SFNMC Contact Meeting

Shellman, Georgia

July 29, 2025

Evaluating Postiva® and Miravis®Neo for Fusiform Rust Control in Bareroot Loblolly and Slash Pine Seedlings

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Evaluating Postiva® and Miravis®Neo for Fusiform Rust Control in Bareroot Loblolly and Slash Pine Seedlings

Chemical Control from 1980 to Present
Previous SFNMC Research
Research Justification
Methods
Results
Conclusion

Fusiform Rust Control in Forest Tree Nurseries: A Timeline

- 1980 – SFNMC spearheaded the registration of Bayleton® (triadimefon).
- 2007 – Proline® (prothioconazole) is registered for use in the U.S.
- 2011 – Proline® is registered for use in forest tree seedling nurseries.
- 2012 – Bayer CropScience discontinues production of Bayleton® following the EPA's cancellation order in July 2007.
- EPA reviews all registered pesticides once at least every 15 years.

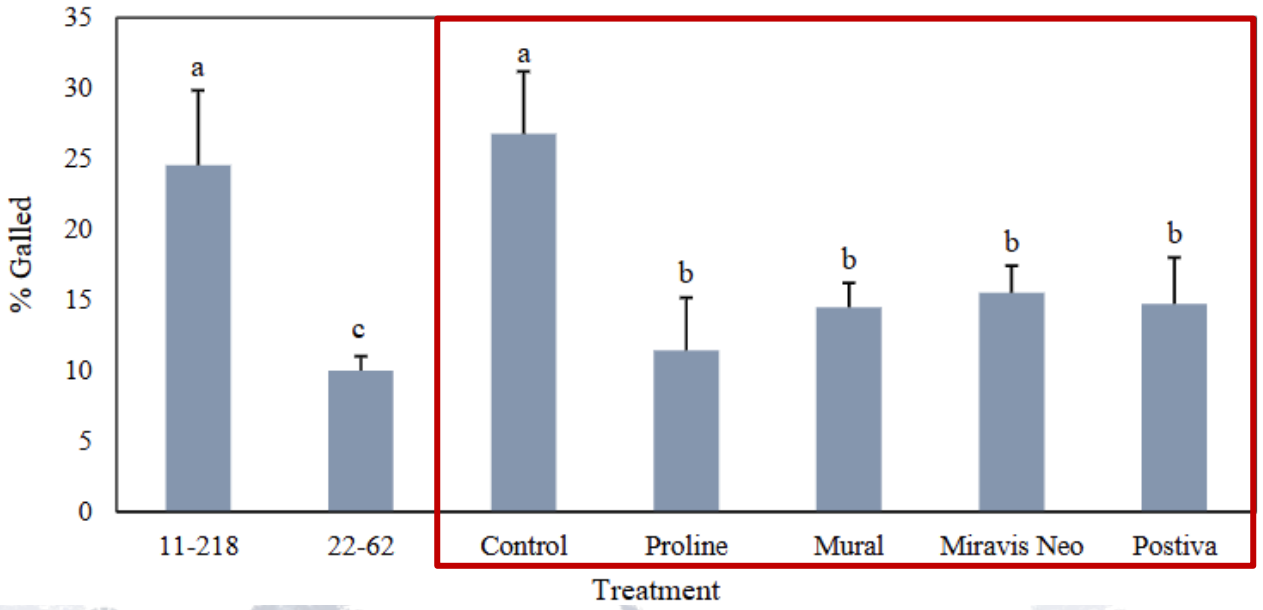
Research Justification

- Proline® is the only fungicide currently labeled for fusiform rust control.
- Proline® can potentially be removed from the market as Bayleton® was removed in 2012.
- Fungal pathogens can become resistant to Proline® due to constant use.
- Research Objectives
    1. Identify cost-effective alternatives to Proline® for the preventative treatment and control of fusiform rust.
    2. Identify a broad-spectrum fungicide that will also control damping-off pathogens (*Fusarium* spp., *Rhizoctonia* spp.).

