PRACTICAL farmers of Iowa
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Field Crops Research Protocols

Roller Crimped Cover Cropping Systems for Corn & Soybean Production

Objective: To test effects of roller crimping and an organic bio-soil enhancer on weed suppression, cover crop winter hardiness, soil properties, overall plant health and soybean (Year 1) and corn (Year 2) yields.

Farmer-cooperators will:
YEAR 1:

- Take photos throughout the project.
- Keep in contact with PFI with updates and questions.
- **Fall 2015**, aerially seed winter cereal rye cover crop at two farms (Farm 1 and Farm 2).
- **Spring 2016**, terminate rye cover in half of Farm 2 with tillage before planting soybeans.
- Plant soybeans into living cover at Farm 1, living cover half at Farm 2, and tilled half at Farm 2.
- Terminate rye cover with roller-crimper shortly after planting soybeans and when rye has reached anthesis at Farm 1 and Farm 2.
- Apply bio-soil enhancer (Sumagrow®) to soybeans at VC-V1 growth stage in both fields.
- Establish a minimum of 4 replications at 2 farms as shown in the diagram below with randomized and replicated plots of:
    - Soybeans with Sumagrow
    - Soybeans with No Sumagrow
- Each plot is 2.5 acres in size.
- **Summer 2016,** make bi-weekly weed and pest observations.
- Collect soil samples at regular intervals to measure pH, electrical conductivity, macro- and micronutrient levels, cation exchange capacity, base saturation, and soil organic matter. Assess soil biological diversity using Biolog Ecoplates® at the Sustainable Vegetable Production Lab, Iowa State University.
- Harvest soybeans at both farms from plots separately.
- Turn in data to Practical Farmers of Iowa by the end of 2016.

Soybeans + No Sumagrow	Soybeans + Sumagrow	Soybeans + No Sumagrow	Soybeans + Sumagrow
Soybeans + Sumagrow	Soybeans + No Sumagrow	Soybeans + Sumagrow	Soybeans + No Sumagrow
REP 1	REP 2	REP 3	REP 4

- *Farm 1*: All reps roll-crimped to terminate rye cover crop.
- *Farm 2*: Reps 1 and 2 roll-crimped; Reps 3 and 4 tilled to terminate rye cover crop.

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YEAR 2:

- Take photos throughout the project.
- Keep in contact with PFI with updates and questions.
- **Fall 2016**, aerially seed hairy vetch/oats cover crop at both farms (Farm 1 and Farm 2) when soybeans reach 50% yellowing.
- Apply bio-soil stimulant (Sumagrow®) to hairy vetch/oats cover crop after soybean harvest.
- Establish a minimum of 4 replications at both farms as shown in the diagram below with randomized and replicated plots of:
    - Hairy vetch/oats cover crop with Sumagrow
    - Hairy vetch/oats cover crop with No Sumagrow
- Each plot is 2.5 acres in size.
- **Spring 2017**, plant corn into living hairy vetch cover at both farms.
- Terminate hairy vetch cover with roller-crimper shortly after planting corn at both farms.
- **Summer 2016,** make bi-weekly weed and pest observations.
- Collect soil samples at regular intervals to measure pH, electrical conductivity, macro- and micronutrient levels, cation exchange capacity, base saturation, and soil organic matter. Assess soil biological diversity using Biolog Ecoplates® at the Sustainable Vegetable Production Lab, Iowa State University.
- Harvest corn at both farms from plots separately.
- Turn in data to Practical Farmers of Iowa by the end of 2017.

Vetch/oats+ Sumagrow	Vetch/oats+ No Sumagrow	Vetch/oats+ Sumagrow	Vetch/oats+ No Sumagrow
Vetch/oats+ No Sumagrow	Vetch/oats+ Sumagrow	Vetch/oats+ No Sumagrow	Vetch/oats+ Sumagrow
REP 1	REP 2	REP 3	REP 4

Practical Farmers of Iowa will:

- Help set up monitoring protocol, monitor progress of project and provide support when needed.
- Publish results in a PFI research report, on PFI website, and potentially other outlets.

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