

Evaluation of Organic Nematicides for Strawberry Production in Florida

Johan A. Desaegeer, Hung X. Bui, Justin Carter

Summary

All tested biological nematicides showed limited impact on control of sting nematodes or yield improvement in a sting/disease-infested field at the GCREC.

Background

Nematode management options in organic strawberries are limited. Sting nematode is one of the main problems for organic strawberry production in Florida. Without fumigants, the only option for organic growers to manage nematodes is to use cultural practices (crop rotation, cover crops) and apply bio-nematicides and organic approved soil amendments.

Methods

The trial was conducted at the GCREC in a sting nematode-infested strawberry field. Eight different OMRI-approved organic products and the chemical nematicide Velum were tested (Table 1). Products were all applied thru the drip irrigation system (1 drip tape in the center of the bed) in 38 ft long plots.

The treatments were 1) dazitol (mustard oil and capsaicin), 2) Terra MG (mustard meal), 3) Ecozin+ (azadirachtin), 4) Majestene (Burkholderia dead bacteria), 5) Melocon LC (Purpureocillium lilicanus, live fungus), 6) Promax + Fertigold (Thyme oil), 7) Kyte Gold (Bacillus chitosporus and shrimp meal), 8) Crablife (crab meal), 9) Velum (fluopyram), 10) untreated control (Table 1)

Bare-rooted strawberry seedlings (cv. Sensation) were transplanted on October 13, 2021. Each cultivar was planted in 13 ft double-row sections within each treated plot. The experiment was conducted as a randomized complete block design with five replicates per treatment. Crop stands were counted at 13, 55, 98 and 145 days after transplanting (DAT). Plant vigor was

measured every two weeks (from November 3rd, 2021 to February 24th, 2022) by using a GreenSeeker™ hand-held sensor (Trimble, Sunnyvale, CA, USA) which generates normalized difference vegetation index (NDVI) value based on the reflection of infrared light from the plant canopy. Harvest was performed 13 times from December 22nd, 2021 to March 14th, 2022. Mid-season and end-season of soil populations of plant-parasitic nematodes were determined by extracting nematodes from a 200cc soil sample from each plot by the Baermann pan technique with a 2-day incubation period and collected through a 25- μ m sieve and transferred in water into vials and stored at 5°C for counting.

Results

Crop stands were not significantly different among treatments and also plant vigor was not statistically different (data not given).

Also, no difference in yield was noted from the untreated control (Table 2).

Root-knot, sting, stunt and stubby root nematodes were the plant-parasitic nematodes found in this experiment. Population densities of root-knot, stunt and stubby nematodes were low during the experiment. Sting nematode population density increased towards the end-season, but no significant differences were found among treatments. Dazitol had numerically the highest number of sting nematodes at mid-season and end-season, while the chemical nematicide Velum had the lowest counts.

Visible sting nematode damage was noted across plots in this trial, not particularly related with any specific treatment. None of the treatments provided good control of sting nematode in this trial.

Contact

Dr. Johan A. Desaeger

UF/IFAS Gulf Coast Research and Education Center

P: 813-419-6592

E: jad@ufl.edu

<https://gcrec.ifas.ufl.edu/gcrec-facultystaff-directory/johan-desaeager/>

Treatment	Bio-nematicides	Rate/A	Application timing
1	Dazitol	2 6.25 + 1.5 gal	At plant + 3 wap
2	Terra MG	20 gal	10 days pre-plant
3	Ecozin+	22.5 oz	At plant + 3 wap
4	Majestene	2 gal	At plant + 3 wap
5	Melocon LC	10.25 fl oz	At plant + 4 wap + 8 wap
6	ProMax + Fertigold	1 gal + 0.5 gal	At plant + 4 wap + 8 wap + 12 wap
7	Kyte Gold	2 qt	At plant + 4 wap + 8 wap
8	CrabLife Flake + powder	1,000 lbs + 80 lbs	At plant + 5 wap + 8 wap
9	Velum	6.8 oz	At plant
10	UTC		

UTC: Untreated control; Wap: weeks after planting

Products	Early season (Dec)	Mid-season (Jan)	End-season (Feb-March)	Total
Majestene	0.67	1.03	1.19	2.90
Dazitol	1.09	1.81	1.88	4.78
Kyte Gold	0.80	1.24	1.57	3.62
TerraMG	0.79	1.17	1.34	3.30
ProMax + Fertigold	1.37	1.85	1.79	5.01
Ecozin+	0.71	0.84	0.81	2.36
Melocon LC	1.14	1.82	1.86	4.82
CrabLife	1.28	1.76	1.86	4.89
Velum	0.89	1.37	1.61	3.87
UTC	1.25	1.95	1.86	5.06
<i>P value</i>	0.69	0.56	0.92	0.74

P value > 0.10 indicates no significant difference between treatments

Table 3. Plant-parasitic nematodes on strawberry at mid-season 2021-2022				
Products	Root-knot nematode	Sting nematode	Stunt nematode	Stubby root nematode
Dazitol	0	11	2	3
Terra MG	1	6	1	0
Ecozin+	0	5	2	0
Majestene	0	4	1	0
Melocon LC	0	8	1	1
ProMax + Fertigold	0	8	3	4
Kyte Gold	0	4	0	0
CrabLife	1	3	1	0
Velum	0	4	0	0
UTC	0	6	3	0
<i>P value</i>	0.33	0.89	0.55	0.50

P value > 0.10 indicates no significant difference between treatments

Table 4. Plant-parasitic nematodes on strawberry at the end of the season 2021-2022				
Products	Root-knot nematode	Sting nematode	Stunt nematode	Stubby root nematode
Dazitol	0	33	3	1
Terra MG	1	12	1	1
Ecozin+	0	13	5	1
Majestene	1	18	3	1
Melocon LC	2	17	9	1
ProMax + Fertigold	2	19	5	0
Kyte Gold	1	11	4	0
CrabLife	0	10	4	0
Velum	2	8	3	0
UTC	1	15	2	1
<i>P value</i>	0.35	0.17	0.89	0.90

P value > 0.10 indicates no significant difference between treatment