Organic News

Cotton/Peanut Seminar, Jan. 26

It was definitely not the best weather in Seminole to have a seminar, but it was still successful. There was a good turnout, good food, good speakers with lots of information and the ice was gone by the time it was over!

Producer Survey

I handed out a producer survey to farmers who attended the seminar and there was a pretty good group that filled them out. Here are some interesting numbers.

Average years farming – **18.6**
Average of total acres farmed – **3,726**
Average of total acres organic – **1,210**
Average of organic peanut acres – **659**
Average of organic cotton acres – **1,055**

Rank all these problems you face as an organic farmer?

#1 Weeds **(ranked most important)**
#2 Disease or insect problems
#3 Adapted organic seed varieties
#4 Market Price or Marketing Issues
#5 Water/Irrigation
#6 Organic fertilizer **(ranked least important)**

What is your source of information for organic farming?

#1 Other growers **(most responses)**
#2 Consultant
#3 Company representatives
#4 Texas A&M AgriLife Extension/Research
#5 ACRES, Rodale, other organic groups
#6 Other sources **(least responses)**

When I asked how they heard about the meeting, most said "from other growers" but in close second was the "**Organic News"** newsletter like this one! Still, most of you are getting news and information **from each other**!

Cotton Varieties Planted

I asked producers who did the survey to tell me the cotton varieties they plant. I know there aren't really any true organic cotton varieties but, these conventional varieties are the most used.

Cotton Varieties:
University of Arkansas - UA48
Green Dirt Exceed - 2244, 4344, 6000 and 6494
Brownfield Seed and Delinting - BX4, BX9, and BSD 598
Israel Ido Tal Pima - GL 6 and V 70
Gowan - 1432 Pima Hybrid

Peanut Varieties Planted

Same question for those that plant peanuts knowing that there is no "organic" peanut variety but plenty that are used on organic acres.

Peanut Varieties: Spanish AT 9899, TamVal OL14 , Tamnut OL 06, Valencia C, Span 17, Valencia 309.

Planting Quality Seed

Bob Whitney, Regents Fellow and Extension Organic Specialist • bob.whitney@ag.tamu.edu • (979) 571-2086 cell

Planting quality seed continued….

Dr. Justin Tuggle did a great job at the Seminar discussing peanut seed quality. He showed some great pictures of peanut seed with the seed coat removed showing the damage underneath. His point, which is 100% right, is that this damage is causing the germination problems in peanut fields and this damage is mostly caused by harvest equipment.

I was in a "webinar" this past week and part of the discussion was damaged cotton seed as well. Some observations have shown that upwards of 30% of the seed in a bag is damaged in some way. In some cases, the damage was up to 50%. The seed may germinate but it is evident that the vigor is diminished. This was in a conventional seed bag with seed treatments!

Corn seed can have just as many problems but again seed treatments can make a difference and do. I have seen lots of estimates but in cold soils damaged corn seed in the bag can lower overall germination 20% to as much as 50%.

This issue is difficult to solve but realizing some of the causes is a big first step.

Time to Soil Test

This is definitely the time to be out in the field soil testing. I am a big proponent for taking your soil samples at the same time every year so that I can reasonably expect that the soil is at the same environmental condition as in previous years. I also like to keep my soil test results in a spreadsheet where I can place them side by side and see every year's results. How can I monitor fertility unless I measure fertility? How can I know progress unless I can see the changes from year on top of year? Here are some test results I like to see.

Of course, a normal soil test or what you might call a **Regular Soil Test** is a must. These are not usually expensive, +/- $15, or more with micronutrients. This test is mostly meaningless unless I have previous year's results to see what is going on. I have taken literally thousands of soil samples and often I will see something show up that is off the charts. I am not known to panic when I see a problem because I am not going to react to that test unless I know it has steadily been a problem that is just getting worse. For instance, we can see pH swings in sand from one year to the next. Before I lime a soil, I may take a second sample just to verify I need lime. A $15 soil test is cheaper than a $60 per acre lime application.

Second, I like to have a **Haney Soil Test** done. What does a Haney soil test give me? Here is a list of the test results you get:

- Soil Respiration CO2-C ppm
- WEOC – Water Extractable Organic Carbon
- WEON – Water Extractable Organic Nitrogen
- %MAC – % Microbially Active Carbon
- Organic C:N
- Organic N to Inorganic N
- Organic N Release
- Organic N Reserve
- Soil Health Score

If you thought it was cheap, guess again. Most labs charge $50 so you don't usually just send everything in for a Haney Test. Again, the results are only good if you have several years' worth of data to see if you are getting better.

