



Small orchards and agroforestry in the field

Field growers add trees and shrubs to improve land and diversify income

By Jane Tanner

When Elisa Lane bought land for Two Boots Farm north of Baltimore in 2014 it already had an established quarter-of-an-acre pawpaw orchard. Fruit from the 80 trees (*Asimina triloba*) added a novelty crop to her offerings of field and high tunnel vegetables and flowers. Over time, Two Boots emphasized flowers and floral design, but when COVID-19 hit the farm shifted to mostly food crops to meet high demand for local food. Last fall, the farm held pop-up pawpaw markets in Baltimore and Washington, DC, where curious, then loyal customers paid \$8 to \$11 a pound.

"I don't think the pawpaw orchard is something I would have chosen for myself," Lane said. "I stumbled into it." She embraced it and recently added 80 pawpaws saplings to expand the orchard to half an acre.

As natives, she says they haven't had pest and disease issues and were no maintenance until two years ago when they pruned them for air circulation and easier harvesting. Last year they added compost at the base of the established trees along with Fertrell amendment Super N 4-2-4, a soil mineralizer, and aragonite for calcium. The farm crew planted a windbreak of lilacs, abelia and smokebush next to the new trees and are filling in under and around the trees with other flowering perennial shrubs and fruit trees.

For robust harvests, pawpaws need full sun and grow in hardiness zones 5 through 9, pushing its boundaries in southern Ontario. "It's a tropical fruit that went north," says Michael Judd, author of *For the Love of PawPaws: A Mini Manual for Growing and Caring for Pawpaws—*



Perennial corridors grow next to vegetable crops at La Ferme des Quatre-Temps in Quebec. Researchers are currently studying the insects drawn to the perennial hedgerows at the farm by periodically vacuuming them up. Photo courtesy of Jean-Martin Fortier

From Seed to Table. Breweries offer a strong wholesale market for seconds that have fallen from trees, he says. It's cumbersome to extract the pulp, so Judd freezes them whole to easily peel and remove the seeds. The pulp freez-



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Perennial buffers between annual vegetable rows at Philo Ridge Farm in Vermont. The photo was taken during the summer of 2019, two years after the buffers were planted with trees, shrubs and herbs. Photo courtesy of Diana McCargo.

es well and lasts up to a year. “Otherwise you’re dealing with soft mushy fruit to process,” he says.

Dan Moe at The Farm of Minnesota in Hutchinson likewise is a vegetable farmer who tends an orchard, in his case elderberries. The native shrubs (*Sambucus canadensis*) provide habitat for 67 different insects, including bumblebees that Moe watches aggressively move pollen among his 50 vegetable crops on 8 acres. Elderberry juice and jellies are his top selling orchard product. He sells hundreds of pounds of berries to wholesale clients. He also sells flowers, cuttings for propagating, and an herbalist bought leaves to make a tincture.

GROWING FOR MARKET IS PUBLISHED 10 TIMES PER YEAR BY TOMATERO PUBLICATIONS, INC., PO BOX 75, SKOWHEGAN, MAINE 04976

ISSN 1060-9296
Volume 30, Number 2,
February 2021

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Berries must be sanitized with two rinses and frozen within 24 hours. Moe’s father, an engineer, designed a de-stemmer to solve the biggest post-harvest challenge. Others around the country — including Terry Durham at River Hills Harvest in Missouri, who has led the surge in elderberry growing — have manufactured de-stemmers. River Hills also sells organic stems of popular cultivars. There’s a shortage of organically certified stems, but once farms have their own, it’s easy to propagate. Farmers like Moe coppice the elderberries each year to suppress spreading.

Today, Moe grows 80 percent vegetables and 20 percent elderberries, but plans to shift to all elderberries on 100 acres. It’s partly a retirement plan to allow him to leave a streamlined elderberry operation to a younger family member who likely wouldn’t take on the rigors of vegetable farming. It will help meet skyrocketing demand for elderberries in the United States where 95 percent are currently imported.

