THE ROCK SPRINGS ROTATION

A monthly newsletter from the Organic Cropping Systems Project team

August 2009

Meet the Team

Dave Sandy

Dave has been a Research Technician in the Department of Crop and Soil Sciences since 2006. He joined our RAMP team in February of 2007 and is responsible for the weed data collection and oversees the agronomic management of the project.

Dave's skills are in high demand. Dave splits his time between our project and managing an NEIPM project with Dr. Bill Curran. He is also the lab manager for the weed ecology lab. Prior to joining our team, Dave worked in the Soil Analytical Lab and the Department of Horticulture doing small fruit variety trials and fungicide work.

Dave grew up in Erie, PA. Most people do not know that Dave also has a degree in Anthropology and can play the banjo. Unfortunately, Dave has had little time to play his banjo lately, as most of his free time has been occupied with remodeling his new house. Dave and his wife, Sara Eckert, live near Bellefonte, PA and plan on starting their own vegetable business in the very near future.

Bucky Ziegler

Bucky owns and runs Paradise Valley Organic Farm in Limestoneville, PA. He and his family specialize in growing corn, soybeans, wheat, spelt, and hay, and produce around 200 tons of feed each year.

Bucky has worked hard to establish a successful farming operation. Upon taking over the family farm in 1989, Bucky noticed that his soils were low in organic matter and susceptible to drought. He utilized cover crops and sod to improve soil organic matter content and moisture holding capacity. In 1997, Bucky began transitioning his conventional row-crop operation to organic and by 2000 was producing certified organic crops and poultry. Today, Bucky's operation also includes some beef cows and is a thriving example of diversification and ingenuity.

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Too much of a good thing?

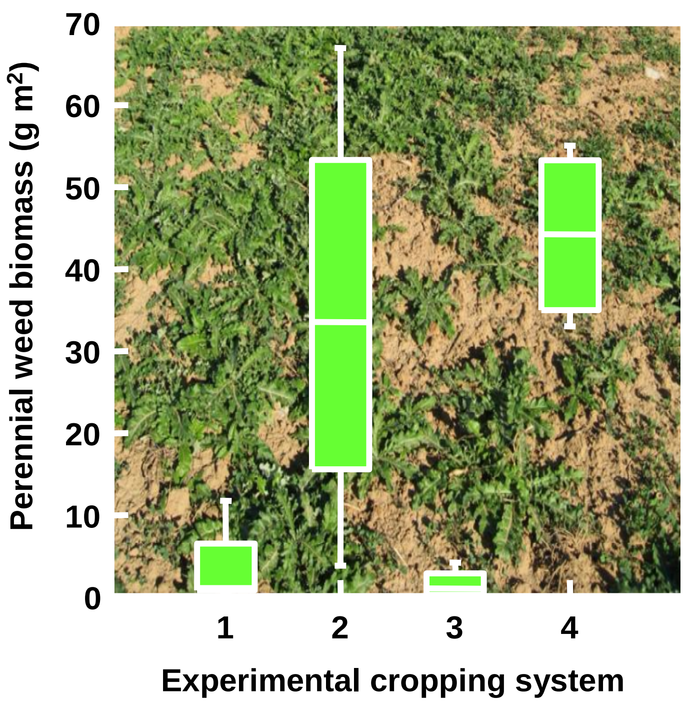
- This summer has been very wet and cool.
- These conditions create challenges for crop management and storage.
- Forage producers should be taking steps to prevent mold and mycotoxins from becoming problems in their operations.
- Helpful information can be found at http://cn.agronomy.psu.edu/2009/fcn0917.cfm#c

Thinking back, looking forward...

The perennial challenge of reduced-till

By Rich Smith

Preliminary data from our study suggest that perennial weeds (Canada thistle and field bindweed) may be able to respond rather quickly to changes in tillage regime. In July we assessed the abundance of weeds growing in our four experimental organic cropping systems. We did this by removing all of the weeds growing within five sampling areas that were randomly assigned in each plot. The weeds within each sampling area were clipped at the soil surface, separated by species, dried, and then weighed to determine the biomass of each weed species present in each plot.



The abundance of perennial weeds, represented here by box plots showing the spread in the data, in our four experimental organic cropping systems in July 2009. During the transition period, Systems 2 and 4 were managed with full tillage and therefore had lower perennial weed densities (at the end of the transition period in 2007) compared to systems 1 and 3. However, since organic certification, Systems 2 and 4 have been managed with a reduced-tillage strategy to build soil organic matter (while systems 1 and 3 have been aggressively cultivated), which appears to be leading to a growing perennial weed problem.

What we found was that perennial weed abundance in experimental Systems 1 and 3 was relatively low, while perennial weed abundance in Systems 2 and 4 was quite high (see graph). This pattern is very interesting because Systems 1 and 3 were reduced tillage systems during the original organic transition study (from 2004-2006). Because these systems were disturbed less frequently and intensively than Systems 2 and 4 they developed large populations of perennial weeds by the end of the study (2006) compared to the full-tillage systems (Systems 2 and 4). In fact, that result was part of the impetus for the current study. The question driving the current study was "Now that these systems are certified organic and two of the systems have high perennial weed populations (Systems 1 and 3), can we manage them in such a way as to reduce weed abundance but still maintain our soil quality?". What these preliminary data suggest is that *yes*, we can reduce perennial weed populations by altering tillage and cover cropping, and this reduction can occur relatively rapidly (1-2 yrs). Interestingly, these data suggest that the converse is also true. The systems which had low perennial weed populations initially, and in which we subsequently reduced tillage following organic certification (Systems 2 and 3), have now developed high perennial weed populations just as quickly.

It is interesting to note that the abundance of perennial weeds in System 2 is more variable from plot to plot than in System 4 (indicated in the graph by the large spread of data encompassed by the box plot). System 4 is the least disturbed of all four systems, while System 3 is the most disturbed. As of now, the abundance of perennial weeds in the four systems mirrors very closely the degree of tillage within each of the four experimental cropping systems. Whether these results hold for the remainder of the study remains to be seen.