



2014 DEMONSTRATION REPORT

Monsanto Learning Center at Monmouth, IL

Cover Crop Systems

Study Guidelines

There is an increasing interest in planting cover crops in the central Corn Belt, primarily as a means of capturing unused nutrients, such as nitrogen, helping to keep those nutrients within the root zone, and making them more available for the following year's crop.

Two trials were established at the Monsanto Learning Center at Monmouth, IL:

- The first was a replicated trial to evaluate the impact of cover crops on plant nutrient availability and yield on the following crop.
- The second was a non-replicated trial to evaluate the impact of early seeding of cover crops on the current crop yield.

The following cover crops were compared:

- Annual Ryegrass
- Radish
- Ryegrass/Radish Mix
- Commercial cover crop seed blend

Plant tissue samples were collected at V4 and VT and tested for plant nutrient content.

Yields in the cover crop plots were compared to untreated checks.

In a separate trial, the impact of seeding cover crops into corn at V7 on corn yield was evaluated.

The plant nutrient/yield trial was conducted on 2nd year corn. The previous crop was sweet corn, which was removed the previous fall and cover crops were seeded using a grain drill. Plots were strip tilled in the spring, prior to planting. No burndown herbicide was needed, as winter weather had sufficiently killed the cover crop. Plant tissue samples from the corn crop were taken, comparing nutrient content in the cover crop plots to nutrient content in the untreated check. Corn was harvested in the fall. Yields in the cover crop plots were compared to the untreated check.

The cover crop seeding trial was conducted on a long-term continuous corn plot. Cover crops were seeded using a high clearance spreader, broadcasting over the plots at the V7 growth stage. Corn was harvested and yields in the cover crop plots were compared to the untreated check.

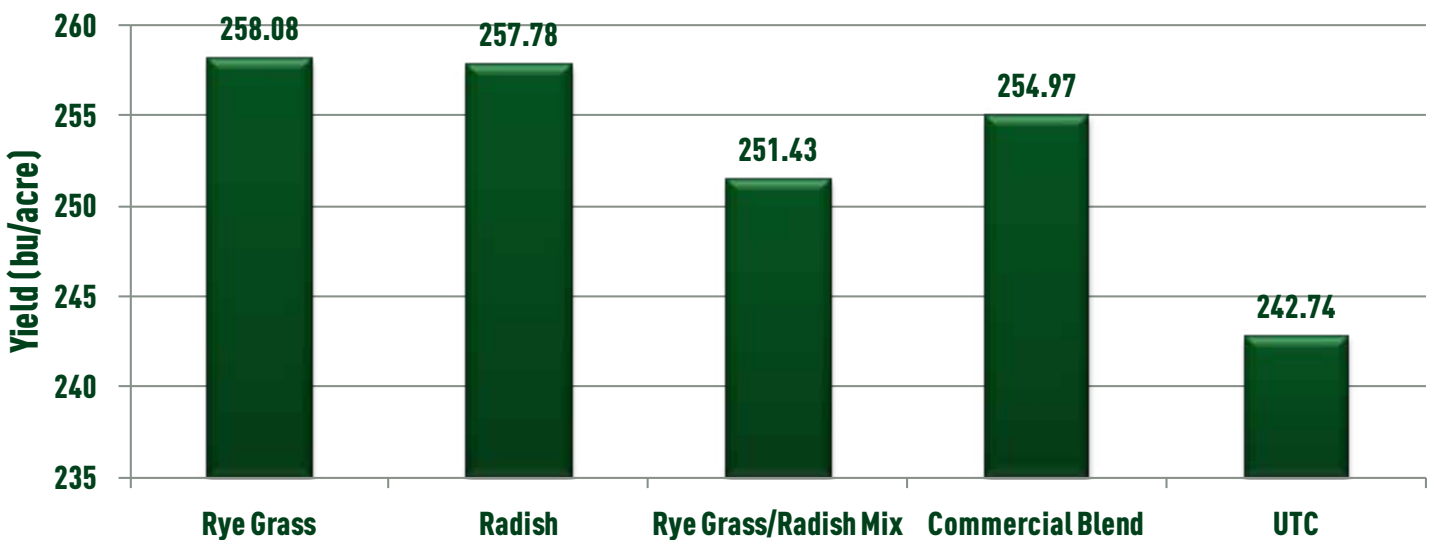


Figure 1. Cover crop comparisons.



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Results and Discussion

- There is a potential for cover crops to capture and hold nutrients in the root zone, making them more available to next year's crop. This may provide increased yield potential.
- Cover crops may provide additional advantages, such as preventing soil erosion, sequestering carbon, and suppressing weed growth.
- There are risks and challenges associated with cover crop systems. Timely establishment is important to maximize benefits to next year's crop, while minimizing negative impacts to the current year's crop. In addition, some cover crops possess allelopathic characteristics that can stunt crop growth if not managed carefully.
- 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.

