

**2015 ACORN Conference & Trade Show  
Delta Prince Edward Hotel, Charlottetown, PE**

**Workshop Title: Transitioning to No-Till Vegetables**

**Speaker & their title:** Jeff Moyer, Executive Director Rodale Institute

**Executive Summary:**

Organic agriculture is modern agriculture. We need to take advantage of high tech advances in agricultural engineering, computer science and crop breeding. This includes our ability to practice no-till vegetable production. It is not only possible but also practical. We discover the secret biological nuggets of information that make the systems work on any farm and for many different crops. The potential is limitless but the challenges are great.

**Detailed Notes**

Organic farming takes advantage of all the modern tools and resources. It is not a step backward.

Nature does not want soil to be uncovered if we don't cover it, it will die. With no till we are trying to protect the soil and increase its organic content. The organic portion of the soil is the living portion of the soil. The total weight of living organisms in the top six inches of soil per acre is between 5,000 to 20,000 pounds. Temperature is also very important for soil health. At 107F organisms in the soil begin to die whereas they thrive at 87F.

We have to increase the incorporation of crop rotation into our organic systems and these rotations must be complex. No till works best when it is combined with complex crop rotations. No other method of weed control is as effective as a well-arranged sequence of green crops and rotation.

Jeff encouraged us to think of the life an Olympic athlete as an analogy for soil health and performance. If we do nothing all year we won't perform when we need to. Training all year long is necessary for the athlete just as soil enhancement all year long is necessary for soils to perform well. He encouraged us to find opportunities to plant cover crops and create additional opportunities wherever possible. Effective crop rotations must be planned, especially when dealing with perennial weeds.

Cover crops are also the key to a no till system. Important characteristics to consider when selecting cover crops include:

- moderately priced
- Easily established
- Highly productive
- Easily killed mechanically
- Not allelopathic to the main crop
- Nitrogen fixing

Our goal is to become cover crop farmers. There are challenges however:

- Crops must be planted on time
- We need to select the right variety
- Use the right seeding rate

All of these factors are necessary to ensure the biomass you need.

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Let it grow to maturity to get biomass required.

Then we can think of no till. Every day we till the soil, it's a bad day for the microbiology of the soil. Jeff asks, what if we grew the mulch we will use before we plant our crop? We can grow the mulch in the field and there is a wide variety of cover crops to choose from - hairy vetch, rye, clovers, etc.

The cover crop is terminated with a roller crimper. This machine was developed at Rodale. It lays the cover crop down as mulch. The decision as to when to terminate varies with the crop. Usually Nitrogen is at the peak in flower production so that is often a good time to terminate. A planter is attached to the back of a tractor and the crimper on the front. Both steps are done at the same time. This technology is size neutral. The results include no erosion, no weeds and great moisture retention. Water usage decreased by 30% in the trials at Rodale.

Jeff suggested that 5,000 to 8,000 ponds of biomass are needed per acre. Not all cover crops are created equally. He encouraged participants to look at our own farms to see which cover crops work on our farms.

The tools used in this process need to be adjusted to ensure good planting rates. A residue slicer can also help to ensure that the crop residue is properly sliced. Timing of planting has made great differences in yields. One of the key benefits is to eliminate weeding so time can be used for other tasks.

Jeff described a trial using organic soybeans in Wisconsin. Thirty percent more beans were produced utilizing a cover crop and no-till versus a conventional approach. Cover crops can also serve as a substitute for black plastic. No till transplanters have been developed as well. Again, huge savings in time is the result. Jeff created a roller/crimper for raised beds and rollers have also built for walk behind tractors. This process can also be done by hand on a small scale.

As organic farmers we can use these.

Q. When to plant cover crops? When to terminate?

A. Termination is done when most plants are just in flower. Planting depends on the season and type of cover crop to ensure coverage over the winter or to meet other requirements.

Q. Has this system been used in potato production?

A. Yes, potatoes develop under the heavy mulch.

Q. What about weed suppression?

A. The more complex and planned the rotation the better the weed suppression.