
innovations

IN SUSTAINABLE AGRICULTURE

THE NORTHEAST REGION SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION PROGRAM

For good measure: How to verify project results



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INNOVATIONS

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For good measure:

How to verify project results

Each year, Northeast SARE awards about \$3 million to as many as 100 different grantees. Although these projects differ widely in content, approach, and audience, almost all SARE project managers share the common goal of improving agricultural sustainability through changes in practices or, for research projects, investigating new sustainable methods. Researchers inherently understand, through the application of the scientific method, that measurement and verification are needed for meaningful research results, but project leaders who have specific outreach goals and performance targets often fail to measure or verify that their objectives have been achieved.

The challenge

It doesn't matter whether the project runs six months or four years; it doesn't even matter whether a project has specific, structured milestones and a written performance target or a much simpler statement of proposed results. What does matter is the underlying challenge of verification—

how do people find out *what really happened* as the result of the time, effort, and money they've expended?

It's important to note right away that verification is different from documenting activities, events, studies, trainings, or products generated by a project. Under Northeast SARE's outcome funding, projects should document new behaviors, adoption of new practices, or other meaningful changes in a target audience. Measuring these changes takes thoughtful planning and involves skills and a mindset that many of us are not completely comfortable with.

Specific, measurable, realistic

To help us understand verification better, the Northeast SARE leadership, state coordinators, and office staff recently met with Nancy Ellen Kiernan from Penn State University. This is her area of expertise, and we asked her to help us develop better tools for project verification and refine our own understanding of how the process really works. Note that we



**Talk is not cheap.
Talk is how you find out
what happened.
Use surveys, meetings,
telephone calls, e-mail,
or other communication
to measure change.**

are using the term *verification* rather than *evaluation*, since it more clearly describes the intent to document *an anticipated or intended change*, while evaluation often means using an external person or entity to capture *all change* and make unbiased judgments about impact.

One of the core features covered by Kiernan was that a good verification process starts with project goals that are specific, measurable, and realistic. And these goals must be in place from the beginning; without goals up front, it's impossible to verify that you accomplished what you *intended* to accomplish.

This may sound obvious, but both staff and proposal reviewers have been surprised at how often a clear, precise, and measurable goal is lacking in grant proposals, even though it's asked for in the call for proposals. Strong verification will flow naturally from well-defined project goals that describe the learning process and subsequent changes in what a target audience does differently as a result.

For instance

Let's say a proposal comes in to train farmers to use a thrilling new widget that will create customized spreadsheets and tracking tools for adding value to a wide range of crops. Out of enthusiasm for the concept, and perhaps a feeling that the benefit is self-evident, the applicant may focus on the number of farmers that get trained and how many copies of the widget get distributed.

It can be easy to forget that the proposed widget and the training only yield some benefit if farmers understand the widget, think it's valuable and meaningful, and then actually use it. Further, once the widget is used, there must be some way to measure how well it worked and whether it increased farm profits, improved stewardship, increased farmer satisfaction, or improved some other measure of sustainability.

Who, what, and when?

Another way to think about specific, measurable, and realistic results is to frame a project in terms of who is expected to benefit, what they will do to achieve that

benefit, and when the benefit will likely occur.

In the case of the thrilling widget, these questions not only address how many people get trained, but other important components like what their current state of widget knowledge really is, what information you will need to teach them about the widget, how best to deliver the training (hands-on, in a group, individually, on-line, or some combination of techniques), how extensive the training will need to be in order to be effective, and what kind of follow-up is necessary to reinforce new knowledge about the widget and promote its adoption.

Past as prologue to the future

Verification is always a comparison over time: To do it accurately, it's important to measure the baseline conditions so the extent of change can be assessed. Before a project even starts, it's helpful to ask questions that measure what people already know, and what their skills, attitudes, and intentions are.

continued

Then ask more questions in mid-stream to see if these variables are changing and to assess whether the project's efforts are effective, and if they aren't, how they can be adjusted.

At the end of the project—after leaving enough lag time for knowledge to be applied—a final survey or other follow-up can verify whether the farmers used the widget, how well it worked, and how much farmer benefit came from using it in our demanding and unpredictable world.

Taxation without representation?

It may seem, at first glance, that verification is simply another requirement, an added tax on projects that already have plenty of work to do. Fortunately, this isn't the case; in order to get the results they want, or to meet the expectations of their employers or colleagues, project leaders will of necessity do many verification tasks anyway.

