complete (8 fl oz), Trivapro, and Veltyma applied at R1 and Delaro Complete at R3 had significantly lower yields compared to not treating. No significant differences were observed for canopy greening among all treatments. Phytotoxicity was not observed for any treatment.

Table 3. Canopy greening, tar spot severity, and yield for dent corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)[z]	Canopy Greening (%)[y]	Tar Spot Severity (%)[x,w]	Yield (bu/A)[w]
Delaro Complete 3.83SC 12.0 fl oz (V12)	30.0	0.11 cd	172.0 a
Non-treated check	35.0	0.16 ab	171.1 a
Delaro Complete 3.83SC 8.0 fl oz (V12)	30.0	0.16 ab	167.6 ab
Delaro Complete 3.83SC 8.0 fl oz (R1) Prosaro Pro 400SC 10.3 fl oz (R3)	32.5	0.11 cd	167.5 ab
Delaro Complete 3.83SC 12.0 fl oz (R1)	25.0	0.11 d	167.3 ab
Delaro Complete 3.83SC 10.0 fl oz (R1)	32.5	0.15 a-c	165.3 ab
Delaro Complete 3.83SC 8.0 fl oz (R1) Absolute MAXX 2.18SC 6.0 fl oz (R3)	32.5	0.11 d	164.2 a-c
Delaro 325SC 10.0 fl oz (R1)	32.5	0.11 cd	163.4 a-c
Delaro Complete 3.83SC 8.0 fl oz (R1) Delaro 325SC 8.0 fl oz (R3)	35.0	0.10 d	162.62 a-d
Delaro Complete 3.83SC 8.0 fl oz (R1) Delaro Complete 3.83SC 8.0 fl oz (R3)	30.0	0.10 d	160.8 a-d
Delaro Complete 3.83SC 8.0 fl oz (R3)	32.5	0.11 cd	158.3 b-d
Veltyma 3.34SC 7.0 fl oz (R1)	37.5	0.11 d	157.9 b-d
Trivapro 2.21EC 13.7 fl oz (R1)	35.0	0.10 d	155.6 b-d
Delaro Complete 3.83SC 8.0 fl oz (R1)	37.5	0.13 b-d	153.0 cd
Miravis Neo 2.5SE 13.7 fl oz (R1)	35.0	0.19 a	150.7 d
P-value	ns[v]	<0.001	<0.05

[z]Induce 90% SL (Non-ionic surfactant) at 0.125% v/v was added to fungicide treatments applied at R1 and R3.
[y]Greening effect determined by rating the percentage green foliage still present in each plot at early black layer.
[x]Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis
[w]Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05).
[v]ns = not significant (α=0.05).

Trial 4: Evaluation of foliar fungicides for control of tar spot of dent corn in Arlington, Wisconsin, 2024- Experiment #4

DENT CORN (*Zea mays* 'CP3899VT2P/RIB')
Tar spot; *Phyllachora maydis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'CP3899VT2P/RIB' was planted 6 May, behind corn, no-till, in a field consisting of a Plano silt loam soil (2 to 6% slopes). The trial was arranged in a randomized complete block design with four replications. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and five fungicide programs. Treatments were mixed with the non-ionic surfactant, Induce 90SL, at 0.25% v/v. Foliar fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10 ft boom calibrated to deliver 20 GPA at 40 psi. Treatments were applied at growth stages R1 (silk) on 27 Jul or a two-spray program at V16 on 15 Jul followed by R3 (milk) on 12 Aug. Natural sources of pathogen inoculum were relied upon for disease. Tar spot severity was rated at late R5 on 17 Sep. Tar spot was visually assessed by estimating average severity (% stroma on ear leaf) on five leaves per plot with the aid of standardized area diagrams. Yield (corrected to 15.5% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Late season development led to low levels of tar spot observed in this trial. There were no significant differences in canopy greening, tar spot severity, yield among all treatments (Table 4). Phytotoxicity was not observed for any treatment.

Table 4. Canopy greening, tar spot severity, and yield for dent corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)[z]	Canopy Greening (%)[y]	Tar Spot Severity (%)[x]	Yield (bu/A)
Non-treated control	12.5	0.17	152.1
Delaro Complete 3.83SC 8.0 fl oz (R1)	10.0	0.12	147.4
Adastrio 4.0SC 8.0 fl oz (R1)	12.5	0.14	142.8
Miravis Neo 2.5SE 13.7 fl oz (R1)	15.0	0.13	139.5
Veltyma 3.34S 7.0 fl oz (V16) Veltyma 3.34S 7.0 fl oz (R3)	15.0	0.10	133.4
Veltyma 3.34S 7.0 fl oz (R1)	17.5	0.11	130.2
P-value	ns[w]	ns	ns

[z]Induce 90% SL (Non-ionic surfactant) at 0.25% v/v was added to all fungicide treatments.
[y]Canopy greening effect determined by rating the percentage green foliage still present in each plot at black layer.
[x]Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[w]ns=not significant (α=0.05).

Trial 5: Evaluation of foliar fungicides for control of tar spot of dent corn in Arlington, Wisconsin, 2024- Experiment #5

DENT CORN (*Zea mays* 'CP3899VT2P/RIB')
Tar spot; *Phyllachora maydis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'CP3899VT2P/RIB' was planted 6 May, behind corn, no-till, in a field consisting of a Plano silt loam soil (2 to 6% slopes). The trial was arranged in a randomized complete block design with four replications. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and six fungicide programs. Foliar fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10 ft boom calibrated to deliver 20 GPA at 40 psi. Treatments were applied at growth stages V5 on 24 Jun, R1 (silk) on 24 Jul, or a two-spray program at V5 followed by R1. Natural sources of pathogen inoculum were relied upon for disease. Tar spot severity was rated at late R5 on 17 Sep. Tar spot was visually assessed by estimating average severity (% stroma on ear leaf) per plot with the aid of standardized area diagrams. Yield (corrected to 15.5% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Late season development led to low levels of tar spot observed in this trial. There were no significant differences in tar spot severity and yield among all treatments (Table 5). Phytotoxicity was not observed for any treatment.

