ENE06-096

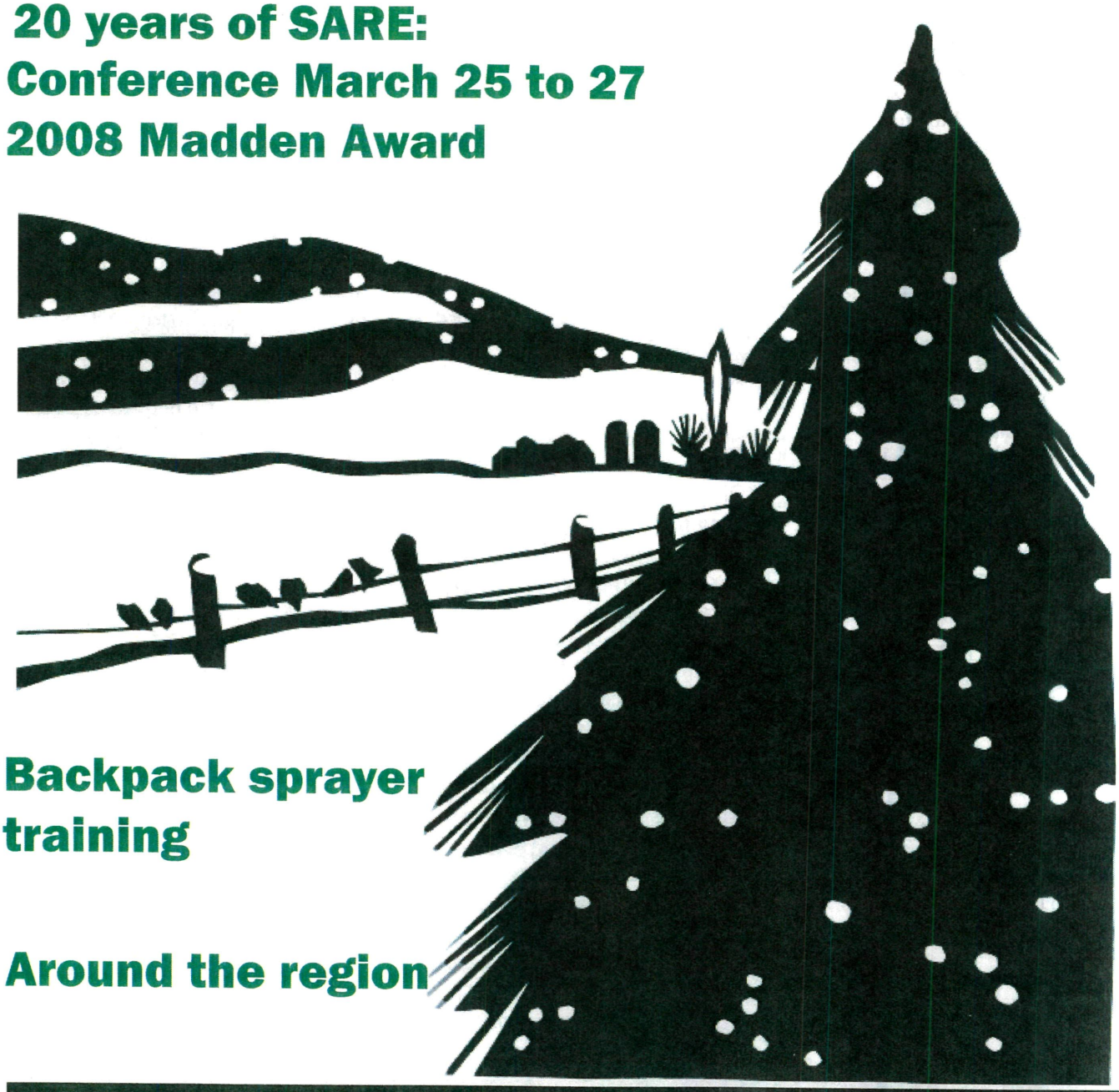
innovations

IN SUSTAINABLE AGRICULTURE

THE NORTHEAST REGION SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION PROGRAM

20 years of SARE: Conference March 25 to 27

2008 Madden Award



Backpack sprayer training

Around the region

Winter 2007-2008

Professional development project

Backpack sprayer training

Participants compared different sprayers and learned how to improve application techniques. Photo provided by John Grande.

John Grande, director of the Rutgers Center for Sustainable Agriculture at Snyder Farm, has spent the past couple of years working to fix what he calls a "technology disconnect" that comes between the people who make backpack sprayers, the people who make what goes in them, and the people who make the nozzles, wands, triggers, valves, and other attachments that affect their performance. In theory, all these manufacturers are working to serve farmers, but without much reference to each other—it's a kind of technological blindness. And, since backpack sprayers are most often used on the smaller plots and varied crops that characterize diversified farming, this disconnect has tended to have a disproportionate effect on organic and alternative farmers.

