Welcome to the 2015 Cornell Soil Health Train the Trainer Workshop! We designed this intensive training workshop to help you get an in depth understanding of what soil health is, how it can be measured and monitored over time, and how soil health can be improved through holistic, adaptive, and data-driven soil management.

Activities will include a mix of classroom training, hands-on field and laboratory experiences, and opportunities to network with national and international colleagues over meals and breaks. You will learn about soil health principles, analysis, reporting, interpretation, and management from experts.

SOME NOTES ON LOGISTICS:

When you arrive on Wednesday morning, we will provide you with a welcome packet that includes this information. Supplemental materials will be available on the Cornell Soil Health Website (http://soilhealth.cals.cornell.edu/), and will include webinar’s and pdfs of the presentations, additional reading materials and some of our team’s more recent work.

Some parts of the training, particularly Saturday morning and early afternoon, will be held outdoors, rain or shine. August weather in our area is generally warm, sometimes cool in the morning, hot in the afternoon. We recommend that you come prepared with layers for temperature changes (50 – 95°F), appropriate footwear for the field and for the lab (no open-toed footwear in the lab), and protection from sun or rain.

Breakfast and Lunch and an afternoon snack are provided daily. There will be a networking dinner provided on Wednesday. We will also have coffee, tea and light refreshments available during the breaks. You may want to bring your travel mug to take coffee/tea on the road for the field trip and for various beverage refills during breaks.

If you have the additional time, you may want to read the Cornell Soil Health Assessment Training Manual (http://soilhealth.cals.cornell.edu/extension/manual.htm) and Building Soils for Better Crops (or the first few chapters anyway) (http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition), so that you can come with questions – links to these can also be found in the Resources section at the end of this packet.

We look forward to meeting you! We hope that the training will surpass your expectations and prove useful to you for many years.

Sincerely,

Aaron Ristow and the Cornell Soil Health Team
2015 CORNELL SOIL HEALTH TRAIN-THE-TRAINER WORKSHOP
AUGUST 5-8, 2015 • ITHACA, NY

Schedule Overview

DAY 1, Wednesday 8/5: Soil Health Basics, Assessment and Management – 8am to 5pm; Dinner – 6pm
Lecture, demonstration and discussion. Participants will spend the day learning about soil health and how the essential physical, biological and chemical soil processes interact: What is soil health, why does it matter, how do we measure it, what does assessing soil health tell us about soil health status, and how can data-driven, targeted management be used to address constraints and maintain soil health? There will be a networking dinner in the evening on the Cornell Campus.

DAY 2, Thursday 8/6: Soil Health Laboratory Practicum – 8 am to 5pm
Rotating stations for demonstration and discussion. Participants will get an in-depth look at the methods and equipment we use to measure soil health indicators. There will be a lab tour with demonstration of all the measurements and opportunities for hands-on lab experience with a selection of indicators.

DAY 3, Friday 8/7: Bringing It All Together – 7:30am to 5:00pm
Case studies, interpretation and planning in small groups. How do you adjust and implement management once you have soil health test information? Lectures, farmer panel, case studies and discussion on management frameworks and opportunities being developed will be combined with interactive group work to learn the process of Soil Health Management Planning.

DAY 4, Saturday 8/8: Soil Health Applications Field Trip (optional) – 8am to 2pm
Field trip to research farm. We will head out for a day in the field to observe soil health contrasts, view farm equipment, implemented practices and their effects, and discuss soil health management options with researchers, Ag service professionals and growers.
## Schedule

### Day 1: Soil Health Basics, Assessment, and Management. 8/5, 8 am - 5:00 pm.

**Networking Dinner: 6pm-8pm**

**Location and time:** Activities will be based out of B25 Warren Hall, with breakfast, lunch and breaks in 401 Warren. Networking Dinner will be at the Big Red Barn on the Cornell Campus.

**Information about the day:** dress for class room

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Instructor</th>
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</thead>
<tbody>
<tr>
<td>8:00 am</td>
<td>Breakfast on campus</td>
<td>401 Warren</td>
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<tr>
<td>9:00 am</td>
<td>Registration, receive workshop materials</td>
<td>401 Warren</td>
<td>Harold vanEs</td>
</tr>
<tr>
<td>9:30 am</td>
<td>Welcome and Introduction to Cornell Soil Health Program</td>
<td>B25 Warren</td>
<td>Bianca Moebius-Clune</td>
</tr>
<tr>
<td>9:45 am</td>
<td>Soil Health in agroecosystems: understanding essential physical, biological, and chemical soil processes and how they interact</td>
<td>B25 Warren</td>
<td>Dan Moebius-Clune</td>
</tr>
<tr>
<td>11:15 am</td>
<td>Break</td>
<td>401 Warren</td>
<td></td>
</tr>
<tr>
<td>11:30 am</td>
<td>Introduction to the Soil Health Assessment Framework</td>
<td>B25 Warren</td>
<td>Bianca Moebius-Clune</td>
</tr>
<tr>
<td>12:15 pm</td>
<td>Lunch</td>
<td>401 Warren</td>
<td></td>
</tr>
<tr>
<td>1:00 pm</td>
<td>Management: dos and don’ts of the Soil Health Management Toolbox Part 1:</td>
<td>B25 Warren</td>
<td>Jeff Liebert/Emily Reiss</td>
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<tr>
<td></td>
<td>- Exploring cover crops</td>
<td></td>
<td>Dan Towery</td>
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<tr>
<td></td>
<td>- Cover crops for managing soil health constraints</td>
<td></td>
<td>Bob Schindelbeck</td>
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<td></td>
<td>- Managing soil physical properties with tillage technologies</td>
<td></td>
<td>Dan Moebius-Clune</td>
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<tr>
<td></td>
<td>- Management of soil biota: disease, inoculants, and symbionts</td>
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<tr>
<td>3:15 pm</td>
<td>Break</td>
<td>401 Warren</td>
<td></td>
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<tr>
<td></td>
<td>- Soil Health for Rangelands</td>
<td></td>
<td>Dan Towery</td>
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<tr>
<td></td>
<td>- The Indiana Conservation Cropping System Initiative</td>
<td></td>
<td>Nina Bassuk</td>
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<tr>
<td></td>
<td>- Soil Health in Perennial Systems</td>
<td></td>
<td>Harold vanEs</td>
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<tr>
<td></td>
<td>- Soil Health in a broader Context</td>
<td></td>
<td>Bianca Moebius-Clune</td>
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<tr>
<td></td>
<td>- Introducing the NRCS Soil Health Division</td>
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<tr>
<td>4:45 – 5:00</td>
<td>Q and A; Adjourn</td>
<td>B25 Warren</td>
<td>Aaron Ristow</td>
</tr>
<tr>
<td>6:00 pm</td>
<td>Networking Dinner on Campus at the Big Red Barn</td>
<td>Big Red Barn</td>
<td></td>
</tr>
</tbody>
</table>
Day 2: Cornell Soil Health Laboratory Practicum. 8/6, 8 am - 5 pm.

