

SACRED SPACE

Pollinator Garden, River Restoration and Elm Tree Harvesting

ARTICLE AND PHOTOS BY SYLVIA ERNESTINA VERGARA

Partnerships can enhance approaches to farming as a sacred space. I would like to share my experience of land stewardship through a unique collaboration with the U.S. Fish and Wildlife Services Partners for Fish and Wildlife Program (Partners Program). This partnership enhanced my education and state of discovery. Through experiencing the day-to-day drama of agriculture and living close to and with nature, a new sense of stability and sustenance for my farm and habitat began to manifest.

Evolving Farm and Habitat through Innovative Land Management

I was having a serious problem with an overwhelming growth of Siberian elms (*Ulmus pumila*), a prolific nonnative plant that grows throughout New Mexico. With so many elms on my land, I felt I would not be able to farm. Also, I was having a serious problem with beavers chewing down the cottonwood trees in the bosque along the Río Embudo. I heard Dr. Maceo Martinet give a talk about the Partners for Fish and Wildlife program, and I knew that this program was the right one for me. It offers multiple opportunities to work with nature in a balanced way that includes the installation of a pollinator garden, invasive species removal, riverbank restoration and habitat enhancement.

I learned through discussions with Dr. Martinet that native pollinators encompassed a large group of domestic and wild insects. I was amazed to learn that, for the most part, wild bees don't sting. They also can be much smaller than domestic bees and survive in different types of habitats.

Education and Networking

At various lectures and workshops in Peñasco, Velarde and Los Lunas, I listened to talks by farmers, naturalists and scientists, and I saw examples, demonstrations and documentaries concerning pollinator insects, pollinator plants and habitats. An interesting learning session in Velarde included real examples of how to protect trees and avoid continued riverbank damage from beavers.

I started to see the land with new eyes. It was the first time I noticed small holes in the sand and realized these were nests for pollinator bees. Through these learning experiences, I started to change my general understanding and concept of the world of pollinators and open up a new recognition and appreciation of the natural world. I also felt a renewed respect for the food chain as an indicator of balance on the farm. I started to open up to the possibility that the beavers and I could somehow manage to co-exist, and, better yet, maybe I could learn from them about nature and the river.

Bosque Cottonwood Tree Planting and Protection

Through this project, I was able to plant cottonwood trees and other riparian trees

and shrubs within the bosque along the Embudo River. Each was planted and then encased and staked in heavy protective 5-foot fencing.

Pollinators Are our Friends

Pollinator gardens comprise three elements: water, nectar from plants, and a pollinator hotel for insect nesting sites. I renamed the pollinator hotel a *santuario*, which, in Spanish, means sanctuary. I like the name santuario because it refers to the structure as a safe place for the pollinators to make their temporary homes. Also, because they would all be living together there, it would be more like a pollinator "community." In addition, the word santuario signifies that the pollinator insects and the spaces they occupy are sacred. It honors their role in nature as being important and beneficial.

The materials used to construct the pollinator santuario were adobe bricks, corn stocks, trunks from dead trees, wood framing material, and red cement bricks. These santuarios would be positive, artistic expressions of a community that helps the human world to continue, thrive and, in a very real sense, eat! Scientists say that, if all the pollinators—mostly insects—died out today, humanity would have only a few years of survival left.

The Pollinator Garden

Dr. Martinet brought several high school students and a teacher from Albuquerque to help me with the project. These young people came from a program called Querencia Institute, a collaboration of educators and professionals to improve the learning experiences of our youth, especially from low-income communities.

During the day, they helped make the adobes, drill holes in the chopped wood trunks, cut the corn stocks and begin the initial assembly of the pollinator santuario. Work breaks were used as times to explain to the students the importance of the pollinator garden to our food supply and sustenance. The students were also shown pictures of other pollinator hotels that were built at other pollinator garden projects.

Students helped to create a special New Mexican lunch, which included biscochitos, tortillas with frijoles and a salad. I enjoyed telling them about my approach to farming using only natural methods, that is, farming without chemicals. Dr. Martinet also spoke about the importance of pollinators. The students had an enjoyable time learning new skills, which we all facilitated along with important farm helper Luís.

Thoughts on Invasive Plants

We are in a state of climate change, commonly called global warming. My perception is that farmers must remain flexible and creative in their approach to their fellow beings on the land. For example, I no longer see elm trees as my enemy. I

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A fruit tree in the Pollinator Garden



Pollinator flowers



The "Pollinator Santuario"



Students from the Querencia Institute in Albuquerque helped make adobes and assemble the "Pollinator Santuario."



