Welcome to the fall 2010 issue of our newsletter, formerly known as the Organic Reduced Tillage Times. We will continue to report on our USDA Organic Research and Education Initiative (OREI) project, Improving Weed and Insect Management in Organic Reduced-Tillage Systems in The ROSE Review.

Our project brings together the largest collaboration of innovative farmers and researchers focused on organic rotational no-till in the Mid-Atlantic region! The Reduced-tillage Organic Systems Experiment was established this summer in PA, MD, and DE and is supported by on-farm research in PA, MD, and NC. Our goal is to develop sustainable reduced-tillage organic grain production systems that integrate pest and soil management practices to overcome constraints associated with high-residue environments. The experiment compares different crop and soil management practices and their impact on yields, pests, energy use, labor, and profitability in corn, soybean, and wheat.

In addition to the outstanding team, regional specificity is one of our greatest strengths. In other parts of the US, organic rotational no-till may not be feasible, particularly in extremely dry or cold regions. Fortunately, this is not the case for the Mid-Atlantic; here we have abundant spring rainfall and large amounts of animal manure that can be used as a soil amendment. Because of the large concentration of dairy and poultry operations in the region, sourcing manure or poultry litter is typically not a problem for organic growers. However, if not carefully managed, manure can pose environmental quality concerns. Integrating cover crops that can “store” nutrients from manure, while adding carbon to the soil are important steps toward protecting water quality.

Photos: 1) upper left, moldboard plowing after liquid dairy manure was applied; 2) upper right, vetch/triticale in ROSE in PA; 3) background- organic corn from the PSU short-season corn trial.
Conducting research at multiple locations will help us provide information on the performance and feasibility of our system under different environmental conditions. One of the three ROSE locations in the Mid-Atlantic is The University of Delaware’s Research and Education Center (UD-REC) in southern DE, near Georgetown. This is the southernmost location for the experiment, with loamy sand soil (~80% sand) and low organic matter (1.3%).

The UD-REC is a 350 acre research farm and houses the Sussex County Cooperative Extension Offices, UD Poultry Diagnostic Laboratory, and state-wide extension programs for Farm Safety, Vegetables, Nutrient Management, Weed Science, and Poultry. The land that hosts the ROSE at the UD-REC will be undergoing a transition to certified organic over the course of the trial, being the first organic certification on UD research farms.

Sussex County is the largest agricultural county in DE. Approximately 170,000 acres of corn, 185,000 acres of soybeans and 70,000 acres of winter wheat were planted in 2009. Double-cropping soybeans or a vegetable crop after winter wheat or barley harvest is normal. No-tillage production is common in DE, particularly in Sussex County with drought-prone soils. Incorporating cover crops for nutrient management has been encouraged and is increasing. Sussex County produces more than 200 million chickens a year, and thus poultry litter will be used to fertilize crops in the ROSE at UD-REC. The UD-REC site will be coordinated by Dr. Mark VanGessel, Quintin Johnson, and Barbara Scott, in addition to the UD-REC farm staff.

The BARC farm operations crew is highly experienced and has been working on sustainable agricultural projects for over twenty years. They are in the process of constructing a poultry litter injector that will be used for side-dressing dry poultry litter through cover crop mulches. They also have an elutriator that separates weed seeds from soil. The elutriator will be used for quantifying weed population dynamics in the ROSE. Due to their proximity, the BARC site will be managed similarly to UD-REC. Taking regional specificity into consideration, both sites will use poultry litter as a fertility amendment. The BARC site will be managed by Drs. Steven Mirsky and Don Weber with support from Ruth Mangum, Chris Felix, and a soon-to-be hired technician.