**Location and time:** Activities will be based out of Warren, Bradfield and Emerson Hall, with use of several rooms in Bradfield for hands-on activities.

**Information about the day:** Dress for class room and lab, hands-on soil/plant experiences

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</thead>
<tbody>
<tr>
<td>8:00 am</td>
<td>Breakfast in 401 Warren</td>
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<tr>
<td>8:30 am</td>
<td>Group Presentation on Sample Intake – 101 Bradfield</td>
</tr>
<tr>
<td>8:45 am</td>
<td>Stations – Rotate through lab demos; 5 groups, 40 min per station – Bradfield Hall</td>
</tr>
<tr>
<td>9:00 am</td>
<td>Proc. &amp; Text.</td>
</tr>
<tr>
<td>9:15 am</td>
<td>Cover Crop</td>
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<tr>
<td>9:40 am</td>
<td>Ag Stability</td>
</tr>
<tr>
<td>10:00 am</td>
<td>Res. / Protein</td>
</tr>
<tr>
<td>10:15 am</td>
<td>Proc. &amp; Text.</td>
</tr>
<tr>
<td>11:00 am</td>
<td>Break in 135 Bradfield</td>
</tr>
<tr>
<td>11:20 am</td>
<td>Proc. &amp; Text.</td>
</tr>
<tr>
<td>12:00 pm</td>
<td>Lunch in 401 Warren</td>
</tr>
<tr>
<td>1:00 pm</td>
<td>Root Bioassay</td>
</tr>
<tr>
<td>1:15 pm</td>
<td>Soil Health Tests</td>
</tr>
<tr>
<td>1:40 pm</td>
<td>ICP/OM</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Break in 135 Bradfield</td>
</tr>
<tr>
<td>3:00 pm</td>
<td>Cover Crop</td>
</tr>
<tr>
<td>3:15 pm</td>
<td>Root Bioassay</td>
</tr>
<tr>
<td>3:40 pm</td>
<td>Soil Health Tests</td>
</tr>
<tr>
<td>4:20 pm</td>
<td>All groups Q and A – 101 Bradfield</td>
</tr>
<tr>
<td>5:00 pm</td>
<td>Adjourn</td>
</tr>
</tbody>
</table>

**Dinner on your own**

**Station Rotation Key:**

<table>
<thead>
<tr>
<th>Session</th>
<th>Room</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Procedures and Soil Texture Reading</td>
<td>G01 Bradfield</td>
<td>Jaimie Potter</td>
</tr>
<tr>
<td>Aggregate Stability Demo</td>
<td>G01 Bradfield</td>
<td>Bob Schindelbeck</td>
</tr>
<tr>
<td>Soil Respiration and Protein Analysis</td>
<td>822 Bradfield</td>
<td>Dan Moebius-Clune</td>
</tr>
<tr>
<td>Available Water Capacity and Active Carbon Demo</td>
<td>1003 Bradfield</td>
<td>Joseph Amsili</td>
</tr>
<tr>
<td>Bean Root Bioassay Demo</td>
<td>Purple Greenhouse</td>
<td>Kirsten Kurtz</td>
</tr>
<tr>
<td>ICP/OM Demo</td>
<td>823 Bradfield</td>
<td>Mike Rutzke</td>
</tr>
<tr>
<td>Cover Crop Demo and discussion</td>
<td>102 Bradfield</td>
<td>Emily R., Jeff L., Kathy H.</td>
</tr>
<tr>
<td>Other methods of Soil Health Testing in the U.S.</td>
<td>110 Bradfield</td>
<td>Harold vanEs, Bianca Moebius-Clune</td>
</tr>
</tbody>
</table>
Day 3: Soil Health Management Planning and Implementation Frontiers 8/7, 7:30 am - 5:00 pm

