

Center for Agricultural Partnerships
Large-Scale Programs to
Improve Farming Practices:
Five Case Studies





The case studies were written by Edward W. Wilson, Ph.D. The publication was designed by Leif Redmond and overseen by Joy Horwitz.

The Center for Agricultural Partnerships is fortunate to have board members who care deeply about the mission of the organization. The following individuals have served on CAP's board offering wise guidance: the late Bil Gilbert (who served as founding Chair until 2012); Angel Braestrup, now Chair; current board members Frank Zarnowski, Ph.D.; Krishna Roy; Kenneth Smith and James W. ("Pete") Woods; and former board member Sandra Granzow.

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Links to the CAP publications cited in the publication can be found at www.agcenter.org.

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Foreword

The Center for Agricultural Partnerships (“CAP”) had its origins in 1994 when Environment Program staff members at The Pew Charitable Trusts were exploring some fundamental questions. Could a foundation help expand and broaden the implementation of farming practices that were cost effective for farmers and better for the environment? If those practices were indeed both cost-effective and more environmentally sound, why wasn’t implementation happening more rapidly and extensively on its own?

We knew that “early adopters” were innovating on their farms, researchers were developing more selective and environmentally sound ways to manage pests (like mating disruption and bio-intensive approaches), and Cooperative Extension agents were working with individual growers to share these advances. And yet, the pace of change was slow. Given the new knowledge needed to effectively employ these emerging approaches, we asked whether the missing element might be models to increase the adoption of better practices at the field level.

Our thinking was informed by a project that was underway with a large farmer-owned cooperative. The coop leaders were forward looking and proactive—they wanted to be ahead of the tighter pesticide regulations that they anticipated. The Trusts worked with them and a local university to design and support a “bottom-up, top down” approach to reduce pesticide use. In that project, the coop’s management and farmer board members, university-based researchers and crop consultants collectively identified better pest management practices for the crop. But they didn’t stop there—the project team focused on how to implement the new practices to drive change. They asked: which coop members would be best to demonstrate the new approaches for their neighbors; what type of yield and economic data should be collected and analyzed; what support should the coop’s grower services staff provide; and what specific goals should be set for changed practices each year. Once a practice was shown to be effective and economically-viable, the cooperative’s grower services staff could guide its 800+ members on how to implement the change. Eventually, the coop could support and/or mandate an alternative practice, for example, by prohibiting the use of a particular pesticide and providing technical assistance to implement a preferred practice.

Inspired by the project with the cooperative, we were excited about the potential to significantly scale-up better practices by working with large agricultural entities that had technical staff and a strong communications outreach to growers. We anticipated that the changes

would extend well beyond the large ag entities themselves: with greater scale came the potential to create new market incentives that would benefit growers more widely. For instance, companies selling pest control products or services would see greater demand for crop consultants who could provide Integrated Pest Management (IPM) scouting as growers focused more on understanding what pests and beneficial insects were in their fields.

But one promising example is just that: one promising example. We needed to answer the question of whether large agricultural entities such as food companies, commodity organizations and other cooperatives were getting the support they needed to help their growers address increased pesticide-resistance, high agrichemical costs, stricter state and federal regulations, water quality impacts and the emergence of new pests. We focused on field-level practices that had consequential environmental and public health impacts. A year of listening, convening, researching and vetting followed as we met with agricultural economists, growers, commodity organization leaders, federal agency staff and researchers.

By 1996, we had the design for what would become the Center for Agricultural Partnerships. Larry Elworth — a grower, marketing board leader, government advisor and one of the smartest people I know — took the plan from the drafting table into fields and orchards. With initial support from the Trusts, and later from the US Environmental Protection Agency, Larry assembled multidisciplinary teams of talented people to amplify the pace and breadth of farm-level change. Equally importantly, CAP refined a model for how to work at a greater scale across diverse crops and in critical watersheds. Over time, the projects evolved from the initial focus on pesticide usage to include weed and nutrient management, and later, better alignment between federal conservation programs and grower needs. The collaborative development of meaningful, quantifiable goals that guided the work was a constant among the diverse projects. New foundation and governmental funders contributed support for these projects as the Trusts’ priorities shifted.

In its twelve years of active project design and implementation assistance, CAP catalyzed and participated in important work that is still very much needed. In that spirit, this publication seeks to capture and convey key lessons learned about implementing large-scale programs. We hope that you will find answers to some of your questions in these pages.

Joy A. (Jamie) Horwitz
May 2014

Introduction

I became the Executive Director of CAP in the fall of 1996 with a background in farming and having just left working for the USDA and the White House. From the beginning, we viewed CAP as an ag organization, even as we undertook finding solutions to environmental problems. We started CAP with the basic conviction that the agriculture community, provided with the right opportunities and support, could adopt important changes that would produce long-term benefits both for the environment and for farming operations. Working with CAP for more than a dozen years, I was regularly reminded of how important it was to take time to listen to people in agriculture, and to understand and make use of the processes by which change takes place. This focus enabled CAP to help farmers all over the country make substantial and productive changes in their practices, accomplishing remarkable things for their farms and their communities.

Several features were present in each of CAP’s early projects, even though they took place in very different agricultural settings – in Salinas, California, with lettuce and celery growers; in Yakima, Washington, with pear growers; in Michigan with apple growers; and in North Carolina with corn, wheat, soybean and cotton growers. The projects focused on problems that the growers thought were important and that also had potential environmental benefits. A typical situation was that growers needed to control a particularly problematic pest, but in a way that reduced risks from pesticide use. The projects were organized and carried out by a management team at the ground level that involved partners who were most important to helping growers understand and adopt new practices – Extension agents, crop consultants, input suppliers, processors and handlers, and researchers. Each of the projects

had an anchor institution that was respected in the industry and a project manager who had responsibility for organizing the effort. Finally, each project was developed and managed using a work plan that included very specific measurable objectives.

