“Innovative Cover Crop Management Strategies”

By Jeff Moyer
Farm Director
“Healthy Soil = Healthy Food = Healthy People”

J.I. Rodale
Soils of the organic systems have a more active soil biological community
→ higher levels of glomalin (a glycoprotein that acts like ‘glue’, binding organic matter to mineral particles),
→ greater populations of mycorrhizae (a fungus that forms a symbiotic relationship with its host plant:
the fungus receives carbohydrates from the plant, which in return gains access to water and nutrients).

This leads to improved soil structure and enhanced carbon sequestration.
Cover Crops

- Soil cover (reduces erosion)
- Builds soil organic matter
- Deliver key nutrients (Legumes - N)
- Conserves (recycles) nutrients
- Nutrient source for soil microbes
- Weed suppression
- Breaks pest cycles

- Reduces compaction
- Increases soil aggregation
- Increases infiltration
- Improves water holding capacity
- Improves aeration
- Reduces soil crusting
Crop Rotation Protocols

- By Plant Type
- To Build Pest Resistance
- To Improve Soil
- To Make More Money
- To Enhance Biodiversity

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Tillage has it’s Drawbacks
Tillage Opens the System Up to Damage
Several Secondary Tillages
We Can Mulch Out Annual Weeds In The Garden
A Different Way of Farming
Past - equipment to kill cover crops

- Culti-packer
- Stalk chopper
- Flail mower
Tools That Make it Possible
**Corn**

**PLOW TILL**
- PLOW
- DISC
- PACK
- PLANT
- ROTARY HOE
- ROTARY HOE
- CULTIVATE
- CULTIVATE
- HARVEST
- (143 Bu/A)

**NO-TILL**
- ROLL/PLANT
- HARVEST
- (160 Bu/A)

A two step organic production system Plant and Harvest!
Cover Crops

The Key To A Successful Weed Program

Crimson Clover

Hairy Vetch/Rye

Hairy Vetch
Average Biomass (lbs/A) of Cover Crop Mixtures: 2003 Corn Cover Crop Trial

Cover Crop Treatment & Date Collected

Biomass (lbs/Acre)

- Oats HV 5/12/03: 3111 lbs/Acre
- BuWh HV 6/9/03: 4837 lbs/Acre
- Oats HV 6/9/03: 5344 lbs/Acre
- Barley HV 6/9/03: 6669 lbs/Acre
- Wheat HV 6/9/03: 6978 lbs/Acre
- Rye HV 6/9/03: 8392 lbs/Acre
Planter Modifications

Additional Weight
130 lb per row

Cast Iron Closing Wheels
Mis-Planted Seed
Residue Slicer

- The Residue Slicer is used in combination with the I&J Mfg Cover Crop Roller to plant organic corn, beans, and other crops into heavy cover crop, no-till conditions.
- Can be used for non-organic, no-till using less chemicals, or in extremely heavy residue conditions without installing row cleaners.
- With enough down spring pressure, a straight blade, in combination with the rubber wheels to hold the heavy residue, will make a clean cut. Without the rubber wheels, the residue may hair-pin into the seed trench.
- The Residue Slicer will also work well under general no-till conditions, with little or no residue.

- The Residue Slicer is compatible with John Deere 7000-7200-1750 planters.
2006 preharvest No-till Corn plant population
Field 60, The Rodale Institute, Berks Co., PA

Seed tag origin of Hairy Vetch

Corn population / acre

- Minnesota
- Oregon 1
- Oregon 2
- Wisconsin
- Steve Groff PA-1 (Early planted HV)
- Steve Groff PA-1 (Late planted HV)
- Field 60 Average
Corn 3 Days After Planting
2013 Corn into Hairy Vetch
Treatment #14 Planted May 23rd w/o Shark Teeth

Cover Crop Removed

Yield 17 Bu/A
Treatment #11 Planted June 1st w/Shark Teeth

Yield 38 Bu/A
Treatment #2 Planted May 23rd w/Shark Teeth

Yield 59 Bu/A
Effects of planting and termination date on cereal rye biomass
(Penn State University, Rock Springs, PA; Aroostook cereal rye)

Photographs taken on April 1

Termination Dates

May 20

May 30

2200 kg ha\(^{-1}\)

Cereal rye biomass (kg ha\(^{-1}\))

Planting Date

Increasing seeding rate did not increase cereal rye biomass.

However, it did decrease weed biomass.

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Bare Soil 1 WAF

Weed Density 4 WAT

Weed Biomass 4 WAT

0.54***

0.41***

0.52***

0.66

Weed biomass (g m⁻¹)

Seeding rate (kg seed ha⁻¹)

0 100 200 300

A

AB

B

90 150 210

Polygonum convolvulus

Ambrosia artemisiifolia

Early emerging weeds dominate

6 weeks after rolling
No-Till Pumpkins into Rye – Long Island, NY
No-Till Grain Drill

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Horse Drawn & Pull Type
The Concept is Scale Neutral
High Residue Cultivator
Thank You!

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