

## Low-cost forage crop returns to N.Y. farms, thanks to Cornell research

By Blaine P. Friedlander Jr.

Many New York state dairy farmers, who have suffered for two decades without affordable, disease-resistant forage to supplement grass for their animals, are getting their fields of dreams: Cornell agricultural scientists and Cornell Cooperative Extension (CCE) researchers have developed a birdsfoot trefoil that fends off the devastating fungus, fusarium wilt.

Seeds of the new legume variety, Pardee birdsfoot trefoil, will be available this growing season on a large scale for cattle, sheep, goats and horses. The seed pods on the Pardee trefoil are shaped like a bird's foot, hence the name.

Because of the absence of birdsfoot trefoil, dairy farmers in the state's Lake Champlain Valley and in Erie and Wyoming counties have been forced to buy more expensive forage or to invest in additional grass seed and nitrogen fertilizer, said William Pardee, Cornell professor emeritus of plant breeding, and the variety's namesake.

The seed industry suggested the name as a way of thanking Pardee for years of extension help. Said Bruce Tillapaugh, a program leader with CCE in Wyoming County, "We're hoping the Pardee birdsfoot trefoil will be put on the farmer's buffet table and take its rightful place among the forage choices available."

The plant returns season after season and farmers can grow it in poor soil conditions. This will enable dairy producers to improve their financial margin, according to Pardee. "If dairy farmers can grow this forage to supplement their grass, rather than growing just straight grass, they will be way ahead," he said.



Bruce Tillapaugh/CCE

**A close-up of a Pardee birdsfoot trefoil plant.**

Alfalfa is the preferred forage crop because it has a higher yield potential and, as silage, makes a high-protein, tasty feed. Alfalfa also improves soil structure for future grass and grain crops. However, alfalfa does not grow well on poorly draining soil, thus the need for a disease-resistant birdsfoot trefoil.

Fusarium wilt kills the plant by clogging the vascular system. Over the years, some seed-production companies in the affected areas have moved their birdsfoot trefoil operations to the upper Midwest to avoid the fungus. Research on combating the wilt began three decades ago. The late Carl Lowe, Cornell professor of plant breeding, and Kenneth Zeiders, a former U.S. Department of Agriculture employee at Pennsylvania State University, had collaborated on birdsfoot trefoil research in the 1970s and 1980s, selecting

stock that seemed resistant to fusarium wilt. After their retirement, research lay dormant for several years.

Tillapaugh was the catalyst for restarting the research. In 1990, when he was a Cornell graduate student in crop and soil sciences, he began conducting studies on the legume under the direction of Robert Lucey, now a Cornell professor emeritus of crop and soil sciences. Tillapaugh also worked with Gary C. Bergstrom, Cornell professor of plant pathology; David Kalb, a former Cornell researcher in plant pathology; and with Donald Viands, Cornell professor of plant breeding.

The first step was to understand the fungus. "It is a highly specific pathogen. The strain of fungus that causes wilt of birdsfoot trefoil is different from related strains that cause wilt on alfalfa or other legume plants," said Bergstrom. "We took all the birdsfoot trefoil varieties common in the marketplace—the best of what we had—and found that none stood up to fusarium wilt." However, he said, the fungus had a milder effect on seed used in the earlier research by Zeiders and Lowe.

Viands's laboratory took cultures of the fungus and exposed many birdsfoot trefoil plants to the fungus. The plants that survived were selected as parents for the next generation. Jill Miller-Garvin, previously a Cornell researcher in plant breeding, developed the final stages of the trefoil, giving the plants higher levels of resistance. In the field, Viands and Miller-Garvin selected plants for vigor. Julie Hansen, Cornell researcher in plant breeding, found that Pardee birdsfoot trefoil yields up to twice as much forage compared with other varieties.

The seed will be available through Agway Farm Seed, Syracuse, N.Y., and Seedway Inc., Hall, N.Y.

## Biodiversity lab in Punta Cana expands into a new consortium

By Roger Segelken

The Cornell Biodiversity Laboratory, an education/research field station at Punta Cana on the eastern coast of the Dominican Republic, has been expanded and renamed the Punta Cana Association on Sustainability and Biodiversity.

The newly formed consortium of academic and nonprofit organizations will accommodate the growing number of such organizations interested in using the field laboratory and the expanding environmental resources and facilities at Punta Cana.

"This change in organization will make an incomparable facility into one of the world's treasure sites for biodiversity—the Caribbean—more widely available to students, faculty members and researchers worldwide," said Susan A. Henry, dean of Cornell's College of Agriculture and Life Sciences (CALS). Henry, who has agreed to serve as the honorary chair of the association, explains that the consortium of academic and nonprofit organizations, with Cornell as a founding member, will administer the resources and environmental facilities at Punta Cana, with the laboratory, renamed the Punta Cana Laboratory and Field Station, as the centerpiece.

