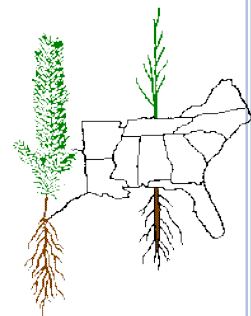


SOIL, TISSUE AND NEMATODE
SAMPLING

BACK TO THE BASICS

Tom Starkey
Southern Forest Nursery
Management Cooperative
September 2015



OUTLINE

- Laboratories we use
- Sampling for foliage
- Sampling for soil
- Sampling for nematodes
- Sending seedlings to the Nursery Cooperative



LABORATORIES FOR ANALYSIS

~~A&L Labs – Memphis, TN~~

Waypoint Analytical –
Memphis, TN



- 2790 Whitten Road
Memphis, TN 38133
800-264-4522
901-213-2400
Fax: 901-213-2440
supporttn@waypointanalytical.com

Waters Lab – Cairo, GA



- P.O. Box 382
257 Newton Highway
Camilla, GA 31730
229 -336 -7216
Fax: 229 -336-7967
info@watersag.com

LABORATORIES FOR ANALYSIS

Waypoint Analytical –
Memphis, TN



Waters Lab – Cairo, GA



- Full soil test *
- Greenhouse media test
- Water analysis
- Tissue analysis *
- Nematode assay
- Pesticide residue

* Be sure your ask for the test and method of analysis you want.

SOIL SAMPLES



<http://t1.gstatic.com/images>



SOIL SAMPLING

- **Goal:** To collect a soil sample that is representative of a field or portion of a field
- Plan far enough ahead of when you need results.
- Clean all equipment.
- **Only sample top 6" of soil profile**
- Use plastic bucket to collect soil. Do not use brass, bronze or galvanized tools/buckets.
- Stratify area if soil types are different.
- Zig-Zag across field taking 15 -20 samples
- Remove any plant debris from surface.
- If sample is wet, air dry before mailing
- Thoroughly mix samples from each field/unit
- Put sample (~ 1 pint) in bag or box provided by lab
- Code each sample



SAMPLING FOLIAGE FOR NUTRITIONAL PROBLEMS



<http://t3.gstatic.com/images>



TISSUE SAMPLING FOR NUTRIENT DEFICIENCY

- Don't sample in the heat of the day, i.e. when plants are moisture stressed.
- Avoid sample contamination from dust, fertilizers, chemical sprays as well as perspiration and sunscreen from hands.
- Rinse foliage with distilled or deionized water and let dry. **Do you want what is on the foliage or inside?**
- Place washed, dry needles in paper bag and send immediately to lab. Never send fresh samples in plastic bags.
- Sample the portion of the seedling which is showing the problem. Grouping healthy and diseased foliage together will “dilute” results.