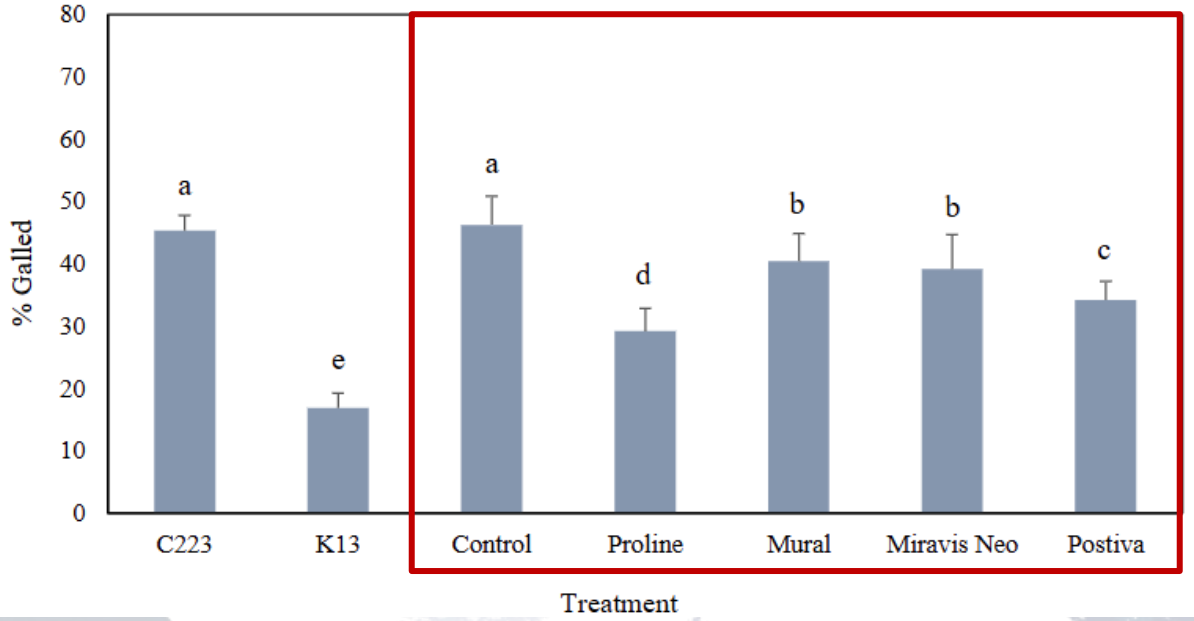
Greenhouse Screening – 2022

Fusiform Rust

Loblolly Pine

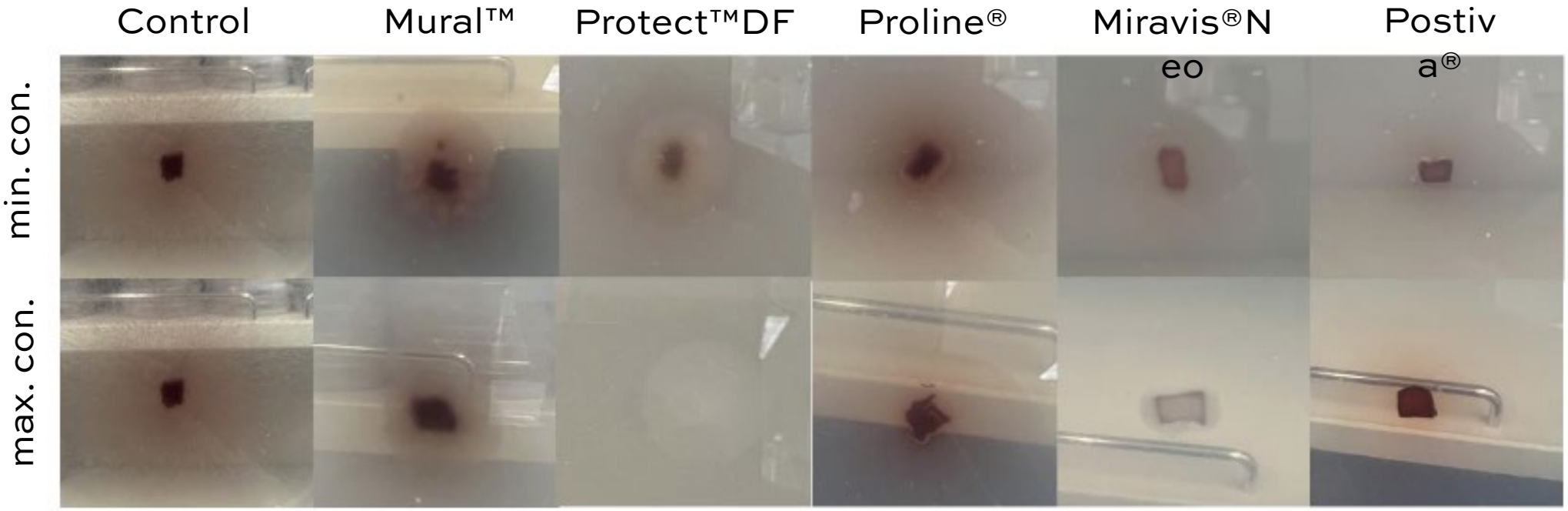


Slash Pine



In Vitro Fungicide Sensitivity Assay – 2023

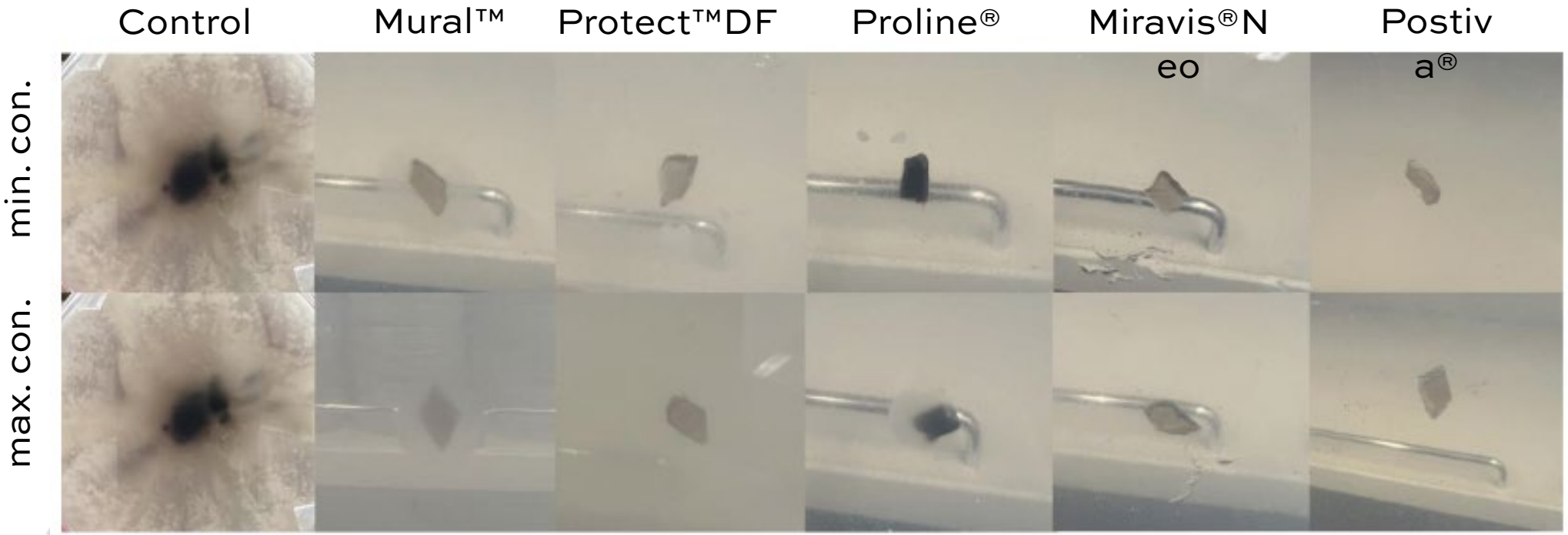
Pitch canker *(Fusarium circinatum)*



Mycelial growth after incubating at room temperature for 6 days.

In Vitro Fungicide Sensitivity Assay – 2023

Rhizoctonia *(Rhizoctonia spp.)*



Mycelial growth after incubating at room temperature for 6 days.

DIFENOCONAZOLE	GROUP	3	FUNGICIDE
PYDIFLUMETOFEN	GROUP	7	FUNGICIDE

Postiva®

Fungicide

For control of diseases of ornamental plants; ornamental bulb, corm and tuber crops; conifers; Christmas trees; non-bearing fruit and nut trees; and listed vegetable plants grown for retail sales to consumers

For application to field- and container grown plants produced in greenhouses and nurseries (including shade houses, lath houses and other outdoor growing structures), evergreen (including conifer) and deciduous tree nurseries, Christmas tree farms, residential and commercial landscapes, parks and interior plantscapes

ADEPIDYN® technology*

**technology denotes the Syngenta active ingredient trademark of pydiflumetofen*

Active Ingredients:	
Pydiflumetofen*:	6.9%
Difenoconazole**:	11.5%
Other Ingredients:	81.6%
Total:	100.0%

*CAS No. 1228284-64-7
**CAS No. 119446-68-3

Postiva® is formulated as a suspension concentrate and contains 0.63 lb of pydiflumetofen and 1.04 lb difenoconazole per gallon.