**Location and time:** Activities will be based out of Warren and Emerson Halls, and the Ag Quad on Campus

**Information about the day:** Although there will be activities in the afternoon in the classroom, you should dress for the outdoors for the morning activities as we hope to be outside. August weather in our area is generally warm, sometimes cool in the morning, hot in the afternoon – in other words – a lot can change! We recommend that you come prepared with layers for temperature changes, and for sun or rain (sunscreen, hat, sunglasses, raincoat, umbrella…)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30am</td>
<td>Breakfast</td>
<td>401 Warren</td>
<td></td>
</tr>
<tr>
<td>8:15 am</td>
<td>Soil Health Management Toolbox Part 3: Soil Health Assessment, Planning and Implementation Separate into 2 groups:</td>
<td></td>
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<tr>
<td></td>
<td>Group 1 - Perennial Systems</td>
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<tr>
<td></td>
<td>Group 2 - Outreach and Demonstration Tools for Agricultural Systems</td>
<td></td>
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<tr>
<td>8:30 am</td>
<td>Group 1: – Ag Quad tour of Soil Health in perennial systems</td>
<td>Ag Quad</td>
<td>Nina Bassuk/Miles Schwartz Sax</td>
</tr>
<tr>
<td></td>
<td>▪ Soil Health for Urban Landscapes</td>
<td></td>
<td>Chuck Sherzi</td>
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<tr>
<td></td>
<td>▪ Alleviating compaction with the Airspade and Auger</td>
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</tr>
<tr>
<td></td>
<td>Group 2 – Soil Health Outreach and Demonstration Tools</td>
<td>Emerson Patio</td>
<td>Paul Salon/ Bob S.</td>
</tr>
<tr>
<td></td>
<td>▪ Soil Stability/Hardness Tests</td>
<td></td>
<td>Bob Schindelbeck</td>
</tr>
<tr>
<td></td>
<td>▪ The Cornell Soil Health Dripper</td>
<td>Emerson Patio</td>
<td>Paul Salon/ Aaron R.</td>
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<tr>
<td></td>
<td>▪ NRCS/NYS Ag and Markets Runoff Demonstration</td>
<td>Emerson Patio</td>
<td>Harold vanEs</td>
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<tr>
<td></td>
<td>▪ Soil Water Holding Capacity Demonstration</td>
<td>Emerson 135</td>
<td>Dorn Cox</td>
</tr>
<tr>
<td></td>
<td>▪ Soil Health Online Application</td>
<td>Emerson Patio</td>
<td></td>
</tr>
<tr>
<td>10:45 am</td>
<td>Break</td>
<td>401 Warren</td>
<td></td>
</tr>
<tr>
<td>11:00 am</td>
<td>Producer Panel discussion on Soil Health Management</td>
<td>B25 Warren</td>
<td>Dan Towery</td>
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<tr>
<td>12:00 pm</td>
<td>Lunch</td>
<td>401 Warren</td>
<td></td>
</tr>
<tr>
<td>1:00 pm</td>
<td><strong>(ELLS Students Meet Separately with Grower Panelists)</strong> Putting it all together – Interpreting the Cornell Assessment numbers and creating management plans</td>
<td>(101 Bradfield)</td>
<td>(Fatma Rekik)</td>
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<td></td>
<td>B25 Warren</td>
<td></td>
<td>Bianca Moebius-Clune</td>
</tr>
<tr>
<td>1:45 pm</td>
<td>Soil Health Management Planning Scenarios Separate into 6 groups:</td>
<td>B25 Warren</td>
<td>Bianca Moebius-Clune</td>
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<tr>
<td></td>
<td>▪ Case Study 1 – Conventional Vegetables</td>
<td></td>
<td>Kirsten Kurtz</td>
</tr>
<tr>
<td></td>
<td>▪ Case Study 2 – Urban Garden</td>
<td>B25 Warren</td>
<td>Nina Bassuk/Miles S.</td>
</tr>
<tr>
<td></td>
<td>▪ Case Study 3 – Conventional (cash) Grain</td>
<td>B75 Warren</td>
<td>Aaron Ristow</td>
</tr>
<tr>
<td></td>
<td>▪ Case Study 4 – Rice-Wheat in India</td>
<td>B50 Warren</td>
<td>Dan Moebius-Clune</td>
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<tr>
<td></td>
<td>▪ Case Study 5 – Organic Dairy</td>
<td>B02 Warren</td>
<td>Bianca Moebius-Clune</td>
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<tr>
<td></td>
<td>▪ Case Study 6 – U-pick Berries and Apples</td>
<td>401 Warren</td>
<td>Bob Schindelbeck</td>
</tr>
<tr>
<td>2:45 pm</td>
<td>Break</td>
<td>401 Warren</td>
<td></td>
</tr>
<tr>
<td>3:00 pm</td>
<td>Presentation of Groups’ Soil Health Management Plans</td>
<td>B25 Warren</td>
<td>All</td>
</tr>
<tr>
<td>4:45-5:00</td>
<td>Q and A and Adjourn</td>
<td>B25 Warren</td>
<td>Aaron Ristow</td>
</tr>
</tbody>
</table>

*Dinner on your own*
Day 4: Soil Health Applications Field Trip.  8/8, 8 am - 2 pm.

**Location and time:** Starts in 135 Emerson Hall. Vans depart at 8:30 am, and return to campus by 2pm. Please be sure to meet us at 135 Emerson promptly at 8 am so that we can be on the road on time.

**Information about the day:** Dress for the field! August weather in our area is generally warm, sometimes cool in the morning, hot in the afternoon – in other words – a lot can change! We recommend that you come prepared with layers for temperature changes, and for sun or rain (sunscreen, hat, sunglasses, raincoat, umbrella...). Vans will come prepared with lunch and drinks. Bring your travel mug to take coffee/tea on the road from breakfast!

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 am</td>
<td><strong>Breakfast on Campus – New location!</strong></td>
<td>135 Emerson</td>
<td></td>
</tr>
<tr>
<td>8:30 am</td>
<td>Follow up and Orientation for the Day</td>
<td>135 Emerson</td>
<td>Aaron Ristow</td>
</tr>
<tr>
<td>8:45 am</td>
<td>Separate into groups and depart to farm in vans</td>
<td>Tower Road</td>
<td>Aaron Ristow Bob Schindelbeck Dan Moebius-Clune</td>
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<tr>
<td></td>
<td>- South end of Bradfield Hall</td>
<td></td>
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<tr>
<td>9:45 am</td>
<td>The Cornell Musgrave Research Farm</td>
<td></td>
<td>Harold vanEs Bianca Moebius-Clune Bob Schindel Beck Aaron Ristow</td>
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<tr>
<td></td>
<td>▪ Farm Orientation</td>
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<td></td>
<td>▪ Soil Health Test Sampling Demo</td>
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<td></td>
<td>▪ Tillage and Cover Crop Demo</td>
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<td></td>
<td>▪ Adapt-N Integrating Soil Health Dynamics into N</td>
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<tr>
<td></td>
<td>Management</td>
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<tr>
<td></td>
<td>▪ Soil Health Farm Equipment</td>
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<td></td>
<td>▪ 3-way No-till Seeder</td>
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<td></td>
<td>▪ Cover Crops in Alternative Systems</td>
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<tr>
<td>11:50 am</td>
<td><strong>Boxed Lunch</strong></td>
<td>Farmstead</td>
<td>Bob S. / Harold Chris Pelzer Bob S. / Harold</td>
</tr>
<tr>
<td>12:15 pm</td>
<td>Musgrave Research Farm tour continued</td>
<td>Field H</td>
<td>Bob S. / Harold Bob S. / Harold</td>
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<tr>
<td></td>
<td>▪ Roller/Crimper Plots</td>
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<td></td>
<td>▪ Closing Remarks</td>
<td></td>
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<tr>
<td>1:00 pm</td>
<td>Board busses and depart for return to Cornell</td>
<td>Farmstead</td>
<td>Aaron Ristow Bob Schindel Beck Dan Moebius-Clune</td>
</tr>
<tr>
<td></td>
<td>Campus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00 pm</td>
<td><strong>Arrive to campus and adjourn</strong></td>
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</tbody>
</table>
2015 CORNELL SOIL HEALTH TRAIN-THE-TRAINER WORKSHOP
AUGUST 5-8, 2015 • ITHACA, NY