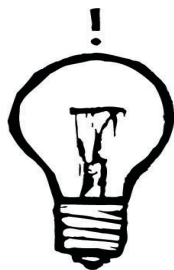
SARE's goal is not to add work but to sharpen the effectiveness of our grants by focusing on meaningful, measurable change. To that end, we are offering some specific tools that can support effective and efficient verification; many of these were developed by Nancy Ellen Kiernan specifically for the Northeast SARE program.

Sample surveys, handouts, timelines, and other verification tools have been posted to www.nesare.org (look under "Manage Your Grant") and we invite all project managers to explore and use them to strengthen their documentation of results. These materials

are straightforward and offer a variety of examples that will work with different audiences and types of projects.

Opportunity and unintended consequences

Often, verification leads to interesting and even pleasant surprises, not just about intended results, but unintended ones. For example, a project may have helped to redirect a larger research program at a university, uncovered a previously unknown benefit of a farming practice, leveraged additional funds for an organization, or built new connections between the farm community and non-farming neighbors or consumers.



Sometimes verification also points to what looks like failure, but it's amazing how often a project that appears to fail does it in an interesting way. We've found that almost all failure is useful, and that a really first-rate failure can shed new light on approaches that may be more successful in future attempts to tackle the same or similar problem. We all seek success, of course, but it doesn't always come in the expected package—as Thomas Edison once commented, he

now knew a thousand ways *not* to build a light bulb.

Power to the people

SARE provides funding to promote innovation and improvement in our food system, and we do this by looking for and funding projects with good ideas, sound approaches, experienced teams, and a plan to measure meaningful results by the time a project ends. Meaningful results are changes in things like people, farms, the environment, and the economy; it is only through the aggregation of project results that SARE can document its own effectiveness.

Innovation and improvement can only be accomplished through effective projects, and through the intelligence and skill of the people who manage them. Ultimately, the future of SARE is in the hands of its grantees.

Verification summaries



- 1 **Soil health**
- 2 **On-farm research**
- 3 **Backpack sprayers**

Verification tools on the web:

Workshop presentation and planning

Sample performance targets, milestones, and verification questions

www.nesare.org

SELECT
"MANAGE YOUR GRANT"

Verification summary 1

Research and Education Grant

Farms adopt conservation tillage, cover crops, and new rotation strategies

Intensive crop production in the Northeast region has often resulted in soil degradation, contributing to reduced crop yield, increased production inputs, and lower farm profitability.

The Cornell Soil Health Team, with Dr. George Abawi acting as the project manager, wanted to help farmers understand how improving soil health led to a range of farm improvements, including improved fertility, reduced erosion, and better yield. And they also wanted to shoot very high: out of 1500 growers initially contacted, the team proposed that 200 farmers would get soil tests and reports and 100 would adopt a long-term practice like reduced tillage, improved crop rotation, new cover crops, or using compost or green manure to improve sustainability.

Outreach was robust: They offered more than 50 grower meet-

ings, field days, special educational sessions, and hands-on workshops. The project team also gave presentations on soil health at professional meetings, put together publications on soil health issues, and revised and expanded the soil health content on the Cornell website. The project reached more than 2,500 individual farmers and lasted almost three years.

But how did the project manager know how things were going? Answer: He asked. Or, more precisely, he gave farmers useful tools and then surveyed and talked to them about whether they really used them.

One thing that marked this project was the range of opportunity farmers had—at growers' conferences, in classrooms, informal demonstrations, field days, farm visits, interactive small-group dis-

continued

cussions, and both daylong and weeklong train-the-trainer sessions—to talk, ask questions, and identify important soil health issues and how they affect individual farms. These farmer gatherings were reinforced by the 881 soil tests done at the farmers' requests, exceeding his target of 200 by a very wide margin. When the tests were complete, farmers got reports that helped them make practical, knowledge-based decisions about how to improve and conserve soils by understanding the conditions on their farms.



The team then surveyed the farmers to verify that their efforts had led to measurable, improved practice on the ground. The results show that almost all the participants who responded used the soil report to identify critical soil health constraints, and more than half had applied what they learned by adopting new tillage, cover crop, or crop rotation strategies. These farmers also reported that they had

already seen improvements in their operations or profitability as a result. Then, to get feedback that was more in-depth than the survey, the team followed up by talking directly with a smaller sample of participants to explore and confirm that the results were sound. The out-

come was that the team exceeded the performance target by a comfortable margin.

A secondary benefit of this project lay in an improved knowledge source for all farmers, whether they participated in

the project or not. The Cornell Soil Health Test is now available to growers as a tool for the holistic and long-term soil management of their fields, and a new edition of the Cornell Soil Health Training Manual is in circulation.

