

SFNMC Contact Meeting

Little Rock, Arkansas

July 22, 2024

Intro to Nina's presentations



Nina Dowling Payne

4 presentations:

1. 2023 Vexis[®] Bareroot Pine Results + Status of 24(c) Labeling
granular pyrimisulfan

2. 2023 Arkon[™] Bareroot Pine Results + 2024 Trials
liquid pyrimisulfan

3. 2023 Vexis[®] Hardwood Results + 2024 Trials
granular pyrimisulfan

4. 2024 Gallery[®] and Arkon[™] Container Pine Trials
dry flowable isoxaben and liquid pyrimisulfan



SFNMC Contact Meeting

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2023 Vexis[®] Bareroot Pine Trial Results

Status of 24(c) Vexis[®] Labeling



Nina Dowling Payne

2023 Vexis[®] Bareroot Pine Trial Results

Purpose
Methods
Results
Conclusions



Southern Forest Nursery Management Cooperative

Results of 2023 Vexis® Bareroot Pine Trials

Purpose of trial

- To test Vexis® for its suitability for use in weed control in bareroot pine seedlings and to provide PBI-Gordon with additional data for 24(c) applications
- Vexis®:
 - Granular
 - 0.025% pyrimisulfan
 - Post-emergent
 - Annual sedge, purple and yellow nutsedge, rush, broadleaf weeds
 - Labeled for turf, sod production, non-cropland sites, *not conifer nurseries*
- SFNMC Vexis® history:
 - Third year of SFNMC trials in bareroot pine

Southern Forest Nursery Management Cooperative

Results of 2023 Vexis® Bareroot Pine Trials



Methods

- Trials in ArborGen Shellman, GA Nursery, PRT-IFCO Pine Hill, AL Nursery and Weyerhaeuser Quail Ridge Nursery, Aiken, SC
- Trials in loblolly and slash pine
- 3 rates: 0, 1X, and 2X label rate
- 2 application timings: 1. at 7 weeks post-sowing
2. at 7 and 12 weeks post-sowing
- 5-foot plots used for each rate; 5 replications per species
- Collected all seedlings within a 9-inch by 4-foot counting frame in each plot and took measurements of seedling quality
- Results in Research Report 24-01



RESEARCH REPORT 24-01

A THIRD YEAR OF VEXIS® (PYRIMISULFAN) TRIALS FOR
NUTSEDGE CONTROL IN BAREROOT PINE SEEDLING BEDS

by
Nina Payne and Annakay Newell

INTRODUCTION

A provision of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) is Section 24(c), which permits states to register "additional uses of federally registered pesticides" to meet special local needs within a state. Earlier Southern Forest Nursery Management Cooperative (SFNMC) herbicide trials with Reflex® (fomesafen) resulted in its successful 24(c) labeling for use in pine seedling nurseries in several southern states. Applications are made by the herbicide manufacturer to individual states for approval and to the EPA for review. These applications contain information on the scope of the problem being addressed, other possible herbicides currently labeled for the site and target pest, support from potential users of the herbicide, data and analyses from multiple trials, and proposed label information. The application must show that there is a pest problem present (in this case, nutsedge) in the state with no federally registered herbicide available that provides sufficient control in the crop (in this case, pine seedlings grown in beds).

When Vexis® was approved by the EPA in 2018 for use in turf sites, sod production areas, and other nonproduction sites, bareroot conifer nurseries were not listed as approved sites of use. Because its label lists annual sedge and purple and yellow nutsedge as controlled, the SFNMC chose this herbicide for testing in bareroot pine seedling beds in 2021 to control nutsedge and reduce its impact on seedling production costs, quantity, and quality each year. Following successful Vexis® trials in 2021 (Research Report 22-03) and 2022 (Research Report 23-05) in SFNMC member nurseries, additional field studies were installed in 2023. The purpose of this further testing was to provide data on seedling tolerance to the Vexis® manufacturer, PBI-Gordon, for use in 24(c) labeling applications to individual state's pesticide regulatory organizations.