Ornamentals

Breeding crops
Bulb crops (including Calla Lilies, Easter Lilies, Gladiolas and Caladiums)
Cut flowers
Evergreens (including conifers)
Flowering plants
Flowers grown for seed production
Foliage plants
Ground covers
Juvenile (non-bearing) fruit trees[1]
Juvenile (non-bearing) nut trees[1]
Juvenile (non-bearing) vines[1]
Ornamental grasses
Ornamental trees and shrubs
Palms
Perennial shrubs
Pot and bedding plants (annual and perennial)
Succulent plants

Target Disease	Dilution Rate (fl oz/100 gallons)	Application Timing	Use Directions
Root Diseases Fusarium (*Fusarium* spp.) Rhizoctonia (*Rhizoctonia* spp.) Sclerotinia (*Sclerotinia* spp.) Suppression *Ralstonia* spp.	10.0 – 28.0[2]	Begin applications prior to disease development or at first sign of disease symptoms. If conditions favor disease development, reapply in 7-14 days.	Apply via chemigation or as a container drench. See **Section 4.1.2** for specific application details for drench applications. Use higher rate and shorter interval when under severe disease pressure or when conditions are conducive to disease development. To broaden disease-control spectrum, Postiva may be tank-mixed with another fungicide labeled for ornamentals, such as Subdue MAXX (mefenoxam; EPA Reg. No. 100-796) OR Heritage Fungicide (azoxystrobin; EPA Reg. No. 100-1093).

[1]Postiva may be applied to juvenile (or non-bearing) fruit, nut and vine plants in commercial greenhouse and nursery production. **DO NOT** make applications to plants that will bear harvestable fruit within 12 months.
[2]10.0 fl oz product is equivalent to 0.049 lb ai pydiflumetofen and 0.081 lb ai difenoconazole. 28.0 fl oz product is equivalent to 0.138 lb ai pydiflumetofen and 0.228 lb ai difenoconazole.

Resistance Management:
- **DO NOT** make more than two applications of Postiva or other Group 3 and 7 fungicides before alternation with a fungicide that is not in Group 3 or 7.

PYDIFLUMETOFEN	GROUP	7	FUNGICIDE
PROPICONAZOLE	GROUP	3	FUNGICIDE
AZOXYSTROBIN	GROUP	11	FUNGICIDE

Miravis® Neo

Fungicide

ADEPIDYN® Technology*

Active Ingredients:

Pydiflumetofen**	7.0%
Azoxystrobin***	9.3%
Propiconazole****	11.6%
Other Ingredients:	72.1%
Total:	100.0%

*Technology denotes the active ingredient Pydiflumetofen.
**CAS No. 1228284-64-7
***CAS No. 131860-33-8
****CAS No. 60207-90-1

Miravis Neo is a suspoemulsion (SE) formulation and contains 0.63 lb of active ingredient pydiflumetofen and 0.83 lb ai active ingredient azoxystrobin and 1.04 lb ai active ingredient propiconazole per gallon.

Crops (Including all cultivars and/or varieties of these) Not for use in California

Sorghum (grain)
Sorghum (milo)

Target Disease	Rate fl oz/A	Application Timing	Use Directions
Anthracnose (*Colletotrichum graminicola*) Fusarium head blight, root and stalk rot (*Fusarium* spp.) Gray leaf spot (*Cercospora sorghi*) Leaf blight (*Setosphaeria turcica*) Northern leaf blight (*Exserohilum turcicum*)	13.7*	Begin applications prior to disease development. Continue applications through season on a 7- to 14-day interval, following the resistance management guidelines.	Applications may be made by ground, air, or chemigation. An adjuvant may be added at specified rates. If disease pressure is high, use the shortest interval.

Crop (Including all cultivars and/or varieties of these)

