2013 ACORN Conference
Delta Beauséjour, Moncton NB

Workshop Title: Building the Best Soil: Creating Healthy Soils Through Soil Tests, Mulching and Cover Crops

Speaker(s) & their titles: Paul and Sandy Arnold, Pleasant Valley Farm (NY)

Executive Summary

Paul and Sandy discuss the importance of mulching with straw to control weeds and improve soil fertility. They outline their method, the fertilizers and cover crops they use.

Detailed Notes

Introduction

Paul and Sandy both grew up in suburbs but were driven to be self-employed so they began farming. They now cultivate 5 acres of their land, which was 40 acres of conventional corn for 30 years and is a rocky silt loam and it had 2% organic matter. Their growing season is from end of May to the beginning of October.

Mulching

When Paul and Sandy started their farm in the 1980s it was easier to get hay than manure and even less compost was available. Their soil was already overloaded with nutrients due to the corn production. Mulching with hay provides many benefits for the soil despite the time it takes to put it down.

Method

Paul and Sandy use a flail chopper, which cuts the hay and blows it into a wagon before it goes to seed. They use a self-unloading wagon, which means “you unload it yourself”. They cover the fields with hay and then turn it over to build up organic matter. The nutrients in their soil have remained the same but they have become available where they weren’t previously due to the organic matter.

They also buy straw from a local farmer baled before the hay went to seed. The mulch’s main purpose is to increase and maintain organic matter. Crops are planned based on where organic matter is needed. They keep several acres in mulch each season. They mulch using a whole round bale which is rolled onto the soil 4-6 inches thick. They also use bio-telo which is a biodegradable corn-based black plastic on paths. If straw is left on bio-telo it will cause the plastic to break down, especially if it rains with straw on bio-telo, which causes the straw to stick.

In October of 2010 they bought a round bale chopper that chops and blows at the same time, which saves a lot of labour reducing the number of people doing the job from 6-8 to 2. Paul and Sandy have too many worms that eat the seeds they plant such as peas so now they transplant peas. Now their soil has 4-5% organic matter.

Tillage

Their soil had a lot of compaction due to the 30 years of corn crops. First they plowed with a chisel plow and then rolling harrow. After the initial plow they used harrowing disks to further loosen the soil.

Soil Health

To ensure their soil remains healthy they do annual soil tests. They take 15 - 20 soil samples per year which helps them to find trends. They emphasize that NPK are not the most important but that all micro-nutrients are important.

Micro-nutrient Spreadsheet

They keep a spreadsheet with information from all their soil tests, which gives numbers for each field and their needed micro-nutrients.

Looking at Combinations of N-P-K

Paul and Sandy explain the concept of paying per unit for nutrients as opposed to the price per ton. This means that a fertilizer that has all 3 nutrients at lower levels and is cheaper might not be a better deal if you need a large amount of one nutrient. Figuring out the best value is important to consider if you don't need all 3 nutrients.

Paul and Sandy also mention that you can order custom blended fertilizers based on your soil tests. They also say it is important to get more than one opinion on what is needed in your soil. One side note is that hollow celery and black spots on beets are both symptoms of a lack of boron.

Soil Health

They say is critical that your soil is weed free and very important to test it before planting.

Cover Crops

For cover crops they mention the value of using buckwheat, rye and sorghum sudan. Clover is the most used cover crop. Rye also has an allelopathic effect meaning it prevents other seeds from germinating. Paul and Sandy till it in a few weeks before their cash crops are planted to give it time to break down. They also plant rye or clover on paths between rows that are covered in bio-telo.

Mustards can also act as a fumigant. Planting mustard helped them to get rid of diseases such as potato disease. When they planted potatoes one area before planting mustard the potatoes were covered in scab and after mustard there was no scab at all. However it is important to consider that mustards are another brassica and this must factor into your crop rotation. Ida Gold is the mustard variety they use.

High Tunnel Fertility

In high tunnels the density of crops is so high that the nutrient levels and rotations are even more critical. In their high tunnel Paul and Sandy have 4-6% organic matter.

They discuss that diseases easily spread from seeds. To help prevent this they recommend a hot water treatment of seeds to kill disease but this can impact germination. Hot water treatment has helped them with disease on celery, spinach and parsley. They also take the plastic off of their tunnels, which allows natural rain water clean out salts left from fertilizers. Irrigation is key to farming as the water allows nutrients to flow.