The Henry A. Wallace, Beltsville Agricultural Research Center (BARC) in Beltsville, MD will host the ROSE on the South Farm of the facility. The soils are Codorus-Hatboro silt loam with slopes varying from 0-1%, and organic matter averaging 1.3%. BARC is the largest and most diversified agricultural research complex in the world. Field facilities at BARC include many acres of conventionally managed experimental fields (entire complex >7,000 acres). Since 2000, there has been a 22-acre certified organic field, which is managed like an organic farm in a 5 year grain/forage crop rotation. In addition, the long-term Farming Systems Project, established in 1996, compares organic and conventional cropping systems. With the initiation of ROSE, an additional 15 acres is being transitioned to organic at this site.
Betsey and Aaron Cooper operate Cutfresh Organics, LLC. This is an organic vegetable and grain farm that operates on a small portion of a 600 acre conventional grain farm (Cutmaptico Farms). Aaron’s father, Clifford Cooper, owns the farm and grows corn, wheat, and soybeans using almost complete no-till practices. The farm is located in Allen, MD in Wicomico County. Their land has been farmed by the Cooper family for over 150 years. Originally, vegetables were grown with some grain, but by the 1970’s only grain was grown. As Aaron worked towards making farming his main livelihood, organic crops were selected as the best value-added venture. After purchasing a mechanical bean picker in 2009, Cutfresh Organics will be rotating string beans and possibly edamame soybeans with field corn and wheat. Soybeans and barley may be rotated as well. (A on map to right)

Located on Maryland’s Eastern Shore in Kent County, Andelot farm consists of 2,980 acres with 1,500 tillable. Crops grown include corn, soybeans, wheat, barley, and hay. The farm, managed by Eddie Taylor, has 400 acres devoted to organic grain production with the remaining 1,100 acres in various forms of conservation tillage and no-till. The farm is located on the Chesapeake Bay with two creeks to the east and west, which gives it some 7 miles of shoreline. Conservation practices such as tree plantings, waterways, buffer strips, cover crops and wildlife plantings are numerous throughout the property. Soil and water stewardship along with sound wildlife management play an important role in the operation of the farm. (B on map below)

Although not directly involved in our project, innovative MD farmer, Bill Mason rolls rye and drills soybean.
**Penn State Update.** On 8/26/10 we collected soil samples from ROSE plots in PA to determine soil fertility, organic matter, pH, and other metrics of soil quality. We archived soil from these “before” samples for future comparisons.

Prior to plowing, plots received liquid dairy manure. On 9/3/10, we seeded hairy vetch ‘Groff Early Cover’ and triticale ‘Trical 815’ in a 50/50 mixture at 60 lbs/a. These plots will be no-till planted to corn next spring.

We irrigated on 9/10/10 because of the drought. On 9/22/10, we seeded ‘Aroostook’ rye by spinning-on 1 bu/a and drilling 2 bu/a to increase uniformity. The vetch/triticale and rye are growing vigorously and look great!

On 10/10/10 we seeded ‘USG 3770’ soft-red wheat at 2 bu/a using a Great Plains grain drill. After being locked out of the fields due to wet soil, and with more rain in the forecast, we were happy to finish this seeding.

**The Climate Corner.** This year was almost the complete opposite of 2009, which was cool and wet. As you can see on the map to the left, more heat units have accumulated than normal (see map on left). On 10/10/10, there were between 200 and 500 more GDD in Centre county Pennsylvania than normal. Check out http://pa-pipe.zedxinc.com/cgi-bin/index.cgi, where you can find information on weather, weed emergence, and insect and disease risk. This is a great IPM tool for those who wish to know when their pests are active.
New students at Penn State

**Clair Keene** is from Bellevue, Nebraska and did her undergraduate work at Iowa State University. She graduated with degrees in Biology and Spanish in December 2008. Before starting at Penn State, Clair worked for the USDA Agricultural Research Service in Ames, Iowa and Pioneer Hi-Bred in Johnston, Iowa. She spent the past year in Las Cruces, New Mexico working as an AmeriCorps volunteer at a domestic violence shelter. Her interest in agriculture was sparked by seeing the effects of farming practices on landscapes and soils in southern Costa Rica and central Iowa. Clair is a PhD student in Agronomy and is advised by Bill Curran. Her research will focus on weed population dynamics and control within the Reduced-Tillage Organic Systems Experiment. Her research interests include cover crops, weed suppression by cover crops, weed-crop competition, and weed population dynamics. Clair looks forward to learning about the challenges of crop production and farm management while getting to know agriculture in central Pennsylvania.