To learn more about this project, search the SARE projects database for LNE06-235, "Soil health assessment for sustainable land use and profitable crop production in the Northeastern USA." You can also visit <http://soilhealth.cals.cornell.edu>.



Verification summary 2

Farmers learn from each other, often through informal networks that exchange tips, anecdotes, and the results of trial and error, but a 2006 survey indicated that almost all of the responding organic farmers in Vermont wanted more than informal support—they specifically wanted to learn how to do on-farm research trials that would improve their production practices and help them meet the rising demand for local fruits and vegetables in a sustainable way.

This is why, in 2009, Dr. Wendy Sue Harper of the Vermont chapter of the Northeast Organic Farming Association began a two-year effort to help farmers identify their research priorities and learn to conduct on-farm trials. The work began when 62 farmers attended a farmer-to-farmer workshop to talk about knowledge gaps and production priorities; as it turned out, the main interest area among farmers focused on winter production, storage, and season extension.

The results of this meeting were then made available to more than 100 agricultural service providers,

Partnership Grant



Farmers learn research techniques, improve winter storage and production

agencies, and the agricultural service sector across the state, making the people who serve farmers aware of what their clients were interested in.

This is already a useful result, but it wasn't the primary goal—Harper also wanted to identify at least six farmers who felt they were ready to plan and implement an on-farm research effort. She also set a goal that at least three of those farmers would then share their results at a conference and publish their findings so other farmers could learn from them.

As a result of the initial workshop, Harper actually identified *ten* farmers who wanted to proceed with on-farm research. She worked with each of them via e-mail, telephone, and site visits to develop sound, workable, results-oriented projects that addressed the issues that mattered to each grower. This continuing contact made it easy for the project leader to not only track her results but gather key information about the quality and quantity of support each farmer needed.

In the end, eight of the ten farmers completed their research and

wrote a report—exceeding the initial target—and four farmers presented their results at a winter conference. All the reports were published on a high-traffic website, in a newsletter, and via bulk e-mail to organic subscribers.

One of the strengths of this project is that verification was built in—Harper could easily verify that she exceeded her targets because of the project's focus, follow-up, and responsiveness. By listening to farmer needs and offering nimble, flexible project delivery, the participating growers were able to feel real ownership and stay fully engaged. Harper instilled confidence and excitement about on-farm research driven by ideas—with appropriate support, the farmers developed robust, useful project plans that had randomization and replication built into them. They then used these plans to address practical, interesting, and important questions, and as a result became more sure of their ability to refine their on-farm research as new and better ideas emerged.

The farmers' topics included winter storage, the effect of watering on soil temperature, bed pitch and its impact on soil temperature, several different trials with row covers, and post-harvest treatments for winter squash. All these reports are available on the NOFA-VT website and are included in the project report for Northeast SARE.

To learn more about this project, search the SARE projects database for ONE08-084, "Developing on-farm research expertise among farmers in Vermont." You can also visit the NOFA-VT website at www.nofavt.org and search for "winter growing research results."

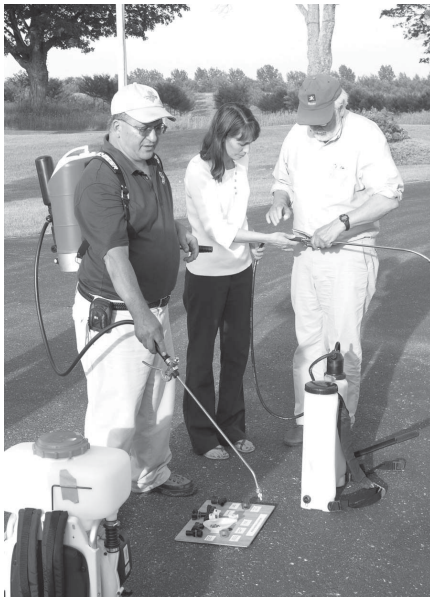


photo courtesy of John Grande

Verification summary 3 Professional Development Grant Backpack sprayers for organic pest management

Verification revealed that only eleven service providers used the training kits to teach farmers—well below the 40 planned for.

But verification also showed that those eleven service providers actually trained 417 farmers (the target was 250) about using backpack sprayers on both organic and non-organic farms. The project met its performance target with room to spare.

Dr. John Grande, director of Rutgers University's Snyder Research Farm, knew from the USDA ag census that most vegetable farms in the Northeast were on relatively small acreage. He also saw deficiencies in application guidelines for organic pest management materials and in farmer understanding of how to apply these materials effectively, pointing to a need for a training program that would help farmers optimize their use of a simple, low-cost device for pest control on small farms—a backpack sprayer.