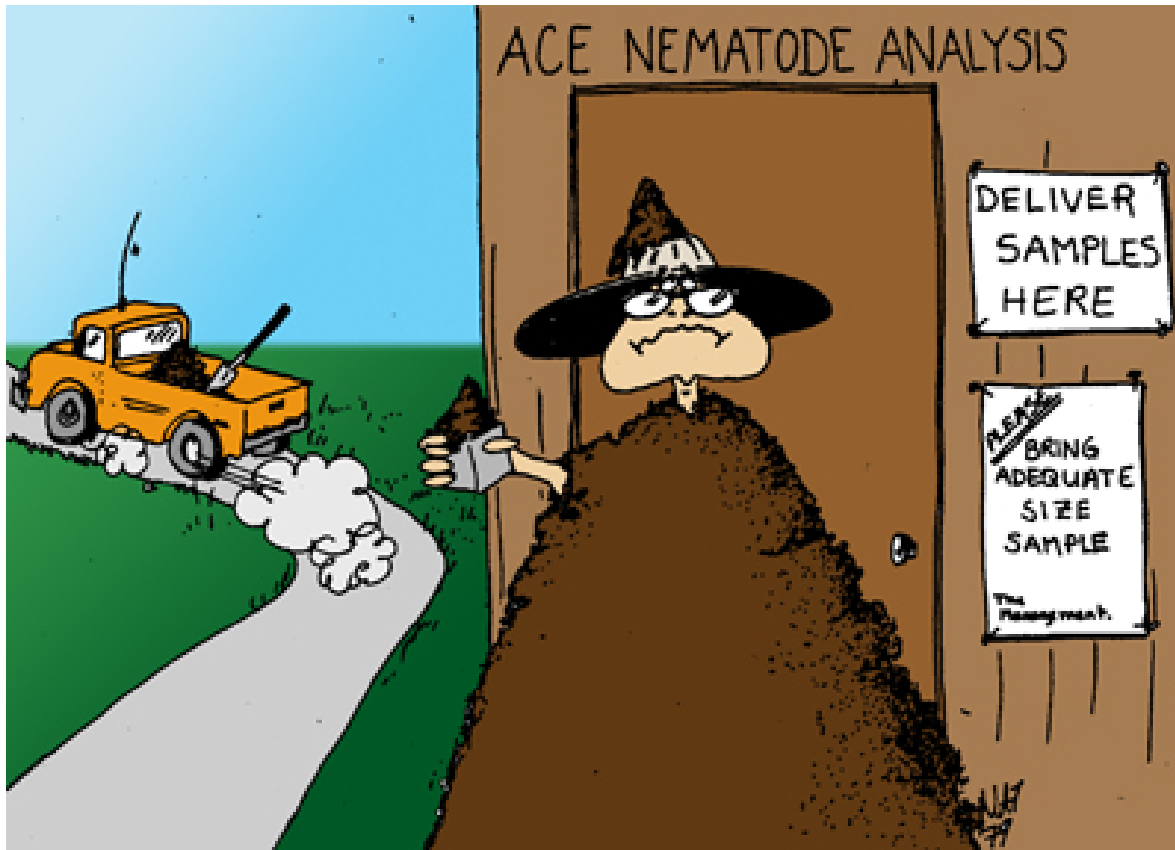


TISSUE SAMPLING FOR NUTRIENT DEFICIENCY

- Send a healthy sample for comparison
- Take samples from both “good” and “bad” areas. Comparison between the two samples helps pinpoint the limiting element.
- A soil sample may help to complete the evaluation.
- Avoid combining healthy plant parts with unhealthy plant parts.
- Label bags
- Refrigerate or dry if samples can't be sent to the laboratory immediately, to arrive before the weekend.



SAMPLING FOR NEMATODES



<http://informedfarmers.com/wp-content/uploads/2011/05/nematodes-1.jpg>

SAMPLING FOR NEMATODES

- Population densities of plant parasitic nematodes vary greatly in time and space.
- Although the objective of detection seems simple, a negative result does not necessarily prove absence of the pest, but only indicates that a nematode population where you sampled is below the detection level.
- Sampling should be done before any treatment or management decision is made and before sowing.
- Sampling should occur when nematodes are active and at high populations. (Fall)
- Soil should be moist but not excessively wet or frozen.



SAMPLING FOR NEMATODES

- The precision of the nematode estimates can be improved by increasing the number of soil cores in the sample. This is also less expensive than increasing the actual number of samples sent to the lab.
- When sampling soil during the growing season, it is very important to get the feeder roots of the crop in the soil sample, since this is where many nematodes live.
- Even the most carefully taken samples may yield inferior results if not stored and delivered properly. Keep the sample *cool, ideally at 50 to 55 F*. Do not leave the sample in direct sunlight, car trunk or other areas that may heat excessively. An insulated cooler is convenient for sample protection. Deliver or mail the sample immediately to the processing laboratory. Use First Class, or express delivery and pack well in a sturdy cardboard box or coffee can