Some of the students baked biscochitos while at the farm.

SFCC'S GREENHOUSE MANAGEMENT PROGRAM

Four years ago, when the Greenhouse Management and Operations program was created at Santa Fe Community College, experiential learning was confined to a 26-foot-diameter geodesic-dome greenhouse. While this was sufficient to provide the initial annual cohort of 12 students with many “get your hands wet and dirty” experiences, the current fall 2016 cohort has expanded to 26 students, and SFCC is starting a second cohort in the spring of 2017. (Classes will run in the evenings.)

With this increased enrollment, significantly more teaching space is needed to expand production systems and provide quality learning experiences. To meet this need, this fall, SFCC will break ground on a dedicated laboratory that can handle up to 26 students per class and a new greenhouse (nearly 12,000 sq. ft.) to teach Controlled Environment Agriculture (CEA).

Controlled Environment Agriculture is an industry term that refers to methods of agricultural production performed within a structure where environmental factors can be managed. Originally the program was founded to teach Hydroponics and Aquaponics. Both methods grow plants without the use of soil, but Aquaponics integrates the culture of fish as second production crop and the source of nutrients for the plants. Recirculating Aquaculture will be added into the next phase of the program, with the hope of expanding this industry in New Mexico.

The new greenhouse will contain four separate production areas, each measuring 22x128

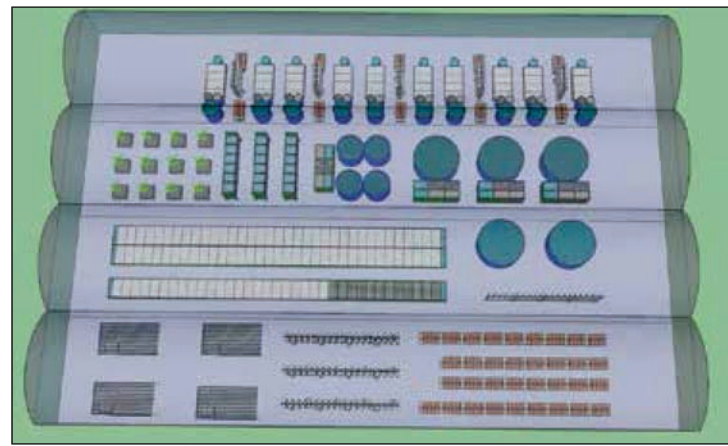
feet: two bays will be devoted to commercial production-scale systems of Hydroponics and Aquaponics; a third bay will be used to teach the new Recirculating Aquaculture facet of the program; and the final greenhouse bay will be used for students to build, operate and experiment with various methods of production.

The new facility will also house the SFCC Microgrid program. This will allow students in both programs to learn the intricacies of on-site power generation and how to design and manage systems efficiently to make use of varied energy resources. One primary goal for this integration is to gain a highly detailed view of exactly what resources are needed to run CEA systems and how to design the next generation of systems to increase the efficiency of all aspects of food production and resource utilization.

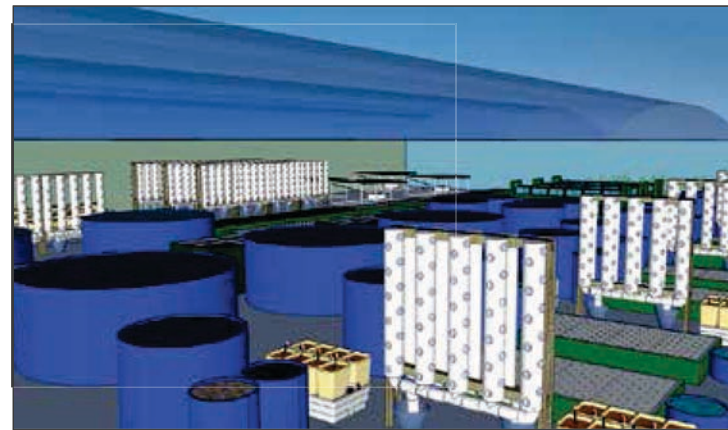
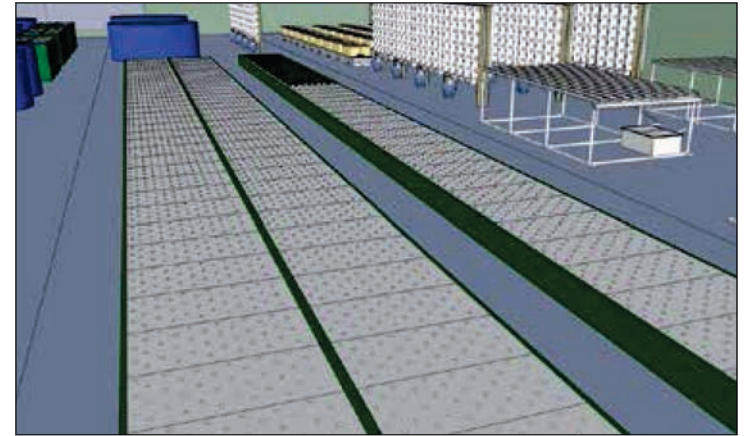
This expansion will provide SFCC students with state-of-the-art hands-on experiences in Hydroponics, Aquaponics and Recirculating Aquaculture. Simultaneously, they can learn the science and theory behind each of these techniques. Graduates will leave with a Professional Certificate and Associate in Applied Sciences, as well as enough experience with production methods to immediately go out and open their own farms in New Mexico. ❧