A review of traditional and OMRI approved materials used in organic farming indicates significant deficiencies: First, that detailed application instructions are generally not provided, only use rates; next, that product formulations vary widely in viscosity and particle size; and, finally, that agricultural professionals and farmers receive safety training, but have limited knowledge of smaller-scale liquid application technologies.

Grande envisioned a train-the-

trainer program as the best way to achieve this goal, and he got a Professional Development Grant to train extension educators, NRCS personnel, and other agricultural service providers on the use of backpack sprayers for small-scale fruit and vegetable production. His project's performance target was to train 60 service providers and have 40 of them go on to teach 250 farmers about using backpack sprayers.

Grande knew that backpack sprayers were already being used by small-scale farmers in many parts of the world, including the Northeast, but often were not used effectively, since there wasn't much information about which backpack sprayers worked reliably and well, which ones could be calibrated accurately, and how effectively they could apply materials such as those approved by OMRI for use on organic farms.

Grande conducted extensive *Consumer Reports*-type testing on different sprayers and sprayer accessories like pressure regulators, high-quality spray arms, and

nozzles. He also developed calibration techniques and tried working with some difficult-to-apply materials. He identified the top-performing sprayers, the best accessories for optimizing sprayer performance, and created a program of best-use practices. In short, he put together a complete package of deployable technical resources, and the train-the-trainer program was ready to roll out.

Grande and the project team offered two hands-on training sessions in New Jersey and Delaware for 69 agricultural service providers. Some teaching took place in a classroom setting, where participants learned about backpack sprayer technology, pumps, nozzle designs, their effect on drift control and coverage, and calibration essentials. Classroom instruction was followed by a hands-on session, where participants operated various types of sprayers—both backpack and tractor-mounted—and collected data on calibration, crop coverage, spray drift, and time efficiency. Project participants found this combined approach effective, and rated their increased knowledge in all topic areas as high or very high after the trainings.

To increase the confidence and success of service providers who would go on to teach farmers, Grande also assembled training kits for them. These kits included

an array of sprayer nozzles, filters, pressure regulators, and other accessories, along with equipment documentation and PowerPoint presentations that included instructional video clips.

His follow-up showed that, over the next two years, eleven service providers used the training kits to teach farmers. This was well below his target of 40, but he also found that these eleven trainers actually reached far more than the 250 farmers originally proposed. In fact, the eleven service providers actually trained 417 farmers about the optimal use of backpack sprayers on both organic and non-organic farms—his verification showed that the project succeeded in spite of the initial disappointing numbers.

To increase the number of service providers who train farmers after attending a Professional Development program, Grande believes he will need to provide more incentives, have participants develop individualized education plans at the end of the training, and provide more support and continued communication with project trainees after the training.

To learn more about this project, search the SARE projects database for ENE06-096, "Matching small-farm crop sprayer application technology with OMRI and traditional agricultural products."

Verification overview

- ◆ Set realistic, measurable goals
- ◆ Keep good project records
- ◆ Develop strong relationships with your farmers or other beneficiaries
- ◆ Ask questions often and listen to the answers
- ◆ Accept that there may be surprises and course corrections
- ◆ Keep in mind that activities are not outcomes
- ◆ Track, follow up, and seek feedback from project participants
- ◆ Report clearly and frankly about your progress



Searching project reports

All the project summaries in this issue of *Innovations* end with a brief description of how to learn more about the project, and often directs you to the SARE project database.

You can use the project numbers at the end of each story to read specific reports or, if you're interested in seeing a range of projects from across the country associated with a keyword, you can do that, too. There is a wealth of information in these project reports, both annual and final, and you can find resources like the guide for using organic nutrient sources described on page 11.

To do a search, go to www.sare.org. From the top navigation bar, select "project reports." This will bring up some tips on searching and access to a search query window.

Resource from the National Academies

Different paths to a single goal

Last summer, the National Research Council summarized the book-length report, *Toward Sustainable Agriculture in the Twenty-First Century*, developed by the National Academies, which describes the need for two different approaches to agricultural sustainability: Incremental and transformative.

On the incremental side are efforts that have been a component of SARE from its inception, where the focus is on applied research into pest management, water conservation, marketing, profitability, and—as is consistent with outcome funding—farmer adoption.

The transformative side is also a part of SARE programming—a part challenging to implement but full of promise. The council's summary calls for "new thinking about farming practices and the natural environment, food markets, and the communities in which they are embedded."