Table 5. Tar spot severity and yield for dent corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)	Tar Spot Severity (%)[z]	Yield (bu/A)
Non-treated control	0.13	150.3
Delaro Complete 3.83SC 8.0 fl oz (R1)	0.13	148.0
Miravis Neo 2.5SE 13.7 fl oz (R1)	0.12	146.6
Affiance 1.5SC 10.0 fl oz (V5)	0.15	146.3
Veltyma 3.34SC 7.0 fl oz (R1)	0.10	146.0
Affiance 1.5SC 10.0 fl oz (R1)	0.12	144.9
Affiance 1.5SC 10.0 fl oz (V5) Veltyma 3.34SC 7.0 fl oz (R1)	0.10	140.4
P-value	ns[y]	ns

[z]Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[y]ns= not significant (α=0.05).

Trial 6: Evaluation of foliar fungicides and biologicals for control of tar spot of dent corn in Arlington, Wisconsin, 2024- Experiment #6

DENT CORN (*Zea mays* 'CP3899VT2P/RIB')
Tar spot; *Phyllachora maydis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'CP3899VT2P/RIB' was planted 6 May, behind corn, no-till, in a field consisting of a Plano silt loam soil (2 to 6% slopes). The trial was arranged in a randomized complete block design with four replications. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and five fungicide programs. Foliar fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10 ft boom calibrated to deliver 20 GPA at 40 psi. Treatments were applied at growth stages R1 (silk) on 24 Jul or a two-spray program at R1 followed by R3 on 14 Aug. Natural sources of pathogen inoculum were relied upon for disease. Tar spot severity was rated at late R5 on 17 Sep. Tar spot was visually assessed by estimating average severity (% stroma on ear leaf) per plot with the aid of standardized area diagrams. Yield (corrected to 15.5% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Low levels of tar spot were observed in this trial due to late disease development. However, applications of Headline Amp at R1 + R3, Miravis Neo at R1 + R3, and Veltyma at R1 resulted in significantly lower tar spot severity than the non-treated control (Table 6). There were no significant differences among treatments for canopy greening and yield. Phytotoxicity was not observed for any treatment.

Table 6. Canopy greening, tar spot severity, and yield for dent corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)	Canopy Greening (%)[z]	Tar Spot Severity (%)[y,x]	Yield (bu/A)
Veltyma 3.34SC 7.0 fl oz (R1)	27.5	0.02 c	165.0
Headline AMP 1.68SC 10.0 fl oz (R1) Headline AMP 1.68SC 10.0 fl oz (R3)	20.0	0.03 bc	170.0
Miravis Neo 2.5SE 13.7 fl oz (R1) Miravis Neo 2.5SE 13.7 fl oz (R3)	25.0	0.04 bc	162.4
Activ8 5.0 gal (R1) Activ8 5.0 gal (R3)	20.0	0.10 ab	159.1
DefendPro 5.0 gal (R1) DefendPro 5.0 gal (R3)	22.5	0.10 a-c	165.0
Non-treated control	25.0	0.17 a	167.7
P-value	ns[w]	0.05	ns

[z]Canopy greening effect determined by rating the percentage green foliage still present in each plot at black layer.
[y]Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[x]Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05).
[w]ns= not significant (α=0.05).

Trial 7: Evaluation of in-furrow and foliar fungicides for control of tar spot and ear rot on silage corn in Arlington, Wisconsin, 2024.

SILAGE CORN (*Zea mays* 'B10B77SX')
Ear rot; *Gibberella zeae*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The corn hybrid 'B10B77SX' (110-day relative maturity brown midrib hybrid) was chosen for this trial. Winter wheat proceeded this crop. Corn was planted on 1 May in a field consisting of a Joy silt loam soil (0 to 4% slopes). The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of one non-treated check and 13 fungicide programs. Fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10-ft boom calibrated to deliver 20 GPA at 40 psi. At-plant application equipment was calibrated to deliver 5 GPA at 16 psi. Treatments were applied at plant on 1 May, V12 on 15 Jul, R1 on 22 Jul, V12 followed by R1, and R3 on 14 Aug. Plots were infested at a rate of 25 lbs/A of *Fusarium graminearum*-colonized corn grain at VT. Ear rot was rated at the R5.5 growth stage (17 Sep). Tar spot was visually assessed by estimating average severity (% ear leaf with symptoms) on 5 leaves per plot with the aid of a standardized area diagram. Ear rot severity was assessed by visually rating five ears per plot in the center two rows with the aid of a standardized area diagram. Stalk rot severity was rated by the stalk push test on 10 plants per plot and converted to a percentage of snapped stalks. Yield was determined by harvesting the center two rows of each plot using a small plot silage chopper with an onboard platform weigh system. Chopped sub-samples were collected from each plot and analyzed for quality total-tract neutral detergent fiber digestibility (TTNDFD), deoxynivalenol (DON) content and Fumonisin B1. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Fungicide treatments had significant differences in TTNDFD, however, no treatments were significantly different from the non-treated check (Table 7). Miravis Neo applied at R3 resulted in significantly lower DON levels compared to the non-treated check. There were no significant differences in yield, tar spot severity, ear rot severity, fumonisin B1, and stalk rot severity among all treatments. Phytotoxicity was not observed for any treatment.