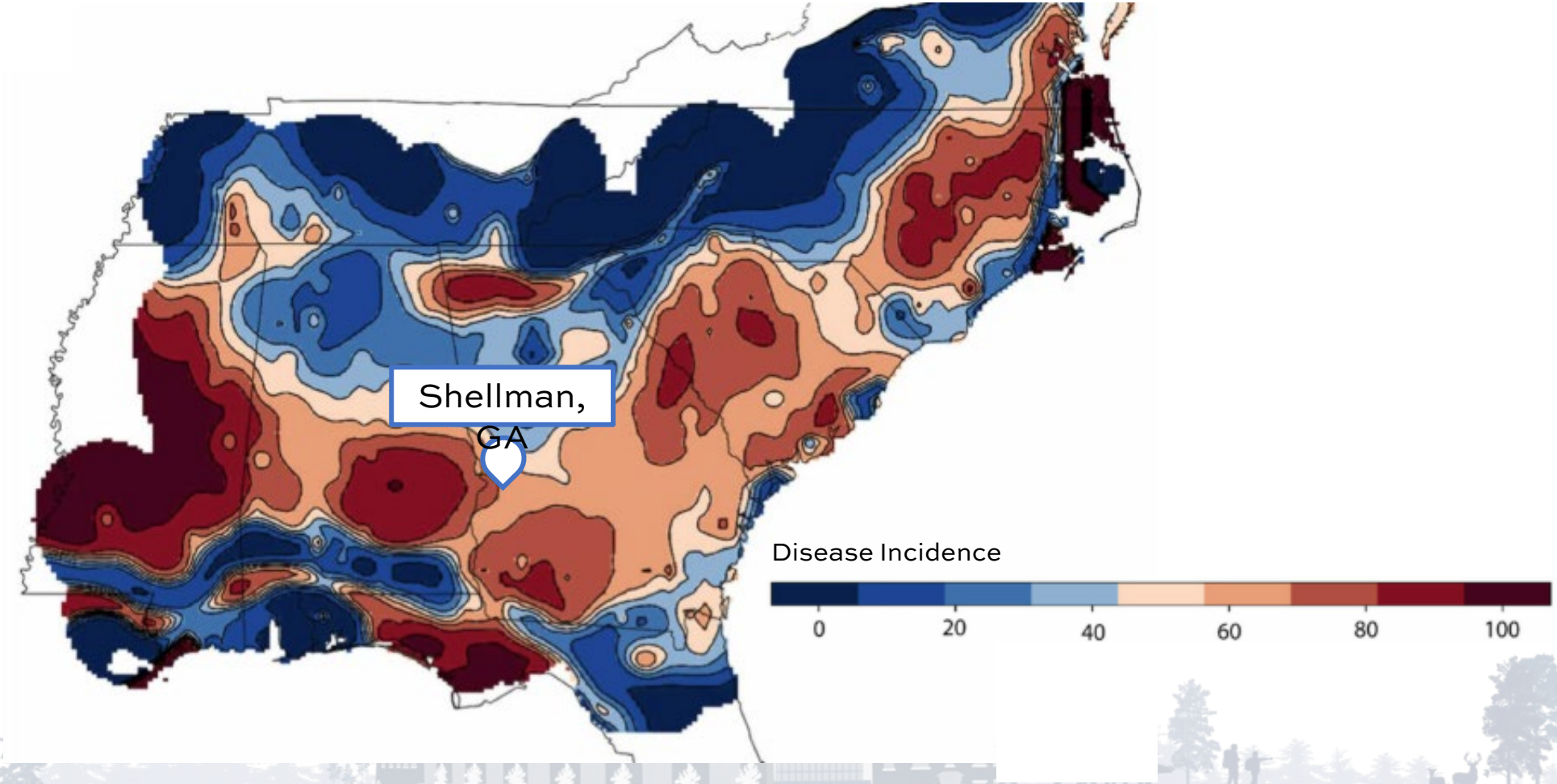
Soybean

Target Disease	Rate (fl oz/A)	Application Timing	Use Directions
Aerial web blight (*Rhizoctonia solani*) Alternaria leaf spot (*Alternaria* spp.) Anthracnose (*Colletotrichum truncatum*) Brown spot (*Septoria glycines*) Cercospora blight and leaf spot (*C. kikuchii*) Frogeye Leaf Spot (*Cercospora sojina*) Pod and stem blight (*Diaporthe phaseolorum*) Powdery mildew (*Microsphaera diffusa*) Target spot (*Corynespora cassiicola*)	13.7 – 20.8*	Begin applications prior to disease development. For best results, apply at growth stage R3 (early pod set) when pods are 1/8-1/4 inch long) for disease control and plant health benefits. Continue applications through season on a 14-day interval, following the resistance management guidelines.	Apply by ground, air, or chemigation. An adjuvant may be added at specified rates.