In 1997, we started the Central Coast Vegetable IPM project in the Salinas Valley of California with funding from The Pew Charitable Trusts. The next three projects (in North Carolina, Michigan and Washington) were funded from 1998 through 2001 by the Trusts and the US Environmental Protection Agency (USEPA) at a total of more than \$1.5 million and were at the time among the larger, more ambitious agricultural initiatives in the country. In the wake of the passage of the Food Quality Protection Act (FQPA) and significant public attention to the impact of agriculture on water quality, these CAP projects were timely in both the nature of the problems they addressed and the scope of the changes they were intended to accomplish. Rather than being demonstration projects, like many other agricultural change efforts, they were designed as large-scale implementation projects intended to scale up change across an industry, not just a few particularly innovative farmers.

In taking on that type of challenge, we learned a lot about how large-scale change can happen in the farming community. We saw that smart, dedicated professionals in Cooperative Extension or crop consulting can be incredibly effective in helping farmers understand new practices and make them work. In every project there were researchers who took the time and put in extra effort to make sure their work would be directly relevant to the problems farmers were facing. Each region was also fortunate to have people

in processing and packing companies, cooperatives and input suppliers who lent their support to farmers who were trying to adapt new practices. And, perhaps most important, there were groups of farmers who were willing to try new ways of managing their farms. None of these things were mere coincidences. We had purposefully looked for those areas where there were real problems, legitimate solutions, and people interested in and capable of solving important problems. As a consequence, not only were the projects ambitious in what they were hoping to accomplish; they also were ambitious in establishing a different model for working with agriculture on a large scale.

As with any ambitious endeavor, the projects provided opportunities for learning a great deal about how to manage and support broader implementation - and how not to do so. From the beginning we had focused on including specific measurable results in our project planning and in our written agreements with the sponsoring organizations, and we saw both the benefits of setting numeric goals and the limitations in guiding how a project actually works. Numeric goals (e.g., the number of acres using new practices) were important in setting expectations, in making sure that these were not just "demonstration" projects, and in actually helping farmers change practices. But such goals also led to a tendency to count changes in practices that were collateral and not directly related to project activities. At a certain point a light went on for us - we had unintentionally created a kind of "final exam" question that project managers felt they had to get around rather than a new way of doing things that would lead to broad-scale, long-term changes in agriculture. We realized that what mattered and what set our projects apart - what made them ultimately successful in achieving results - was the way we went about working, not just what we hoped to get done.

In the wake of that epiphany, we were in the midst of dealing with the post 9/11 economic downturn and making the transition from the initial four large scale-projects funded by the Trusts and USEPA. By necessity we had to diversify the funding base for CAP's work, and in doing so we

diversified the range of crops and projects we worked on. We developed new relationships with organizations and universities that led to partnerships with peanut growers in North Carolina, and corn and soybean growers in Minnesota. In response to the significant increase in resources available for conservation programs in the 2002 Farm Bill, we created a program called "Putting the Farm Bill to Work," which helped specialty crop producers and organic farmers gain access to federal conservation programs. Through that effort and projects in a dozen states, CAP provided national leadership for improving the effectiveness and reach of conservation programs.

At about the same time CAP launched an effort to meet the unique needs of small and new farmers. The Washington State Hispanic Orchardist program, led by Naná Simone, a remarkable crop consultant in Wenatchee, created a tree fruit IPM program in Spanish for Hispanic growers, the fastest growing group of farmers in Washington. In addition to creating a community of learning among the participants, the project improved life for Hispanic growers and their families and produced the first tree fruit IPM guide completely in Spanish. In North Carolina, working with community organizations, the state Department of Agriculture's Small Farms Program and local NRCS offices, CAP developed a program to help small farmers make better use of federal conservation programs and understand their farms' conservation needs. Also in North Carolina, we embarked on a large project with North Carolina State University's Center for Environmental Farming Systems and NC Choices to develop a training program and set of practices to improve the environmental performance of outdoor hog farming operations that were expanding opportunities for small farmers in the state. In each of these projects CAP developed strong working relationships with farmers and the people who worked with them to address their key issues.

As CAP's work diversified, we felt the need to articulate more deliberately the methodology we were using to identify, organize and support projects. With funds from USEPA we developed *Working from the Ground Up*, a document that

laid out a blueprint for implementation projects that could be used across a broad range of agricultural issues and was applicable to large and small projects alike. The blueprint drew on concepts presented by Everett Rogers in his book *Diffusion of Innovations* and on comments from a wide range of reviewers in the public and private sectors. With the blueprint as the foundation, we initiated a series of small, innovative projects in coordination with EPA's Pesticide Environmental Stewardship Program. The projects were carried out in a variety of unique situations: working with relatively small-scale growers in New England to use biological controls in sweet corn; developing and implementing a program to achieve dramatic reductions in insecticide application in a theme park; engaging apple growers in Wisconsin in conservation programs; training grape growers in Michigan to carry out more effective IPM programs; and helping fruit growers in Oregon change homeowner practices, thus enabling commercial growers to use mating disruption programs to reduce pesticide risk. Although the projects were very different, each demonstrated the applicability of CAP's deliberate approach to engendering change.

The most extensive use of CAP's methodology came about through work with the Chesapeake Bay Funder's Network (CBFN) Agriculture Initiative. Working with a dozen different foundations, CAP and CBFN staff designed a program to support large-scale projects that would make a notable contribution toward restoring the Chesapeake Bay. The program differed significantly from previous efforts in the Bay. Rather than relying on a Request for Proposals to identify projects, we took three months to travel through Virginia, Maryland and Pennsylvania, determining where the best set of circumstances existed for successful efforts. Once those opportunities were identified, we worked with each local project team to develop a work plan, taking time that ordinarily would have been spent filling out application forms. The work plans were designed to serve as management tools, providing simple reporting protocols and ensuring that performance evaluation would be an integral part of the project's work, not simply a set of final exam questions. When the plans

were completed and the funding approved, we worked closely with the staff and participants to make sure that each project had the support it needed, and that the project teams were able to communicate with one another and learn from each other's experiences.

