

# GROWING KNOWLEDGE

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Figure 1. Layout of the field study in Hubbard, Oregon in the spring of 2020. PHOTO COURTESY OF OREGON STATE UNIVERSITY

## Nixing nostoc

Researchers 'go to the mats' to test various control products

BY MARCELO L MORETTI AND DAVID KING

**N**OSTOC ARE CYANOBACTERIA COLONIES that can grow where abundant moisture is available. These bacteria form continuous colonies that resemble mats covering gravel, plastic, concrete, or flat surfaces. Nostoc grow during the spring and summer and create a slippery mat, posing a safety hazard to nursery work crews.

Control options for nostoc are very limited in nurseries. The objective of this study was to evaluate products to control nostoc.

In 2020, Oregon State University (OSU) Horticulture initiated

a project to assess potential new chemical management options for growers. We collaborated with a nursery in Hubbard, Oregon (Figure 1). This project was funded by the IR-4 Project Environmental Horticulture program (<https://www.ir4project.org/ehc/>). The findings of this research will support future registrations in ornamental crops.

At the time of this article's writing, the products listed below were not labeled for nostoc control in nurseries. The trade names and products are listed for reference and are not be interpreted as a recommendation. 



**Figure 2.** Captain XTR 6 lbs./100 gal. (Treatment 2) plot at the beginning of the experiment (June 26, 2020), 21 DAT (July 17, 2020), and the end of the experiment (August 14, 2020) in the left, center, and right photos, respectively.

### Methods

The study was conducted in an irrigated gravel site. Plots were chosen because at least 50% of their area was covered by nostoc mats. Treatments included Captain XTR (copper ethanolamine complex), Marengo (indaziflam), Kalmor (copper hydroxide), Scythe (pelargonic acid), and Sonar (fluridone) (Table 1), and were

applied using a research sprayer calibrated to deliver 50 gallons per acre.

Captain and Kalmor were reapplied 14 days after the initial treatment. Assessments included visual estimates of nostoc control; we recorded coverage at 3, 7, 10, 14, 21, 35, and 50 days after application. For simplicity, only the data for the final evaluation are presented.

### Results

The copper-containing products, Captain XTR and Kalmor, controlled nostoc. As early as three days after treatment, Captain XTR controlled nostoc. Control reached 75–95% at seven days after treatment with a single application.

At the end of the experiment, Captain XTR resulted in 73–92% control and less



**Figure 3.** Kalmor 10 lbs./100 gal. (Treatment 5) plot at the beginning of the experiment (June 26, 2020), 21 DAT (July 17, 2020), and the end of the experiment (August 14, 2020) in the left, center, and right photos, respectively.



**Figure 4.** Marengo SC 18.6 fl. oz./A plot (Treatment 4) at the beginning of the experiment (June 26, 2020), 21 DAT (July 17, 2020), and the end of the experiment (August 14, 2020) in the left, center, and right photos, respectively.

than 12% of surface coverage, while nostoc covered 58% of the nontreated plots (Table 1 & figure 2).

Kalmor also controlled nostoc, but acted more slowly than Captain XTR, providing significant control (83%) 14

days after treatment. At the end of the experiment, Kalmor controlled 50–73% of the nostoc, and plot coverage was between 10–19% (Figure 3).

None of the other treatments tested in this experiment controlled nostoc.

This preliminary work indicates that copper-based treatments are effective in controlling nostoc. The project will continue in 2021. The long term goal is to expand the pest management tools for nurseries in Oregon. ©



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## Nixing nostoc

Table 1. Nostoc control and coverage in response to various treatments in a irrigate gravel yard during the summer of 2020 in Hubbard, Oregon. Data were collected 50 days after initial treatment

Product (rate)	AI	Appl.	Control	
Treatment			(%)	
1. nontreated	-	-	0 b	58 ab
2. Captain XTR (6 gal/100 gallon)	Copper	2	73 a	12 c
3. Captain XTR (12 gal/100 gal)	Copper	2	92 a	3 c
4. Marengo SC (18.5 fl oz/A)	Indaziflam	1	0 b	58 ab
5. Kalmor (10 lb/100 gal)	Copper	2	50 a	19 c
6. Kalmor (20 lb/ 100 gal)	Copper	2	73 a	10 c
7 Scythe (10 % v/v)	Pelargonic acid	2	0 b	56 ab
8 Sonar (32 fl oz/A)	Fluridone	1	0 b	56 ab

Means followed by the same letter are not statistically different according to Tukey's test. Treatments were applied at 50 gallons per acre. Abbreviation: AI – the active ingredient. Appl. – number of applications

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