Table 7. Yield, TTNDFD, tar spot severity, ear rot severity, deoxynivalenol (DON), fumonisin B1, and stalk rot severity for silage corn treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (growth stage at application)[z]	Yield (tons dry matter/A)	TTNDFD[y,x]	Tar Spot Severity (%)[w]	Ear rot severity (%)[v]	DON (ppm)[u,x]	Fumonisin B1 (ppm)[t]	Stalk rot severity (%)[s]
Miravis Neo 2.5SE 13.7 fl oz (R3)	10.9	35.4 a-d	0.17	0.17	0.11 d	0.11	0.5
Adastrio 4.0SC 8.0 fl oz (R1)	10.5	33.2 c-e	0.18	0.14	0.14 cd	0.11	1.5
Prosaro Pro 400SC 10.3 fl oz (R1)	10.2	36.6 ab	0.32	0.11	0.14 cd	0.11	0.5
Miravis Neo 2.5SE 13.7 fl oz (R1)	10.1	34.8 b-d	0.21	0.18	0.15 cd	0.11	0.5
Proline 5.7 fl oz (R1)	11.0	30.8 e	0.31	0.14	0.15 cd	0.17	0.2
Delaro Complete 3.83SC 12.0 fl oz (R1)	10.4	34.1 b-e	0.21	0.11	0.16 cd	0.23	4.9
Experimental 1 13.7 fl oz (R1)	10.0	38.2 a-d	0.27	0.14	0.19 b-d	0.11	0.5
Headline AMP 14.4 fl oz (R1)	11.0	32.4 de	0.15	0.19	0.21 b-d	0.30	0.2
Lucento 4.17SC 5.0 fl oz (R1)	10.3	33.7 b-e	0.27	0.27	0.22 b-d	0.30	0.2
Xyway LFR 15.2 fl oz (FurrowJet at-plant)	9.5	32.8 de	0.21	0.14	0.36 a-d	0.16	0.6
Topguard EQ 4.29SC 7.0 fl oz (R1)	10.5	31.0 e	0.18	0.11	0.38 a-c	0.23	0.2
Non-treated check	10.3	33.8 b-e	0.21	0.14	0.45 a-c	0.22	0.2
Miravis Neo 2.5SE 13.7 fl oz (V12)	11.0	34.9 a-d	0.31	0.19	0.59 ab	0.15	0.5
Miravis Neo 2.5SE 13.7 fl oz (V12 + R1)	10.8	36.5 a-c	0.29	0.11	0.90 a	0.16	0.2
P-value	ns[r]	<0.01	ns	ns	<0.05	ns	ns

[z]Induce 90% SL (Non-ionic surfactant) at 0.125% v/v was added to fungicide treatments applied at R1 and R3.
[y]Total-Tract Neutral Detergent Fiber Digestibility.
[x]Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05).
[w]Tar spot severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[v]Ear rot severity was assessed by visually rating five ears per plot in the center two rows with the aid of a standardized area diagram.
[u]Deoxynivalenol (DON) content were analyzed for each plot; means for each plot were used in the analysis.
[t]Fumonisin B1 content were analyzed for each plot; means for each plot were used in the analysis.
[s]Stalk rot severity was rated by the stalk push test on 10 plants per plot and converted to a percentage of snapped stalks.
[r]ns = not significant (α=0.05)

Trial 8: Evaluation of foliar fungicides for control of diseases of sweet corn in Arlington, Wisconsin, 2024.

SWEET CORN (*Zea mays* 'Providence')
Northern corn leaf blight; *Setosphaeria turcica*
Southern rust; *Puccinia polysora*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The sweet corn hybrid 'Providence' was planted on 4 Jun, behind winter wheat, no-till, in a field consisting of a Joy silt loam soil (0 to 4% slopes). The experimental design was a randomized complete block with 3 replicates. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys. Standard corn production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of one non-treated check and five fungicide programs. Foliar fungicides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles on a 10 ft boom calibrated to deliver 20 GPA at 40 psi. Treatments were applied at growth stages V8 on 29 Jul, R1 on 7 Aug, or a two-spray program at V8 followed by R1. Natural sources of pathogen inoculum were relied upon for disease. Northern corn leaf blight (NCLB) and Southern Rust was visually assessed by estimating average severity (% ear leaf with symptoms) on five leaves per plot with the aid of standardized area diagrams on 5 Sep. Marketable ears were harvested by hand from one center row (17.5 ft) of each plot on 5 Sep. Data were analyzed using a mixed model analysis of variance and means were separated using Fisher's Least Significant Difference (LSD; α=0.05).

Temperatures during the trial were average for the growing region, with above average precipitation early in the season and adequate precipitation to finish out the growing season. Low levels of disease were observed in this trial. There were no significant differences in NCLB severity, Southern Rust severity, and yield among all treatments (Table 8). Phytotoxicity was not observed for any treatment.

Table 8. Northern corn leaf blight severity, southern rust severity, and yield for sweet corn treated with fungicide or not treated with fungicide in Wisconsin in 2024.

Treatment and rate/A (growth stage at application)	Northern Corn Leaf Blight Severity (%)[z]	Southern Rust Severity (%)[y]	Yield (tons/A)[y]
Veltyma 3.34SC 7.0 fl oz (R1)	0.99	1.00	7.5
Headline AMP 1.68SC 10.0 fl oz (R1)	3.10	0.75	7.3
Delaro Complete 3.83SC 8.0 fl oz (R1)	1.35	0.99	6.9
Non-treated control	2.63	0.70	6.5
Headline AMP 1.68SC 10.0 fl oz (V8+ R1)	3.28	0.95	6.5
Miravis Neo 2.5SE 13.7 fl oz (R1)	1.96	1.17	6.4
P-value	ns[x]	ns	ns

[z]NCLB severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[y]Southern rust severity was visually assessed as the average % ear leaf symptomatic per plot with the aid of a standard area diagram; means for each plot were used in the analysis.
[x]ns= not significant (α=0.05).

