2024 Oregon Ag Science Research

Fertilization Trials and Weed Control

CYRUS SMITH

OCEAN SPRAY AG SCIENTIST

BANDON, OR



- Will urea applied through fertigation during bloom have a positive impact on cranberry production?
- What impact will applying a 2:1:2 granular fertilizer at just 25 lbs N/A, and total N/A of only 34 lbs (with the inclusion of supplemental urea) have on cranberry production?
- What will be the result of applying all fertilizer in a soluble form through fertigation?

Experiment Locations and Approach

'Pilgrim' planted in 2018: pH: 6.0 OM: 0.8 *'Stevens' planted in 1996:* pH: 4.9 OM: 2.7

Avg. Upright length at hook (mm) 22.85 24.04

Three Treatments + Control (weights given below are of actual N):

Urea applications were 3 lbs/A each applied at early, mid, and late bloom (9 lbs total).

N-P-K fertilizers were a 2:1:2 ratio. Total weight was split evenly in two applications, at fruit set and 10 days later.

- The Control = 50 lbs/A.
- 50/lbs/A + fertigated urea.
- Fertigated 50/lbs/A + fertigated urea.
- 25/lbs/A + fertigated urea.

Notable Trends During Fertilization

'Pilgrim'

- Vines "greened up" after urea treatments.
- Symptoms of nutrient deficiency very apparent in vines and consistent with amount of N supplied.
- Fertigated plots stayed greener through N-P-K fertilization.



'Pilgrim' 6/15

'Stevens'

- Greenness of vines from urea not as pronounced as in 'Pilgrim' bog.
- Symptoms of nutrient deficiency not as pronounced as in 'Pilgrim' bog. Very little difference between treatments and the control.



'Stevens' 6/21

Tissue Sampling

Samples taken on 8/31 and 9/1.

| Nutrient Sufficiency Range (Hart J. et al., 2015) | | | | |
|---|-------|--------|--|--|
| Nutrient | Low % | High % | | |
| N | 0.9 | 1.1 | | |
| Р | 0.1 | 0.2 | | |
| Κ | 0.4 | 0.75 | | |

| ST | % N | % P | % K |
|-------------|-------------------|------|------|
| 50 lbs/A | 1.08 | 0.12 | 0.58 |
| 25 lbs/A | 0.93 | 0.11 | 0.45 |
| Fertigation | 1.01 | 0.13 | 0.56 |
| Control | 0.93 | 0.12 | 0.47 |
| PI | | | |
| 50 lbs/A | 0.94 | 0.11 | 0.46 |
| 25 lbs/A | <mark>0.88</mark> | 0.11 | 0.43 |
| Fertigation | 1.08 | 0.11 | 0.43 |
| Control | 0.99 | 0.12 | 0.49 |

No significant difference between average harvest sample weight from any treatments or the control!



- This experiment requires multiple years.
- Upright length at hook was shorter in both bogs than what would be expected (2-4") (Hart J. et al., 2015).
- The 'Pilgrim' bog was more expressive of changes from fertilization.
- The 'Pilgrim' bog showed measurable N deficiency at 25 lbs/A + fertigated urea.
- No difference between average harvest sample weight from any treatments or the control.

Birdsfoot Trefoil (Lotus corniculatus) Trials

Treatments

- Quinclorac (Quinstar 4L 40.0% a.i.) Max Rate Mesotrione (Callisto 40.0% a.i.) Max Rate
- Quinstar 4L + Callisto Max Rates
- All treatments included a non-ionic surfactant (Activator 90 at 0.25% v/v ratio)

Applications made in April when lotus was approaching the top of canopy. Made in the equivalent of 400 gal/A of water and irrigation held until next day.

Summary

Quinstar 4L: Lotus stopped growing just above the canopy. Flower suppression of ~70-90%.

Callisto: Regrowth suppression highly variable from plots closer to the center (~50-60%) to plots on the edges (~25-35%) of the bog. Flowering occurred in regrowing lotus.

Callisto + Quinstar 4L: With the exception of the southernmost plot on the edge of the bog, which had late regrowth of ~20-30% and flowering suppression of regrowth similar to Quinstar 4L alone of ~70-80%, suppression was ~90-100% with no flowering.