As a result of the work with CBFN, we came to understand the importance of capacity building as the key to achieving and sustaining substantial, wide-scale change for agriculture and the environment. By approaching projects as long-term investments, we were able to focus on increasing the capacity of a project's people and organizations to achieve and sustain meaningful results. We learned that the value of our role was to help build skills and understanding among project participants that would yield benefits for the project and that could be applied in sustaining ongoing returns for the farm community and the watershed.

In reflecting on CAP's accomplishments over more than a dozen years - which can be summarized by noting that we facilitated the adoption of new practices on more than 500,000 acres of farmland - I have concluded that our key innovation was developing and mastering tools to scale up work on environmental issues in agriculture. Going forward, the challenge will be broadening the use of CAP's innovative methodology to create programs capable of achieving comparable results in public and private organizations across the country.

Lawrence E. Elworth
May 2014

Central Washington's Yakima Valley Reducing Risks from Pesticide Use in Pears



In the mid-1990s, Washington state tree fruit growers and agribusinesses were still reeling from the "Alar scare" of 1989, after a *60 Minutes* report touched off widespread alarm about chemical residues in apples and other produce. The ensuing public debate helped lead to passage of the Food Quality Protection Act of 1996, which mandated new standards for the use of pesticides in fruits and vegetables. However, the tree fruit industry remained wary that further attention to chemical use could disrupt their markets, especially in light of the use of organophosphates to control insect pests.

Pear growers, in particular, made ample use of organophosphates to control codling moth, the fruit's main pest. These broad-spectrum insecticides killed a wide range of species, including some of the natural predators of secondary pests like the pear *psylla*. Still more pesticides were needed to control the damage from secondary pests, thus escalating pesticide usage.

Fruit processing and marketing companies, such as Del Monte Foods, saw the use of organophosphates as a significant issue. In the words of Steve Balling, Ph.D., Del Monte's Director of Agriculture and Analytical Services, "It was clear that organophosphates would be a big problem, especially for pears. We were shocked to see how many pesticides were sprayed on pears, so we knew we could be in for a boatload of problems. . . . The last thing you want as a company is to have uncertainty. Organophosphates represented uncertainty."

Similarly, the heavy use of organophosphates was a problem for the orchardists who grew the pears, not only because it potentially threatened their sales, but also because of the high financial cost of the chemicals. Moreover, there was a sense in the community that reliance on broad-spectrum pesticides was unsustainable and that change was on the horizon.

Recognizing that conditions were ripe for alternative approaches to pest management, CAP initiated discussions with leaders of Washington's pear production community in 1997, leading to initiation of the Washington State Pear IPM Project with funding from



The Pew Charitable Trusts and the U.S. Environmental Protection Agency (USEPA). The geographic focus of the project was the Yakima Valley of central Washington, one of the state's leading pear producing regions. The main goal of the project was to use Integrated Pest Management (IPM) systems to reduce pest infestations, improve fruit quality and reduce the use of organophosphates. Key to the approach was the use of pheromones to disrupt the mating cycles of the codling moth and, through reduced usage of broad-spectrum pesticides, to increase the abundance of natural predators that control pear *psylla*.

Although mating disruption had been used elsewhere, principally in California, the approach had to be tailored to particular local conditions, and constant monitoring was needed to determine if the pheromones were having their desired effects, if secondary pests were emerging and if adjustments were needed to ensure success. The project partners included the USDA Agricultural Research Service and Washington State University Cooperative Extension, who were instrumental in adapting the approach to the Yakima Valley and developing a rigorous monitoring system. Also important was the participation of crop consultants and representatives of chemical supply companies. Although the latter were in the business of selling pesticides, some saw opportunities in distributing pheromones as well and in providing consulting services in IPM and mating disruption. Two large fruit processing companies, Del Monte Foods and Snokist

Growers, played a critical role in the project. As major purchasers of pears, they helped get growers to the table by making it clear that pesticide management was a priority for them, and by assuming some of the risk for failed crops. Another key partner was the Washington State Horticultural Association, which provided project management services.

CAP's strategy assumed that the main obstacles to be overcome were not technical in nature; the general principles of mating disruption were well understood. Rather, the main challenge was to help growers change their practices and to do so in a way that they became invested in the process. This demanded a bottom-up approach. According to Pat Weddle, an independent crop consultant hired by CAP to oversee the project, "Larry sat down with the growers, and they came to an agreement on what they were going to do and how to measure it. . . . The idea was to give growers more tools and opportunities to reduce reliance on broad-spectrum pesticides and to improve the sustainability of their operations."

It was not enough simply to reach agreement on goals and ways to evaluate process. As Pat Weddle notes, participants had a tendency to revert to old ways of doing things, and he was often in the position of reminding them of their commitments, a role that earned him the sobriquet of "project nag." "My job was to say, 'You agreed to this. Is there some reason we aren't doing it? If we need to change, how should it change, and how can we evaluate if it's working?'"

Such interventions helped keep the project on course, and by the time it concluded in January 2001, it was able to report some impressive accomplishments. By the final year of the project, participants had reduced the use of organophosphates by approximately 30 percent on 3,500 acres. At the same time, growers saved as much as \$79 per acre by reducing the use of pesticides. Participants did not eliminate the use of organophosphates altogether but tests for pesticide residues on sampled fruit revealed levels that were far below federal limits and, in many cases, undetectable.

The Pear IPM Project in the Yakima Valley helped demonstrate the effectiveness of IPM and mating disruption

in reducing pesticide reliance without sacrificing quality. It has served as a model for tree fruit production in the Northwest. In addition, the project included "scouting schools" to train orchard employees, in both English and Spanish, to monitor IPM systems. The curriculum used in that training has since been adapted for use by community colleges.

