

SMALL FARM QUARTERLY SUBMISSION FORM 2019

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Article Title:

New SARE manual helps farmers innovate and solve problems

Article Lead:

A new manual written by Cornell University faculty and a team of experienced farmers offers a step-by-step process for on-farm problem solving and experimentation.

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Photo Information (File Name and Caption):

See attached

Figure 1: Karma Glos (Kingbird Farm, Berkshire, NY) checks in on her organic chicken flock. Photo courtesy of Rosemary Glos.

Figure 2: Steve Groff (Cedar Meadow Farm, Holtwood, PA) demonstrates the roller-crimper he helped develop. Photo courtesy of Steve Groff.

Article Text:

To thrive, farmers need to adapt to changes that arise on a near-constant basis, including unpredictable weather, new pests, volatile prices, and changing customer preferences. *Problem Solving and Innovation on the Farm: A how-to manual* is a new publication that will guide you through a step-by-step process to bring out your inner innovator. Written by a team of Cornell University faculty, experienced farmer-innovators, and extension educators, this manual will help you address problems and improve your farm in a creative manner.

Other guides that lay out basic on-farm research approaches tend to describe the scientific method as a way of performing on-farm trials using formalized research approaches. By contrast, the goal

of this new manual is to present informal, farmer-developed experimental methods that are compatible with day-to-day farming activities. The seven-step Problem Solving and Innovation Framework introduced in the manual involves multiple, continuous cycles of adjusting, evaluating, and improving farming systems in response to changes on an ongoing basis. It is presented in general terms so you can apply it to the unique conditions of your farm. As a result, this publication will teach you the necessary skills to experiment on your own, including establishing benchmarks, organizing data, and analyzing results.

The Problem Solving and Innovation Framework is brought to life through numerous real-world examples and case studies detailing creative farmers' experiments. These stories include valuable suggestions and tips that are applicable to all attempts at innovation and problem solving. For example, Klaas Marten's (Lakeview Organic Grain, Penn Yan, NY) efforts to identify the cause of his declining bean yields and subsequent experimentation with cover cropping systems illustrate how farmers can study their farm system, design trials, and devote time to innovation. Similarly, Karma Glos's (Kingbird Farm, Berkshire, NY) quest to dehybridize and raise organic chicken breeding stock shows the cyclic nature of innovation and the importance of having a clearly-defined farm vision.

Several farmers and extension educators offered positive reviews of the new manual. For instance, Mike Kane (Shamrock Hill Farm, Port Crane, NY) noted, "Forty years ago, the ideas in this manual would have been invaluable to me as I designed and developed my farm." Lou Lego (Elderberry Pond Farm, Auburn, NY) echoed the opinion, saying, "It is a great new framework that will benefit both farms and universities. [It has] lots of good references, graphs, and illustrations, and the farmer examples add to the value."

The importance of solving problems in innovative ways will become all the more important in the coming years as the speed and magnitude of changes are likely to increase due to environmental shifts, accelerating technological development, and an increasingly interconnected economy. This is particularly true for small farms that don't have access to the resources needed to maintain the approaches they've become accustomed to using in the face of drastic and large-scale changes.

Despite their importance, the skills needed for adaptive farm management are often believed to be innate rather than learned. As a result, many farmers tend to "wing it" rather than systematically plan and execute detailed plans for experimentation. On the other hand, some farmers have integrated Problem Solving and Innovation Framework into their normal farming operations, resulting in solutions that are more appropriate for their farms than generalized, cookie-cutter fixes.

The first steps of the framework offer an overview to developing a whole farm plan through a series of introspective exercises which assist you in identifying a vision for your farm moving forward. Establishing these goals helps prioritize which aspects of farm production need to be urgently addressed and those that can simmer on the back burner until more time is available to devote to less-pressing issues. The next steps detail how to make and document observations. Farmer-innovators noted the importance of walking their fields, but they also recognized that they could not trust their memories alone, underscoring the importance of systematically recording notable observations. These detailed observations of the farm system allowed them to identify problems before they threaten farm operations and provide inspiration for possible solutions.

These introductory steps serve as the foundation for designing, implementing, and evaluating experiments alongside normal farming activities. The approaches that you use will differ depending on your motivations, site-specific farm conditions, and the nature of the problem itself, highlighting the complexities involved in experimentation. As a result, many farmers expressed a common set of uncertainties. How do you pair a question with experimental methods? Identify which problems can make do with quick fixes as opposed to system redesigns? Account for different sources of variability through the use of controls? Determine whether replication is necessary? Respond to unexpected problems that arise during trials? These questions may initially appear overwhelming, but the manual breaks the process down into approachable steps to find effective, sustainable, innovative solutions that are specifically adapted to your farm. It also describes methods and tools which you may find both useful and novel, including cell phone apps for recording data, mapping software, and equipment for monitoring environmental conditions.

The manual's comprehensive content is complemented with references to additional resources, including lists of farmer networks and agricultural organizations that support farmer problem solving, adaptive farm management worksheets, and funding sources for on-farm research grants. A range of figures and tables accompany the text to illustrate the principles presented and assist visual learners.

Depending on their experience and background, readers will find different uses for the manual. For instance, new farmers can focus on the content regarding whole farm planning so that they will be able to effectively and easily integrate experimentation into their future farm management. On the other hand, more experienced farmers will benefit more from the techniques presented in case studies and example experimental designs. Regardless of your experience, however, the manual will teach you something about how you can manage your farm sustainably and successfully.

The manual was written with support from the Northeast Sustainable Agriculture Research and Education (SARE) program and will be available in full as a free PDF download on their website at: <https://www.sare.org/Learning-Center>.

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