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Veggie Bits  
R. Precheur

Americans will spend \$6.9 billion on Halloween festivities this year, up from just \$2.5 billion in 1995. (Source: Time Magazine, Numbers, pg 23, 10/21/02)

Soil Testing, pH, Acid Soils, Lime, Liming, and Essential Vegetable Nutrients.  
R. Precheur

With this issue of the VegNet newsletter, we begin a three part series on basic soil and plant nutrition for vegetable crops. These articles will review some of the fundamental principles that produce high crop yields for the lowest possible costs. Article 1 discusses how to select a soil test lab, see below

Mid American Ag and Hort Services, Inc. Receives Food Safety Grant  
John Wargowsky, Executive Director - Mid American Ag and Hort Services, Inc.,  
Director, Labor Services - Ohio Farm Bureau Federation

BOWLING GREEN, Ohio. Mid American Ag and Hort Services, Inc., (MAAHS), received a \$53,000 grant to increase awareness and adoption of Good Agricultural Practices (GAP) by specialty crop producers in Ohio.

John Wargowsky, executive director of MAAHS and Mary Donnell, OSU Extension agent and Ohio's collaborator for GAP, wrote the grant to help fresh fruit and vegetable growers increase the safety of the food they produce. As a result of the grant, Ohio growers will have the opportunity to learn about Good Agricultural Practices through on-farm consultations, food safety workshops, and a variety of educational materials. GAP education increases awareness of methods of production, harvesting, and post-harvest handling that increase the safety of fresh fruits and vegetables.

MAAHS will work with the Center for Innovative Food Technology (CIFT), Ohio State University Extension ABE Center in consultation with the Ohio Department of Agriculture Division of Food Safety in delivering the GAP teaching materials to producers.

The Ohio Specialty Crop Food Safety Initiative will help increase the awareness and adoption of Good Agricultural Practices, increase ratings on third-party audit inspections, and increase recognition by produce buyers throughout the United States of Ohio's high standards of food safety and good agricultural practices. This program will be featured at the upcoming Ohio Fruit and Vegetable Growers Congress in a general session and at the tradeshow.

This initiative is financed in part or totally through a grant from the Ohio Department of Agriculture, the State of Ohio and the United States Department of Agriculture under the provisions of the Specialty Crop Grant.

For more information on the Ohio Specialty Crop Food Safety Initiative, Contact:

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### Choosing a Soil Testing Laboratory

The first of three articles on vegetable crop nutrition. Next week, the second article will review soil pH, acid soils, lime and liming. Compiled by Robert J. Precheur

When done properly, periodic soil testing is necessary and the only tool available to quantitatively determine current soil nutrient levels. If, however, a producer is using inaccurate soil fertility data, a producer may apply fertilizer when there is no likelihood that the application will increase yield or profits. Conversely, if the soil fertility analysis data does not indicate a need for fertilizer when it is needed, maximum economic yields may be foregone and income lost.

The most common mistake people make when trying to determine if a soil testing laboratory is accurate is to send split samples to two laboratories. More than likely, results will come back different. In fact, if split samples are sent to 10 laboratories, chances are three or four results will be similar and the other six will probably not align with the rest.

Why go to all of this work when someone has already done this sampling splitting? The North American Proficiency Testing (NAPT) program is a national sample exchange program for agricultural laboratories. The program is managed through the American Society of Agronomy (Soil Science Society of America). The majority of the agricultural laboratories participate in this voluntary program.

The goal of the NAPT Program is to assist soil and plant tissue testing laboratories in evaluating their performance through inter-laboratory sample exchanges of actual tests of reference samples and a statistical evaluation of the analytical data for inter-laboratory comparison. With the increasing attention in nutrient management and water quality there is a greater need for soil and plant analysis laboratories to monitor and document the quality of their results.

### Factors to Consider When Choosing a Soil-Testing Laboratory

Laboratories that determine concentrations of plant- available nutrients in the soil are generally not regulated by state or federal agencies. Consequently, it is important for growers to investigate these laboratories by obtaining information about their performance, operation, and service before sending soil samples for

analysis. A grower requires assurance that the test results will be of quality, be credible, and meaningful

#### 1. Test Methods

- The use of appropriate test methods is very important in order to accurately determine the concentrations of plant-available nutrients in the soil. Research at many land-grant universities over many decades has resulted in soil-testing methods that are specific for soils in particular regions of the United States. For example, methods developed for testing the predominant soils in the Southern region of the United States may not be applicable for soils in the North Central region. The North Central Regional Research Committee (NCR-13) has developed methods that work best on soils in the North Central region. A publication of these methods is entitled Recommended Chemical Soil Test Procedures for the North Central Region. Laboratories that test Ohio soils should use these procedures. Therefore, potential clients need to determine if these testing methods, recognized for Ohio soils, are being used by the laboratory.

