

FRD01 - On Farm Research and Demonstration



On Farm Research and Demonstration

On farm research and demonstration consists of the implementation of applied research projects on working farms to gather information and demonstrate the efficacy of the activity. The projects must fit within identified state priority topic areas.

Land Use Applicability

Cropland, Pastureland, Rangeland and/or Forest land, each approved project will have a land use

designated.

Benefits

Researchers often need willing farmers to help them carry out research projects on working farms. Participating in such projects can help farmers learn about new technologies while helping researchers determine the results of new technologies. The results of the research can help NRCS identify new and innovative techniques to address on farm conservation problems.

Criteria

On-Farm Research and Demonstration projects consist of implementing applied research on working land to gather information and demonstrate the effectiveness of new and innovative conservation activities. The research projects must be conducted by an entity that seeks to determine the value of a conservation practice, component, treatment, or process. The entity must have the means and expertise to conduct the research, analyze the findings and develop conclusions from the findings that are relevant to NRCS. Projects are preapproved by the NRCS State Conservationist in each state.

This is not intended to require farmers to initiate on farm research and demonstrations but rather to encourage them to participate in new or ongoing research projects sponsored by other responsible parties such as universities or other research oriented entities. However, if farmers have the necessary capability they can initiate their own projects within the topic areas identified by their state and the criteria of this activity.

Participants will need to follow criteria as outlined for each project that include:

- Goals of the research and demonstration
- A schedule showing completion of the project during the contract period
- A chronological list or plan of activities expected to take place during the project
- Planned end products or outcomes from the project
- Acreage needed



United States Department of Agriculture
Natural Resources Conservation Service

2011 Ranking Period 1

- Years research is to be conducted
- Farm inputs, equipment needs, etc.
- Expected assistance with data collection

Documentation Requirements

- Results or conclusions from the research and demonstration
- Documentation of the CSP participant's participation in the research project including:
 - A schedule of activities undertaken by the participant
 - Fields or other areas of the farm involved in the research

Indiana CSP Enhancement Supplemental Information

FRD01 – On Farm Research and Demonstrations (Cover Crop Trials):

Acceptable Indiana On-Farm Research and Demonstrations include:

- Indiana Nitrogen Rate Trials
- Indiana Cover Crop Nitrogen Scavenging Trial

Indiana Cover Crop Nitrogen Scavenging Trial

- This enhancement is available statewide.
- Although, it is only available to 15 CSP applicants based on CSP ranking.
NOTE: for producers who are interested but not selected, the CSP offer may have the FPP02 – *On Farm Pilot Projects* enhancement activity substituted.

CSP participants are required to work with Purdue researchers to collect and share data as outlined below. To set up the trial, participants need to contact Eileen Kladvko (kladvko@purdue.edu, 765-494-6372) as soon as they know they are accepted into CSP.

Purdue University is not committed to any additional obligations to the CSP participant for this enhancement activity beyond what is outlined in this document.

All information provided to Purdue University to complete this activity will be protected under USDA's Personal Identifiable Information protocols.

Criteria

- **Producers must use No-Till or Strip-Till only.**
- Nitrogen rate trials for corn following soybean should include five different nitrogen rates; approximately 60, 100, 140, 180, and 220 pounds of N per acre (this rate includes N applied in spring pre-plant fertilizer and in starter as well as side-dress N).
 - For corn following corn N rate trials, increase each of the five suggested N rates by 30 lbs.
- **It is important that the same N rate be applied to the strips with cover and no cover. (No manure for this field).**
- Each treatment plot (strip) with Nitrogen + cover crops and plots with Nitrogen only should be at least 350 feet long and replicated at least twice (Fig. 1).
 - Growers will calibrate their nitrogen applicators prior to the season to ensure that the targeted rates of N will be accurately applied.
 - The width of each plot (strip) should be equal to two or more combine header widths to enable harvesting a full header width down the center of each plot yet avoid having to glean partial header widths between plots. Harvesting the center of each treatment plot instead of the entire plot avoids possible border effects with adjacent N rates.
 - The same plots will be replicated for 3 sequential years (including corn-soybean rotations to evaluate the potential build-up effects of Nitrogen).

Indiana CSP Enhancement Supplemental Information

- Plots will be started in 2011 and located where corn will follow a fall cover crop (i.e. – cover crops should be established in the fall of 2010 where corn will be planted in 2011).
- The number of rows suitable for each treatment plot should also be compatible with all equipment widths to be used in the field (planter, fertilizer applicators, combines, etc). Table 1 shows examples of compatible plot sizes for different implement sizes.

