Workshop Title:

Organic Science Cluster II Research

Speaker:

Martine Dorais

Executive Summary:

The speaker Martine Dorais presented her research from various studies that she has been a part of. These studies included monitoring the nutrient content of greenhouse soils from fertilization rates and the use of biochar. More studies will need to be done for long-term observations. Her studies were heavily focused on organic methods of fertilisation.

Main Notes:

- Under greenhouse we have production 10x higher than in the field. Important to use fertilizers balanced to the plants. You don't want to wash out any nutrients from the soil.
- When consumer buys organic, they expect to have things that are better for the plant and also tastes better.
- When plants reach maturity, they need more nutrition: fertilizer management to meet the needs of the plants.
- Sometimes there are problems with quality
- System developed- cultivated in containers 60-30cm, 150-180L/m^2
- Looking at living mulch- effect on soil and plant production

- Plastic mulch, coconut fiber mulch, white clover and red clover, organic productivity of the soil- didn't find any major productivity of the fruits. Physical barrier when fertilizers were put into the soil.
- Microbial activity was higher- still trying to understand those observations
- Not enough light reaching the soil
- Fertilization frequency- productivity of fruit- fertilize at the right time and place
- Mixture of peat and coconut- different frequencies of fertilization
- Saw some differences in fruit yield; fertilization frequency had no impact on fruit growth. Quality of fruit: no significant effect. Different specs of dry matter: no sig effect.
- Conclude that fertilization frequency has no significant effect on soil and organic matter in the soil.
- Fertilization rate: reduced N could help to reduce the wash out of N.
- One of her students started a student's study, wanted to have better knowledge of availability of N in fertilization.
- Want to give people a tool to manage N; want to make sure it is user friendly. Organic soil.
- Did samples to get levels; gave indication of speed of mineralization
- N is mineralized, results clear in organic soil.
- Sample commercial areas in greenhouse production for cucumbers, tomatoes- collect area by mass to check against results of colleagues.
- In order to improve soil activity and fertilization: biochar.

- Biochar: coal that has agriculture use. Taken and heated up to above 400 degrees which turns it into biochar.
- There are advantages for pot cultures; significant for plant but negative for lettuce, no effect on peppers, basil, and coriander. Wanted to know if added biochar had an effect on idiom.
- With biochar, there was more idiom in cultures; it is nice but need to be careful before introducing biochar, need to load it with diff products.
- Did same studies for tomato culture; 3-year study; sand loam and black earth. Peat moss. Biochar in some, observed g emissions no effect of productivity of plant
- 2nd year did another tomato; biochar increase microbial activity; reduce emission of co2; negative effect of production of earthworms.
- Increase N in soil. Observe reduction of other things in soil but no sig diff in nutritional elements in the soil
- Lowered 30%
- Plant has small increases but no yield diff
- 3rd year; added more biochar but not diff in yield; more microbial activity
- Worms did not like the biochar; population reduced by 49%
- Adding 10-20% biochar increases microbial activity but does not change yield; microbial diversity.
- Some cultivars like seascape reacted well to biological fertilization
- Shallot cultivar response not as well
- 6 cultivars

- Depends on cultivars, but in general very positive result
- Improves overall yield; again depends on cultivars.
- Wollastonite – fine, coarse, fine & coarse; put in at planting time, some put in irrigation
- Doubled sometimes tripled what they did the first time; done this summer; still analyzing so no results yet
- Increase of CO_2 in green house becomes limiting factor
- Tested 2 systems: water screen used as heat exchanger but creating too much shade over plants, improved yield
- Could inject CO_2
- Project right now is biological mother bio plants; LED's to assess the cuttings and to see if quality is good
- Intense inspection
- In first cluster, worked with a lot of fertilization
- Bio stimulant; does it work in organic production or not?
- Crab meal was more beneficial rather than other products
- Lettuce, peppers, tomatoes in green house; organic clusters
- Goal was to meet needs of the producers and also consumers; organic cluster expected to meet those needs
- Win-win; learn a lot from producers as researchers; hope to improve by working with producers
- Wanted to do transplant and yield for the green house

- Electric conductivity- important to know quality of your product and nutrients in the soil
- Organic farming has limit in being able to add nutrients to the soil
- Weekly fertilization had best results for electric conductivity because it was more stable

Questions

- Don’t have long-term results of soil health
- Have to continue observing results of effects
- Want to develop systems that reduce risk that will end up in the soil