METHODOLOGY

Modifications to previous Vexis® study plans were made in 2023 on the recommendation of the manufacturer to focus on the appropriate rates and timing of applications in bareroot pine seedling beds. Two rates of Vexis® were tested: 1) the current label rate of 2 pounds/500 square feet and 2) twice the current label rate (4 pounds/500 square feet). Two different timing schemes were tested to imitate projected use in seedling beds during the growing season: 1) a single application made at 7 weeks after seeds were sown and 2) two applications made at 7 and 12 weeks after seeds were sown. This double application testing was done to provide seedling tolerance information should an additional second application be needed in the nursery. All applications were made at the noted number of weeks post-sowing, between early June and late July of 2023.

Individual plots were measured and flagged for identification prior to herbicide application. A PVC pipe frame (4' X 5') was placed at each plot to identify the application area. Hand applications of premeasured Vexis® samples were

Results – loblolly pine

Table 1. Bareroot loblolly pine seedling characteristics treated with pyrimisulfan (Vexis®) at 7 weeks and 12 weeks post-sowing on June 2 and July 6, 2023, at Weyerhaeuser Quail Ridge Nursery, Aiken, SC.

| Treatment | Rate (lbs./ 500 ft ²) | Density (seedlings/ft ²) | Shoot height (cm) | Root collar diameter (mm) | Shoot dry weight (g) | Root dry weight (g) ^{1,2} |
|---------------------------------|---|---|----------------------|---------------------------------|-------------------------|---------------------------------------|
| Control | 0.0 | 30.3 ± 2.05 | 27.9 ± 0.22 | 4.55 ± 0.04 | 2.18 ± 0.07 | 0.41 ± 0.02 a |
| 1X label rate 7 weeks | 2.0 | 31.7 ± 1.46 | 28.0 ± 0.22 | 4.45 ± 0.04 | 2.19 ± 0.08 | 0.41 ± 0.02 a |
| 1X label rate 7 and 12 weeks | 2.0 + 2.0 | 29.9 ± 1.38 | 28.0 ± 0.26 | 4.71 ± 0.14 | 2.31 ± 0.07 | 0.44 ± 0.002 ab |
| 2X label rate 7 weeks | 4.0 | 31.9 ± 0.33 | 27.8 ± 0.22 | 4.43 ± 0.04 | 2.17 ± 0.08 | 0.41 ± 0.01 a |
| 2X label rate 7 and 12 weeks | 4.0 + 4.0 | 31.5 ± 1.05 | 27.2 ± 0.28 | 4.88 ± 0.31 | 2.33 ± 0.07 | 0.49 ± 0.01 b |
| <i>p>f</i> | | <i>0.777</i> | <i>0.093</i> | <i>0.193</i> | <i>0.406</i> | <i><0.001</i> |

¹Bold within a seedling characteristic indicates significant difference between that rate and control.

²Different letters within a seedling characteristic indicate significant differences in rates.

Results – loblolly pine

Table 2. Bareroot loblolly pine seedling characteristics treated with pyrimisulfan (Vexis®) at 7 weeks and 12 weeks post-sowing on June 17 and July 28, 2023, at PRT-IFCO Pine Hill Nursery, Camden, AL.

| Treatment | Rate (lbs./ 500 ft ²) | Density (seedlings/ft ²) ^{1,2} | Shoot height (cm) ^{1,2} | Root collar diameter (mm) ^{1,2} | Shoot dry weight (g) | Root dry weight (g) |
|---------------------------------|---|---|-------------------------------------|--|-------------------------|------------------------|
| Control | 0.0 | 17.8 ± 2.72 a | 30.0 ± 0.44 a | 5.35 ± 0.08 a | 3.62 ± 0.27 | 0.77 ± 0.05 |
| 1X label rate 7 weeks | 2.0 | 23.5 ± 1.75 ab | 31.6 ± 0.30 b | 6.03 ± 0.34 b | 4.45 ± 0.15 | 0.90 ± 0.03 |
| 1X label rate 7 and 12 weeks | 2.0 + 2.0 | 25.9 ± 0.92 b | 30.7 ± 0.34 ab | 5.67 ± 0.09 ab | 4.47 ± 0.36 | 0.94 ± 0.08 |
| 2X label rate 7 weeks | 4.0 | 24.6 ± 0.59 ab | 30.0 ± 0.30 a | 5.41 ± 0.08 ab | 3.95 ± 0.28 | 0.83 ± 0.02 |
| 2X label rate 7 and 12 weeks | 4.0 + 4.0 | 24.6 ± 1.11 ab | 30.8 ± 0.30 ab | 5.74 ± 0.07 ab | 4.36 ± 0.20 | 0.95 ± 0.03 |
| <i>p>f</i> | | 0.036 | 0.003 | 0.040 | 0.164 | 0.090 |