Table 1.

Implement	Example 1	Example 2	Example 3
Planter:	12 row	16	12
Applicator:	12 row	8	12
Combine:	6 row	8	8
Compatible plot size:	12 row	16	24

- Cover crop options:
 - Establishment (dates, rates) must meet NRCS FOTG 340 (Cover Crop)
 - Species will be non-legume only (for example - oats/radish, annual ryegrass, cereal rye, wheat, etc.).
- Availability of a combine with GPS-equipped yield monitor greatly simplifies the harvest logistics. For most accurate yield estimates, yield monitors should be calibrated to the conditions of the test field. If a yield monitor is not available, a weigh wagon can be used to measure the grain weight harvested from each plot, but the length of each plot must also be known and recorded. Harvest and record data from each treatment plot separately.
- **Yield Loss Factors:** Potential collaborators may ask about potential yield losses expected from the lower N rate treatments in the trial. This is a fair question and, unfortunately, we do not have the financial resources to compensate collaborators for such losses. Based on our field trials to date, growers could expect to lose yield primarily with the two lowest N rate treatments (60 & 100 lbs N for corn after soybean or 90 & 130 lbs N rates for corn after corn) at amounts ranging from 8 to 20%.

Indiana CSP Enhancement Supplemental Information

Figure 1. Example of randomized plot layout for a nitrogen trial with 5 N rates with and without prior cover crops, each replicated 2 times for a total of 20 treatment “plots”. Each colored rectangle is equal to a treatment “plot” and would equal a compatible plot size listed in Table 1. The sequence of the treatment plots within each replicate can be changed, but each replicate should contain one and only one plot of each N with or without a prior cover crop rate treatment. As one might imagine, such a randomized treatment layout is most easily accomplished with sidedress N applications where you have the rows of corn to guide you from one replicate of a treatment to the next. Availability of accurate GPS lightbar navigation systems would allow you to put out preplant N rate treatment strips that should then match up with the planted rows of corn. (Please talk to Eileen Kladvko if there are questions)

Cover Crops + 60 lb N/acre	Cover Crops + 100 lb N/acre	Cover Crops + 140 lb N/acre	Cover Crops + 180 lb N/acre	Cover Crops + 220 lb N/acre	100 lb N/acre	180 lb N/acre	220 lb N/acre	60 lb N/acre	140 lb N/acre	Cover Crops + 60 lb N/acre	Cover Crops + 180 lb N/acre	Cover Crops + 220 lb N/acre	Cover Crops + 100 lb N/acre	Cover Crops + 140 lb N/acre	60 lb N/acre	180 lb N/acre	220 lb N/acre	100 lb N/acre	140 lb N/acre
Replicate 1					Replicate 2					Replicate 3					Replicate 4				

Note: If the cover crop seeding is completed by airplane, an extra plot should be added between the cover crop block and non-cover crop block.

Indiana CSP Enhancement Supplemental Information

Use this form to record the pertinent information about the cover crop nitrogen scavenging trial and return to Eileen Kladvko, Purdue Univ., Agronomy Dept, 915 W State St, West Lafayette, IN 47907-2054

Name		County				Soil series			
¹ Tillage				² Drainage					
Recent soil sample results ³	O.M.	pH	P	K	Ca	Mg	CEC		
Units	Circle units used for P, K, Ca, and Mg – pounds per acre or ppm								
Soil Sample Date:		Previous Crop:			Current Crop:				
Cover Crop:		Plant Date:			Termination Date				
Seeding Method:									
Current Crop Hybrid:					Seed rate:				
Plant date:					Harvest date:				
Broadcast/date : ⁴				Starter/placement : ⁵					
Sidedress type/date : ⁶									
Rain/weather stn. ⁷ (Inches per month)		April	May	June	July	Aug	Sept	Oct.	Nov.
¹ Tillage method preceding this crop, such as no-till, strip-till, disc, moldboard plow, etc.									
² If the field is tile drained how is it functioning. Judgment call by the farmer - poor, fair, good or excellent.									
³ A copy of a recent soil sample for the field if it is available or record on sheet. Soil O.M. is a strong interest.									
⁴ Rate, analysis and date of broadcast fertilizer application if any.									
⁵ Rate/gallons, starter fertilizer and placement (2x2, surface band, etc.) if any.									
⁶ Type (UAN, urea, AA, etc.) and date of application.									
⁷ April -Nov. Or more weather dependent on harvest or a nearby weather station if known.									
Other comments:									