Trial Objectives

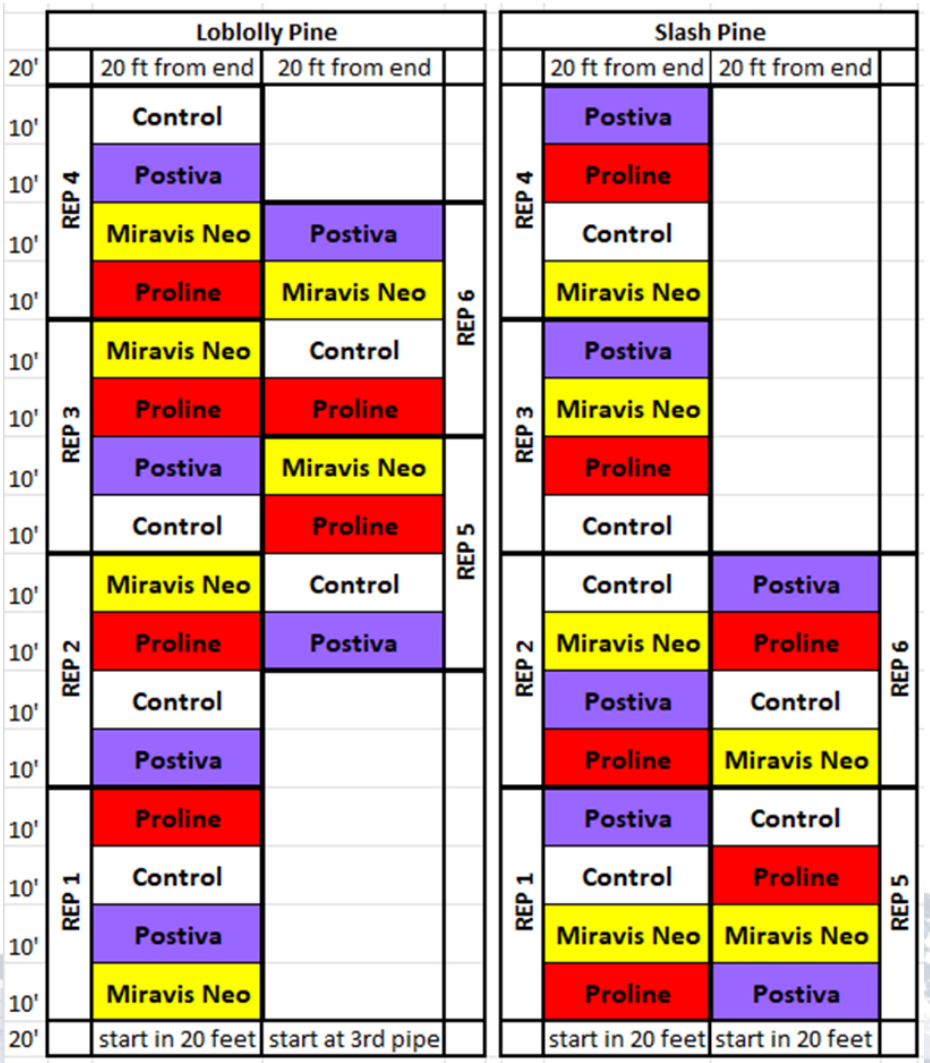
1. Evaluate the efficacy of Postiva® and Miravis®Neo in controlling fusiform rust in bareroot loblolly and slash pine seedlings under operational nursery conditions.
2. Determine the effects of Postiva® and Miravis®Neo on seedling survival and quality.

