



## ID Services

### Nematode Laboratory 2006 Price Schedule

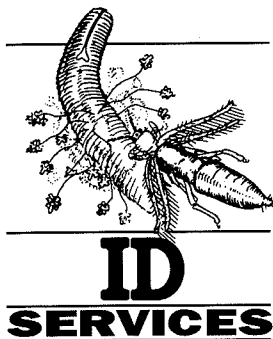
<b>Sugar Flotation (SF)</b> Single standard analysis done on fallow, row crop and vegetable ground. Can extract Grape Phylloxera from grape soils	<b>\$35.00</b> per sample
<b>Mist Extraction (SM)</b> Incubates the soil and roots for 4 days at 80°F. Only live nematodes are extracted. Used to test Nematicide efficacy.	<b>\$35.00</b> per sample
<b>Washed Roots (WR)</b> Extracts nematodes that are inside or embedded into roots, indicates potential egg hatch	<b>\$25.00</b> per sample
<b>Sugar Flotation (SF) + Mist Extraction (SM)</b> Conducted with 1000 cc soil and roots. Obtains active and inactive soil nematodes, hatches eggs and extracts nematodes from roots	<b>\$55.00</b> per sample
<b>Combined Extraction – (CE)</b> SF, SM and WR done on the same sample, best for evaluating control measures or setting up trials	<b>\$65.00</b> per sample
<b>Citrus Nematode Female Extraction (CFE)</b>	<b>\$20.00</b> per sample
<b>Field Sampling</b> General recommendation, 1 sample per ten acres. Cotton, 1 sample per 15 acres.	<b>\$25.00</b> per sample
<b>Field Sampling for Fertility Analysis</b>	<b>\$20.00</b> per sample + actual shipping cost.
<b>Volume Discount</b> Greater than twenty samples, applies to Laboratory Analysis only.	<b>5%</b>

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#### **Payment Terms** **1/10 Net 30**

SF + SM and Combined Extraction (CE) tests will give two to three separate sets of results. The analysis requires at least 50 grams of fresh feeder roots plus 1 kilogram, or 1 gallon of soil.

**NEMATODE • DISEASE • INSECT – IDENTIFICATION/MONITORING • SAMPLING**  
12419 Lytle Ave. • McFarland, CA 93250 • Lab (661) 792-2051 • Fax (661) 792-6728  
Alan Butterfield (661) 978-8290 • PCA #3543 • QA #30892



12419 LYTTLE AVENUE  
 McFARLAND, CA 93250  
 661/792-2051

Submitted by: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Crop: \_\_\_\_\_  
 Previous Crop: \_\_\_\_\_  
 No. Samples: \_\_\_\_\_  
 Date Sampled: \_\_\_\_\_  
 \_\_\_\_\_

## Nematode Samples

### Field Information:

Location or description: \_\_\_\_\_  
 Problems or condition of crop: \_\_\_\_\_  
 Acres or number of plants affected: \_\_\_\_\_ Total Acres: \_\_\_\_\_

### Analysis requested:

- |  |   |
|--|---|
| <input type="checkbox"/> SF (Sugar Flotation)    | SF extracts active and inactive larvae and adults. Recommended for fallow or open fields where nematodes may be under stress. |
| <input type="checkbox"/> SM (Sieving Mist)       | SM extracts only active larvae, adults, and hatched eggs.   |
| <input type="checkbox"/> WR (Washed Roots)       | WR extracts larvae from roots and hatches eggs inside or attached to a root.  |
| <input type="checkbox"/> FE (Female Extraction)  | FE Citrus adult females only  |
| <input type="checkbox"/> DE (Direct Examination) | DE Root Gall indexing   |

### Row Crop or Preplant Tree Crop Soil Sampling:

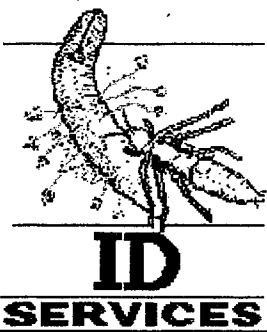
Insert 18" soil probe perpendicular to ground to desired depth, remove carefully, and deposit soil core in a gallon sized "ziplock" bag. For best results take 16 cores per sample per ten acres. A smaller "survey sample" of 20-40 acres may be taken. Sample in a zig-zag pattern, being careful to space core samples equal distance apart. Check roots for visible symptoms of damage and note on bag. Be sure to label each bag carefully.

### Existing Tree or Vine Sampling:

Divide rows, sampling every 10, 15, or 20 rows depending on size of block. Take 3-4 shovel samples per row, 0-16" deep, sampling the ends and middle of each row. Sample by weak trees and vines, note problems and condition of crop. About 1/3 of the bag should contain small feeder roots if possible.

### Sample Handling/Shipping:

Keep samples out of direct sunlight, preferably in a cooler during the summer. October to March samples can be shipped in a box via UPS or US Postal Service. April to September samples should be shipped in a cooler (your choice) with blue ice. We will return cooler and ice to you.