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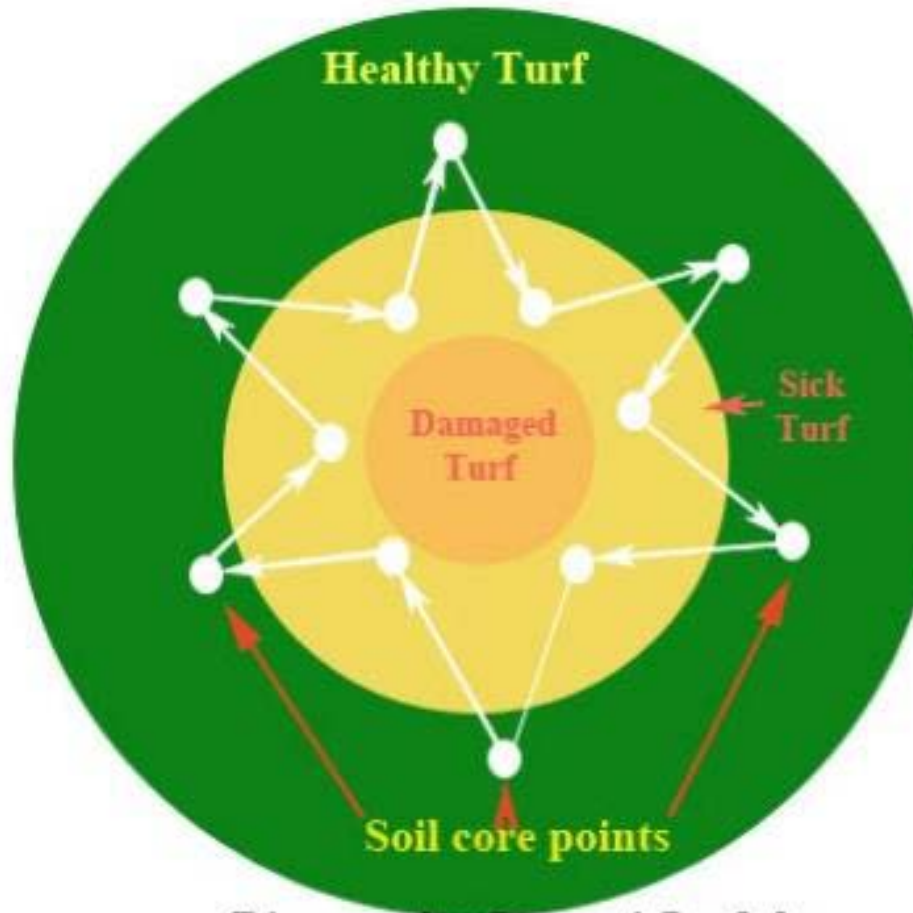
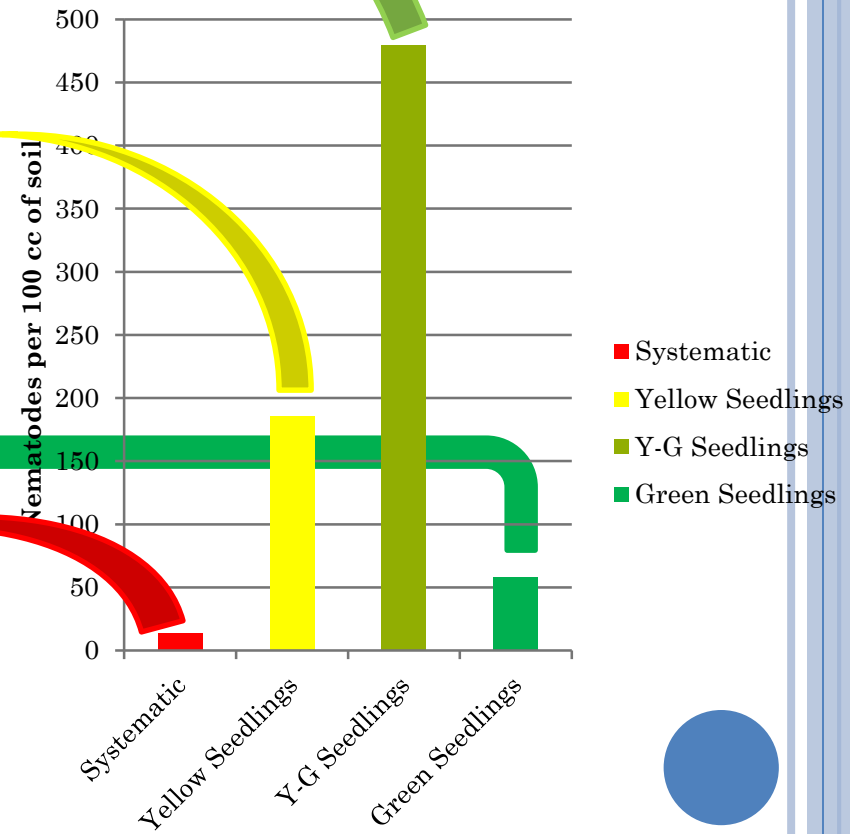


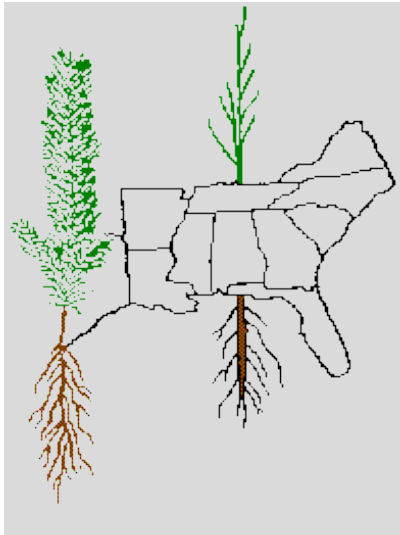
Diagram by Ganpati Jagdale



The variability in nematode sampling



SENDING SEEDLINGS TO THE NURSERY COOPERATIVE PLANT CLINIC @ AUBURN UNIVERSITY



SEEDLINGS FROM OUTPLANTING

- Do not send seedlings wrapped in wet paper towels. Place is between dry paper towels and then into zip lock bags
- Collect seedlings that are healthy, dying and nearly dead. If you can't peel bark with thumb nail – too dry!
- At least 10 of each group
- Provide background information (minimum)
 - When lifted
 - When and where planted
 - Soil conditions – wet, dry, bedded, etc
 - If available – site prep data



SEEDLINGS FROM NURSERY

- Do not send seedlings wrapped in wet paper towels. Place is between dry paper towels and then into zip lock bags
- Seedlings that are healthy, dying and nearly dead.
- At least 10 of each group
- Cultural information
 - Date of sowing
 - Pesticide usage information since sowing
 - Fertilization since sowing
- Send via express delivery so they are not sitting in a truck or warehouse/depot over a weekend!



Address to send seedlings:

Tom Starkey

School of Forestry & Wildlife

602 Duncan Dr

Auburn University, AL 36849

Phone: 334-844-8069

Tom.Starkey@auburn.edu