Under Cornell's leadership, the laboratory has become a base for undergraduate research and education on a 10-acre site within the 2,000-acre Punta Cana Ecological Reserve and adjacent to the Punta Cana Resort and Club. It has attracted wide atten-

tion as a teaching and research facility in the Caribbean.

The laboratory was built in 2000 and dedicated in 2001, partly through the philanthropy of Theodore W. Kheel, lawyer, mediator, Cornell alumnus ('35 Arts, '37 Law) and partner (with Frank R. Rainieri, Oscar de la Renta and Julio Iglesias) in the Punta Cana Resort and Club.

"We have demonstrated that a great institution of learning can establish and successfully operate a laboratory on biodiversity in the ecological reserve of a resort committed to sustainable tourism—and that talented students and pioneering scientists can work together to catalog and preserve the natural resources that are so important to the people and the ecosystem of this region," said Kheel. "Now it's time to share this valuable facility and accompanying environmental resources and facilities so that more academic and nonprofit organizations can join us in this important work."

The laboratory, located on the shoreline where the ecological reserve meets the Caribbean and a seven-kilometer coral reef, is fully equipped for the study of plants, animals and marine and microbial organisms that might offer clues to new medicines. It has been the base of operations for a Cornell program in ethno-medicine, teaching undergraduate students the theory and practice of biomedical, anthropological and health research. The complex consists of a 5,000-square-foot biology and analytical chemistry building with dormitory space for 20



Jane Segelken

**Leading students through a village marketplace near Punta Cana, Dominican Republic, Eloy Rodriguez, center, the founding director of the Cornell Biodiversity Laboratory, examines a plant-based medicine offered by the herbalist, at right.**

students and six faculty members.

With its distance-learning facilities (including interactive video and computer communications via satellite and the Internet), the laboratory also has been used by CALS, the Harvard University Museum of Comparative Zoology, the Autonomous University of Santo Domingo, the Center on Environmental Research and Conservation at Columbia University, Cornell's College of Veterinary Medicine and Laboratory of Ornithology, Stevens Institute of Technology and the University of California-Berkeley. The Punta Cana facility also is used by the Center for Complementary and Integrative Medicine at Weill Cornell Medical College

and by the Global Seminar program.

Eloy Rodriguez, Cornell's James A. Perkins Professor of Environmental Studies and founding director of the Cornell Biodiversity Laboratory, said: "We extend a cordial invitation to administrators, faculty and students of academic and nonprofit organizations worldwide to join the Punta Cana Association on Sustainability and Biodiversity and to use, for teaching and research, both the laboratory and the expanding environmental resources and facilities at Punta Cana. There is no more important challenge than the study, conservation and preservation of biodiversity on Earth."

## CU nutritionists: Work stress affects how lower-income families eat at home

By Susan Lang

The effects of low-paying jobs with inflexible hours could be more threatening than stress and financial insecurity, according to a new study by nutritionists at Cornell. Such jobs also can influence how well workers and their families eat.

The reason: Many workers with long hours on the job, inflexible schedules and shift work report that they have inadequate time and energy to feed their families as well as they would like.

"The spillover effects of these kinds of demanding jobs not only threaten food intake but also result in feelings of guilt and inadequacy and may interfere with how workers perceive their ability to perform their parental and spousal roles," said Carol Devine, associate professor of nutritional studies at Cornell. Low-status and heavy-workload jobs, she said, "can affect the health and well-being of the entire family."

With colleagues Margaret Connors, Jeffrey Sobal and Carole Bisogni, all in the Division of Nutritional Sciences, Devine analyzed data from in-depth interviews conducted

with 51 low- and middle-income adults in an urban area of upstate New York about influences on their food choices.

Their findings are published in a recent issue of *Social Science and Medicine* (Vol. 53, 2003).

The nutritionists found that although both men and women experienced the negative effects of their jobs spilling over to family life, the strain was greatest for women with children. That, they say, is probably because in many families women feel responsible for the care of children and food preparation.

While African-American and white workers reported that men and women shared in meal preparation, Latino workers reported that women carried more of those responsibilities.

"We also found that many of these low- and middle-income working adults felt that sacrificing healthful eating was a temporary but necessary price to pay to allow them to work toward other values and goals, such as meeting the needs of demanding jobs, spending time with family, pursuing education and working toward a better future," said Devine.

Many felt that less-than-ideal food choices were an inevi-

table part of working and that healthful eating and self-care were incompatible with the demands of juggling work and family needs. Participants, Devine said, reported that they served take-out from fast-food restaurants and cereal to children for dinner. They also said they skipped meals, ate on the run and ate junk food as ways of coping with demanding jobs.

Many workers might not lack information about healthful dietary choices, Devine pointed out, but perceive that they cannot put these ideals into practice in the context of their current work and family responsibilities. The authors make several recommendations, such as providing healthful food choices at the work site and helping workers identify acceptable strategies to cope with their conflicting demands.

"Our findings highlight the need to move from viewing workers only at the workplace to seeing them within their larger social and family contexts in which their food choices are embedded," concluded Devine.

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