



2015 Demonstration Report

MONSANTO LEARNING CENTER AT MONMOUTH, IL

Cover Crop Systems

Background

There is an increasing interest in the utilization of cover crops in the Central Corn Belt.

Potential benefits of cover crops are: soil conservation, moisture conservation, weed suppression, improved organic matter, improved soil structure, help with 'fallow syndrome' in prevent-plant situations, improved nutrient cycling.

A similar cover crop systems demonstration was conducted in 2014 at the Monsanto Learning Center at Monmouth, IL. Results from 2014 showed higher yields in plots with a cover crop. Corn plant tissue test samples taken at tassel (VT) reported a slightly higher nutrient content in cover crop plots when compared to the untreated check. The results showed that immobile nutrients, such as phosphorus and zinc, appeared to be made more available in the cover crop plots. This increase may be due to increased nutrients in the decaying cover crop residue.

Study Guidelines

In the fall of 2014, a demonstration was established at the Monsanto Learning Center at Monmouth, IL. Four different cover crop plots were established, annual rye, radishes, commercial blend of multiple species, and cereal rye.

Cover crops were sprayed with Roundup PowerMAX® Herbicide at 32 fl oz/acre and 2,4-D at 24 fl oz/acre in the spring to kill any remaining cover crop/weed growth that survived the winter. A 112 RM Genuity® SmartStax® RIB Complete® corn blend was planted on June 2, 2015 with two replications. An untreated check (UTC) was established consisting of no previous cover crop.

Plant tissue samples were collected from each plot at V4 and R1 and tested for plant nutrient content. Yields in the cover crop plots were compared to the untreated check.

Corn was harvested on October 15, 2015, yields were adjusted to 15% moisture, and yields in the cover crop plots were compared to the untreated check.

Results and Discussion

All plots with a cover crop prior to corn out-yielded the untreated check. The commercial blend of multiple cover crop species provided the highest yield increase, followed by annual rye, radish, and then cereal rye (Figure 1). These yield results are similar to the results from the 2014 demonstration conducted at the Monsanto Learning Center at Monmouth, IL.

Cover Crop	Average Yield (bu/acre)
Annual Rye	208.75
Radish	206.83
Commercial Mix	211.25
Cereal Rye	203.16
Untreated Check (UTC)	201.74

Figure 1. Yield results of cover crop demonstration trial.

Plant tissue samples from all plots were taken at V4 growth stage and at silking (R1) to compare nutrient content in the cover crop plots to nutrient content in the untreated check. Plant tissue tests were inconclusive and showed no discernible trends between plots. The results from 2015 were different from 2014 results in which relatively immobile nutrients, such as phosphorus and zinc, appeared to be made more available in the cover crop plots.

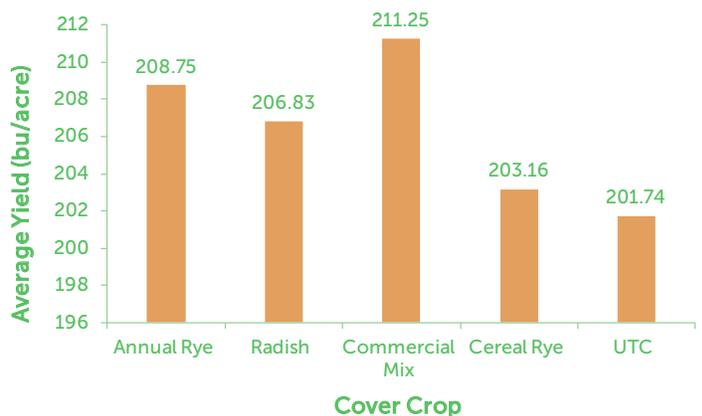


Figure 2. Average yield by cover crop.



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Summary

Yield results from 2014 and 2015 are very encouraging and supported the adoption of cover crops; however, management practices need to be refined. Research will continue on plant tissue test due to inconclusive results.

There are many variables to consider when establishing a cover crop. Some of the most

important variables are timing and method of cover crop establishment in the fall and termination of the cover crop in the spring. The Monsanto Learning Center at Monmouth, IL will continue to evaluate the impact of cover crops on yield and the most effective cover crop establishment practices.



Figure 3. Annual rye cover crop prior to corn planting.



Figure 5. Cereal rye cover crop after corn planting.



Figure 4. Cereal rye cover crop prior to corn planting.



Figure 6. Corn crop on plot with cereal rye cover crop.



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Sources

Wander, M., Ugarte, C., and Martin, J. 2010. Can we keep soils covered as climate changes? Issue 1.15. University of Illinois at Urbana-Champaign. <http://sustainability.illinois.edu>.

Singer, J., Kaspar, T., and Pedersen, P. 2005. Small grain cover crops for corn and soybean. Iowa State University Extension. <http://extension.agron.iastate.edu>

Cover Crop Systems. 2014. Monsanto Learning Center. Monmouth, IL. <http://www.monsanto.com/products/documents/learning-center-research/2014/mlc-lc-cover-crop-systems.pdf>

Web sources verified 11/5/15.

Legals

The information discussed in this report is from a single site, non-replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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