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Del Monte's Steve Balling reports that the IPM approaches pioneered by the Yakima Valley project are now widespread throughout the Northwest. Even though growers in the region might have moved in that direction over time owing to regulatory and market pressures, CAP's collaborative efforts in the Yakima Valley helped accelerate the adoption of mating disruption as a way to reduce reliance on organophosphates in tree fruit production. ■

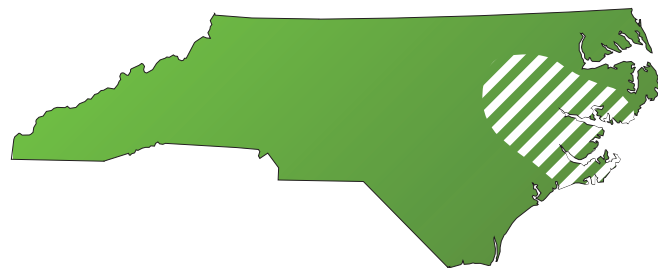
North Carolina's Neuse River Managing Nutrients in Major Commodity Crops



The Neuse River of central and eastern North Carolina drains an area of 1.2 million acres encompassing rapidly growing urban centers (including much of the Raleigh-Durham area); extensive forests; and large tracts of farmland devoted to cotton, corn, wheat and soybean production. In the 1980s and 1990s, the Neuse River estuary experienced massive fish kills resulting from harmful algae blooms, generally caused by ag-related runoff from fields. Adding to the problem was the discovery of *Pfiesteria*, a microorganism that was linked to the fish kills and suspected of causing a variety of health problems in humans.

In the wake of widespread public concern, North Carolina adopted regulations mandating a 30 percent reduction in nitrogen pollution, the source of the algae blooms and the associated *Pfiesteria* infestations. Agricultural fertilizers were estimated to contribute more than half of the estuary's nitrogen load. Thus, area farmers were charged with reducing nitrogen runoff by a combined total of more than one million pounds annually. At the same time, the local agricultural community was under pressure to reduce risks from pesticides as the US Environmental Protection Agency (USEPA) implemented the Food Quality Protection Act. These conditions made the Neuse River Basin an ideal place to launch one of CAP's early projects: an opportunity existed to produce significant environmental benefits by addressing challenges that were of pressing concern to farmers.

CAP's Neuse Crop Management Program was initiated in 1998 with the dual purpose of improving nutrient management and reducing risks from herbicide usage by local farmers. With funding from both The Pew Charitable Trusts and USEPA, CAP brought important resources to table. The state of North Carolina had previously established the Neuse Education Team as part of the Cooperative Extension Service housed at NC State University in order to help farmers understand the benefits of nutrient-reducing best management practices (BMPs). Most of the state money, however, went into creating new personnel positions, and CAP provided the funding to support program activities. In particular, the USEPA funds enabled the team to move beyond its initial focus on nutrient



management to address integrated pest management (IPM) for weeds as well.

Involving a broad range of stakeholders and engaging them in sustained discussions was particularly important given the highly contentious atmosphere that prevailed at the time. In the face of public concern about fish kills and *Pfiesteria* outbreaks, with different sectors of the economy vying with each other to avert blame for the problem, many crop growers felt they had been unfairly targeted by the regulators. In such an environment, as Larry Elworth explains, it took time for growers to understand the situation they were facing and develop a degree of comfort with how they needed to deal with it. Key to achieving this level of acceptance was the stakeholder dialogue fostered by the project, and the involvement of groups such as commodity organizations and agricultural supply companies, whose engagement was instrumental in farmer participation.

CAP's role was by no means limited to that of a traditional hands-off funder. Rather, CAP was an active participant in the process. Larry Elworth interacted regularly with the on-the-ground project team to provide insights and support in focusing on project objectives. Moreover, CAP helped expand the range of stakeholders involved in the process, creating an unprecedented partnership involving farmers, crop consultants, agribusinesses, grower organizations, university researchers and Extension agents. CAP was especially helpful in fostering conversations with agricultural supply companies. Because they sell fertilizers to farmers, efforts to minimize agricultural nutrients could be seen as contrary to those companies' interests. Several, though, were willing to participate

for stewardship purposes and, in other cases, because they hoped to expand their business by providing consulting services in nutrient management.

Of the two project priorities — nutrient management and herbicide risk reduction — the latter proved to be less successful but for reasons beyond the project's control. The project's main approach to herbicides was an IPM program developed to help growers make better choices about the application of soil-applied (pre-emergent) herbicides. The program employed a computer-based decision-support system designed to allow farmers and their consultants to determine the most cost-effective and environmentally sound approaches. The situation changed dramatically during the course of the project, however, with the introduction of herbicide resistant crops. Local farmers quickly adopted the new glyphosate-resistant varieties, which allowed them to apply the herbicide Roundup without damaging crops. As a result, the need for a weed IPM program was dramatically reduced by adoption of a new technology unrelated to CAP's efforts.

The project adapted to the unanticipated change in herbicide technology by concentrating its efforts on nutrient reduction. Training materials in nutrient management planning and best practices were developed and distributed with the help of the state's Cooperative Extension Service and independent crop consultants. In addition, the project established on-farm demonstrations throughout the river basin and sponsored field days on the demonstration farms to give farmers, commodity suppliers and agency personnel opportunities to see nutrient management techniques in action.

Nutrient management planning, using realistic yield estimates for crops, was a key tool in helping farmers identify the most appropriate rate of nitrogen to apply to their fields. Project personnel developed a spreadsheet to help determine the optimal use of nitrogen fertilizer, and they sponsored group planning sessions in which they collaborated with farmers, supplier-certified crop advisors and independent crop consultants to write nutrient management plans. Ac-

ording to Deanna Osmond, Ph.D., of North Carolina State University, who served as the manager of the project, working directly with farmers to prepare nutrient management plans was a "novel approach" that helped give farmers a sense of ownership of the plans. Cost-benefit analyses showed that nutrient management was also cost effective, allowing many farmers to save \$20 to \$40 per acre of cropland.