Speakers

Bianca Moebius-Clune
Director, Bianca.Moebius-Clune@wdc.usda.gov
Soil Health Division, USDA-Natural Resources Conservation Service

Dr. Bianca Moebius-Clune now directs the new NRCS Soil Health Division that is being stood up to incentivize and facilitate producers in implementing science-based, effective, economically viable soil health management systems on the nation’s diverse agricultural lands, in collaboration with partner organizations. Key goals of the Soil Health Division include providing advanced training to diverse audiences, and facilitating soil health assessment, farm/ranch scale soil health management planning adapted to local conditions, and assistance for on-the-ground implementation of soil health management systems. Bianca came to the agency from the Soil and Crop Sciences Section at Cornell University, where she served on the faculty as a Senior Extension Associate and Lecturer with research and extension responsibilities in soil health assessment and management and in weather-based precision nitrogen management. She also taught a class in Sustainable Soil Management. She has authored numerous peer-reviewed and extension publications, and provides workshops and trainings nationally and internationally. She co-authored the Cornell Soil Health Assessment Training Manual that is now widely used by growers and agricultural service providers in the Northeastern United States and elsewhere. She also co-authored the books Soil! Get the Inside Scoop and chapters in Know Soil, Know Life to increase the public’s appreciation for soils. Bianca has conducted research on agricultural management impacts on soil health and N dynamics in the Northeast and Midwest, as well as in Kenya, and has developed a new framework for Soil Health Management Planning. She holds PhD and Masters degrees from Cornell University and a Bachelor of Science from University of New Hampshire, all in soil science.

Harold van Es
Professor of Soil and Water Management, hmv1@cornell.edu
Soil and Crop Sciences Section at Cornell University

Harold van Es is a Professor of Soil and Water Management and former Chair of the Soil and Crop Sciences Section at Cornell University. He received degrees from the University of Amsterdam, Iowa State University and North Carolina State University. He works on approaches to precision soil management, with current emphases on a holistic soil health management framework, and a computational tool for precision nitrogen management (Adapt-N) that was recently commercialized. He has published over 110 peer reviewed papers and chapters, co-authored a widely-read book on sustainable soil management (Building Soils for Better Crops), developed numerous extension articles and videos, and advised 45 graduate students. He teaches an undergraduate course in Soil Management for Sustainability, and a graduate course in Space-Time Statistics. He is the President-Elect and a Fellow of the Soil Science Society of America, and also a Fellow of the American Society of Agronomy.
2015 CORNELL SOIL HEALTH TRAIN-THE-TRAINER WORKSHOP
AUGUST 5-8, 2015 • ITHACA, NY

Dan Moebius-Clune
Postdoctoral Associate, djc74@cornell.edu
Soil and Crop Sciences Section at Cornell University
Visiting Scientist, Sustainable Agricultural Systems Lab, Beltsville Agricultural Research Center, USDA-ARS

Dr. Dan Moebius-Clune is a biologist specializing in soil biology and the biology of plant-microbe interactions, and a member of the Cornell Soil Health Team. He earned his M.S. from Cornell in the Department of Crop and Soil Sciences, working on adapting methods to quantify the size, activity, and diversity of soil microbial communities in different tillage systems, and on the relationship between soil protein content, aggregate stability, and soil health. He then earned his Ph.D. from Cornell in the Department of Plant Pathology and Plant-Microbe Biology, where he explored the field community diversity and distribution of arbuscular mycorrhizal fungi (Glomeromycota) in corn fields, and the transfer of carbon and nutrients between grass and legume root systems through common mycorrhizal networks. Following this work, he returned to the Crop and Soil Sciences department as a postdoctoral associate, where he spearheaded the incorporation of soil protein and soil respiration measurements into the Cornell Soil Health Assessment, and the restructuring of soil health assessment reporting, as well as development of prescription maps for replicated on farm adaptive N management trials. He is currently in the Washington, D.C. area, working on soil biology related projects with several organizations.

Bob Schindelbeck
Extension Associate, rrs3@cornell.edu
Soil and Crop Sciences Section at Cornell University

Bob Schindelbeck is an Extension Associate in the Department of Crop and Soil Science with responsibilities in research, teaching and extension. Bob coordinates the Cornell Soil Health Laboratory operations and development. Bob has been part of the Cornell Soil Health Team’s development of soil management strategies to address laboratory-measured soil constraints. He has produced numerous peer reviewed and extension articles and has delivered over 200 presentations related to tillage, soil compaction and soil quality at farmer twilight meetings and professional conferences. These Extension presentations feature combining the comprehensive soil health testing results with generalized soil management options to allow for farmer- and field- specific adaptive management strategies to be developed for sustainable soil management. Bob has produced and given hands-on soils workshops and workshop modules to soil professionals, crop consultants and Extension personnel where attendees can cross-train with other professionals. Bob has developed and presented modules on soil physical processes and soil health assessment to various Cornell graduate and undergraduate classes in Crop and Soil Sciences, Horticulture and Agricultural Sciences. Field and laboratory exercises demonstrate the utility of the Cornell Soil Health laboratory assessments to quantify soil parameters. Students learn of the interactive nature of soil processes towards developing a holistic agroecosystem management strategy.
Aaron Ristow

Extension Associate, ajr229@cornell.edu

Soil and Crop Sciences Section at Cornell University

Aaron Ristow is an Extension Associate in the Soil and Crop Sciences Section. He joined the Cornell Soil Health Team in January of 2015 to coordinate research and extension activities, and a number of projects related to the Adapt-N Precision Nitrogen Management Tool. Aaron was a Peace Corps volunteer in Bolivia where he saw the effects that severe soil degradation can have on both soil productivity and the environment. At U.C. Davis he received his Masters degree in both Soil Biogeochemistry and International Agricultural Development while conducting research on agricultural management impacts on water quality. In New York State he worked with the Upper Susquehanna Coalition to prioritize watershed goals and plan and implement Agricultural Best Management Practices. He played a key role in coordinating and planning the Ag portion to the State’s Watershed Implementation Plans both in 2010 and 2012 and served as an advisor on numerous Agricultural related committees of the Chesapeake Bay Program. Aaron is currently coordinating the development of the Cornell Soil Health program which includes expanding the testing services of the lab, enhancing the utility of our Comprehensive Assessment of Soil Health for use on a national scale, and collaborating for the development of a standardized Soil Health Assessment Framework. He has published a number of extension articles in addition to planning, coordinating, and presenting at workshops and trainings at the local, state and regional levels.