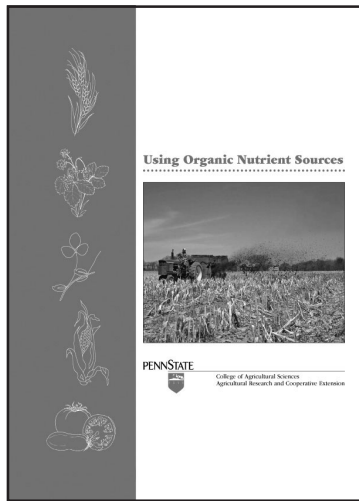
This multidisciplinary work is demanding, as Northeast SARE has learned from systems research projects funded in 2008 and 2009, but it can be done. Holistic, whole-farm planning has been part of SARE since 2001, when the region awarded its first grant on the topic. This was inspired, at least in part, by the National Research Council's *Alternative Agriculture*, published in 1989.

Toward Sustainable Agriculture in the Twenty-First Century follows through on elements in the earlier book, and it also recognizes that participatory research—that is, research where farmers are active partners in planning and implementing on-farm trials—is a source of innovation, new knowledge, and the adaptation of sustainable techniques to local conditions. This confirms the role of farmers as cooperators and contributors and validates SARE's longstanding conviction that successful projects draw on farmer expertise.

The report also makes it clear that decisions to adopt certain practices are driven by science, markets, public policy, land tenure arrangements, and other elements. Each farm is different; improving sustainability requires a better understanding of these differences and how individual and regional characteristics affect farmer decisions.

Copies of *Toward Sustainable Agriculture in the Twenty-First Century* are available from the National Academies Press; call 202-334-3313 or 1-800-624-6242, or go to www.nap.edu.

Resource from project reports



Organic nutrient sources: The care and feeding of soil

A free 14-page booklet, “Using Organic Nutrient Sources,” helps organic farmers understand their soil test results and go on to respond wisely and compliantly, within the USDA National Organic Program standards.

Filled with useful detail and valuable reference charts, the booklet acknowledges from the start that nutrient management is often a major challenge for organic farms. And since soil test results don’t come with specific recipes for applying different nutrient sources, the guide shows farmers how to make informed decisions about the best use of the amendments and fertilizers available to organic growers. The text and charts in the booklet guide farmers on how to manage pH, calcium, and magnesium levels and how to apply nitrogen, phosphorus and potash from organic sources to satisfy crop requirements without accumulating excessive levels of nitrogen and phosphorus.

The publication is connected with a 2007 Professional Development Grant, “Whole-farm nutrient planning for organic farms.” The project, led by Dr. Elsa Sanchez from Penn State University, supported intensive training on this topic for New York and Pennsylvania educators and service providers. The overall focus was to help organic farmers improve nutrient management through more relevant soil and compost analysis recommendations and use of computer-based whole-farm nutrient planning.

This same project also resulted in another change: Soil test reports now include a statement of the hazards of above-optimum-level nutrients, and says that compost applied on an N basis will have an excess of P and K relative to plant demand. These salts and minerals can accumulate with repeated application—farmers should test frequently and avoid overapplication.

The booklet can be downloaded at no charge from <http://pubs.cas.psu.edu/FreePubs/pdfs/uj256.pdf>

<http://pubs.cas.psu.edu/FreePubs/pdfs/uj256.pdf>

There is also a companion worksheet that helps farmers decide which organic nutrients to use and how much to apply available at http://horticulture.psu.edu/system/files/Decision_Tree.pdf. This decision-making tool shows how to figure out the right questions to ask, get real-world estimates of residual nitrogen from compost, calculate nitrogen availability from last season’s cover crop, and decide whether compost is the best way to apply nutrients.

Both the booklet and the worksheet were developed by Penn State. If you prefer a printed copy over download, you can request one from the Publications Distribution Center, Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802; call 814-865-6713.

To learn more about this project, search the SARE project reports database for ENE07-104, “Whole-farm nutrient planning for organic farms.”

Go green—get Innovations on screen

If you are reading a printed copy of this newsletter, you should consider the benefits of getting an electronic version instead. The less money SARE spends on things like printing, paper, and postage, the more we can spend on outreach, grants, and other initiatives like Sustainable Farmer Educators and the Speakers Fund. To make the switch, send your e-mail address to nesare@uvm.edu.

Mark your calendar

- March** 2011 grant awards announced
- April** Opening of online submissions for Graduate Student Grants
- May 31** Deadline to submit a Graduate Student Grant proposal

www.nesare.org