By 2002, nutrient management plans covering more than 105,000 acres of farmland had been developed. Implementation of these plans, together with the use of nutrient management activities promoted by the project, resulted in an estimated 23 percent reduction in the amount of nitrogen fertilizer applied per acre of cropland.

A less tangible outcome of the project was a shift in farmers' attitude toward the challenges they faced. As Deanna Osmond observed, "When I first started working in the community, I was getting yelled at because farmers were so fearful of the regulatory structure. Larry had extensive contacts in the ag sector and helped bring together agricultural leaders who then worked with their communities to help farmers become more informed and comfortable with the project and what it would accomplish."

As Larry Elworth notes, "The project did not eliminate farmers' deep concerns about regulation, but it did demonstrate that there were constructive and cost-effective steps they could take to address the challenges of nutrient management." And with these steps, they successfully implemented practices that benefitted the double bottom-line—their livelihoods and their communities. ■

North-Central Washington Creating An Apple IPM Program for Hispanic Orchardists



North-central Washington, the largest apple-growing region in the United States, is home to a sizeable and expanding community of Hispanic orchard owners. Beginning in the late 1980s, when the apple industry was facing hard times and land prices began to fall, Hispanics who had worked in the orchards for years found they could afford to purchase their own acreage, often with the help of USDA loans. These new owners mainly farmed smaller tracts, and most had little experience with the full range of activities needed to run a successful orchard business. They also had ready access to labor and limited cash flow, so there was an attractive potential for reducing the chemical input costs per acre.

Naná Simone, an independent Integrated Pest Management (IPM) consultant based in Wenatchee, Washington, conceived the idea of a program focused on assisting Hispanic orchardists when she was teaching Spanish language classes as part of CAP's Pear IPM Project in the Yakima Valley. She became aware of an important gap in the available services for the tree fruit industry: the region's fastest growing group of growers found it difficult to access IPM training resources because of language barriers. Even those growers who understood English often felt more comfortable when technical information was presented in Spanish.

Naná worked with CAP to obtain support for an educational program tailored to the needs of Hispanic orchard owners and managers. Thanks to strong working relationship with Naná, and with educational institutions such as Washington State University's Tree Fruit Research and Extension Center and Wenatchee Valley College, CAP was able to identify a good idea, design a program around it, find resources to support it and recruit motivated Hispanic growers to participate in it. The five-year program was launched in March 2002.

Although the program originally intended to serve a group of growers in the Wenatchee region, a second community of orchardists further north, in the vicinity of Tonasket, expressed interest. Soon, the program was extended to include them. Both groups were re-



ceptive, but the Tonasket-area growers were particularly eager to participate. Operating in a relatively isolated region, they were a tight-knit community; and with few other agricultural support services available, they welcomed these new training opportunities.

The program began with a series of on-farm workshop sessions in which Naná Simone taught growers the basics of IPM, focusing on such topics as insect identification, insect lifecycles, monitoring methods, pheromone-based pest management and efficient use of chemical controls. A Spanish-language manual on IPM that Naná wrote was an important resource for participants.



The sessions were designed to accommodate the unique needs of these Hispanic growers and their families. Recognizing that many participants had limited formal education and were uncomfortable in classroom settings, Naná conducted the sessions on-site in orchards and organized them to be hands-on and interactive. They were held in the evenings when it was easier for most participants to attend, and they included a meal. Family members were invited because the growers typically ran their orchards as family operations.

A key objective of the workshops was to give growers the skills and knowledge they needed to make sound

decisions about the use of chemical pesticides. Most of them were relying on the advice of agrichemical company representatives, commonly called "fieldmen." These fieldmen tended to make blanket recommendations to apply pesticides, and often encouraged growers to use more pesticides than they might need. If a fieldman found an insect pest in one part of the orchard, for example, he would typically recommend spraying the entire orchard with expensive chemicals. The workshops showed participants how to monitor their own orchards to determine which trees needed treatment and avoid spraying pesticides where they were not required. Growers also learned when, in the lifecycle of insect pests, chemical application would be most effective. By using pesticides more efficiently, participants could not only save money, they could also protect themselves and their families by limiting their exposure to potentially harmful chemicals. More than 40 orchardists from the Wenatchee and Tonasket areas participated in the program, and the land they owned or managed amounted to nearly 1,900 acres.

As the program developed, its scope expanded beyond the initial focus on IPM. CAP drew on its connections with other educational programs in the region to diversify the training that was offered. For example, CAP partnered with the Hispanic Orchard Employee Education Program at Wenatchee Valley College to provide courses on such topics as pesticide applicator license training and irrigation management. Similarly, in response to requests from growers, the program collaborated with the Washington State Department of Agriculture's Farmworker Education Program to hold classes on orchard sprayer calibration.

Participants expressed interest in learning how to manage irrigation water more efficiently, and in response the program successfully solicited funding from a new USEPA program called Community Action for a Renewed Environment (CARE). The participating growers were the only agricultural community selected for the CARE program, through which they received field-based training in irrigation management. CAP also helped growers apply for funding from additional government programs to support IPM and other conservation practices.

From Naná Simone's perspective, combining IPM education with other sorts of training and support was entirely appropriate. As she wrote in a 2007 report,

"A more holistic approach makes sense since pest management, nutrient management, water management, soil management and wildlife management are fundamentally inter-related. . . . [C]reating an educational program for growers that integrates pest management into a wider array of conservation practices can reduce costs, improve worker protection, protect water quality and increase ecosystem health."