Trial 9: Evaluation of fungicides for control of Sclerotinia stem rot of soybean in Hancock, Wisconsin, 2024-Experiment #1

SOYBEAN (*Glycine max* 'Xitavo XO 1822E')
Sclerotinia stem rot; *Sclerotinia sclerotiorum*

The trial was established at the Hancock Agricultural Research Station located in Hancock, WI. The soybean cultivar 'Xitavo XO 1822E' was chosen for this study. Soybeans were planted on 23 May in a field with a Plainfield sand (0 to 2% slopes). The trial was planted in a field with history of severe Sclerotinia stem rot. The field was overhead irrigated as needed to prevent drought stress. The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in. spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and 16 fungicide programs. Most fungicide treatments applied at R2 and R3 were mixed with the non-ionic surfactant, Induce 90SL, at 0.125% v/v. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles calibrated to deliver 20 GPA at 30 psi. Pesticides were broadcast sprayed at-plant (23 May), at growth stage R3 (25 Jul), or both at plant and R3. Some treatments were applied at R2 (18 Jul) based on guidance from the Sporecaster smartphone application or a two spray program using the Sporecaster app where the second application was made at R3. Sclerotinia stem rot incidence and severity were rated at R6 (11 Sep). Sclerotinia stem rot severity index (DSI) was determined by rating 30 arbitrarily selected plants in each plot and scoring plants on a 0 to 3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were multiplied by their scale values, totaled, and divided by 0.9. Disease incidence (DI) was scored as a percentage of symptomatic plants relative to the total stand. The DI and DSI were then combined to calculate the disease index (DIX) where DIX=DI*(Average DSI/3). Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge on 2 Oct. All disease and yield data were analyzed with SAS PROC GLIMMIX using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Additional overhead irrigation throughout the season was also applied. Given the history of severe Sclerotinia stem rot and favorable conditions disease pressure was moderately-high in this trial. Applications of Experimental 1 + Experimental 3 at-plant followed by Endura (8.0 oz) + Experimental 2 + Experimental 3 at R3, Endura (8.0 oz) at R3, Endura (6.0 oz) using the model followed by Miravis Neo (16.0 fl oz) at R3, Endura (6.0 oz) at R3, Delaro Complete (8.0 fl oz) at R3, Endura (8.0 oz) using the model, and Endura (6.0 oz) + Miravis Neo (13.7 fl oz) at R3 significantly reduced Sclerotinia stem rot incidence and DIX compared to the non-treated check (Table 9). Experimental 1 + Experimental 3 at-plant followed by Endura (8.0 oz) + Experimental 2 + Experimental 3 at R3, Endura (8.0 oz) and Delaro Complete (8.0 fl oz) at R3, Endura (8.0 oz) using the model, Omega (12.0 fl oz) using the model followed by Miravis Neo (16.0 fl oz) at R3, and Experimental 1 + Contans applied at plant had significantly higher yield than the non-treated check. Phytotoxicity was not observed for any treatments.

Table 9. Sclerotinia stem rot disease incidence, Sclerotinia stem rot disease severity index (DSI), DIX, and yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)	Disease Incidence (%)[z,y]	Sclerotinia Stem Rot DSI (0-100)[x,y]	DIX[w,y]	Yield (bu/A)[y]
Experimental 1 2.0 pt (at-plant) +Experimental 3 1.5 fl oz (at-plant) Endura 70WDG 8.0 oz (R3) +Experimental 2 0.4 % v/v (R3) +Experimental 3 1.5 fl oz (R3)	1.5 f	9.5 f	1.2 fg	66.7 a-d
Endura 70WDG 8.0 oz (R3)[v]	1.5 f	9.4 f	1.1 g	69.0 ab
Endura 70WDG 6.0 oz (Model)[v,t] Miravis Neo 2.5SE 16.0 fl oz (R3)[v]	2.8 ef	18.4 d-f	2.4 e-g	65.0 a-e
Endura 70WDG 6.0 oz (R3)[v]	3.2 d-f	22.7 de	3.0 d-f	63.9 b-e
Delaro Complete 3.83SC 8.0 fl oz (R3)[v,t]	3.8 c-e	21.7 de	3.1 d-f	70.3 a
Endura 70WDG 8.0 oz (Model)[v,t]	3.9 c-e	27.2 cd	3.4 c-e	67.3 a-c
Endura 70WDG 6.0 oz (R3)[v] + Miravis Neo 2.5SE 13.7 fl oz (R3)	4.5 c-e	27.6 cd	4.2 c-e	65.0 a-e
Omega 500F 14.0 oz (Model)[v,t]	5.1 b-e	34.6 a-d	4.6 b-e	63.4 b-e
Omega 500F 12.0 oz (Model)[v,t] Miravis Neo 2.5SE 16.0 fl oz (R3)[v]	5.4 b-e	31.0 b-d	4.6 b-e	67.5 ab
Experimental 1 2.0 pt (at-plant) Endura 70WDG 8.0 oz (R3) Experimental 2 0.4 % v/v (R3)	6.6 a-e	34.2 a-d	5.9 a-e	61.1 c-e
Experimental 1 2.0 pt (at-plant) +Contans 1.0 lbs (at-plant)	7.3 a-d	37.1 a-d	6.4 a-d	66.4 a-d
Miravis Neo 2.5SE 13.7 fl oz (R3)[v]	7.7 a-c	39.9 a-e	6.9 a-d	64.4 a-e
Experimental 4 8.5 fl oz (Model)[v,t]	8.2 a-c	47.6 a-c	7.9 a-c	63.4 b-e
Non-Treated Check	10.2 ab	49.0 a-c	9.5 ab	60.9 e
Experimental 5 13.7 fl oz (Model)[v,t]	11.5 ab	61.7 ab	11.5ab	64.2 a-e
Contans 2.0 lbs (at-plant)	11.7 ab	66.3 a	11.8 a	60.8 de
Miravis Neo 2.5SE 20.8 fl oz (Model)[v,t]	13.0 a	66.6 a	12.5 a	58.8 e
P-value	<0.01	<0.01	<0.01	<0.05