Nina Bassuk

Professor and Program Leader, nlb2@cornell.edu

Urban Horticulture Institute at Cornell University

Nina Bassuk has been a professor and program leader of the Urban Horticulture Institute at Cornell University for the past 35 years. She is a member of the Board of Directors of the New York State Urban Forestry Council and is co-author of “Trees in the Urban Landscape”, a text for landscape architects and horticultural practitioners on establishing trees in disturbed and urban landscapes. In addition, Dr. Bassuk has authored over 100 papers on the physiological problems of plants growing in urban environments, including improved plant selections for difficult sites, soil modification including the development of ‘CU-Structural Soil’ and improved transplanting technology. She works closely with municipalities to help implement best practices in urban forestry management and developed the Student Weekend Arborist Team to inventory public trees in communities in NY State. Nina co-teaches a course at Cornell University titled “Creating the Urban Eden”, which integrates the woody plant identification and use with landscape establishment techniques for difficult urban sites. She is a frequent invited speaker at national conferences and workshops and recently received the Alex Shigo Award for Excellence in Arboricultural Education from the International Society of Arboriculture.
2015 CORNELL SOIL HEALTH TRAIN-THE-TRAINER WORKSHOP
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Diane Stott

National Soil Health Specialist, diane.stott@in.usda.gov

Soil Health Division, USDA-Natural Resources Conservation Service

Diane Stott is the National Soil Health Specialist with the newly formed Soil Health Division, joining at the end of 2014. She received a B.S. and M.S. in Microbiology from Oregon State University and a Ph.D. in Soil Science from the University of California, Riverside. Before joining NRCS she was a Research Soil Scientist with the USDA Agricultural Research Service, with 30 years at the National Soil Erosion Research Laboratory located on the campus of Purdue University, where she is also an Adjunct Professor of Soil Science in the Agronomy Department. Her areas of research over four decades have touched on several areas such as crop residues: decomposition, and overwintering and tillage losses, with much of that work included in RUSLE 2, WEPP and WEPS; carbon cycling, greenhouse gas emissions and soil health in Midwestern cropping systems; soil microbial metabolic activity; CEAP cropland soil health assessments; and adapting and expanding the Soil Management Assessment Framework (SMAF). She has had research projects in crop, forest and rangeland ecosystems in a number of different states as well as Brazil, Kenya and South Africa.

Chuck Sherzi, Jr.

Owner and Principal, cscherzi@comcast.net

Sherzi & Company, LLC

Chuck Sherzi, Jr. is a horticulturist at Sherzi & Company, LLC which is a fine garden maintenance and estate management business co-owned and operated with his wife, Karen. Chuck is an avid believer in soil health and utilizes a selection of sampling tools and a range of diagnostic field indicators to assess soil in the urban landscape.

Chuck holds a B.S in Plant and Soil Science from the University of Massachusetts, Amherst and an A.S. in Horticulture from Massachusetts Bay Community College, Wellesley. He is an International Society of Arboriculture (ISA) certified arborist, Massachusetts Certified Arborist, Massachusetts Certified Horticulturist, and is accredited by the Northeast Organic Farming Association (NOFA). Chuck served as an instructor of professional practice at the Landscape Institute, Arnold Arboretum of Harvard University (2005-09), developing and teaching the soils curriculum, as well as a series of landscape cultural practices workshops.
Dan Towery

Founder, dan@agconservationsolutions.com

Ag Conservation Solutions LLC

Dan Towery operates Ag Conservation Solutions in Lafayette, Indiana which specializes in continuous no-till, cover crops, and soil health. His focus is on the “how and why” a healthy soil becomes more resilient over time and can be the most profitable production system while also improving the environment. He has been assisting growers and making presentations on this subject on behalf of numerous clients (Soil Health Partnership, Illinois Council on Best Management Practices, CTIC, American Farmland Trust, Oregon Ryegrass Growers Commission, Indiana Conservation Cropping System Initiative, and others) in the Midwest.

Kirsten Kurtz

Soil Health Lab Operations Manager, ksk64@cornell.edu

Soil Health Laboratory at Cornell University

Kirsten Kurtz is the Operations Manager for the Cornell Soil Health Lab with responsibilities in lab management, research, teaching and outreach. She has more than four years of experience working with Soil Health Assessments. Before joining the Lab, Kirsten worked extensively with various prestigious Finger Lakes wineries and vineyards, accumulating valuable agricultural and scientific knowledge. Kirsten also gained a very wide range of hands-on experience co-owning and managing a small-scale organic farm selling garlic and small fruits commercially. She is pursuing advanced studies in soil health, continuing her strong passion for and studies of sustainable agriculture, soil health, physical properties of soil and viticulture. Kirsten is also an artist. Part of her work focuses on creating paintings with soil, bringing her love of art and soil science together.
Jeff Liebert
Graduate Student, jal485@cornell.edu
Sustainable Cropping Systems Lab at Cornell University

Jeff Liebert completed his BSc at the University of British Columbia (UBC) in the Global Resource Systems program, specializing in soil science and food systems. While attending UBC, he helped design and build numerous school and community gardens in Vancouver, BC. Jeff also worked at the 24-hectare organically-managed UBC Farm where he developed perennial crop nutrient management protocols, oversaw the Community-Supported Agriculture (CSA) program, and assisted with rotationally-grazed, integrated livestock research. At Cornell University, Jeff is working on multiple projects for his MSc in Agroecology: (1) performance of cover crop-based, organic, rotational no-till tofu soybean production; (2) trade-offs between forage quality and yield for winter cereals grown as forage in double cropping systems; and (3) winter cereal thermal models to predict phenology and biomass for enhanced cover crop management. While much of this work includes mechanistic components to better understand the ecological underpinnings of a particular management practice, all of this research has distinctly applied objectives that aim to support grain farmers and dairy producers in the Northeast and Mid-Atlantic regions of the US.