Other farms also are integrating perennials and annuals. Bread & Butter Farm, part of the Vermont Agrarian Commons in Shelburne, is experimenting with trellised black raspberries and other cane fruit and woody perennials spaced between vegetables in their 50-foot EverBed no-till beds. The deep mulch compost system in the beds is ideal for perennials, said Brandon Bless, Bread & Butter’s land and animal manager. In other beds, the farm combines vegetable crops and trees (chestnut, apple, pear,

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persimmons and mulberry) planted at intervals.

As the trees mature, they plan to grow cool-weather crops in the shade. "People tend to downplay crops doing well in dappled shade," Bless said. They are developing farm-scale agroforestry plans with Propagate Ventures, an agroforestry investment platform that conducts economic analysis of crops and provides financing, management and marketing support.

Three years ago, on a windswept ridge in Charlotte, Vermont, Philo Ridge Farm established 100-foot-long perennial hedgerows that run parallel to rows of annual vegetable crops to heal soil compacted by machine tilling. The windbreaks and alley-cropping-esque perennial corridors subdue wind, retain soil moisture, provide habitat for beneficial and desirable predatory insects and migrating animals, offer shade and produce bits of cash crops along the way as flowers are harvested for bouquets along with berries, nuts and herbs for the chef at the farm cafe.

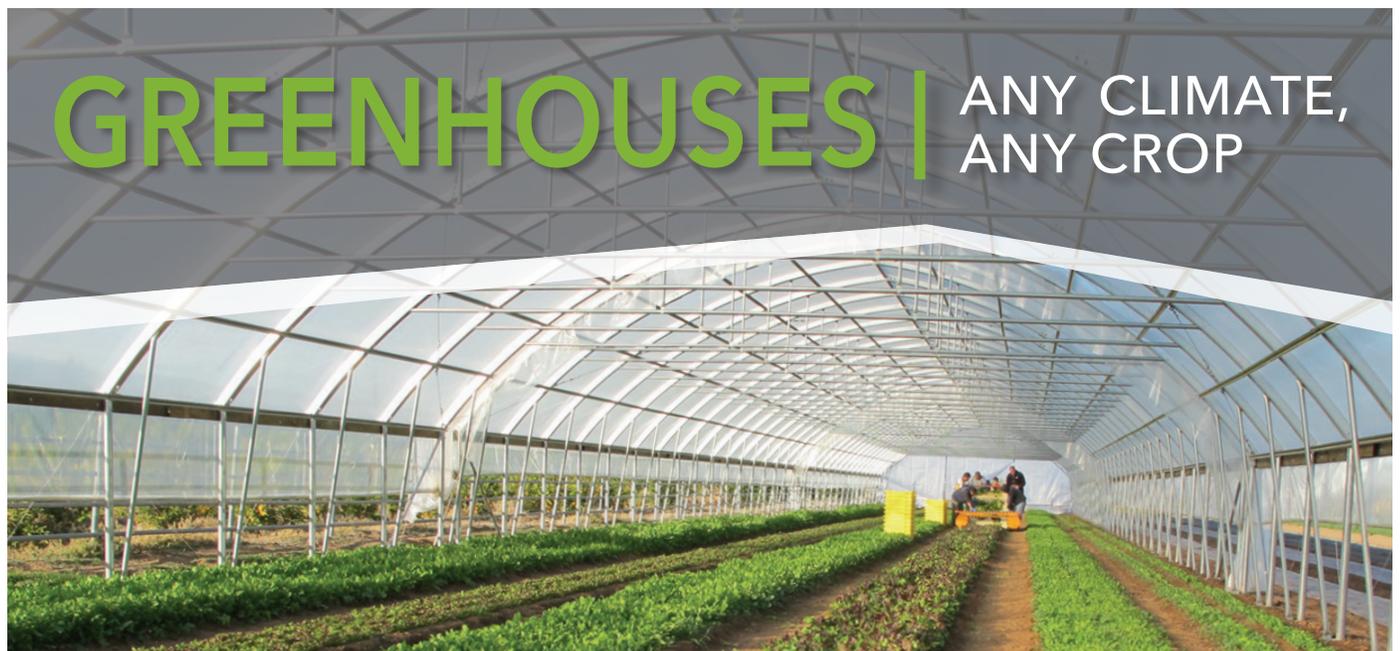
Jean-Martin Fortier who earlier established lush hedgerows at his farm La Ferme des Quatre-Temps in Quebec, designed the Philo Ridge 40-inch-wide perennial corridors. They contain elderberries, highbush cranberries, hazelbert trees (a hazelnut and filbert cross: *Corylus americana* x *avellana*), and a slew of perennials, including herbs. Next to each set of three perennial hedgerows are 10 rows of annual vegetable crops followed by another set of hedgerows, then 10 vegetable rows and so on to fill an acre. Philo Ridge plans to replicate the pattern in other annual vegetable fields.