#### 2. Laboratory Proficiency

- The proficiency of a laboratory refers to its ability to produce accurate and precise test results. It is difficult for a laboratory to independently assess this factor. Thus, regional soil-testing research committees and other organizations established the North American Proficiency Testing (NAPT) program in 1998. This program is backed by the professional scientific organization, the Soil Science Society of America. A main purpose of the NAPT is to provide "double-blind" check samples to laboratories who wish to monitor and improve the quality of their soil-testing data. NAPT not only provides the check samples but also collects and statistically analyzes the data from laboratories in the program. Participating laboratories receive a summary of their performance for each soil-test method. Continued self-evaluation and adjustment improves the integrity of the soil-test results. A prospective client should ask the laboratory management if they are members of the NAPT program. (A list of laboratories in and around OH is provided at the end of this article)

3. Laboratory's NAPT Results - It is important that a representative of the laboratory review with the potential client their NAPT quarterly test results with those summarized for all NAPT participating laboratories. Information for each test parameter of interest to the client should be included. Growers should ask for this comparison in order to make a good decision about a laboratory. If the laboratory refuses, consider selecting another laboratory.

#### 4. Other Customers

- The potential client should ask the laboratory to provide the names and telephone numbers of 10 customers. This allows the grower to evaluate the laboratory from the perspective of users like themselves.

#### 5. Units of Results

- Ask a laboratory representative what units are used for each test parameter. Some laboratories use lbs/a, ppm, or lbs/1,000 square feet. If results from different labs are compared, make sure the units associated with the results are the same. For a valid comparison, a simple conversion may be necessary. For example, to convert

ppm to lbs/a, multiply the ppm value by 2. Certain test parameters may have unfamiliar units, such as meq/100 g for cation exchange capacity. Ask the laboratory representative to explain the meaning of the units if they are unclear.

#### 6. Categories of Quantity

- Some laboratories may place test results into categories. Examples are the categories of low, medium, and high. There may be additional categories or different categories than these. These categories usually denote a range of test values. It is likely that the categories given by one laboratory do not represent the same nutrient concentrations for another laboratory. Ask the laboratory to define each range that is used. In addition, find out if the categories are crop-dependent or calibrated for specific soil conditions (e.g., soil types). That is, results that may be regarded medium for one crop may be considered low for another crop.

#### 7. Turn-Around Time

- Ask how long it takes the laboratory to do the routine soil testing and return the results. In order for the results and recommendations to be useful, the turn-around time must be as short as possible. A good laboratory should be able to provide the results in two to three working days for the routine soil tests of pH, lime requirement, phosphorus, potassium, calcium, and magnesium. It is also very important to make sure the laboratory does not sacrifice accuracy by short cutting the methods to attain this turn-around time. It is a good idea to check the turn-around time with those who have used the laboratory. The Internet can be a useful system to obtain test results rapidly. Find out if the laboratory can provide the results on the Internet. In addition, determine if the recommendations for the application of lime and fertilizer can also be obtained on the Internet. In some cases, the laboratory may be able to accept the customer's sample identification information over the Internet, rather than using the sample information form. Most laboratories will also have an e-mail address that will allow direct and rapid communication with the laboratory manager and/or laboratory professional.

#### 8. Lime and Fertilizer Recommendations

- Determine if the soil-testing laboratory provides recommendations for the application of lime and fertilizer for the crops of interest. Also ask about the basis for lime and fertilizer recommendations that are used for other crops. Are they calibrated for your specific soil types or growing conditions? Ask if crop rotations and yield goals are considered. In addition, ask if the timing of the application of lime and fertilizer is included in the laboratory's recommendations. The Ohio State University's Vegetable Team can help you interpret results and make recommendations.

#### 9. Reference Check Samples

- Find out if the laboratory routinely uses internal "blind" and "double-blind" check samples where possible. A "blind" check sample is one that the laboratory technician knows is a check sample and is aware of the range of acceptable values for the parameters being tested. The technician uses this kind of check sample to make sure the method and instrument are performing normally. A "double-blind" check sample is one that the laboratory technician does not know is an internal check sample. In this case, the laboratory manager evaluates the data and

determines if the test results produced are in the acceptable range. If they are not, then corrective action must be taken to solve the problem.

#### 10. Test Kits

- Most soil-testing laboratories supply test kits for their customers. As a minimum, the test kits should contain the sample information form and soil sample container. Some additional information may be included with the test kit. Find out about the sample kits and how they are obtained from the laboratory. Laboratory

#### 11. Test Prices

- Prices for soil testing often vary greatly from one laboratory to the next. Ask about the prices. Determine if the price for each test or test package is given in writing. Also find out if discounts are given for large numbers of samples and whether prices are negotiable.

### Soil Testing Laboratories That Participate in the North American Proficiency Testing (NAPT) program

#### Laboratory Name

KY

Waters Lab

2101 Old Calhoun Rd

Owensboro, KY 42301

Work Phone: 2706854039

Fax Number: 2706853989

UK Soils Lab/Princeton

Research & Education Center

Princeton, KY 42445

Work Phone: 2702579503

Fax Number: 2703652667

UK Soils Lab/Lexington

103 Regulatory Service Bldg.

Lexington, KY 40546

Work Phone: 8592572785

Fax Number: 859257735

IN

A&L Great Lakes Labs

3505 Conestoga Dr

Fort Wayne, IN 46808

Work Phone: 2604834759

Fax Number: 2604835274

Sure-Tech Laboratories

2435 Kentucky Ave., Bldg. 9

Indianapolis, IN 46221

Work Phone: 3172431502

Fax Number: 3172431584

OH

Spectrum Analytic, Inc.