Callisto



Callisto + Quinstar 4L

July 17th



Quinstar 4L



Untreated

Temporary Phytotoxicity





Callisto + Quinstar 4L 5/25

- Some phytotoxicity occurred in all treatments but most significantly in the combined treatment.
- Disappeared from individual treatments by 6/19 and from combined treatments by 7/17.
- No significant difference between average harvest sample weight from any treatments or the control.

Conclusions

- The inclusion of Activator 90 at 0.25% v/v ratio and the lack of wash off that occurs during regular chemigation contributed to the effectiveness of these applications as well as temporary phytotoxicity.
- Spot spraying or boom spray equipment would be required to prevent wash off. Further testing needs to be done to determine crop safety and efficacy at the higher concentrations used in boom spraying. Cannot be recommended at this time!

Three-Square Bulrush (*Schoenoplectus pungens*) Trials Year Two

Treatments

- Product X: Low and High Rate
- Rimsulfuron (Pruvin 25.0% a.i.): Max Rate
- Sulfentrazone (Zeus XC 39.6% a.i.): Max Rate



2nd year of trials in 'Stevens' bog

• Application timing for Product X: Cabbage Head/Bud Break

New 'Yellow River' bog added

- Application timing for Product X and Pruvin: Bud Elongation/Roughneck
- Zeus XC:

Applied during dormancy! Phytotoxic if applied after!



YR Mean Number of Stems From Four 1ft² Areas Per Replication



7/20/2024 YR Bog



Untreated

In Both Bogs

Product X High Rate

- No phytotoxicity observed .
- Average harvest sample weight from plots treated with the high rate of Product X was significantly greater, and the low rate was not significantly different than, the control in the ST bog. No significant differences in the YR bog.

Conclusions

- Product X proves to be effective against three-square bulrush.
- Product X is proving to be crop safe.
- Zeus XC and Pruvin have no significant effect.
- Efficacy of Product X is variable.
- Increased rainfall and earlier application timing could have contributed to reduced efficacy in 2024.

Haircap (Polytrichum commune) and Sphagnum Moss Trials



Haircap Moss



Treatments

- Product Y at 2.0 and 3.0 oz/A
- Applied during dormancy! Phytotoxic if applied after!

Research Goals

- Confirmation of effectiveness.
- Determination of year-round control program.

Sphagnum sp.

Moss recovering from a 2022 spring and 2023 fall application



2 oz/A, 2 apps ~ 1 year ALA



Untreated

- No difference between 2 and 3 oz/A rates.
- Reduced biomass.
- Complete control not obtained from 11/27/2023 application.
- Applications were made to new plots this year.

Sphagnum moss treated on 3/14/2024



2 oz/A

5/31/2024

Untreated

- Results similar to previous spring applications.
- Full control obtained with no difference between 2 and 3 oz/A rates.
- Moss began recovering in late-September/early-October, around the same time as previous trials.



2 oz/A 10/8/2024

Second treatment of sphagnum moss on 11/6/2024

First Row of Pictures Taken on 12/5/2024



Spring and Fall 2 oz/A

Spring 2 oz/A

Earlier application timing and post-application irrigation reduced from .25" to .10".



Untreated



Spring 2 oz/A 1/21/2025



Spring and Fall 2 oz/A



Spring and Fall 2 oz/A

Haircap moss treated on 3/14/2024





2 oz/A 3/29/2024 2 oz/A 5/27/2024 Moss made a full recovery. No difference between 2 and 3 oz/A rates.

Conclusions

- Product Y is effective at controlling sphagnum moss at as little as 2 oz/A (no difference between rates) until late-September/early-October when it begins regrowth.
- A fall application at the same rate suppresses regrowth.
- Further observation will determine the level and duration of the effectiveness of the fall application.
- Product Y is not effective at controlling haircap moss at as much as 3 oz/A.
- No significant difference between average harvest sample weight from any treatments or the control.

Questions?

Work Cited

Hart J. et al., 2015. A nutrient management guide for south coastal Oregon. Oregon State University Extension Service.