Last, is the PLFA Test or **Phospholipid Fatty Acid Test**. This test measures the biomass of the microbes in the soil and is one of the tests that is currently being conducted to determine the microbial population of soil. Looking at the example (next page) you can see the microbial biomass, the diversity index with a rating chart, the different groups – bacteria, fungi, protozoa and undifferentiated (unknown). This test is not cheap either costing $75 per sample, but it does help to know if you are putting in the right mix of crops and fertility to see microbes increasing.

Bob Whitney, Regents Fellow and Extension Organic Specialist • bob.whitney@ag.tamu.edu • (979) 571-2086 cell

Account No. :

Biological Soil Analysis Report

Invoice No. :
Date Received :
Date Reported :

Results For :
Sample ID 1 :
Sample ID 2 :
Lab No. :

PLFA Soil Microbial Community Analysis

Functional Group Biomass & Diversity

Total Living Microbial Biomass, Phospholipid Fatty Acid (PLFA) ng/g 5021.18
Functional Group Diversity Index 1.581

Total Biomass	Diversity	Rating
< 500	< 1.0	Very Poor
500+ - 1000	1.0+ - 1.1	Poor
1000+ - 1500	1.1+ - 1.2	Slightly Below Average
1500+ - 2500	1.2+ - 1.3	Average
2500+ - 3000	1.3+ - 1.4	Slightly Above Average
3000+ - 3500	1.4+ - 1.5	Good
3500+ - 4000	1.5+ - 1.6	Very Good
> 4000	> 1.6	Excellent

Functional Group	Biomass, PLFA ng/g	% of Total Biomass
Total Bacteria	1881.75	37.48
Gram (+)	1182.99	23.56
Actinomycetes	358.71	7.14
Gram (-)	698.76	13.92
Rhizobia	50.72	1.01
Total Fungi	399.36	7.95
Arbuscular Mycorrhizal	123.64	2.46
Saprophytes	275.72	5.49
Protozoa	45.75	0.91
Undifferentiated	2694.32	53.66

Organic Fertilizer in Short Supply?

I had several calls this last month asking if I knew someone that had any organic fertilizer. From the rice folks in South Texas to corn, sorghum and cotton guys on the Plains "organic" fertilizer is in demand.

Now, hopefully you are not experiencing any problems, but please be aware that conventional fertilizer prices are causing all growers to look at organic fertilizers and, in many cases, they are buying. If you talk to any distributor, they will tell you how busy they are and how booked they are into the future. If you already have your organic fertilizer scheduled or applied – great! But if you haven't even thought about it, now might be the time.

Do We Need Organic Variety Breeding Programs?

Yes! That was easy.

Many plant breeders and seed companies are hesitant to grow and sell organic varieties – as you know there is a lot of paperwork! Also, even if the organic variety is superior there is the concern that conventional growers won't buy or even look at a great variety with an organic label. But there is a growing body of evidence that we need to be looking at varieties from below the ground first before looking at the above ground yields.

What am I talking about? Well according to many sources but in particular an article in Trends in Plant Science, "Breeding crop varieties with the target of improving soil health and reducing soil degradation will produce better conditions for crop growth through more efficient resource use and stress tolerance, so a win-win is possible where both yield and soil are improved and could be the cornerstone of regenerative agriculture."

"By targeting soil structure building traits *(in plant breeding)*, abiotic *(environmental)* stress resistance of both plants and soils could increase through microbial habitat formation to improve nutrient cycling, stabilization of soil against erosion, and a greater capacity of soil to absorb, store and drain water, … but these processes are generally ignored in plant breeding, where the primary focus is **yield**."

In other words, the scientific ability to monitor and measure what roots are actually doing is teaching us how important they are to "**naturally**" living and interacting with soil and all the microbiome in soil.

"Perhaps plant breeding exacerbated soil degradation by focusing on yield and resource capture in **conventionally** fertilized soils. Fertilizers *(conventional)* decrease the benefit of root-soil interface **plant traits** such as exudates and root hairs to capture nutrients (*the normal, natural process*) making those exudates and root hairs expendable."