[z] Percentage of symptomatic plants relative to the total stand.
[y] Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05).
[x] Sclerotinia stem rot DSI was generated by rating 30 arbitrarily selected plants in each plot and scoring plants with on a 0 to 3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were totaled for each class and divided by 0.9.
[w] DIX=DI*(Average DSI/3)
[v] Induce 90% SL (Non-ionic surfactant) at 0.125% v/v was added to fungicide treatments
[t] Model application sprays were determined using the Sporecaster smartphone application.

Trial 10: Evaluation of foliar fungicide treatments for control of Sclerotinia stem rot of soybean in Hancock, Wisconsin, 2024- Experiment #2

SOYBEAN (*Glycine max* 'Xitavo XO 1822E')
Sclerotinia stem rot; *Sclerotinia sclerotiorum*

The trial was established at the Hancock Agricultural Research Station located in Hancock, WI. The soybean cultivar 'Xitavo XO 1822E' was chosen for this study. Soybeans were planted on 23 May in a field with a Plainfield sand (0 to 2% slopes). The trial was planted in a field with history of severe Sclerotinia stem rot. The field was overhead irrigated as needed to prevent drought stress. The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in. spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and seven fungicide programs. Treatments were mixed with the non-ionic surfactant, Induce 90SL, at 0.125% v/v. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles calibrated to deliver 20 GPA at 30 psi. Pesticides were applied at R1 on 11 Jul or a two-spray program at R1 and R3 (25 Jul). Sclerotinia stem rot incidence and severity were rated at R6 on 11 Sep. Sclerotinia stem rot severity index (DSI) was determined by rating 30 arbitrarily selected plants in each plot and scoring plants on a 0 to 3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were multiplied by their scale values, totaled, and divided by 0.9. Disease incidence (DI) was scored as a percentage of symptomatic plants relative to the total stand. The DI and DSI were then combined to calculate the disease index (DIX) where DIX=DI*(Average DSI/3). Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge on 2 Oct. All disease and yield data were analyzed with SAS PROC GlIMMIX using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Additional overhead irrigation throughout the season was also applied. Given the history of severe Sclerotinia stem rot and favorable conditions disease pressure was moderately-high in this trial. Endura applied at R1 resulted in significantly lower Sclerotinia stem rot incidence compared to not treating (Table 10). Fungicide treatments varied significantly in DSI and DIX levels, however, no treatments were significantly different when compared to the non-treated check. No significant differences were observed for yield among all treatments. Phytotoxicity was not observed for any treatment.

Table 10. Sclerotinia stem rot disease incidence, Sclerotinia stem rot disease severity index (DSI), DIX, and yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)[z]	Disease Incidence (%)[y,x]	Sclerotinia Stem Rot DSI (0-100)[w,x]	DIX[v,x]	Yield (bu/A)
Endura 70WDG 8.0 oz (R1)	2.7 d	19.5 bc	2.3 c	58.7
Delaro Complete 3.83SC 8.0 fl oz (R1+R3)	3.2 cd	17.2 c	2.5 bc	62.0
Propulse 3.34SC 8.0 fl oz (R1) Delaro Complete 3.83SC 8.0 fl oz (R3)	4.9 b-d	28.6 a-c	3.8 bc	63.0
Propulse 3.34SC 8.0 fl oz (R1)	6.1 a-d	38.1 a-c	6.0 ab	61.3
Non-Treated Check	6.5 a-c	36.3 a-c	5.4 a-c	57.6
Delaro Complete 3.83SC 8.0 fl oz (R1)	7.0 a-c	43.3 ab	6.2 ab	58.3
Miravis Neo 2.5SE 13.7 fl oz (R1)	10.2 ab	52.4 a	10.1 a	58.3
Viatude 2.09SC 10.0 fl oz (R1)	11.6 a	58.6 a	11.3 a	58.7
P-value	<0.05	<0.05	<0.05	ns[u]

[z] Induce 90% SL (Non-ionic surfactant) at 0.25% v/v was added to fungicide treatments
[y] Percentage of symptomatic plants relative to the total stand.
[x] Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05).
[w] Sclerotinia stem rot DSI was generated by rating 30 arbitrarily selected plants in each plot and scoring plants with on a 0 to 3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were totaled for each class and divided by 0.9.
[v] DIX=DI*(Average DSI/3)
[u] ns = not significant (α=0.05).

Trial 11: Evaluation of foliar fungicide treatments for control of Sclerotinia stem rot of soybean in Hancock, Wisconsin, 2024- Experiment #3

SOYBEAN (*Glycine max* 'Xitavo XO 1822E')
Sclerotinia stem rot; *Sclerotinia sclerotiorum*

The trial was established at the Hancock Agricultural Research Station located in Hancock, WI. The soybean cultivar 'Xitavo XO 1822E' was chosen for this study. Soybeans were planted on 23 May in a field with a Plainfield sand (0 to 2% slopes). The trial was planted in a field with history of severe Sclerotinia stem rot. The field was overhead irrigated as needed to prevent drought stress. The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in. spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and 10 fungicide programs. Treatments were mixed with the non-ionic surfactant, Induce 90SL, at 0.25% v/v. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles calibrated to deliver 20 GPA at 30 psi. Pesticides were applied at R2 on 18 Jul. Sclerotinia stem rot incidence and severity were rated at R6 on 11 Sep. Sclerotinia stem rot severity index (DSI) was determined by rating 30 arbitrarily selected plants in each plot and scoring plants on a 0 to 3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were multiplied by their scale values, totaled, and divided by 0.9. Disease incidence (DI) was scored as a percentage of symptomatic plants relative to the total stand. The DI and DSI were then combined to calculate the disease index (DIX) where DIX=DI*(Average DSI/3). Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge on 2 Oct. All disease and yield data were analyzed with SAS PROC GlIMMIX using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Additional overhead irrigation throughout the season was also applied. Given the history of severe Sclerotinia stem rot and favorable conditions disease pressure was moderately-high in this trial. However, no significant differences were observed for Sclerotinia stem rot incidence, DSI, DIX, and yield among all treatments (Table 11). Phytotoxicity was not observed for any treatment.