Emily Reiss
Graduate Student, err76@cornell.edu
Section of Horticulture, School of Integrative Plant Science at Cornell University

Emily Reiss received her B.S. in Environmental Science from the University of Rochester in 2008. She recently completed her M.S. in Horticulture from Cornell University on her way to her PhD looking at cover crop diversity and the impact on important management functions like weed suppression and nitrogen fixation. Emily grew up in the Garden State of New Jersey and with a detour in energy efficiency work, returned to the application of ecological thinking to agricultural systems.
Kathy Howard
Teaching Support Specialist, Kch3@cornell.edu
Soil and Crop Sciences Section at Cornell University

Kathy graduated with a B.S. from Cornell University, and has worked for the Soil and Crop Sciences section for over 30 years as Teaching Support. In the summer months, she maintains two gardens - one is the Weed and Poisonous Plant garden and the second is the Crops of the World garden, both used in Cornell teaching programs.

Miles Schwartz Sax
Ph.D. Candidate, MS2785@cornell.edu
Section of Horticulture, School of Integrative Plant Science at Cornell University

Miles Schwartz Sax is a Ph.D. candidate in the section of Horticulture working with Dr. Nina Bassuk. Before starting his doctoral studies, he completed his Masters degree at Cornell in 2014. His Masters research involved the Soil Health Test to study urban soil remediation and tree stress physiology in the human-impacted environment. He is a member of the Urban Horticulture Institute, which focuses on landscape management and urban forestry. Miles has a background performing research in botanical gardens in North America and South Africa. Of particular interest, he has worked at the Morton Arboretum Soil Science laboratory led by urban soil scientist Dr. Bryant Scharenbroch.
Paul Salon

State Plant Materials Specialist, paul.salon@ny.usda.gov

Plant Materials Center, USDA-NRCS New York

Paul Salon, Ph.D. has worked for the USDA-Natural Resources Conservation Service (NRCS) since 1978. Paul has worked as a Soil Conservationist and District Conservationist at field offices in New York State for nine years planning and implementing conservation practices with farmers and other landowners. Since 1987 Paul has worked as a Research Agronomist at the USDA-NRCS Big Flats Plant Materials Center a 200 acre research facility. As a Research Agronomist he has conducted research developing plants and methodology to utilize plants to solve conservation problems. Paul has worked on the establishment and management of cover crops since 1987. He received two Sustainable Agriculture Research and Education Grants for work on the establishment and utilization of a native grass, eastern gamagrass, for forage production; and for the development of a cover cropping system for silage corn production which included the management and interactions of the crop, weeds and cover crops with herbicides. This project was evaluated for soil health and soil biology by the Cornell soil Health Lab and the NRCS National Soil Survey Lab. Paul initiated and collaborated with the National Soil Survey Lab and USDA-ARS on a project evaluating the soil biological and physical properties in silage corn systems with and without tillage and fall seeded cover crops in Pennsylvania. He has organized over 10 workshops on cover crops and soil health at the Big Flats Plant Materials Center and on farms. He has written The Guide: To: Conservation Plantings on Critical Areas in the Northeast. Paul received a B.S. degree in Ornamental Horticulture and a Ph.D. in Plant Breeding from Cornell University. He holds a professional certification as a Certified Crop Advisor, Certified Pesticide Applicator and is a member of the American Society of Agronomy, Soil Science Society and the Soil and Water Conservation Society.

Michael Rutzke

Director, mar9@cornell.edu

Cornell University College of Agriculture and Life Sciences Nutrient Analysis Lab

Michael A. Rutzke, Ph.D has a strong interest, natural ability and resources to develop new technologies in the field of analytical chemistry. His research focuses on improving analytical methods in atomic spectroscopy for measuring the concentration of minerals in biological materials. He focuses on developing new technologies, two of which have been patented. The first technology reduced the matrix interferences in an axially viewed plasma. The other technology improved the detection limits in an ICP-AES by three fold by increasing the efficiency of the sample introduction system. These and other technologies he has developed provide researchers in many fields new opportunities to assist them in cutting edge research in agriculture, cell biology, human nutrition, and environmental sciences. He also has a family farm in Ithaca NY where he grows greenhouse tomatoes and other vegetables, processes sap into maple syrup, and collects eggs from free range chickens. He also has two goats used for milk. This farming experience gives him insight into which new methods of analysis need to be developed to improve agricultural practices.
Dorn Cox

Executive Director, dornawcox@gmail.com

GreenStart

Dorn Cox is the director of GreenStart, an educational non-profit organization that fosters a resilient food and energy system in New Hampshire by providing technical education and practical agricultural examples. Dorn is also a farmer working the 250-acre family farm in Lee, NH. He has designed and constructed systems for small-scale grain and oil seeds processing and biofuel production, worked to select effective cover crops, grains and oilseed for food and energy production, and has developed no-till and low-till equipment to reduce energy use and increase soil health in New Hampshire conditions. Dorn is also a founding member of Farm Hack, the New England Farmers’ Union, the Great Bay Grain Cooperative, the Oyster River Biofuel Initiative, and he serves as a Vice President of the New Hampshire Association of Conservation Districts. He has a B.S. from Cornell University and is a PhD candidate at the University of New Hampshire, developing open source agricultural research and development systems to improve farm productivity and resilience.