¹Bold within a seedling characteristic indicates significant difference between that rate and control.

²Different letters within a seedling characteristic indicate significant differences in rates.

Results of 2023 Vexis® Bareroot Pine Trials

Results – loblolly pine

Table 3. Bareroot loblolly pine seedling characteristics treated with pyrimisulfan (Vexis®) at 7 weeks and 12 weeks post-sowing on June 8 and July 13, 2023, at ArborGen Nursery, Shellman, GA.

| Treatment | Rate (lbs./ 500 ft ²) | Density (seedlings/ft ²) | Shoot height (cm) | Root collar diameter (mm) ¹ | Shoot dry weight (g) | Root dry weight (g) |
|---------------------------------|---|---|----------------------|--|-------------------------|------------------------|
| Control | 0.0 | 17.1 ± 0.65 | 30.9 ± 0.39 | 6.70 ± 0.16 ab | 5.14 ± 0.14 | 1.07 ± 0.01 |
| 1X label rate 7 weeks | 2.0 | 17.4 ± 0.61 | 30.0 ± 0.46 | 6.89 ± 0.28 a | 5.23 ± 0.18 | 1.16 ± 0.04 |
| 1X label rate 7 and 12 weeks | 2.0 + 2.0 | 17.1 ± 0.83 | 30.6 ± 0.39 | 6.58 ± 0.10 ab | 5.23 ± 0.24 | 1.18 ± 0.04 |
| 2X label rate 7 weeks | 4.0 | 17.5 ± 0.56 | 28.7 ± 0.38 | 6.36 ± 0.09 ab | 4.85 ± 0.19 | 1.06 ± 0.05 |
| 2X label rate 7 and 12 weeks | 4.0 + 4.0 | 17.9 ± 0.51 | 29.5 ± 1.68 | 6.25 ± 0.09 b | 4.60 ± 0.15 | 1.09 ± 0.06 |
| <i>p>f</i> | | 0.878 | 0.349 | 0.042 | 0.092 | 0.271 |

¹Different letters within a seedling characteristic indicate significant differences in rates.

Results – slash pine

Table 4. Bareroot slash pine seedling characteristics treated with pyrimisulfan (Vexis®) at 7 weeks and 12 weeks post-sowing on June 2 and July 6, 2023, at Weyerhaeuser Quail Ridge Nursery, Aiken, SC.

| Treatment | Rate (lbs./ 500 ft ²) | Density (seedlings/ ft ²) | Shoot height (cm) ^{1,2} | Root collar diameter (mm) | Shoot dry weight (g) | Root dry weight (g) |
|---------------------------------|---|---|-------------------------------------|------------------------------|-------------------------|------------------------|
| Control | 0.0 | 15.9 ± 0.90 | 28.9 ± 0.24 a | 5.80 ± 0.06 | 4.17 ± 0.18 | 0.79 ± 0.04 |
| 1X label rate 7 weeks | 2.0 | 15.7 ± 0.68 | 28.5 ± 0.22 ab | 5.83 ± 0.06 | 4.18 ± 0.10 | 0.85 ± 0.03 |
| 1X label rate 7 and 12 weeks | 2.0 + 2.0 | 16.3 ± 0.57 | 28.5 ± 0.20 ab | 5.93 ± 0.06 | 4.32 ± 0.11 | 0.95 ± 0.04 |
| 2X label rate 7 weeks | 4.0 | 15.9 ± 1.03 | 27.7 ± 0.25 b | 5.71 ± 0.07 | 4.17 ± 0.11 | 0.86 ± 0.04 |
| 2X label rate 7 and 12 weeks | 4.0 + 4.0 | 15.5 ± 0.93 | 28.0 ± 0.24 ab | 5.79 ± 0.07 | 4.21 ± 0.20 | 0.94 ± 0.04 |
| <i>p>f</i> | | <i>0.972</i> | <i>0.004</i> | <i>0.203</i> | <i>0.938</i> | <i>0.050</i> |

¹Bold within a seedling characteristic indicates significant difference between that rate and control.