De-stemming elderberries is a post-harvest challenge. At The Farm of Minnesota, farmer Dan Moe's father built a destemming machine as have others around the country. Photo courtesy of Dan Moe.

"Agricultural schools advocated getting rid of the hedgerows, we're bringing them back to regenerate health to the land," said Diana McCargo, who owns Philo Ridge with her husband Peter Swift. Already, the perennials help reduce wind tears to leafy vegetables, and when the elderberries were throwing off more shade than anticipated, mid-summer lettuces and spinach were planted in the shade.

Juan Alvez, professor at University of Vermont Center for Sustainable Agriculture, helped Philo Ridge with pasture management and silvopasture designs. The farm has planted more than 2,000 trees, including a variety



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Castanea Farms in Pennsylvania is establishing a chestnut tree orchard and has selected seeds from an old tree that drops the nuts while the burrs remain on the branches. Photo courtesy of Richard Hartlieb.



Jean-Martin Fortier established lush hedgerows at La Ferme des Quatre-Temps in Quebec. Photo courtesy of Jean-Martin Fortier

of oaks and fruit trees. Bio-Logical Capital, an agroforestry funding and land management company, oversees the overall vision for the farm.

Companies like Bio-Logical Capital and Propagate Ventures demonstrate the role agriculture plays in addressing climate change. Along with improving soils and water and creat-

ing habitats, perennial agriculture sequesters far more carbon than annual plants. Awareness among consumers is growing while they also are seeking nutrient dense and medicinal foods.

In the October 2020 issue of Growing for Market, I wrote about field farmers adopting forest crops. This article focuses on other practices with trees and shrubs to improve land and diversify income. Fortier adds

that creating beauty on farms carries a high value.

“Finding a way to plant trees in your 20s means having a tree crop come into production after you’ve had your fun with vegetables and allows you to farm in an easier way,” says Bill Davidson, chestnut commercialization lead at the Savanna Institute, a leading source of agroforestry research, education and support. “It’s

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hard for young people to think that way, older people get introspective and start planting trees, although they're not in a position to benefit from them."

While upfront costs are much higher than with annuals and the payoff further down the road, pairing trees with fruiting shrubs generates an income stream in two or three years, says Davidson, who spent seven years as a veggie farmer earlier in his career.

Fortier understands why field farmers focus on annual crops instead of perennials. "It's an expensive capital outlay that could go into a washing station," he says. "That's why most farmers are not making that choice and instead investing in tunnels; they need the cash. On the flip side, however, I would make the case that most small-scale growers are ecologically minded. If we're not doing this on our farms, how can we expect the large-scale farms to do this."

The USDA's Natural Resources Conservation Service, Sustainable Agriculture and Research Education and Conservation Reserve Program along with conservation non-profits and private investors are steering funds to agroforestry practices. "If you have the capacity to apply, a lot of funders know about this and they want viable options," Davidson said. The Savanna Institute helps farms create enterprise budgets and tap into funding opportunities.

As perennial agriculture gains traction, there's a great need for more training and hubs where growers can aggregate, process and market their harvests. Terry Durham



Two Boots Farm pawpaw pop-up market at the Dupont Circle Market in Washington, DC. Photo by Peter Sparklin.

now offers online elderberry training and the Midwest Elderberry Cooperative is helping establish hubs around the country. Native elderberries grow from zones 3 through 9, fruiting three times a year in Florida.

Chris Patton, the cooperative's president, is trying to close the import gap with a goal of 2,250 profitable producing acres of elderberries by 2025. "Those acres will be made up of both small grower members selling directly to their customers as well as commercial-scale members who have equity in the co-op," Patton said. "I've got growers from California to Virginia."

