



## INNOVATION GRANT FINAL REPORT

PROJECT TITLE: Interseeding Cover Crops while Side-Dressing Nitrogen in V6 Corn

REPORTING PERIOD: Final Report and Invoice due by December 31, 2016

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- 1.) PROJECT ACTIVITIES COMPLETED DURING THE REPORTING PERIOD. (*Describe project progress specific to goals, objectives, and deliverables identified in your project proposal.*)

I built a 12 row, 30" cover crop interseeder/nitrogen side-dress applicator. I interseeded 125 acres of corn with this machine at a rate of 12lbs/A using a mixture of annual ryegrass, radish, crimson clover, rapeseed, and turnips. At the same time, I applied 75lbs of UAN 28% Nitrogen at the V6 growth stage. My goals and tests included: Cover crop stand establishment, monitoring the competitiveness with the primary corn crop via stalk nitrate testing, yield checks, soil nitrate tests and biomass growth of the cover crop after harvest where it is absorbing any excess nutrients.



- 2.) IDENTIFY ANY SIGNIFICANT FINDINGS AND RESULTS OF THE PROJECT. *(This could include photo documentation of the project at various stages if you haven't already provided these as well as final relevant images of the project at completion. Any data, graphics or record of observations throughout the growing season or during the field day event are also anticipated.)*

After seeding on June 21<sup>st</sup> I had emergence of the cover crop in 3 days. It grew 4" tall until the corn reached full canopy. Then the cover crop stalled out, as planned to minimize competition with corn, until September when the corn leaves started to mature and drop. At this point I had a stand of 25 plants/Square foot (about 85% emergence) which is very good for seeding only 12lbs/A. Once the corn leaves dropped the cover crop took off and flourished into late November when a temperature of 26 degrees F killed it.



July 11, 2016

August 10, 2016



September 2, 2016



November 1, 2016

My test plot consisted of 3-12 row, 1100 feet long, replicated strips alternating from Interseeded to check. When the corn reached maturity or “Black Layer” I took a stalk nitrate test from each strip to see if the cover crop had taken excess nitrogen away from the corn plant. The results showed a slightly lower nitrogen content in the interseeded corn but it was still by far in the optimal range. (155lbs/A total applied Nitrogen, 75lbs pre-plant, 80lbs side-dress).

Corn grain yield checks were weighed with a weigh wagon and showed no statistical yield difference between the Interseeding and check strip. This is very positive going forward.

Soil Nitrate samples were taken after the killing frost to measure how much Nitrate the cover crop had taken out of the soil. The results did not show a difference between where the cover crop was growing and the check strip. I don't feel this test is an accurate measure of the cover crop nutrient uptake since any nitrogen would be in the nitrate form for a couple months and most likely would've leached out of the check strips. Quantifying uptake vs leached and other environmental factors in a stripped field study is nearly impossible.

2016 was nearly an ideal year for evaluating cover crop interseeding. Plenty of rain, warm temperatures and a late freeze allowed for fast emergence, rapid root growth and the potential for increased competition with the corn. The stalk nitrate and yield tests revealed that the cover crop didn't compete, it was merely a companion.

3.) CHALLENGES ENCOUNTERED. *(Describe any challenges that you encountered related to project progress specific to goals, objectives, and deliverables identified in the project proposal.)*

My biggest challenge was building the interseeder. The Yetter Strip Freshener units that I was using to apply the cover crop seed interfered with the lift assist wheels on my nitrogen applicator. That only affected 2 rows. To fix that problem, I used a drop tube behind the fertilizer coulter to apply the seed.

4.) EDUCATION AND OUTREACH ACTIVITIES. *(Describe any opportunities to engage with farmers, influencers or the media about your project.)*

I had articles published on the project in the Minnesota Farm Guide, Agri-News and the Farmer Magazine.

I spoke at two separate events for the Nicollet/Sibley County Corn Growers Association and did two radio interviews at them.

My interseeder unit was displayed at Farm Fest for farmers from all over the region to see.

I spoke for the National Resource Conservation Service at a Soil Health Day program.

My project will be published in the Minnesota Department of Agriculture's Greenbook.

5.) HOW CAN WE HELP? *(Please let us know how we can improve the experience for the next generation of projects.)*

I appreciate the one page templates that were sent out for the in-season progress reports. During the growing season is always busy so the time commitment and the layout of those templates made it an easy task. Thank you for offering this to farmers. It enabled me to try something that I otherwise would not have been able to do. With all the positive feedback and following that I have received with this project, you can be assured the money was well used.

Thank you,  
Keith Hartmann