Fusiform Rust Incidence



Methods

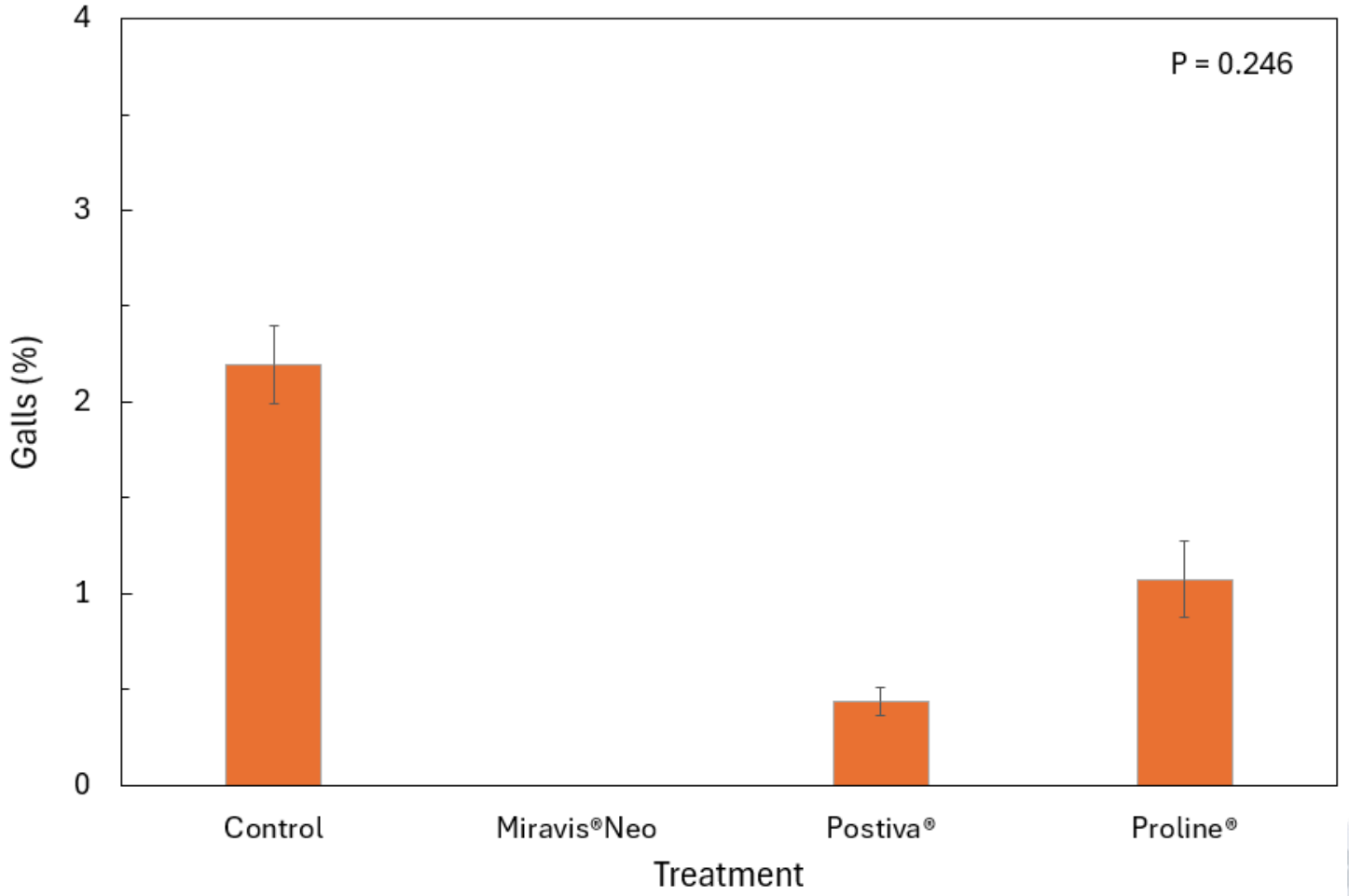
- Trial installed at ArborGen nursery (Shellman, GA) on April 24, 2024
- Labeled rates of Proline®, Postiva®, and Miravis®Neo were applied 5 times during the production season.
  - Proline® (5.0 fl. oz/acre)
  - Postiva® (0.1 fl. oz/acre)
  - Miravis®Neo (13.7 fl. oz/acre)
  - 21 days after sowing (April 24, 2024)
  - 1 application every 14 days over an 8-week period (May 8-June 20)
- Control plots were left untreated.
- 40-ft. plots (10-ft plots x 4 treatments) were replicated 6 times in a randomized complete block design.