So far, Patton has helped establish elderberry hubs in Washington State, Indianapolis, western Pennsylvania, New York and Vermont. He says NRCS and SARE funding is available to get farmers started. "It's paying people to do the right thing," Patton says of the conservation benefits.

Rick Hartlieb at Castanea Farms in Robeson, Pennsylvania, plans to establish a regional hub for chestnut growers. He and his wife Jen grow vegetables for a CSA and farm store where they also sell meat from cows, lambs and pigs. They have six mature chestnuts trees on the property and planted more than 100 additional Chinese chestnut trees (*Castanea mollissima* "Peach," "Kohr," and "Qing") along with seedlings from an established tree that drops the nuts from the burrs while still on branches. He expects to begin light harvests from the new trees in 2028. Meanwhile, he grazes livestock under the mature trees part of the year and grows pumpkin and Indian corn among the small trees.

Hartlieb's goal is to establish a hub with a large water bath, conveyer, sorting machine and cooler where he could store 10,000 pounds of nuts. Chestnuts must be stored in high humidity at 33°F to 34°F degrees to keep them from drying out. Before that, they are washed in a 120°F bath to kill weevils and eggs laid in the nuts in August.

Hartlieb, an assistant district forester in the William

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Penn Forest District, harvested 600 pounds of chestnuts last fall from his trees and trees on neighboring leased land. Local Asian and Eastern European immigrants are enthusiastic retail customers at \$5 a pound. He also sells and ships chestnuts through the farm online store.

Davidson of the Savanna Institute suggests that farms with two acres of sloping land could establish a small chestnut orchard. Chestnut trees grow in zones 4 through 9.

Lily Spring Farm, an educational farm in Osceola, Wisconsin, demonstrates how to establish multistoried seven layer food forests and contoured fields growing a variety of fruit and nut trees along with elderberry, aronia, black current and raspberry. Nina Utne of the Utne Reader created Lily Springs to help elevate agroforestry crops.

“Our care cycle is relatively low maintenance compared with high maintenance rhythms of veggies,” said Elle Sullivan, interim farm manager. She says abilities required at vegetable farms transfer to perennial crops. “Skilled veggie crews know how to move fast and find efficiencies in washing, sorting and packaging,” she said. “That’s where you can get slowed down.”

She advises farmers to select native plants well-adapted to their regions and seek indigenous food producers with experience with perennial food crops. “No Joe Schmo on the street is going to be familiar with aronia berry and other perennial crops or use them in a way that takes advantage of how nutritionally dense they are,” Sullivan said. Lily Springs sells to value-added goods producers



Customers buy elderflowers for tea, syrups, baking and medicinal use. Photo courtesy of Dan Moe at The Farm of Minnesota.

and chefs that bake aronia berries into scones or turn black currants into amazing sauces or dry them and incorporate the berries into granola bars.

The women-owned firm Ecological Design, created the blueprint for Lily Springs, among its projects around the country. Farmers should seek knowledgeable input and not just pop in perennial plants that may not be compatible with other plants and crops. Michael Judd’s permaculture-based design firm is Ecologia Design, and he also wrote *Edible Landscaping with a Permaculture Twist*.

Meghan Giroux, director of Interlace Agroforestry Farm in Whallonsburg, New York, is an agroforestry researcher, educator and field consultant in the northeastern United States through a separate nonprofit, Interlace Commons. She is creating a field school with a residency program that will be running at the Whallonsburg farm in a few years. With a dearth of agroforestry experts to teach farmers, her objective is to train farmers who go on to train other farmers and establish networks.

When she works with farmers who want to implement agroforestry, she asks them first to write a narrative about past uses of the land, current uses, goals, opportunities and problems. She asks them: “Do you have an enterprise now where trees will enhance it ecologically and economically?”

“These are not innovative lands models,” Giroux says. “These were practiced by the indigenous and we’re making them contemporary. We separated these practices to grow annual crops.”

Jane Tanner grew cut flowers and specialty crops at Windcrest Farm and Commonwealth Farms in North Carolina, and helped manage the biodynamic gardens at Spikenard Farm in Virginia.