²Different letters within a seedling characteristic indicate significant differences in rates.

Results of 2023 Vexis® Bareroot Pine Trials

Results – slash pine

Table 5. Bareroot slash pine seedling characteristics treated with pyrimisulfan (Vexis®) at 7 weeks and 12 weeks post-sowing on June 17 and July 28, 2022, at PRT-IFCO Pine Hill Nursery, Camden, AL.

| Treatment | Rate (lbs./ 500 ft ²) | Density (seedlings/ft ²) | Shoot height (cm) ^{1,2} | Root collar diameter (mm) | Shoot dry weight (g) | Root dry weight (g) |
|---------------------------------|---|---|-------------------------------------|------------------------------|-------------------------|------------------------|
| Control | 0.0 | 20.7 ± 0.79 | 29.6 ± 0.86 a | 6.18 ± 0.08 | 4.79 ± 0.08 | 1.02 ± 0.02 |
| 1X label rate 7 weeks | 2.0 | 20.1 ± 0.93 | 26.6 ± 0.44 b | 6.41 ± 0.26 | 4.65 ± 0.18 | 1.04 ± 0.03 |
| 1X label rate 7 and 12 weeks | 2.0 + 2.0 | 20.7 ± 0.20 | 27.2 ± 0.39 b | 6.07 ± 0.09 | 4.69 ± 0.16 | 1.08 ± 0.03 |
| 2X label rate 7 weeks | 4.0 | 19.4 ± 1.20 | 26.7 ± 0.44 b | 6.30 ± 0.22 | 4.92 ± 0.30 | 1.15 ± 0.08 |
| 2X label rate 7 and 12 weeks | 4.0 + 4.0 | 18.5 ± 0.73 | 26.2 ± 0.39 b | 6.10 ± 0.09 | 4.71 ± 0.27 | 1.15 ± 0.07 |
| <i>p>f</i> | | <i>0.313</i> | <i><0.001</i> | <i>0.587</i> | <i>0.902</i> | <i>0.276</i> |

¹Bold within a seedling characteristic indicates significant difference between that rate and control.

²Different letters within a seedling characteristic indicate significant differences in rates.

Results of 2023 Vexis® Bareroot Pine Trials

Results – slash pine

Table 6. Bareroot slash pine seedling characteristics treated with pyrimisulfan (Vexis®) at 7 weeks and 12 weeks post-sowing on June 8 and July 13, 2023, at ArborGen Nursery, Shellman, GA.

| Treatment | Rate (lbs./ 500 ft ²) | Density (seedlings/ft ²) | Shoot height (cm) ^{1,2} | Root collar diameter (mm) | Shoot dry weight (g) | Root dry weight (g) |
|---------------------------------|---|---|-------------------------------------|------------------------------|-------------------------|------------------------|
| Control | 0.0 | 30.8 ± 0.44 | 24.8 ± 0.14 a | 5.83 ± 0.06 | 3.22 ± 0.09 | 0.94 ± 0.05 |
| 1X label rate 7 weeks | 2.0 | 30.8 ± 0.58 | 24.7 ± 0.16 a | 5.64 ± 0.06 | 3.10 ± 0.07 | 0.91 ± 0.03 |
| 1X label rate 7 and 12 weeks | 2.0 + 2.0 | 29.6 ± 0.60 | 24.3 ± 0.16 ab | 5.74 ± 0.06 | 3.28 ± 0.03 | 1.03 ± 0.02 |
| 2X label rate 7 weeks | 4.0 | 29.9 ± 0.29 | 24.8 ± 0.17 a | 5.51 ± 0.06 | 3.11 ± 0.07 | 0.91 ± 0.06 |
| 2X label rate 7 and 12 weeks | 4.0 + 4.0 | 30.1 ± 1.04 | 23.8 ± 0.19 b | 5.79 ± 0.20 | 3.23 ± 0.10 | 1.08 ± 0.04 |
| <i>p>f</i> | | 0.598 | <0.001 | 0.211 | 0.361 | 0.025 |

¹Bold within a seedling characteristic indicates significant difference between that rate and control.