## Grape Nematode Sample Interpretation

	<u>Low Population</u>		<u>Medium Population</u>		<u>High Population</u>	
	Oct-March; March-Oct		Oct-March; March-Oct		Oct-March; March-Oct	
Root Knot	<53	<18	53-358	18-143	>358	>143
Dagger <u>americanum</u> group	<15		15-143	15-72	>143	>72
Dagger <u>index</u> *	<15		15-143		>143	
Lesion <u>vulnus</u>	<15		15-72		>72	
Citrus	<37		37-358		>358	
Stubby Root	<15		15-143		>143	
Ring	<37		37-358		>358	
Spiral	<37		37-358		>358	
Pin	Economic damage potential preplant only		72-717		>717	
Phylloxera; eggs, nymphs, adults			2-17		>17	

University of California, "Grape Pest Management Guidelines (page 286)"  
Table adapted to 500 cc of soil which weighs approximately 717 grams.

\*Dagger index; vectors Fan Leaf Virus, if this nematode is detected then check the vineyard for symptoms of the virus.

If several different types of nematodes are recovered from the same sample there could be an additive effect upon the vines.

Weak vines may have low counts due to a depleted root carbohydrate nematode food source. Samples taken from moderately growing vines near weak vines will frequently have higher counts.

The Sugar Flotation (SF) extraction method works best for Phylloxera, Root Knot, Citrus, Ring, Dagger, and Needle nematodes.

The Seiving Mist (SM) extraction method works best for Lesion, Pin and Dagger nematodes.

The Washed Root (WR) extraction method can give an indication of future infestation levels due to hatch of eggs. No thresholds for this extraction method have been established.

Root Knot counts can be higher in SM and WR methods than the SF method if nematode eggs are present.

Grape nematode sampling is best done with a shovel. Sample near vines where the feeder roots are found. Include a liberal amount of feeder roots and some large roots with bark in the sample. The sample should fill 2/3 of a 1 gallon plastic bag. Keep the sample out of the sun and cool (<50 F) till delivery. Deliver or ship samples within 3 days of sampling.

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## Citrus Nematode Thresholds

University of California, Baereman Funnel, Adjusted to 100% Extraction Efficiency

	Larvae Per 500 cc		Adult Female per 1 gram roots	
	Feb-April	May-July	Feb-April	May-June
Low	<2000	<4000	<100	<300
Medium	>5000	>8000	>400	>700
High	>12000	>18000	>1100	>1400

ID Services, no adjustments for Extraction Efficiency

SM	Sieving Mist – Larvae	20,000/500 cc soil
WR	Washed Roots – Larvae	20,000/500 grams roots
FE	Adult Females	400/1 gram roots

ID Services thresholds are based upon mature bearing trees in fair to good condition. Nematode counts obtained above threshold numbers indicate the probability that treatments for nematodes will result in monetary returns to the grower above the costs of treatments.



### Almond Economic Thresholds

Nemaguard and Hybrid, ID Services levels only.  
 Not documented by UC research. Counts per 500 cc.  
 Actual numbers nematodes SF or SM extraction,  
 no adjustments for extraction efficiency.

Root Knot first 2 years and replant only. Larvae active at 55° F after planting.

Tolerant Population level	Possible Economic injury	Probable Economic Root Damage 1 <sup>st</sup> 2 years
0-10	11-25	26+

Expect 10-20% Summer mortality disked soil with moisture below 6"  
 60-80% Summer mortality dry open fallow  
 80-90% Summer mortality dry and wet fallow  
 80% Winter mortality Oct. 1 to March 1.

Nutgrass, Bermuda grass and other weeds will reduce mortality levels.

Lesion (Pratylenchus penetrans, Pratylenchus vulnus), Preplant, all soil types.

Years I-4	Lesion Tolerant Population level	Lesion Possible Economic injury	Lesion Probable Economic Root Damage
	<10	11-20	21+
5+ years	<20	21-40	40+

Ring: Sandy to Sandy Loam soil only

	Ring Tolerant Population level	Ring Possible Economic injury	Ring Probable Economic Root Damage
Preplant	1-5	6-20	21+
I-4 years	1-10	11-40	41+
5+ years	<20	21-50	40+

Note: Ring can induce Bacterial Canker which if present in a field can reduce threshold levels.

Dagger americanum, Years I-6

	Tolerant Population level	Possible Economic injury	Probable Economic Root Damage
	0-10	10-25	26+

Phytophthora, ppg/gram

0-10	10-15	16+
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Bacterial and Fungal Feeding Beneficial Nematodes

Low Population	Moderate Population	High Population
0-100	101-300	300+

At 3000 Bacterial + Fungal/500 cc soil nutrient cycling may be sufficient for profitable production with reduced fertilizer input.

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