

## 2008 PROGRAM WORK TEAM ANNUAL REPORT

**Name:** Soil Health – Vegetable Production Systems

**PWT Co-Chairs:**

**George Abawi\*, Professor**

Dept. of Plant Pathology  
Cornell University  
113 Barton Laboratory  
Geneva, NY 14456  
Phone: 315-787-2374  
Fax: 315-787-2389  
E-mail: [gsa1@cornell.edu](mailto:gsa1@cornell.edu)

**David Wolfe, Professor**

Dept. of Horticulture  
166 plant Science Bldg.  
Cornell University  
Ithaca, NY 14853  
Phone: 607-255-7888  
Fax: 607-255-0599  
E-mail: [dww5@cornell.edu](mailto:dww5@cornell.edu)

**Carol MacNeil, Sr. Ext. Specialist**

Vegetable Program in Ontario,  
Wayne, Yates & Steuben counties  
480 N. Main street  
Canandaigua, NY 14424  
Phone: 585-394-3977 ext. 33  
Fax: 585-394-0377  
E-mail: [crm6@cornell.edu](mailto:crm6@cornell.edu)



**Photograph:** Picture of a field meeting with a demonstration of aggregate stability and infiltration to growers and educators.

## **Soil Health PWT Activities and Accomplishments (2008):**

**Outreach Activities and Promotion of Soil Health Issues:** We have continued to involve more growers in our soil health project activities by sampling their fields and providing soil health report as management guide for improving soil productivity. In 2008 we analyzed a total of 386 growers' field samples. Soil Health Reports of the sampled fields have been sent to the collaborating growers. Growers, educators and consultants in NY and other parts of the Northeast have continued to show interest in the new Cornell Soil Health Test. In 2008, we held 15 grower focused soil health meetings in NY, 3 meetings in VT and 2 meetings in MD.

**Long-Term Research and Demonstration Soil Health Sites:** We have continued to maintain our long term soil health site at Gates Farm. The Gates Farm experiment consists of vegetable rotations with and without intervening soil building crops, each under three tillage methods (no-till, plow-till and zone-till) and three cover cropping systems (none, rye and vetch). Statistical analysis of 2008 data from the Gates farm experiment showed significant differences in several soil health indicators with tillage and cover crop treatments especially in continuous vegetable rotation. The overall Cornell Soil Health Index was significant for tillage treatment in the continuous vegetable rotation with reduced tillage systems generally having better soil health than the plow-till systems. Indicators showing significant differences include wet aggregate stability, active carbon, potentially mineralizable nitrogen, phosphorus, potassium and zinc. Generally, The zone-till system tend to be better for soil health improvement than the plow-till system.

**Development of Grower-focused Soil Health Test:** The Cornell Soil Health Test is now widely accepted among growers as a tool for holistic management of their fields. The measurement protocol and assessment strategy is now standardized. One of our main goals for 2008 was to help growers, educators and consultants understand the interpretation and the utility of the soil health reports of their fields. Several educational activities were therefore conducted to achieve this goal. The standard Cornell Soil Health Test consists of assessing 15 soil indicators (13 measured in the laboratory and 2 in the field). In 2008, we started to measure soil texture (fraction of sand silt and clay) as a part of the Cornell Soil Health Test. This became necessary because the interpretations of the reports are highly dependent on soil texture and a quantitative estimate of soil texture will facilitate accurate interpretations of selected soil indicators. However, we chose an inexpensive method for soil textural analysis in order to keep the cost of soil health analysis as low as possible.

### **Progress Reports for Collaborating Growers**

Our database of soil health has continued to grow in terms of the number of samples added each year. These samples are coming from both the new fields and previously sampled fields. Some growers have had the opportunity of the same fields being sampled multiple times and are able to assess the changes in soil health over time. In 2008, we sent out a total of 386 soil health reports to growers. We conducted 3 workshops in the Northeast to aid farmers, educators and consultants in interpreting the soil health test.

**Relating Soil Management Practices and Crop productivity to Soil Health:** Our database is becoming more robust and better representative of the NE soil conditions. We have been processing large number of samples from NY and other Northeastern States and we have started to query our data sets to answer important soil management questions. Examples of questions being asked include: i. how the selected soil indicators are affected by the different management systems? ii. what is the impact of tillage on various soil indicators iii. how does soil texture affect soil health indicators? iv. what are the impacts of interactions between management systems, tillage and soil texture on the measured soil indicators. We have started answering a number of these crucial questions which will help us provide better interpretations and recommendation to growers in the region. We hope to continue to maintain and expand our database so that additional mechanistic questions can be answered in the future.

**Additional Funding for Soil Health Activities:**

Fortunately, our NE-SARE and NYFVI soil health funded projects are continuing for another year (Dec. 31, 2008 and Sept. 30, 2008, respectively). In addition, we also have funding from the NNY and FFF hatch projects. However, additional new funding will be needed in order for our team to continue its leadership in research and outreach on soil health issues.

Our major objectives for soil health project in the next year are:

- 1) To expand our soil health database by sampling more fields in the Northeast region
- 2) Continue to query our database to explain some important soil management questions that can help fine-tune our soil health interpretations
- 3) Establish a web-accessible database of regional soil health data and develop software as well as a web-based user interface for determination of an optimum set of soil measurements and interpretation.
- 4) Increase soil health literacy among growers and agricultural support professionals, including familiarity with quantitative assessments