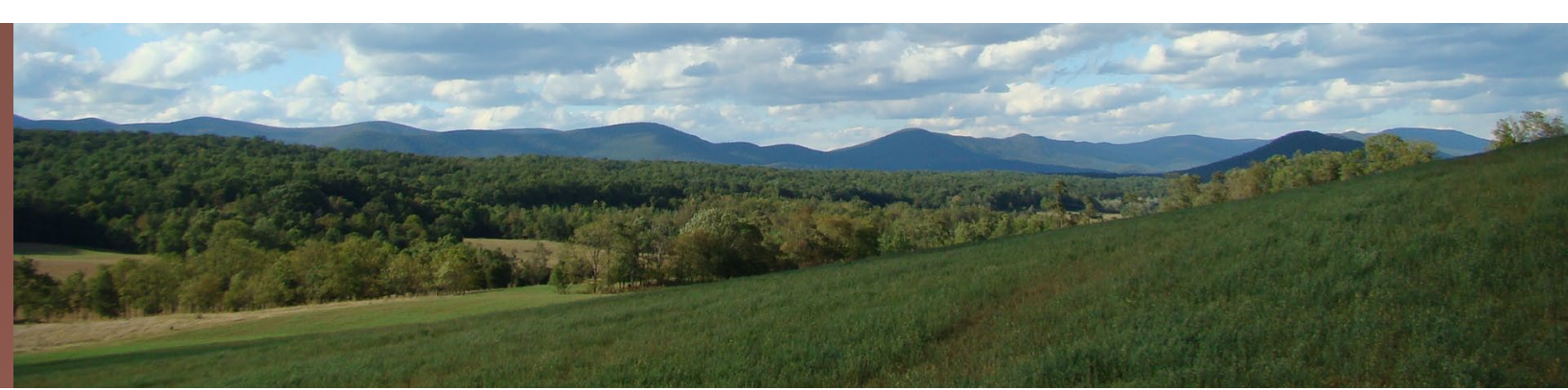
Tragically, Naná met with an untimely death in an accident while hiking in 2008. But according to Leo Garcia, who runs the Hispanic Orchard Employee Education Program, her work has had a lasting impact on the Hispanic orchardist community. "IPM has become established," said Leo, who noted that the Spanish-language IPM manual Naná prepared is still widely used.

According to Vicky Scharlau of 501 Consultants, who conducted a review and evaluation of the Hispanic Orchardists Program, it never would have happened without CAP: "The need would not have been addressed. CAP was willing to fund high-risk projects like this, and given all the other things going on in the tree fruit industry, this wouldn't have been a priority for other funders."

This program is a good illustration of CAP's versatility and adaptability. Capitalizing on lessons learned from an earlier program in the Yakima Valley, CAP developed a new program to address the needs of a specific and expanding group of growers. The experience showed that small-scale, family-oriented enterprises could derive lasting benefits from CAP's approach of engaging with growers to identify their needs, and then drawing on a diverse set of relationships and resources to meet those needs. ■

Eastern Appalachia

Accessing New Avenues for Supporting IPM for Fruit Crops



Along the eastern side of the Appalachian range is a fruit-producing region that extends from south-central Pennsylvania through Maryland, into the West Virginia Panhandle, across Virginia's Shenandoah Valley and south as far as the North Carolina Piedmont. Apples are a major crop throughout the region, but other fruits are also grown, including peaches, pears, nectarines and grapes. Although the region's soils and topography render it well-suited for fruit production, the fruit crops grown there are prey to numerous diseases and insect pests that require active pest management. Strong Integrated Pest Management (IPM) programs have long been established in the region. As in other areas, however, the more intensive IPM practices have been costlier than reliance on pesticides, and those costs have discouraged adoption of the more environmentally sound practices.

With the passage of the 2002 Farm Bill, CAP recognized that Congress had provided new federal incentives that could be used by fruit and other specialty crop growers to support IPM practices. The largest of these was the Environmental Quality Incentives Program (EQIP), administered by the Natural Resource Conservation Service (NRCS), which offered farmers technical and financial assistance to plan and implement conservation practices. CAP initiated a pro-



gram called "Putting the Farm Bill to Work," which helped specialty crop growers in Michigan, California and elsewhere become familiar with, and gain access to, EQIP and other conservation programs.

By the mid-2000's, CAP began working with university researchers and Extension specialists in the Appalachian region to identify ways to help apple growers gain access to Farm Bill programs to support adoption of IPM practices, particularly those involving intensive monitoring, use of bio-pesticides and other measures to reduce environmental risks. Because there was already strong coordination among scientists and Extension staff in Pennsylvania, Virginia and West Virginia, CAP adopted a regional approach that emphasized the exchange of ideas, education materials and program concepts. The intent of this initiative in the Appalachian region, which was funded by EPA Region 3, was to reinforce the recognition that IPM in tree fruit production could serve as a valuable part of conservation programs that traditionally focused on preventing soil erosion and protecting water quality.

The major challenge was to help university scientists, fruit growers and NRCS staff arrive at a common understanding and knowledge base. While all three groups were highly skilled, NRCS staff typically had little familiarity with tree fruit production practices or entomology and relatively few connections with fruit growers. University staff and growers had little or no experience with NRCS staff, nor were they familiar with the agency's conservation programs and their specifications. USDA conservation programs had primarily involved commodity crops (corn, wheat and soybeans), agronomic practices and physical practices to reduce erosion, whereas the fruit growers were interested primarily in intensive management practices. Both approaches could improve crop production and reduce negative environmental impacts, but they came from very different perspectives and required different training and experience. CAP's task was to help fill these gaps and foster the shared understanding that IPM could play an important role in the design of Farm Bill conservation programs that were viable and scientifically sound. As Larry Elworth explained, "CAP also brought in the growers' perspective by consulting with them to learn more about the opportunities and challenges they had encountered in using IPM."

Perhaps most beneficial was Larry's experience working in other parts of the country to help adapt conservation programs to specialty crops. According to Ed Rajotte, Ph.D., Professor of Entomology and IPM Coordinator at Penn State University, "What Larry brought to the effort was the national perspective. NRCS policy varies from state to state. He'd say, 'in one state, they are doing such and such, why can't we do that here?'"