²Different letters within a seedling characteristic indicate significant differences in rates.



Southern Forest Nursery Management Cooperative
Results of 2023 Vexis® Bareroot Pine Trials

Conclusions

- Third year of testing of Vexis® in bareroot loblolly and slash pine showed good seedling tolerance
- Data submitted to PBI-Gordon; they agreed to pursue 24 (c) labeling with 3 years of SFNMC data
- No further testing of Vexis® in bareroot loblolly and slash pine is recommended by PBI-Gordon unless specific states require it

Status of 24(c) Vexis[®] Labeling

PBI-Gordon submits 24(c) packets to individual states' pesticide regulation boards

- PBI-Gordon reviewed SFNMC Vexis® trial data from:
 - 3 growing cycles
 - 8 loblolly pine trials
 - 7 slash pine trials
 - 6 nurseries
 - 5 SFNMC members: ArborGen, Georgia Forestry Commission, PRT-IFCO, Rayonier and Weyerhaeuser
- In addition to data, SFNMC provided information on alternative herbicides, advantages and disadvantages of those, approximate acreages potentially treated, market size, anticipated demand, assistance in writing label, 2022 Pest Management Strategic Plan, etc.

PBI-Gordon submits 24(c) packets to individual states' pesticide regulation boards

- PBI-Gordon decided to pursue 24 (c) labeling in January 2024
- PBI-Gordon requested letters of support from SFNMC member nurseries in February 2024
- PBI-Gordon submitted first application in May 2024
- Georgia approved label in late May 2024
- Alabama and Arkansas approved label in July 2024
- Currently waiting on NC and SC state approval
- States submit their approved label to EPA (90 day approval window at EPA)

Southern Forest Nursery Management Cooperative
Status of Vexis® 24 (c) labeling 2024

Alabama label submitted to EPA

**24(c) Special Local
Need Labeling**

EPA Reg. No. 2217-1024

EPA SLN No.



FOR DISTRIBUTION AND USE ONLY WITHIN
THE STATE OF ALABAMA.

This label expires and must not be distributed or
used in accordance with this SLN registration
after December 31, 2026.

For Use within Bare Root Loblolly and Slash Pine Seedling Beds

IMPORTANT NOTICE: This bulletin contains new or supplemental instructions for the use of Vexis Herbicide Granular, which may not appear on container labels. Follow all applicable directions, restrictions, and precautions on the EPA-registered label. This labeling must be in the possession of the user at the time of pesticide application.

DIRECTIONS FOR USE:

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Use Restrictions:

- Do not apply more than 8.26 lb. of product per 1000 sq. ft. per year, the equivalent of 0.09 lb pyrimisulfan ai per acre.
- Do not apply more than 5.5 lb. of product per 1000 sq. ft. per application, the equivalent of 0.06 lb. pyrimisulfan ai per acre.
- Do not retreat within 30 days of initial application.

Application Directions

How Much to Apply:

Apply 2.5 to 5.5 lb. of product per 1000 sq. ft. (109 to 240 lb. of product per acre). Retreatment after 30 days is allowed but do not apply more than a total of 8.26 lb. per 1000 sq. ft. per year (360 lb. of product per acre per year).

When to Apply:

- Apply when weeds are actively growing.
- Delay application of this product until 7 weeks after seedbed sowing.
- Retreatment may be necessary when weed pressures are high, when soil moisture is low, or when weeds are not actively growing. Delay retreatment of this product until 12 weeks after seedbed sowing and 30 days of initial application.

Application Tips:

- Moisture on leaf surface is not required. Apply when weed leaves are wet or dry.
- Temperatures below 50°F will reduce weed control activity.
- For best results, water-in granules within 24 hours after treatment.

Vexis® is a registered trademark of PBI-Gordon Corporation.

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