Bob Whitney, Regents Fellow and Extension Organic Specialist • bob.whitney@ag.tamu.edu • (979) 571-2086 cell

This article, like many others, gets very technical and in-depth, but the premise is we need to look at what a variety is doing below ground as well as above ground. In organic systems, plants must be able to interact with the soil microbiome in the root rhizosphere to take in nutrients, protect itself, and be more water efficient. So, **YES**, we need organic breeding programs producing highly efficient, high yielding organic varieties!

Does Soil Management Affect Soil Health?

There is a huge amount of research work done and a significant portion is so specific that you can't make application to anything in the real world. On the other hand, there is research that is so broad and almost meaningless that there is no way to apply it in the real world.

I like this study because it took a look at the relationship between a **Soil Management Index (SMI)** they developed for this research and soil health indicators that were developed at Cornell called the CASH (Comprehensive Assessment of Soil Health) protocol. This CASH system looks at the physical, biological, and chemical properties of a soil to develop an overall quality score. The Haney soil test does the same sort of thing.

The soil management index (SMI) for the over 20 farms in the study was developed by **(1) quantifying the crop diversity, (2) the frequency of soil disturbance and the (3) number of applications of external organic amendments (manure).** These 3 items would make up the SMI score and then they compared that to the soil health indicators for those particular farms. Clear as mud? Don't worry because what matters are the results!

What are the results?

- Soil management **significantly affected** all measured soil health indicators.
- Fields with a **higher** soil management index (SMI) showed **better** soil health.
- Soil health of farm fields was generally poorer in comparison with unmanaged soil. Unmanaged soil was a forest area or good pasture area.
- The ratio of soil health of farmed to unmanaged soil **increased with increasing SMI.** *(This is important!)*

So, what they found was that all the soil health measures got better the higher the SMI number was. Generally, this would make sense and be what we would expect. What I was surprised by was that there were two soil health indices that were strongly influenced by the soil management – wet aggregate stability and extractable soil protein (organically bound nitrogen available to microbes).

Soil texture seemed to have more effect on the other three soil health indicators – active carbon, soil respiration and soil organic matter. Soil management did have an effect on these three, but texture had a stronger effect.

Wet aggregate stability is a measure of how well the soil stays together in a rainfall simulation. Aggregate stability means the soil is stable, held together but all kinds of things, one of which is the glue our microbes supply if they are active. Good soil aggregation means less compaction, room for water movement and root growth. Second, the extractable soil protein is a measure of the food available to those microbes. I think it makes sense that a high SMI would mean a high Soil Health Score! Wouldn't you expect that to happen if you reduce tillage, add in cover crops, or change up your crop diversity and add soil organic amendments?

Lastly, there is some thought that a tool like SMI, properly developed, could be a way to know if we are increasing soil health. This research analysis is showing they are highly correlated and that is a good thing.

Cornell Soil Health Assessment

[redacted]
Agricultural Service Provider:
None
Cedar Basin Crop Consulting
cbcc@earthlink.net

Sample ID: L_555
Field/Treatment: Tenge E
Tillage: 1-7 inches
Crops Grown: COG, COG, SOY
Date Sampled: 12:00:00 AM
Given Soil Type: Muscatine
Given Soil Texture: Silty Clay Loam
Coordinates: [redacted]

Measured Soil Textural Class: Silt Loam Sand: 28% Silt: 56% Clay: 16%

Test Report

	Indicator	Value	Rating	Constraint
Physical	Available Water Capacity	0.31	100	
	Surface Hardness			Not Rated: No Field Penetrometer Readings Submitted
	Subsurface Hardness			Not Rated: No Field Penetrometer Readings Submitted
	Aggregate Stability	49.5	78	
Biological	Organic Matter	4.6	79	
	ACE Soil Protein Index	5.8	29	Organic Matter Quality, Organic N Storage, N Mineralization
	Root Pathogen Pressure	4.7	54	
	Respiration	0.58	4	Soil Microbial Abundance and Activity
	Active Carbon	744	76	
Chemical	pH	6.0	66	
	Phosphorus	10.9	100	
	Potassium	164.5	100	
	Minor Elements (Mg: 456 Fe: 0.8 Mn: 9.2 Zn: 0.4)		100	
	Overall Quality Score		71	High

Bob Whitney, Regents Fellow and Extension Organic Specialist • bob.whitney@ag.tamu.edu • (979) 571-2086 cell