For more information, call Adam Cohen, lead faculty at Greenhouse Management and Operations: 505.428.1941.

Groundbreaking Planned for Controlled Environment Agriculture



SFCC's commercial production-scale greenhouse facility will also house the school's microgrid program.



Left and center: Illustrations from a video showing two perspectives of the facility

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started to see the troublesome elms as having diverse potential. I began to recognize them as powerful engines of the hydrologic cycle and allies in countering desertification. During the project, I made a significant number of elms into a renewable, harvestable crop.

Elms grow fast, producing a hard wood for many harvest possibilities. I used the wood for firewood, fence posts, dead root stumps to control erosion, and a clothesline. I even imagined commercial possibilities for elm wood; it could be shaped into rolling pins for rolling out bread dough, baseball bats, or other implements.

The Siberian elm draws water through its roots and emits water vapor through its leaves, creating an important step in the all-encompassing hydrologic cycle. Amazingly, in times of drought, it continues to grow green leaves providing shade. Small animals and birds use it as a food source, and birds use it to build nests. It is an effective windbreak and helps to create privacy with its thick foliage. In spring, the tree is early in delivering a food source for wildlife.

Additionally, the healing properties of the elm are important. Timothy Lee

Scott's book, *Invasive Plant Medicine: The Ecological Benefits and Healing Abilities of Invasives*, describes many medicinal uses of the Siberian elm and its related species. Siberian elm is resistant to Dutch elm disease and possibly is an appropriate substitute for the slippery elm (*U. rubra* or *U. fulva*), relieving inflamed mucous membranes of the stomach, intestines and lungs, and also kills parasites. According to Scott's book, there are no known cautions or contraindications and no known herb and drug reactions.

Siberian elm is an effective tool against *E. coli*, *Bacillus dysenteria*, intestinal worms, cancer and giardia. Siberian elm also removes the following heavy metals from the soil: iron, manganese, aluminum, zinc, lead, nickel, chromium, arsenic, cadmium, copper and toxins—for example, perchlorate—from the earth. Siberian elm provides nectar for bees, and humans have used it as an emergency source of food.

Tree of Heaven (*Ailanthus altissima*) is said to have the capability to clean environmental carbon dioxide emissions. It has anticancer properties, inhibits HIV-1 and is an antimalarial/antimicrobial.

Observation from the Pollinator Santuario

There is much good to say about the thoughtful guidance provided by Dr. Martinet. Other important developments were implementing irrigation for the garden; setting and preparing the large garden area; using a posthole digger for planting trees in the bosque; chipping wood for creating elm tree mulch; using an innovative weed wrench, and introducing a special worm habitat for vermiculture.

After our work on the land, we enjoyed a lot of happy activity in the pollinator garden and all over the farm. Learning that wild bees don't sting made me more comfortable being near and around pollinators. I spent large amounts of time amid the colorful and beautiful flowers, watching the bees.

This project has changed my life. I feel more at peace with myself and proud of having tried so hard to make it work. My relationship to my farm has been deepened and become more loving and caring.

I thank the Partners Program for providing me with an opportunity to become part of the solution of helping our planet continue to survive in a positive way. It has given

me a wonderful and positive experience of working successfully with a government program. It is an exceptional program, and I would recommend it to anyone.

Now I have the feeling that I am really helping my farm become a better place for the future, not only for myself, but for all the animals, plants and soil. The project has helped my overall productivity and given me something positive and important to share with my community. Farming is not a relic of the past; it is an odyssey into the future through partnership with nature. ❧

Sylvia Ernestina Vergara of New Mexico, a member of the New Mexico Acequia Association, farms without chemicals or pesticides in the Dixon/Embudo Valley. She is a composer, photographer, poet, author and research scholar.



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