**Thomas R. Huff** received his bachelors in biology from Kutztown University and his masters in biology from East Stroudsburg University. He is now at Penn State University and is a PhD student in entomology, and is advised by Mary Barbercheck. He has always been interested in the biology of the diversity of insects found in Pennsylvania, and feels that examining insects in organic farming systems is an interesting way to study their various ecologies. He is specifically interested in the response above-ground arthropods have to various types of weed suppression techniques, and how management will affect the community composition of both natural enemies and crop pests.

**Short-season corn**—We evaluated 11 varieties this summer in three separate experiments conducted at Rock Springs and Landisville, PA. One of the experiments is in a field that was managed organically since 2005. Varieties ranged from 80 to 95 day maturity and are listed below. Yield results will be presented at our winter meeting.

- Blue River 30A12 – 90 day
- Blue River 19K19 – 84 day
- Blue River 25A16 – 87 day
- Blue River 36K71 – 95 day
- Doebler’s UT333X – 89 day
- Viking O.7292 – 95 day
- Viking O.39-94N – 94 day
- Viking O.89-80N – 80 day
- Masters Choice OG-463 – 83 day
- American organic B916 – 85-87 day
- American organic C912 – 91-93 day
New program handbook packed with useful information. The new guidance and instructions handbook from the USDA National Organic Program has several instruction documents on certification topics including ‘Five Steps to Organic Certification,’ ‘Record Keeping of Certified Organic Operations,’ and ‘Responsibilities of Certified Operations Changing Accredited Certifying Agents.’ Most of the handbook is comprised of guidance documents on organic standards. These guidance documents cover different topics ranging from ‘Processed Animal Manure in Organic Crop Production’ to ‘Approval of Liquid Fertilizers for Use in Organic Production.’ There are also guidance documents on the Access to Pasture final rule (2/17/10), which requires that “ruminant animals derive not less than an average of 30 percent of their dry matter intake (DMI) from pasture during the grazing season (grazed from vegetation rooted in pasture or residual forage).” Helpful guidance documents include ‘Dry Matter Intake Information for Access to Pasture’ and ‘Calculating Dry Matter Intake from Pasture’, tables for determining dry matter demand for cattle.

For more information: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5086323

Introducing an online database that helps users identify pest control products and sources, the Biopesticide and Organic Database for Integrated Pest Management is a new tool from the IR-4 Project (originally the Interregional Research Project No. 4). The database can be searched by region, crop, or pest problem. Information is provided as a guide only and does not constitute a recommendation. Contact Michael Braverman for more information at Braverman@aesop.rutgers.edu or 1-732-932-9575, ext. 4610.

Visit the Biopesticide and Organic database at: http://ir4.rutgers.edu/Biopesticides/LabelDatabase/index.cfm

Mary Barbercheck recently attended a PCO seminar on the pasture rule. Below are the rules that must be followed.

- Grazing season must be at least 120 days.
- Temporary confinement is only allowed for specific management and healthcare.
- Ruminant animals must have year-round access to the outdoors.
- Roughages used as bedding must be organic.
- Operators must keep records of rations fed and a Pasture Management Plan.

See website below for full guidance document from PCO
Daikon radish is known to be extremely competitive against weeds, especially when seeded in late summer. Unlike cover crops that are used in the ROSE (hairy vetch and cereal rye), daikon radish and oats are winter-killed. Radish residue decomposes quickly in the spring and allows soil to warm faster than if a living cover crop were present. Weed suppression has been reported to persist into late spring, which may be a result of the biofumigation effect from the glucosinolates that are produced from this cover crop. Although inter-row cultivation would likely be needed, this system may allow for organic no-till planting early in the spring. This could save fuel and labor in the spring, a season when labor is typically in high demand.