1087 Jamison Rd.

Washington Court House, OH 43160

Work Phone: 7403351562

Fax Number: 7403351104

CALMAR Soil Testing Laboratory

130 S. State St.

Westerville, OH 43081

Work Phone: 6145231005

Fax Number: 6145231004

Logan Labs

184 W. Main St.

Russells Point OH 43348

Work Phone: 9378426100

Fax Number: 9378422433

Brookside Laboratories, Inc.

308 S. Main St.

New Knoxville, OH 45871

Work Phone: 4197533448

Fax Number: 4197532949

CLC Labs

325 Venture Dr.

Westerville, OH 43081

Work Phone: 6148881663

Fax Number: 6148881330

MI

Agri-Labs, Inc.

420 W. Chicago

Bronson, MI 49028

Work Phone: 5173696052

Fax Number: 5173695522

Litchfield Analytical Services

535 Marshall St.

Litchfield, MI 49252

Work Phone: 5175422915

Fax Number: 5175422014

MSU Soil & Plant Nutrient Lab

A81 Plant & Soil Sciences Bldg.

East Lansing, MI 48824-1325

Work Phone: 5173550211

Fax Number: 5173551732

References:

1. Brown, J. R. (ed.). 1998. Recommended Chemical Soil Test Procedures for the North Central Region. North Central Regional Research Publication No. 221. Missouri Agricultural Experiment Station SB 1001. Columbia, MO.
2. Neufeld, J. and J. Davison. 2000. Practical Considerations When Selecting a Soil Testing Laboratory for an Educational Program. Journal of Extension. August, 2000, Vol. 38, No. 4.

3. North American Proficiency Testing Program. University of Missouri, Lincoln Univ.
4. Watson, M. E.. 1999. Guidelines for Choosing a Soil- Testing Laboratory. Ohio State University Fact Sheet. Horticulture and Crop Science. HYG-1133-99.

#### What's New At The VegNet Web Site

##### Problem Of The Week

A pictorial comparison of Squash Vine borer damage and Bacterial Wilt in pumpkins. While the symptoms are similar, there are some key differences.

Check it out. Click on the 'Problem of the Week' button of the left side.

##### Highlights From the Pumpkin and Muck Crops Field Days

Couldn't make it to Celeryville on July 25th or forgot about The Pumpkin Field Day on August 7th, then take a look at just a few of the highlights from these two field days.

Click on the 'Talk Between The Rows' button on the VegNet homepage.

##### 2001 Slide Presentations

Pepper Variety Slides 2001 | HTML Slide Show

Pumpkin Variety Slides 2001 | HTML Slide Show

Go to the Library Section under Research Reports.

#### VegNet Vegetable Schools

A series of slide presentations are now available in order to update you on the latest pumpkin and sweet corn research. We begin with 6 pumpkin topics in Pumpkins 101 and have 10 slide presentations available in Sweet Corn 101. In sweet corn. Powerpoint presentations and html online slide shows are available now. Go to the VegNet homepage.

##### Pumpkins 101

The use of trap crops and Admire for cucumber beetle control and New varieties for 2001. We have presentations on cover crops for disease control and pumpkin fungicide use.

Perimeter Trap Cropping. Online html slide show | Perimeter Trap Cropping. PPT, 7 Mbytes

See also the Research Results section on the home page for text version of the report.

Pumpkin Variety Slides 2001 | HTML Slide Show

##### Sweet Corn 101

Presently only Powerpoint presentations available. Coming Soon: Online HTML slide shows. Check back often Nine topics including:

Aspects of Variety Selection based on Disease Control [ ppt 40 KB]

Internet Link To "Reactions of Sweet Corn Hybrids to Prevalent Diseases" Dr. Jerald Pataky [www.sweetcorn.uiuc.edu](http://www.sweetcorn.uiuc.edu)

Producing Early Sweet Corn [ ppt 3.5 Mbytes ]

Managing Weeds in Sweet Corn [ ppt, 9 Mbytes ]

Sweet Corn Herbicides & Variety Sensitivity. [ ppt 2Mbytes ]

Sweet Corn Development and Critical Periods for Irrigation Management [ppt 1.6 Mbytes ]

Flea Beetle Management in Sweet Corn [ ppt 510 KB ]

How To Keep Worms Out of Sweet Corn Ears [ ppt 8.3 Mbytes ]

Role of Bt Transgenic Hybrids in Sweet Corn Pest Management. [ ppt 21.2 Mbytes ]

Bt Sweet Corn Efficacy in OH, 1999-2000 [ppt, 208 KB ]

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We appreciate very much the financial support for this series of vegetable reports which we have received from the board of growers responsible for the Ohio Vegetable and Small Fruit research and Development Program. This is an example of use of Funds from the "Assessment Program".

Where trade names are used, no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely and accurate, the pesticide user bears the responsibility of consulting the pesticide label and adhering to those directions.

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