Table 11. Sclerotinia stem rot disease incidence, Sclerotinia stem rot disease severity index (DSI), DIX, and yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)[z]	Disease Incidence (%)[y]	Sclerotinia Stem Rot DSI (0-100)[x]	DIX[w]	Yield (bu/A)
Viatude 2.09SC 12.0 fl oz (R2)	3.9	25.4	3.7	65.1
Bonafide 70WDG 6.0 oz (R2)	3.3	21.3	3.3	64.8
Endura Pro 2.5SC 20.0 fl oz (R2)	5.8	33.1	5.6	64.5
Delaro Complete 3.83SC 8.0 fl oz (R2)	5.7	32.9	5.3	64.0
Endura 70WDG 8.0 oz (R2)	4.0	27.9	4.0	63.8
Propulse 3.34SC 8.0 fl oz (R2)	2.9	21.8	2.9	63.6
Endura Pro 2.5SC 18.5 fl oz (R2)	6.2	33.3	6.1	63.5
Non-Treated Check	7.3	43.5	7.3	62.8
Miravis Neo 2.5SE 13.7 fl oz (R2)	11.8	54.7	11.4	62.6
Endura 70WDG 6.0 oz (R2)	3.4	24.2	3.4	62.4
Bonafide 70WDG 8.0 oz (R2)	3.3	20.8	3.2	62.2
P-value	ns[v]	ns	ns	ns

[z] Induce 90% SL (Non-ionic surfactant) at 0.25% v/v was added to fungicide treatments
[y] Percentage of symptomatic plants relative to the total stand.
[x] Sclerotinia stem rot DSI was generated by rating 30 arbitrarily selected plants in each plot and scoring plants with on a 0 to 3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were totaled for each class and divided by 0.9.
[w] DIX=DI*(Average DSI/3)
[v] ns = not significant (α=0.05).

Trial 12: Evaluation of foliar fungicide treatments for control of Sclerotinia stem rot of soybean in Hancock, Wisconsin, 2024- Experiment #4

SOYBEAN (*Glycine max* 'Xitavo XO 1822E')
Sclerotinia stem rot; *Sclerotinia sclerotiorum*

The trial was established at the Hancock Agricultural Research Station located in Hancock, WI. The soybean cultivar 'Xitavo XO 1822E' was chosen for this study. Soybeans were planted on 23 May in a field with a Plainfield sand (0 to 2% slopes). The trial was planted in a field with history of severe Sclerotinia stem rot. The field was overhead irrigated as needed to prevent drought stress. The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in. spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and seven fungicide programs. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with TeeJet XR 8002-VS flat fan nozzles calibrated to deliver 20 GPA at 30 psi. Pesticides were applied at growth stages R1 (11 Jul) followed by R2 on18 Jul or R1 followed by R3 (25 Jul). Sclerotinia stem rot incidence and severity were rated at R6 on 11 Sep. Sclerotinia stem rot severity index (DSI) was determined by rating 30 arbitrarily selected plants in each plot and scoring plants on a 0-3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were multiplied by their scale values, totaled, and divided by 0.9. Disease incidence was scored as a percentage of symptomatic plants relative to the total stand. The DI and DSI were then combined to calculate the disease index (DIX) where DIX=DI*(Average DSI/3). Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge on 2 Oct. All disease and yield data were analyzed with SAS PROC GLIMMIX using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Additional overhead irrigation throughout the season was also applied. Given the history of severe Sclerotinia stem rot and favorable conditions disease pressure was moderate in this trial. No significant differences were observed for Sclerotinia stem rot incidence, DSI, DIX, and yield among all treatments (Table 12). Phytotoxicity was not observed for any treatment.

Table 12. Sclerotinia stem rot disease incidence, Sclerotinia stem rot disease severity index (DSI), DIX, and yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)	Disease Incidence (%)[z]	Sclerotinia Stem Rot DSI (0-100)[y]	DIX[x]	Yield (bu/A)
Affiance 1.5SC 10.0 fl oz (R1) Endura 70WDG 8.0 oz (R3)	3.4	25.6	3.2	65
Affiance 1.5SC 14.0 fl oz (R1) Affiance 1.5SC 14.0 fl oz (R3)	8.3	50.8	7.6	64.4
Non-treated check	7.0	48.4	6.8	64.2
Affiance 1.5SC 10.0 fl oz (R1) Affiance 1.5SC 10.0 fl oz (R2)	4.8	29.4	4.3	61.2
Affiance 1.5SC 10.0 fl oz (R1) Affiance 1.5SC 10.0 fl oz (R3)	6.2	34.5	5.7	61.1
Domark 230ME 5.0 fl oz (R1) Domark 230ME 5.0 fl oz (R3)	5.8	37.9	5.5	60.6
Domark 230ME 5.0 fl oz (R1) Domark 230ME 5.0 fl oz (R2)	7.2	47.2	6.6	60.1
Domark 230ME 5.0 fl oz (R1) +Topsin-M 4.5F 20.0 fl oz (R1) Domark 230ME 5.0 fl oz (R3) +Topsin-M 4.5F 20.0 fl oz (R3)	1.4	12.0	1.4	58.6
P-value	ns[v]	ns	ns	ns

[z] Percentage of symptomatic plants relative to the total stand.
[y] Sclerotinia stem rot DSI was generated by rating 30 arbitrarily selected plants in each plot and scoring plants with on a 0-3 scale: 0 = no infection; 1 = infection on branches; 2 = infection on main stem with little effect on pod fill; 3 = infection on main stem resulting in death or poor pod fill. The scores of the 30 plants were totaled for each class and divided by 0.9.
[x] DIX=DI*(Average DSI/3)
[v]ns = not significant according to Fisher's least significant difference (α=0.05).