The "reconnect," if that's what we can call it, is that the scale, portability, and ease of use of a backpack sprayer means that it can be, as Grande says, "attached to your brain, not to a tractor."

Backpack sprayers are versatile, easy to fill and clean, and relatively inexpensive; they also do their work at the end of a human arm where results can be seen and evaluated. But applying brain power to sprayer performance has not always been direct or easy—as already noted, sprayer manufacturers don't provide a wide assortment of nozzles, tips, strainers, filters, or other useful accessories. Instead, it has generally been up to the farmer to find out where to get these items and how best to use and combine them.

Added to this is a second problem: Instructions provided by the Organic Materials Research Institute (OMRI) on how to prepare and apply approved materials are sometimes sketchy, and some of these OMRI-approved materials have unusual formulations that have not been widely tested. Since the appropriate materials, applied correctly, are essential to product quality and consumer safety, these two knowledge gaps can combine to make a noticeable hole in how consistent, accurate, and intelligent farmers can be with their pest and disease management plans.

Since 2006, Grande and his team have been using SARE Professional Development Grant funds to evaluate an array of nozzles, pressure valves, and other kinds of hardware retrofitted to different types of hand, battery, and gasoline-powered pumps. The sprayers were evaluated using a solution of kaolin clay—Surround—which dries to a white film that gives a good visual indicator of sprayer performance. Additionally, Surround is a popular product used in organic pest management.

One aspect of the project was to use crops with different growth habits and leaf surfaces for evaluation of the sprayers, nozzles, and regulators. Several farmers experienced in the use of backpack sprayers were asked to evaluate different styles of sprayers for operator utility and performance. This information is being compiled and will be a part of the training materials that are now in development.

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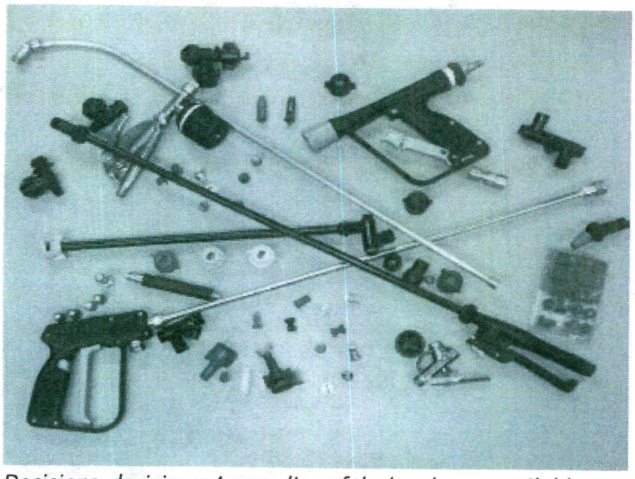

Decisions, decisions: A sampling of the hardware available to modify backpack sprayers.

Backpack sprayers are versatile, easy to fill and clean, and relatively inexpensive. They also do their work at the end of a human arm where results can be seen and evaluated.

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Grande and his team then developed a hands-on training opportunity that gave about 60 service providers in New Jersey, Pennsylvania, and Delaware a new awareness of backpack sprayer design advances, techniques for improving application accuracy, pump design advantages and disadvantages, modification techniques that specifically address liquid product applications of different densities, spray nozzle design, and calibration essentials. Participants also had a chance to directly compare four different sprayer designs and gather data on crop coverage, efficiency, and how the backpack sprayers compared with a tractor-mounted design.

Grande also presented his results at the Mid-Atlantic Fruit and Vegetable Growers Convention in Hershey, Pennsylvania back in February of this year, and was also invited to present the project results to grape growers in Michigan in June.

Now, as the project is reaching maturity, Grande is putting together a complete, portable training experience that will include a PowerPoint CD, hands-on training with preassembled hardware kits, and a tested curriculum that can be used by agricultural educators. The kits also come with an option to borrow sprayers if needed. These training kits will be available later this winter—to learn more about them, send e-mail to John Grande at grande@aesop.rutgers.edu or call 908/730 9419.

By bringing together these technologies, Grande has demonstrated how low-cost backpack-sprayer technology can be effective. "When we increase accuracy," he says, "we minimize the risk of applying chemicals inappropriately and at the wrong rates," which in turn affects quality, labor, and overall farm efficiency. In short, the project is about learning to work smarter, and is an elegant example of what the Professional Development Program is designed to do.