A particular focus of CAP's efforts was Pennsylvania's Fruit Belt, centered in Adams County, ranked fourth in apple production nationwide. This was a natural place for CAP to work. Larry was a former resident of Adams County and had managed an orchard in the region. He had also served as Program Coordinator for the Pennsylvania Department of Agriculture's Apple Marketing Board in the late 1980s and early 1990's. Those close ties enabled

CAP to work with Penn State's Research and Extension staff as well as Adams County growers to build upon some earlier work with NRCS. That relationship had resulted in an IPM program for fruit growers that was funded through a relatively small program known as Agricultural Management Assistance. Thanks largely to CAP's collaboration with Barry Frantz in the Harrisburg NRCS office, it became possible to extend opportunities for IPM to be supported through EQIP, a larger and more stable program.

Meanwhile CAP was working with NRCS offices and other partners in Virginia and West Virginia to make similar changes to EQIP guidelines. Although NRCS staff were at first skeptical that EQIP could be used to support IPM in fruit production due to their unfamiliarity with the crops and their practices, Larry drew on his experience and contacts in other states to show that there were successful precedents for doing so.

In the course of substantive discussions among scientists, NRCS staff and growers, it became clear that even as CAP's program was coordinated across the region, each state's individual program would be different. In Virginia, CAP worked with Dr. Chris Bergh of Virginia Tech and John Myers, then State Resource Conservationist, to develop an IPM program that included bio-intensive IPM practices. CAP collaborated with Dr. Henry Hogmire, an entomologist, and State Conservationist Kevin Wickey in West Virginia to develop a structured IPM program that supported Extension staff to provide technical assistance to growers in implementing IPM practices.

The net result of CAP's regional approach was that incentives for tree fruit IPM through EQIP have been established in the three states. Although the programs differ somewhat from state to state, they all rely on a shared scientific foundation and include a common training program. The inter-state collaboration facilitated by CAP shortened the learning curve for incorporating IPM into EQIP and created substantial opportunities for growers. In Pennsylvania alone, \$1.5 million has been provided to support IPM adoption through conservation programs since 2004. ■

A big part of the work was translating. The university guys would be talking about applied science concerns such as entomology or plant pathology; NRCS would be talking about agronomy and resources – water and soil. They were speaking different languages. A lot of it was bridging the science and production interests, on the one side, and the conservation and resource interests, on the other side.

The Mid-Atlantic's Chesapeake Bay Applying the CAP Model to Improve Water Quality



The Chesapeake Bay, the nation's largest estuary, is also one of its most impaired. The Bay receives runoff and pollution from a 64,000 square mile region drained by five major rivers, the largest being the Susquehanna and the Potomac. Although urbanization and industrial activities contribute to the Chesapeake's water quality problems, agriculture accounts for a substantial portion of the nitrogen, phosphorus and sediment that flows into the Bay.

While various state, federal and intergovernmental initiatives focus on restoring the Chesapeake Bay, private funders are also playing an important role. Some two dozen grantmaking organizations, most of them private foundations, are working together through the Chesapeake Bay Funders Network (CBFN) to coordinate their efforts to clean up the Bay. In addition to helping funders share information and align their grantmaking strategies, CBFN has established several pooled funding programs, one of which seeks to reduce pollution from the agricultural sector. Created in 2005, CBFN's agriculture initiative, called "Strengthening Agriculture Communities, Promoting Healthy Waters," is led by Connie Musgrove at the University of Maryland Center for Environmental Science.

Connie, who had predominantly worked for regulatory agencies prior to joining the Center, initiated a partnership with CAP soon after starting her role with CBFN. In Larry Elworth she saw a colleague who could "speak farmer" and relate well to agricultural communities throughout the region. In addition, she and Larry shared similar grantmaking philosophies. Neither was content with simply sending out a request for proposal and waiting for applications to come back. They felt they could have more impact by seeking out the most promising projects and providing active support as the projects were underway.

By this time, CAP had ample experience with such a proactive approach to project development and management. Working with CBFN gave CAP the opportunity to articulate its unique strategy and apply it on a large scale in multiple states surrounding the Bay. In a "guidance document" prepared for CB-



FN's agricultural initiative, Larry outlined three steps needed to develop a project:

1. Meeting with potential partners to discuss project opportunities and determine if they conform to a set of basic criteria;
2. If a proposed project meets the basic criteria, assessing it further based on its potential to provide farmers with the support they need to make the desired changes; and
3. Once funders have decided that the project deserves support, developing a work plan that articulates the partners' shared commitments and expectations, the actions needed to achieve those expectations and a means for tracking progress.

This approach demanded time and patience, as well as a different way of thinking about the grantmaking process. As Connie Musgrove put it, "That's not the usual mindset for people who were used to being funded by foundations. They wanted to write a proposal. But instead we would sit down with partners and ask, 'If you had one more dollar to spend, how would you use it?' Our philosophy was that people would be more involved when they were doing what they wanted to do."

Larry and Connie remained engaged after each grant was approved. As Larry explained in his guidance document, "We thought of ourselves not merely as supervisors, but as consultants" whose role was to "support team managers/project managers in their efforts on the ground." They would visit each project three to five times a year. In each meeting they would review the project's progress, using the work plan as a touchstone, and draw on their extensive experience to help partners solve problems and keep their projects on track.

One of the first projects to be supported by the agriculture initiative serves to illustrate the approach. Warwick Township is in the heart of Lancaster County, Pennsylvania – a region famous for its picturesque landscapes, rich soils and thriving agricultural economy, but also a hotspot of nutrient-laden runoff that flows into the Susquehanna River and ultimately into the Chesapeake Bay. As part of a comprehensive planning effort to address the area's water quality problems and control polluted runoff, Warwick County supervisors wanted to promote the use of agricultural best management practices (BMPs) such as cover crops, stream bank fences and no-till farming. Working with the Lancaster County Conservation District, they decided the best way to do that would be to encourage farmers to prepare conservation plans, which would assess each farm's natural resources and develop a schedule of actions for implementation.