Trial 13: Evaluation of foliar fungicide treatments for control of diseases of soybean in Arlington, Wisconsin, 2024-Experiment #1

SOYBEAN (*Glycine max* 'AG24XF3')

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The soybean cultivar 'AG24XF3' was chosen for this study. Soybeans were planted on 13 May in a field with a Plano silt loam soil (0 to 2% slopes) and Joy silt loam soil (0 to 4% slopes). The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and five fungicide programs. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with 8002XR TurboJet flat fan nozzles calibrated to deliver 20 GPA at 30 psi. At-plant application equipment was calibrated to deliver 5 GPA at 16 psi. Pesticides were applied at-plant on 13 May and at R3 on 26 Jul. Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. Yield data was analyzed using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Above average precipitation was observed early in the summer, however, no disease was observed. Xyway (15.2 fl oz) applied at-plant had significantly lower yield compared to all other treatments (Table 13). Phytotoxicity was not observed for any treatment.

Table 13. Yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)	Yield (bu/A)[z]
Delaro Complete 3.83SC 8.0 fl oz (R3)	92.5 a
Non-treated check	90.8 ab
Revytek 3.33LC 8.0 fl oz (R3)	90.3 ab
Miravis Neo 2.5SE 13.7 fl oz (R3)	89.4 ab
Xyway LFR 10.5 fl oz (FurrowJet at-plant)	88.7 b
Xyway LFR 15.2 fl oz (FurrowJet at-plant)	81.9 c
P-value	<0.01

[z]Means followed by the same letter are not significantly different within each hybrids based on Fisher's Least Significant Difference (LSD; α=0.05).

Trial 14: Evaluation of foliar fungicide treatments for control of diseases of soybean in Arlington, Wisconsin, 2024-Experiment #2

SOYBEAN (*Glycine max* 'AG24XF3')

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The soybean cultivar 'AG24XF3' was chosen for this study. Soybeans were planted on 13 May in a field with a Plano silt loam soil (0 to 2% slopes) and Joy silt loam soil (0 to 4% slopes). The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and 10 fungicide programs. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with 8002XR TurboJet flat fan nozzles calibrated to deliver 20 GPA at 30 psi. Pesticides were applied at the R3 growth stage (26 Jul). Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. All disease and yield data were analyzed using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Above average precipitation was observed early in the summer, however, no disease was observed. No significant differences were observed for yield among all treatments (Table 14). Phytotoxicity was not observed for any treatment.

Table 14. Yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)[z]	Yield (bu/A)
Chlorothalonil 6.0SC 36.0 fl oz (R3) Folicur 3.6F 4.0 fl oz (R3) Topsin-M 4.5F 20.0 fl oz (R3)	88.0
Delaro Complete 3.83SC 8.0 fl oz (R3)	87.8
Topsin-M 4.5F 20.0 fl oz (R3)	87.5
Miravis Neo 2.5SE 13.7 fl oz (R3)	87.0
Non-treated check	86.4
Revytek 3.33LC 8.0 fl oz (R3)	86.2
Quadris 2.08F 6.0 fl oz (R3)	85.4
Trivapro 2.21EC 13.7 fl oz (R3)	85.3
Topguard EQ 4.29SC 5.0 fl oz (R3)	84.5
Veltyma 3.34SC 7.0 fl oz (R3)	83.8
Lucento 4.17SC 5.0 fl oz (R3)	82.8
P-value	ns[y]

[z] Induce 90% SL (Non-ionic surfactant) at 0.25% v/v was added to fungicide treatments
[y] ns = not significant (α=0.05).

Trial 15: Evaluation of foliar fungicide treatments for control of diseases of soybean in Arlington, Wisconsin, 2024-Experiment #3

SOYBEAN (*Glycine max* 'AG24XF3')

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The soybean cultivar 'AG24XF3' was chosen for this study. Soybeans were planted on 13 May in a field with a Plano silt loam soil (0 to 2% slopes) and Joy silt loam soil (0 to 4% slopes). The experimental design was a randomized complete block with four replicates. Plots consisted of four 30-in spaced rows, 20 ft long and 10 ft wide with 5-ft alleys between plots. Standard soybean production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and eight fungicide programs. Pesticides were applied using a CO_2-pressurized backpack sprayer equipped with 8002XR TurboJet flat fan nozzles calibrated to deliver 20 GPA at 30 psi. Pesticides were applied at the R3 growth stage (26 Jul). Yield (corrected to 13% moisture) was determined by harvesting the center two rows of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic grain gauge. All disease and yield data were analyzed using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation throughout the growing season. Above average precipitation was observed early in the summer. No diseases were observed for this trial. No significant differences were observed for yield among all treatments (Table 15). Phytotoxicity was not observed for any treatment.