Joseph Amsili

Laboratory Technician, jpa28@cornell.edu

Cornell University Soil Health Lab

Joseph Amsili graduated from Cornell University with a B.S. in Earth Systems Science and a minor in Soil Science in spring 2013. In fall 2013, he joined the Cornell Soil Health Team as a lab technician. Since joining the lab almost two years ago, Joseph has spent considerable time on each of the various biological and physical tests. His current responsibilities include overseeing the throughput for the microbial respiration, ACE soil protein index, and available water capacity tests. Joseph has enjoyed several opportunities to teach the soil biological and physical tests to a diverse set of audiences. While not in the lab, Joseph spends his time working with the Youth Farm Project, a local non-profit that focuses on empowering youth through vegetable farming.
Jaimie Potter

Laboratory Technician, jlp339@cornell.edu

Soil Health Laboratory at Cornell University

Jaimie Potter received her B.S. in Environmental Engineering at North Carolina State University in 2010. Jaimie began her journey with soils while studying at NCSU where she worked in the Environmental Engineering Laboratory. She was involved with experiments that focused on the development of bioaugmentation media for soil remediation, and continued with those projects after graduation. In 2014, after working in a commercial lab that specialized in soil testing for construction, landscaping, and recreational purposes, Jaimie became a member of the Soil Health team at Cornell University. She focuses on texture and aggregate stability analysis, and is responsible for much of the training, organization, and sample preparation within the Cornell Soil Health Laboratory.

Fatma Rekik

ELLS Summer Course Coordinator, fr235@cornell.edu

Soil and Crop Sciences Section at Cornell University

Fatma is a NSF Fellow starting her first semester of Graduate school this August. She received a bachelors in Agricultural Sciences with a concentration in Soil Sciences from Cornell University in May 2015. She discovered her passion for soils while working in the Cornell Soil Health lab along with the Cornell Soil health team. She has previously worked with the United States Department of Agriculture, NRCS and the Tunisian Ministry of Agriculture. She is currently the coordinator for the summer course "Soil Health in Agricultural and Urban Environments"
**2015 CORNELL SOIL HEALTH TRAIN-THE-TRAINER WORKSHOP**
**AUGUST 5-8, 2015 • ITHACA, NY**

## Producer Panelists

### Klaas Martens

**Farmer, kandmhfarm@sprintmail.com**

Lakeview Organic Grain

Klaas Martens is a partner in Martens Farm and Lakeview Organic Grain, a family farm operation that uses a diverse crop rotations including 1,600 acres of organic corn, soybeans, dry beans, grains, processing vegetables, and cover crops in Penn Yan, NY. Martens uses crops to change the soil and how soil biological processes perform the services that are expected from tillage, as well as targeted tillage. He employs relay cropping to maintain living roots and cover on the soil all year. Martens Farm is an innovator in weed management techniques and machinery, and has improved soil health and function to cycle nutrients, increase water infiltration and availability, and solve weed and disease pest problems. Martens helped to organize New York Certified Organic, a farmer to farmer extension and networking effort. He consults on Cornell University research programs and is on the board of the Organic Farming Research Foundation.

### Jack Algiere

**Director, info@stonebarnscenter.org**

Four Season Farm

Jack oversees the cultivation of over 200 varieties of produce year-round on 6.5 acres of outdoor fields and gardens and in a 22,000 square-foot minimally heated greenhouse as well as the Stone Barns Center for Food and Agriculture’s extensive landscape and compost operations. He experiments continually with innovative growing methods and seed varieties and is integrally involved in training beginning farmers. Jack graduated from the University of Rhode Island with a degree in turf management and horticulture. Before Stone Barns, he worked as a greenhouse manager for a family-owned nursery in Rhode Island, a park ranger in Costa Rica, restored and managed olive orchards in California, and developed an organic CSA program in Connecticut.
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Jason Cuddeback
CCA, Grazing Specialist and Farmer, jcuddeback@cayugaswcd.org

Cayuga County Soil and Water Conservation District

Jason Cuddeback has been working for the Cayuga County Soil & Water Conservation District for 10 years as a Grazing Specialist and is a certified crop advisor for the District, implementing and designing Comprehensive Nutrient Management plans for Cayuga County farmers. Jason has promoted soil health practices for Cayuga County SWCD since 2010, to date there have been $443,070.00 grant funds accumulated to implement cover crops on a total of 3,766 total acres on 12 farms in Cayuga County.

The Cuddeback farm hosted a soil health seminar in August of 2013 with over 150 farmers and agency personal in attendance. The seminar focused on soil health as a whole. In August 2014 a second soil health seminar with 60 farms was held at the Cuddeback farm focusing on the tillage aspect of soil health along with soil chemistry and precision planting tools. The Cuddeback farm will be hosting a third Soil Health seminar in September 2015 that will focus on biological activity, cover crops and the Cornell Comprehensive Assessment of Soil Health. Jason is also a farmer working on his father’s 800 acre family farm in Skaneateles NY. Jason has worked with his father since 1999 to develop and run a no-till corn/soybean operation. More recently the farm has moved into utilizing a zone till system on the corn grain ground. In 2008 the farm moved into a precision planting program to better utilize seed, fertilizer and herbicide/pesticide placement. Tractors, planters and sprayers were all implemented with onboard computers/GPS precision guidance instruments.

Phil Davis

Co-Owner, Grower, pkdavis1952@gmail.com

Damiani Wine Cellars

Armed with years of experience dating back to his childhood, Phil Davis owns and operates Davis Vineyard. Phil shares a remarkable bond with his vineyard, leaving little space left untouched or unknown to him. Since every vine tells a different story, each is worked by hand and cared for on a vine-by-vine basis. As a firm believer that great winemaking comes from great viticultural practices, Phil continues a thoughtful and constant maintenance program to support the vineyard health. From early leaf-pulling – exposing the grapes to more sunlight, to fruit thinning – removing any weak clusters, allowing the energy to be transferred to more desirable fruit, many precautions are taken to allow for the most optimal fruit quality.
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Attendees

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Attendees

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## Attendees

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<thead>
<tr>
<th>Chad Cochrane</th>
<th>Dale Younker</th>
<th>Russell Dresbach</th>
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<tbody>
<tr>
<td>District Conservationist</td>
<td>Soil Conservationist (Soil Health Specialist)</td>
<td>Lab Supervisor</td>
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<td>USDA-NRCS</td>
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<td><a href="mailto:DresbachR@missouri.edu">DresbachR@missouri.edu</a></td>
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Julie Fine  
Graduate Student  
UMass Amherst  
Amherst, Massachusetts  
[jefine@umass.edu](mailto:jefine@umass.edu)
Course Location:
The course will be based in Warren, Bradfield and Emerson Halls on the Campus of Cornell University [http://www.cornell.edu/about/maps/](http://www.cornell.edu/about/maps/) (Tower Rd, Ithaca, New York 14853 USA). Most meals and breaks are in Warren 401 and, in general, class room activities will take place in Room B25 Warren. The Lab Practicum on day 2 will be in Bradfield and there will be a field day at the Musgrave Research Farm in Aurora, NY on the final day of the workshop.