In 2006, Larry and Connie met with representatives of Warwick Township and the Conservation District as part of their initial reconnaissance of the Chesapeake Bay region. As Don McNutt, Administrator of the Conservation District, remarked, "I thought we were being invited to be told what they have money to fund. Instead, the question was turned on its head. They asked, 'What do you need money to do?' I said, 'We want a conservation plan in every farm.' Connie and Larry listened to what it was we needed."

CBFN agreed to support the effort with a three-year grant that provided funding for conservation plan-

ning and BMP implementation on farms. In addition to Warwick Township and the Conservation District, project partners included a private consulting firm and the USDA Natural Resources Conservation Service (NRCS), which wrote and approved conservation plans and reimbursed some farmers for installed BMPs. The private firm was needed to assist the area's Amish, Mennonite and other Plain Sect farmers, who were reluctant to accept help from government agencies.

As the project progressed, the Township passed an ordinance requiring any farm requesting a building permit to have an approved conservation plan. This reinforced an old state law that required all farms to have conservation plans, but had been generally ignored. Along with this legal "stick," there was an important "carrot" – a program offering to help farmers develop conservation plans at no cost to them.

Larry and Connie made regular visits to Lancaster County to review the project's progress and offer advice. Said Don McNutt, "Instead of just filing the progress reports, they came up and sat down with us and asked, 'How's it going?'"

Such support was especially important during the first year because the project got off to a slow start. A mailing to farmers and information in the local media about the project and the new conservation plan ordinance yielded few responses. Changing tack, the township decided that outreach should include direct, personal contact with farmers. The township's zoning officer, who was well known in the local agricultural community, began meeting with each of the township's 91 farmers, answering questions about conservation plans and describing the free assistance that was available. This approach proved successful, and farmer participation increased dramatically by the project's second year.

When the project concluded, 100 percent of the township's farms – 4,490 acres – had been covered by conservation plans. In addition, by tracking those

emerging conservation plans, the township compiled a comprehensive database of the BMPs that had been prioritized for the farms.

Building on the success in Warwick Township, the Conservation District has adopted the goal of covering all of Lancaster County's farms with conservation plans. As of late 2013, project partners had met with success in eight other townships and had reached out to between 1,500 and 2,000 of the county's 5,000 farmers. Lessons learned during the first three years of the effort have led to greater efficiencies, so that the cost per farmer to produce a conservation plan is now roughly half of what it was in Warwick Township. Moreover, counties throughout Pennsylvania and the Chesapeake region are now looking to Warwick Township as a model to be emulated.

Another early project, located in Virginia's Shenandoah Valley (part of the Potomac watershed), focused on keeping cattle out of streams. Livestock that wander through streams can significantly increase the amount of nutrients, sediment and bacteria that end up in the Chesapeake Bay. Although state and federal cost-sharing programs were available to help farmers pay for fencing, alternative systems for watering livestock, and other measures to keep livestock out of streams, recruiting farmers to use them proved challenging. To a large extent, farmers' resistance stemmed from restrictive rules associated with the government programs – for example, requirements for 20- to 35-foot stream buffers that proved onerous for small-scale farmers who were reluctant to take that much land out of production. In addition, the Shenandoah Valley, like Lancaster County, was home to many Mennonite farmers who would not accept government subsidies. CBFN's approach was to help adapt the government programs by allowing greater flexibility for farmers

who found the government programs too restrictive, and by providing private funding to those who would not accept public money. Cecily Kihn, Executive Director of the Agua Fund (a CBFN partner) commented: "The careful and inclusive process that Larry and Connie established for the stream fencing project in the Valley has been key to its success in reducing pollution to the tributaries of the Shenandoah River and beginning the restoration of its riparian zone. The Agua Fund has renewed support for the stream fencing project through CBFN for the past eight years."

Other projects supported by CBFN's agricultural initiative, with CAP's assistance, have included:

- Mentoring programs to enable farmers to teach other farmers the techniques of no-till farming in central Maryland and Lebanon County, Pennsylvania;
- Expanding rotational grazing and improved pasture management to support production of grass-fed animal products in Maryland;
- Planning and building a compost facility in Lancaster County, Pennsylvania, which takes manure that otherwise could contribute nutrient pollution to local streams and converts it into high-quality, marketable compost.

Although CAP was involved with CBFN's agriculture initiative only during its first three years, it has had a lasting influence on the program. Asked how the initiative might have been different had CAP not participated, Connie Musgrove responded, "I think we would have had similar projects. Would they have been as successful? Probably not. Larry brought a rapport with farmers that we didn't have, but he also brought a strategy. This project represented the culmination of his learning with CAP." ■



CAP Board Chair Angel Braestrup (left) and CAP Executive Director Lawrence Elworth.

CAP Publications

Hispanic Orchardists Manual

www.agcenter.org/HispOrchArticle.pdf

Working from the Ground Up

www.agcenter.org/BlueprintDocFINAL.pdf

Solanaceous Crops in Southern Appalachians

www.agcenter.org/SolanaceousBookletMedRez.pdf

Chesapeake Bay Funders Network Guidance

www.agcenter.org/docs/CBFN_Guidance_FINAL.pdf

Other Publications

Diffusion of Innovations (4th edition)

by Everett M. Rogers. The Free Press, 1995.

Mail and Telephone Surveys: The Total Design Method

by Don A. Dillman. John Wiley, 1978.

The Structure of Scientific Revolutions

by Thomas A. Kuhn. University of Chicago, 1970.

Positive Deviant

by David Dorsey. Fast Company, December 2000.

www.fastcompany.com/online/41/sternin.html