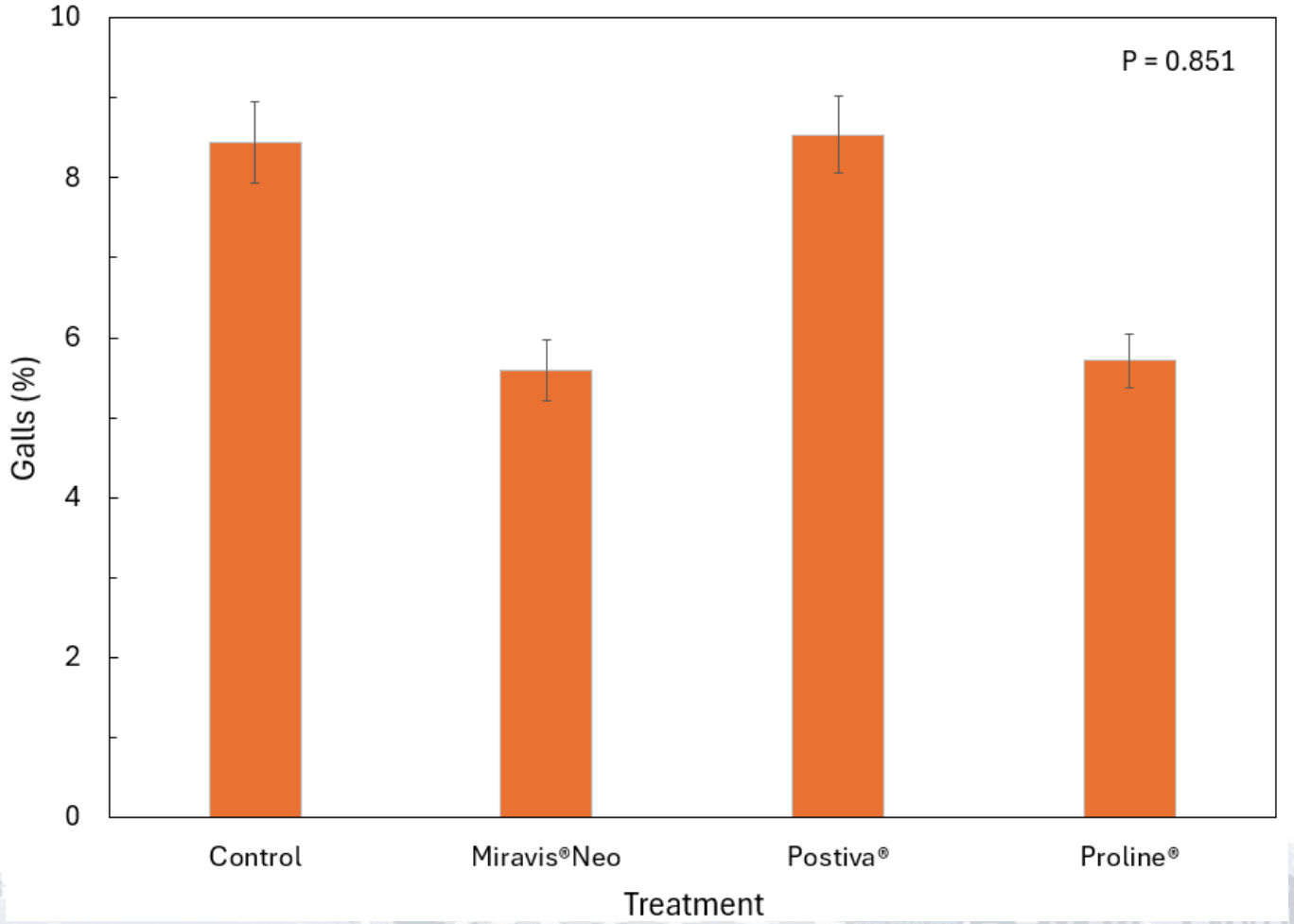
Methods

- Seedlings were hand lifted on October 29, 2024.
- From November 1, 2024, to January 30, 2025:
  - Seedling density = number of seedlings/ft.^{2}
  - Number of stem galls
  - A random sample (n = 25) from each plot was used to evaluate seedling quality.
  - Root collar diameter (RCD)
  - Height
  - Shoot dry weight
  - Root dry weight
  - Root-weight ratio (RWR) = root dry weight/total seedling dry weight
- ANOVAs were used to determine significant differences between means of each measured parameter (α = 0.05) (R Statistical Software).

Fusiform Rust Incidence – Loblolly



Fusiform Rust Incidence – Slash Pine



Seedling Quality – Loblolly Pine

Treatment	RCD (mm)	Height (cm)	Shoot Weight (g)	Root Weight (g)	RWR (%)	Density[a]
Control	5.04 ± 0.11	30.67 ± 0.24	4.00 ± 0.05	0.82 ± 0.01	17.35	12
Miravis Neo®	5.00 ± 0.07	31.07 ± 0.30	3.77 ± 0.04	0.84 ± 0.01	18.14	13
Postiva®	4.92 ± 0.07	30.50 ± 0.28	3.83 ± 0.05	0.83 ± 0.01	17.58	13
Proline®	5.15 ± 0.07	30.33 ± 0.25	3.88 ± 0.04	0.79 ± 0.02	16.73	12

[a]Number of seedlings per ft^2
Significance level (α) = 0.05
±SE of the mean.

Seedling Quality – Slash Pine

Treatment	RCD (mm)	Height (cm)	Shoot Weight (g)	Root Weight (g)	RWR (%)	Density[a]
Control	7.36 ± 0.11	32.50 ± 0.41	5.95 ± 0.10	1.21 ± 0.02	17.03	10
Miravis Neo®	7.02 ± 0.11	31.00 ± 0.44	6.07 ± 0.08	1.06 ± 0.02	14.85	10
Postiva®	7.06 ± 0.11	33.50 ± 0.40	6.33 ± 0.07	1.14 ± 0.01	15.28	10
Proline®	6.98 ± 0.10	32.33 ± 0.39	6.79 ± 0.06	1.22 ± 0.01	15.20	11

[a]Number of seedlings per ft^2
Significance level (α) = 0.05
±SE of the mean.

Conclusions & Future Work

- Gall formation was not significantly different between untreated (control) seedlings and seedlings treated with Miravis®Neo, Postiva®, or Proline®.
- Because fusiform rust incidence was low, we could not establish how well Miravis®Neo or Postiva® controls fusiform rust on loblolly or slash pine in nursery settings.
- Neither Miravis®Neo or Postiva® appear to have an adverse effect on seedling survival or quality.
- Replicating this study where environmental conditions are favorable for disease incidence may provide insight into the efficacy of these new chemistries.
- The SFNMC is still searching for new broad-spectrum fungicides to test for fusiform rust control.

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