Contacts:

Aaron Ristow, Extension Associate, (607) 745-7165, ajr229@cornell.edu
Jenn Thomas-Murphy, Extension Support Specialist, 607-255-2177, jnt3@cornell.edu

Transportation Options:

**Walking from the Statler and Mews Hall:**
The Statler Hotel is approximately 0.4 miles to Warren Hall. Mews Hall is approximately 0.5 miles with a bit of an uphill walk after a scenic pass over the Triphammer Foot Bridge.

**Bus:**
TCAT Bus Route 81 loops around the Cornell Campus, with stops in front of Mews Hall. Route 82 follows a similar path but ventures out to the East Hill Plaza, the location of the Best Western Hotel. Tower Road is currently closed due to construction so it has been diverted away from Tower Road. We would suggest getting off at the Dairy Bar stop on the corner of Wing Road and Tower Road and walking west towards Bradfield Hall. One advantage to the diversion is that it directs the bus past the Statler Hotel, so there is an option to get on the bus there.
Bus (continued):
If you are downtown or want to get there, Route 10 loops between Cornell University (stop name: Goldwin Smith Hall) and downtown Ithaca (stop name: Seneca @ Commons, located across the street from the Hilton Garden Inn) every 10 min from 7:30 am to 8 pm. After stepping off at Goldwin Smith Hall, walk east on Tower Road for ~10 minutes (~25-30 minutes for the whole trip) until you see Bradfield Hall on your left. There are additional routes that also go to campus. More information at: http://www.tcatbus.com/. (Use the trip planner option for other options).

Taxis:
Additional options: http://www.ithaca.edu/ithacaguide/?action=cat&id=32

Driving to Campus:
There is construction on campus and all lots and parking are at some distance from Warren, Bradfield and Emerson Halls ($1.50/hr). Please allow AT LEAST 15 minutes to walk from parking lots to the building

Parking Information:
Parking on campus: There are information booths at the entrances to the Cornell campus. Inquire at the booth for directions to the lot closest to Bradfield and Emerson Halls. You may also purchase a daily parking permit at the booth. See Cornell’s interactive map at: http://www.cornell.edu/about/maps/ (also, see next page).

1. **Metered parking:** Cost is $1.50/hr See attached map. More information at: https://transportation.fs.cornell.edu:8496/parking/campusparking/visitors/metered.cfm
2. **Parkmobile:** To use this option, download the app ahead of time.
   http://transportation.fs.cornell.edu/parking/campusparking/visitors/parkmobile.cfm.

Parking downtown: available in the parking garage right next to the Hilton Garden Inn and the bus stop on Seneca St. Parking is $1/hr, max of $7/day. Or free on residential streets a short walk away.

Restaurants:
Ithaca proudly has a greater number of restaurants per capita than New York City and is a renowned place for ‘foodies’. Here are some restaurants recommended by workshop speakers:

- **Aladdins Natural Eatery:** 100 Dryden Rd., Ithaca, NY 14850. http://www.aladdinsithaca.com/
- **Luna:** 310 Stewart Ave, Ithaca, NY 14850. http://www.lunastreetfood.com/
- **Agava:** 381 Pine Tree Road, Ithaca, NY 14850. http://www.agavarestaurant.com/
- **Madeline’s Restaurant:** 215 E State St., Ithaca, NY 14850. http://www.madelines-restaurant.com/
- **Mia Restaurant:** 130 E State St., Ithaca, NY 14850. http://www.miaithaca.com/
- **Moosewood Restaurant:** 99 W Seneca St., Ithaca, NY 14850.http://www.moosewoodcooks.com/restaurant/
- **Northstar House:** 202 E Falls St., Ithaca, NY 14850.
  http://www.northstarpub.com/Northstar_House/Welcome_to_Northstar.html
- **Viva Taqueria & Cantina:** 101 N Aurora St., Ithaca, NY 14850. http://www.vivataqueria.com/
- **Taste of Thai:** 216 The Commons, Ithaca NY 14850. http://tasteofthainy.com/
Campus Maps
An interactive Map is available here: http://www.cornell.edu/about/maps/

Major Workshop Locations

Walking from Warren Hall to the Big Red Barn
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Campus Maps

Walking from Mews Hall to Warren Hall

Walking from the Statler Hotel to Warren Hall
Resources

Cornell Soil Health Website and Manual

http://soilhealth.cals.cornell.edu/


Cornell Soil Health Testing: http://soilhealth.cals.cornell.edu/extension/test.htm

Building Better Soils for Better Crops


Crop Rotations on Organic Farms

http://www.sare.org/Learning-Center/Books/Crop-Rotation-on-Organic-Farms

Cover Crop Info

http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition


Cover Crops for Vegetable Growers:

Cover crop selection tool: http://covercrops.cals.cornell.edu/

Cornell Waste Management Institute

Including information on heavy metals testing and management, as well as on composting.
http://cwmi.css.cornell.edu/

Soil Heavy Metal Contaminants Testing factsheets:

- Soil contaminant testing and interpretation: http://cwmi.css.cornell.edu/guidetosoil.pdf
- Management: http://cwmi.css.cornell.edu/Soil_Contaminants.pdf

Pastures for Profit: A Guide to Rotational Grazing


Tillage Equipment Information

NRCS Tillage Equipment Pocket Identification Guide.
Soil History & Culture:

*Dirt the Erosion of Civilizations* (Montgomery, 2007)


*Tales from the Underground: A Natural History of Subterranean Life* (Wolfe, 2002)

http://tinyurl.com/p67sk83

Soil Science Background Reading:


**Soil Classification:** *NRCS Web Soil Survey* to determine soil type and its characteristics and ratings at any location nationwide: [http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm](http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

Soils for Students and Teachers:

