

Penn State University
Final Activity and Outcome Summary for the 2011-2014 State Program Project
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Project Title: Cover crop innovations: A training program for agricultural service providers and farmers

Performance Target:

- 30 agricultural service providers from Extension, NRCS, Conservation Districts, and Industry will deliver educational programs about innovative cover crop management to 500 vegetable or agronomic crop farmers who manage a total of 25,000 acres; 50 of these farmers will implement a new cover crop management practice on 2,500 acres of land.

Performance Target Outcomes Reported

- **28 ag service providers** used information or resources from the State Program in **230 educational activities** that **reached 130,126 farmers**. Activities reported were:
 - 37 Workshops
 - 19 On-farm demonstrations
 - 41 Webinars/presentations
 - 4 Fact sheets/guidance documents
 - 16 Articles
 - 1 Web content element
 - 112 Individual consultations

Highlights from these activities by ag service providers included:

- Extension educator, NRCS, and conservation district recommendations to farmers about the species and seeding rates to use in mixtures
- NRCS Plant Material Center cover crop demonstration plots
- NRCS cover crop exhibits at Ag Progress Days
- Revised NRCS cover crop practice standard (code 340) that includes information about cover crop mixtures
- Cover crop demonstrations and field days conducted by Extension, Conservation Districts, and a non-profit
- Articles written in 4 commercial farm press publications, 3 non-profit organization newsletters, and Extension newsletters. Farmer readership of these publications is conservatively estimated at 100,000.
- **607 farmers adopted** an innovative cover crop management practice on **34,263 acres** of land as a result of learning from the 28 educators or the state program.

Examples of practices adopted by the farmers include:

- Using cover crop mixtures with appropriately designed species and seeding rates
- New use of winter cover crop monocultures, including cereal rye seeding, forage radish, and winter wheat
- Interseeding clover into standing corn
- Spring pea drilling prior to corn planting
- Trialing new management of winter cover crop seed mix, to provide resources for overwintered bumble bee queens
- Trialing summer planting of seed mix to achieve floral resources for gyne life stage of the pollinator, *Bombus impatiens*
- Spread barley on soybean stubble, turbotilled
- Using spring legume cover crop on most of crop ground

Additional Outcomes Reported

This project resulted in 4 new working collaborations that guided research, farmer education and adoption:

- Advice to PSU Entomology researchers about flowering cover crop species and how to manage these species in a mixture. As a result, the USDA Specialty Crop Research Initiative-funded 'Project Integrated Crop Pollination' incorporated flowering cover crop mixtures as one of the practices to test in research trials.
- Advice and technical support to PASA, who was awarded a conservation district grant to conduct on-farm trials and education about using cover crops to reduce tillage in vegetables. Grant project educational activities reached 6,029 farmers.
- Collaboration with a NE-SARE-funded project on winter-killed cover crops at the Univ. of Maryland to provide

a platform for engagement with farmers and ag service providers in PA, organizing an on-farm trial for two years and participating in 2 field days, 2 conference workshops, and a webinar series held in Pennsylvania.

- Significant levels of support to the NRCS State Agronomists in Pennsylvania and Virginia and the Big Flats NRCS Plant Materials Center. NRCS used state program guidance documents and PPT presentations on agronomic management principles and nitrogen management with cover crop mixtures to revise NRCS Conservation Practice Standards for Cover Crops (Code 340) to specify guidelines for cover crop mixtures.

Subsequently, 529 farmers followed these guidelines to obtain EQIP funding for planting cover crops on 22,235 acres. The VA-NRCS State Agronomist used the guidance documents and PPT presentations to conduct 48 educational activities that reached 1,070 farmers. As a result, 15 farmers designed appropriate seeding rates of cover crop mixtures planted on 2,250 acres.

Project Milestone Activities Conducted	Participants	
3 Workshops	84 from Extension	133 from NRCS
4 On-farm demonstrations	122 from Non-profits	150 from Industry
1 Tour	200 Farmers	276 Other
20 Webinars or Presentations	A core group of 12 educators participated intensively, requesting and receiving educational materials; supplies, technical & speaking support at farmer events; and individual consultations as needed.	
30 Individual consultations		
Assessments of Learning		
<ul style="list-style-type: none"> • 333 ag service providers and 75 farmers verified they learned new knowledge and skills on surveys conducted at program events and in follow-up. • 281 service providers and 57 farmers indicated their intention to use new knowledge and skills learned. <p>Key knowledge and skills taught through the program included:</p> <ul style="list-style-type: none"> – Management practices for cover crop mixtures, including species selection and seeding rates – Using cover crops for forage – Interseeding cover crops – Cover crop/herbicide interactions – Managing nitrogen with cover crop mixtures – Spring Seedbed Characteristics After Winter-killed Cover Crops – Invertebrate Pests and Their Natural Enemies – Optimizing Weed Suppression and Nutrient Use Efficiency in Cover Crop-Based No-Till Organic Corn 		

Participants expressed their assessments of the value of the project in these quotes:

I consider the State Program one of the very top Extension resources on cover crops in the mid-Atlantic region. I include a one-page excerpt from the State Program’s documents about formulating mixtures every time I create a handout to give during field or classroom presentations on advanced cover crop management.

The State Program’s help and work has been one of the single most useful forms of outside information I have come across in the past few years to help me fulfill my job. I am integrating these concepts (rather than data or documents) into my own products and outreach.

I have turned to the State Program on several occasions for feedback on both scientific questions and questions about optimizing extension efforts and they have always given prompt and thoughtful feedback.

Outreach about SARE Grant Programs

During the 3-year project, the Pennsylvania state program reached more than 1,800 agricultural service providers and 6,000 farmers with information about SARE grants through grant workshops, presentations and exhibits at conferences such as PASA Farming for the Future and Ag Progress Days.