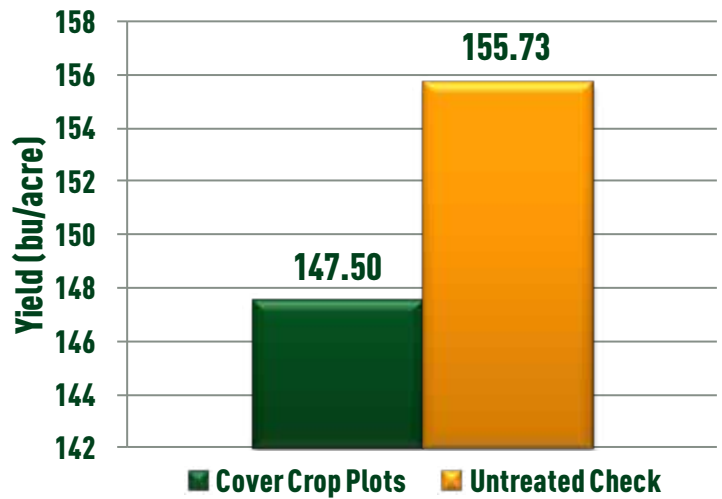


Figure 2. Some cover crops possess allelopathic characteristics that can stunt crop growth if not managed carefully.

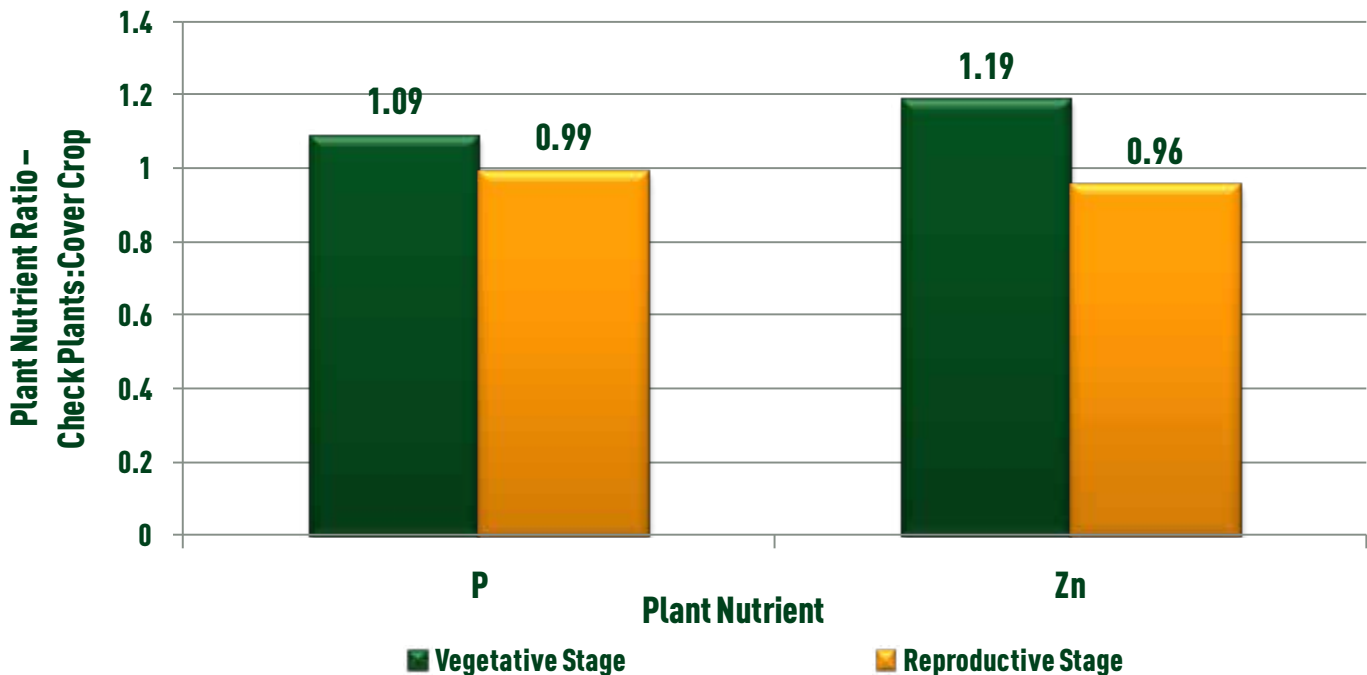


Figure 3. This is an index comparing the nutrient content of corn plants in the check plot to corn plants in the cover crop plots. An index greater than 1 indicates higher nutrient content in the check plants. An index less than 1 indicates higher nutrient content in the cover crop plants. This data suggests that, due to the decaying cover crop residue, the relatively immobile nutrients phosphorus (P) and zinc (Zn) were made more readily available to corn plants as the season progressed.



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Figure 4. Broadcasting cover crop seed into corn early in the season led to excellent establishment. However, early cover crop establishment may negatively impact the current crop's yield potential.

Sources

Wander, M., Ugarte, C., Martin, J. 2010. Can we keep soils covered as climate changes? Issue 1.15. University of Illinois at Urbana-Champaign. <http://sustainability.illinois.edu>. (verified 11/11/14)

Singer, J., Kaspar, T., Pedersen, P. Small grain cover crops for corn and soybean. Iowa State University Extension. <http://extension.agron.iastate.edu> (verified 11/11/14)

Legals

The information discussed in this report is from a single year demonstration, replicated and non-replicated trials. 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.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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