Table 15. Yield for soybean treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment and rate/A (crop stage at application)[z]	Yield (bu/A)
Delaro Complete 3.83SC 8.0 fl oz (R3)	87.1
Viatude 2.09SC 10.0 fl oz (R3)	83.8
Revylok 3.33SC 5.5 fl oz (R3)	83.5
Revytek 3.33LC 8.0 fl oz (R3)	83.0
Lucento 4.17SC 5.5 fl oz (R3)	82.6
Non-treated check	82.5
Miravis Neo 2.5SE 13.7 fl oz (R3)	82.0
Miravis Top 1.67SC 13.7 fl oz (R3) +Quadris 2.08F 6.85 fl oz (R3)	81.4
Veltyma 3.34SC 7.0 fl oz (R3)	81.3
P-value	ns[y]

[z] Induce 90% SL (Non-ionic surfactant) at 0.25% v/v was added to fungicide treatments
[y] ns = not significant (α=0.05).

Trial 16: Evaluation of foliar fungicides for control of Fusarium head blight of 'Kaskaskia' wheat in Wisconsin, 2024.

WHEAT, SOFT RED WINTER (*Triticum aestivum* 'Kaskaskia')
Fusarium Head Blight; *Fusarium graminearum*
Tan spot; *Pyrenophora tritici-repentis*

The trial was established at the Arlington Agricultural Research Station located in Arlington, WI. The soft red winter wheat cultivar 'Kaskaskia' was chosen for this study. Wheat was planted on 4 Oct 2023 in a field with Joy silt loam (0-4% slopes) soil. The experimental design was a randomized complete block with six replicates. Plots were 20 ft long and 7.5 ft wide with 5-ft alleys between plots. Standard wheat production practices as described by the University of Wisconsin Cooperative Extension Service were followed. Treatments consisted of a non-treated control and seven fungicide programs. Fungicide treatments applied at Feekes 10.5.1 were mixed with the non-ionic surfactant, Induce 90SL, at 0.125% v/v. Fungicides were applied using a CO_2 pressurized backpack sprayer equipped with TTJ60-11002 Turbo TwinJet flat fan nozzles calibrated to deliver 20 GPA at 28 psi. Fungicides were applied when the second node was visible above the soil line (Feekes 7) on 8 May, anthesis (Feekes 10.5.1) on 29 May or using a two-spray program with the first spray occurring at Feekes 7 followed by Feekes 10.5.1. Plots were infested with 25 lb/A of *F. graminearum*-colonized corn grain on 9 May and 27 May. Tan spot was evaluated by visually estimating average severity (% flag leaf with symptoms) per plot with the aid of standardized area diagrams. Fusarium head blight (FHB) was evaluated by visually estimating average incidence (% plants with symptoms) and average severity (% area of heads with symptoms) per plot with the aid of standardized area diagrams. Concentration of deoxynivalenol (DON) was also evaluated in grain harvested from each treatment (~75 grams) at the University of Minnesota DON testing lab. Test weight and yield (corrected to 13.5% moisture) were determined by harvesting the center 5-ft width of each plot using an Almaco SPC40 small-plot combine equipped with a HarvestMaster HM800 Classic Grain gauge. All disease and yield data were analyzed using a mixed model analysis of variance, and means were separated using Fisher's least significant difference (α=0.05).

Temperatures during the trial were average for the growing region with adequate precipitation. Moderate levels of tan spot and Fusarium head blight were observed for this trial. All treatments had significantly lower tan spot severity, FHB index, DON, and test weight compared to the non-treated check (Table 16). Trivapro + Experimental 1 applied at Feekes 7 followed by Miravis Ace at Feekes 10.5.1 had significantly higher yields than all other treatments. Phytotoxicity was not observed for any treatment.

Table 16. Tan spot severity, fusarium head blight (FHB) index, deoxynivalenol (DON), test weight, and yield for soft red winter wheat treated with fungicide or not treated with fungicide in Wisconsin, 2024.

Treatment, rate/A[z]	Growth stage at application (Feekes)[y]	Tan Spot Severity (%)[x,w]	FHB Disease Index (%)[v,w]	DON (ppm)[w]	Test Weight (lb/A)[w]	Yield (bu/A)[w]
Non-treated check		15.5 a	12.8 a	0.6 a	57.1 d	70.2 e
Trivapro 2.21EC 9.4 fl oz Miravis Ace 5.2SC 13.7 fl oz[u]	7 fb 10.5.1	3.6 de	0.1 b	0.3 b	60.4 a	87.7 b
Trivapro 2.21EC 9.4 fl oz +Experimental 1 Miravis Ace 5.2SC 13.7 fl oz[u]	7 fb 10.5.1	2.6 e	0.2 b	0.2 b	60.4 a	95.1 a
Miravis Ace 5.2SC 13.7 fl oz[u]	10.5.1	6.1 cd	0.1 b	0.2 b	59.9 a	83.4 bc
Experimental 2 10.2 fl oz[u]	10.5.1	5.1 c-e	0.1 b	0.2 b	60.1 a	82.8 bc
Sphaerex 2.5SC 7.3 fl oz[u]	10.5.1	5.5 cd	0.2 b	0.2 b	58.1 c	75.4 de
Prosaro Pro 400SC 10.3 fl oz[u]	10.5.1	7.5 c	0.1 b	0.3 b	58.9 b	77.9 cd
Prosaro 421SC 8.2 fl oz[u]	10.5.1	11.9 b	0.1 b	0.3 b	58.5 bc	76.0 de
P-value		<0.01	<0.01	<0.01	<0.01	<0.01

[z]Fungicide treatments applied at Feekes 10.5.1 were mixed with the non-ionic surfactant, Induce 90SL, at 0.125% v/v
[y]Fb = followed by.
[x]Tan spot severity was visually assessed as the average % flag leaf symptomatic per plot
[w]Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05)
[v]FHB Index was calculated by multiplying % disease incidence (DI) by % disease severity (DS) divided by 100 (FHB Index=DI x DS/100).