

Technical Information Update: Healthy groves start from the ground up

**DuPont™
Vydate® L**
insecticide/nematicide

When roots are compromised, a tree can be more susceptible to citrus greening and other damaging diseases.

Unfortunately, if you grow citrus in Florida, there's a good chance that nematodes are present in your groves. While most nematode species do not kill trees, they can weaken trees' root systems, significantly reducing tree vigor, growth and grove productivity.

Fortunately, you can suppress key nematodes and promote better root health with well timed applications of DuPont™ Vydate® L insecticide/nematicide.



The importance of nematode management

- Nematode-infested trees generally grow more slowly and can be of smaller size and quality.
- Aboveground symptoms include thinner canopies with less new foliar growth and twig dieback.
- Symptoms of decline frequently increase with time and are more apparent during periods of environmental stress or when combined with damaging soil pests like root weevils, Phytophthora and Huanglongbing (HLB).
- Maintaining good root health is critical when HLB, or citrus greening disease, is present.

An integrated approach to nematode management

Integrated pest management (IPM) for nematodes requires the following steps:

1. Determine whether pathogenic nematodes are present in the grove.

2. Determine which species are present and whether populations are at treatable threshold levels.

3. Select a treatment or management option.

Research shows nematode populations are on the rise

DD Diagnostics, Lake Alfred, Florida, analyzed 1,751 samples during 2012, 2013 and 2014, between January 1 and June 30, and found harmful nematode populations that exceeded thresholds in 50% of the samples. That's five times the levels recorded in 2003 when roughly 10% exceeded thresholds. It's also important to note that in most cases, the thresholds were established in the absence of HLB. Following is a summary of DD Diagnostics' soil-test results.

■ Harmful nematode detected	77%
■ Harmful nematode(s) exceeding threshold	50%
■ Citrus nematode detected	53%
■ Dagger nematode detected*	51%
■ Sting nematode detected	8%
■ Burrowing nematode detected*	2% [†]
■ Root sloughing detected*	63%
■ Root weevil feeding detected*	44%

Nematode species and thresholds in Florida

The nematode species listed below can cause major harm to Florida citrus groves.

- **Citrus:** Causes “*slow decline*.” Thins canopy at the top. Trees can look fine, except production is not what it should be, i.e., “*sleeper*.” Thresholds vary depending on the sampling date.
- **Burrowing*** (*Radopholus similis*): Causes “*spreading decline*.” Threshold is detection.

* Vydate® L is only labeled for citrus and sting nematode suppression in Florida.

[†] Would be a higher percentage for ridge-only samples

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Other damaging nematode species include:

- **Sting** (*Belonolaimus longicaudatus*): Causes stunted trees and swollen root tips. Creates entry wounds for Phytophthora root rot. Thresholds have not been established by the academic community.
- **Dagger*** (*Xiphinema vulgare*): Causes stunted trees and swollen roots. Thresholds have not been established by the academic community.
- **Coffee lesion*** (*Pratylenchus coffeae*): Threshold is detection.

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Nematode management options in citrus

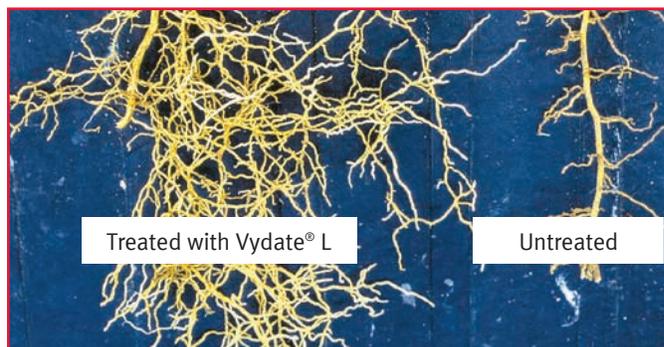
Once nematodes become established in a grove, they cannot be eradicated. Therefore, the best protection is to try to keep them out. However, if nematodes are present, you have three treatment or management options:

- **Sanitation:** Clean equipment thoroughly when moving between groves. Use nursery trees certified to be nematode free by the FDACS Division of Plant Industry.
- **Cultural practices:** Maintain a vigorous root system in the shallow root soil profile.
- **Chemical suppression:** Repeat nematicide applications are required to suppress nematode populations in soil and on roots in order to maintain high productivity in your groves. No soil fumigants are currently registered. Proper nematicide placement under the tree canopy can improve overall nematode control by targeting applications to highest fibrous root and nematode density (top 24–30 inches of soil).

Early management of nematode populations on young trees will have a prolonged beneficial effect on the subsequent growth and productivity of those trees.

Count on DuPont™ Vydate® L to help keep nematodes in check

Vydate® L, a broad-spectrum insecticide/nematicide, is used for the reliable, systemic control of key pests and the suppression of several nematode species in many crops. It reduces nematode feeding, movement, reproduction and hatching to help maintain a healthy root system.



Citrus roots from soil infested with sting nematodes benefited from four applications per year of Vydate® L, applied via micro sprinklers. See table below for rates and timing.

Effective suppression of labeled nematode species requires an annual program:

Vydate® L annual citrus program		
Application number	Application timing	Vydate® L use rate (Micro sprinkler)
1	February	½ gallon per grove acre
2	45 days later	½ gallon per grove acre
3	September	½ gallon per grove acre
4	45 days later	½ gallon per grove acre



Nematode interaction with HLB, or citrus greening disease: HLB infection causes 27% to 40% fibrous root loss before HLB foliar symptoms. Presymptomatic fibrous root decline in citrus trees is caused by Huanglongbing and potential interaction with *Phytophthora* spp., (ARS USDA Research Report — Graham, Johnson, Gottwald and Irey March 2013.)

For more information

Don't let nematodes get the best of your groves: Keep them in check with routine applications of DuPont™ Vydate® L insecticide/nematicide. Contact your local DuPont retailer or representative to learn more. And visit us at vydatel.dupont.com.

DuPont™ Vydate® L is a restricted-use pesticide.

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