As interest in sustainable agriculture grows, Extension educators are teaching Minnesotans about agroforestry and its benefits, including healthier soils, water conservation, and increased crop and forest yields. For Tyler Carlson, a recent graduate of the University of Minnesota, the timing for learning about agroforestry couldn’t have been better.

Carlson, 25, plans to take over management of the Sauk Centre-area farm that has been in his family for nearly four decades. He got to know Extension educator Diomy Zamora during an agroforestry class through the University’s College of Food, Agricultural and Natural Resource Sciences.

But Carlson and Zamora didn’t part ways when the class ended. Zamora’s Extension position keeps him involved with people who want to adopt integrated land-use systems but aren’t sure where to start.

The agroforestry practice Carlson plans to implement is called silvopasture, managing woodlands for livestock grazing and timber. Silvopasture, one of the five integrated agroforestry practices, allows landowners to plant or utilize money-making trees without losing use of the acreage. It also reduces erosion, leads to cleaner stormwater runoff and improves timber value for long-term profit, according to Zamora.

“More than 800,000 acres of Minnesota woodlots are grazed, but the majority is not managed,” Zamora says. “Farmers who turn cattle out into woodland without planting proper forages or strategically rotating the animals eventually downgrade the trees, plants and soil.”

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“The shade offered by the right selection of trees will reduce heat stress on my animals, helping them gain weight,” says Carlson. “And the right perennial forages will require fewer inputs and be more digestible when they are grown in the shade of the trees.”

Carlson will also attend Extension agroforestry workshops to learn about tree selection and management, “like how to thin the timber stand so the trees will let in the right amount of sunlight needed by the growing forages and provide a long-term investment in the timber,” Carlson says.

Extension agroforestry educator Gary Wyatt teaches farmers how to adopt practices that protect Minnesota’s natural resources and fit into their existing operations, too. “Individual landowners can plant crops that offer environmental benefits and are eligible for state and federal incentives,” he says. “But the collective benefits—to water quality, air, soil and wildlife habitat—impact all of us.”

At 200 acres, the Carlson farm may seem small in the middle of dairy country. But Carlson fits the profile that proponents are starting to identify as the modern-day pioneers of agroforestry. “We expect small farms—some of them managed by the new generation—to be some of the earliest adopters,” Zamora says. “Tyler is in a great position right now to assess his farm’s use of land and to make decisions that protect natural resources for generations to come.”

For more Extension agroforestry resources, visit www.extension.umn.edu/agroforestry

A river twists its way through the prairie, while surrounding trees—forming a “riparian forest buffer”—protect water quality and enhance aquatic and wildlife habitats.

Improving water quality along the riverbank

Trees growing along rivers, lakes or other waterways can protect water quality by reducing the amount of sediment, nutrients and pesticides that would otherwise end up in surface waters. When those trees are part of an integrated land-management plan, they comprise a riparian (riverbank) forest buffer, one of the five practices of agroforestry.

Extension, the Minnesota DNR and the Vermillion River Watershed Joint Powers Organization collaborated to establish a permanent riparian forest-buffer demonstration site in 2009. The area sits along the Vermillion River, a state-designated trout stream in Dakota County.

Apart from improving water quality, riparian forest buffers can provide shade to cool the water and reduce threats to trout populations. Trout need cold water to survive, but some of Minnesota’s 450 miles of trout streams are experiencing warmer temperatures, including the Vermillion River.

Since the project’s inception, Extension agriculture production/water quality educator Phyllis Bongard has directed the educational components, developing outreach materials and tours to educate landowners.

“Extension has been fantastic in helping the public learn about the buffers,” says Brian Nerbonne, DNR trout habitat specialist. “They also brought the expertise on tree selection and controlling invasive vegetation.”

For more information on riparian forest buffers and the Vermillion River demonstration, visit www.extension.umn.edu/buffers

AGROFORESTRY 101

Agroforestry is the intensive, intentional combining of trees and/or shrubs with crops and/or livestock to create sustainable land-use systems. There are five integrated practices of agroforestry:

- **ALLEY CROPPING** integrates annual crops with high-value trees and shrubs grown along rows for energy or products.
- **FOREST FARMING** is growing food (nuts, berries, mushrooms), medicinal and decorative products under the protection of a managed forest canopy.
- **RIPARIAN FOREST BUFFERS** are plantings of trees, shrubs or grasses along waterways to stabilize stream and river banks, prevent erosion, filter sediment, nutrients and pesticides, and improve fish habitats.
- **SILVOPASTURE** involves trees, livestock and forages growing together in a managed, interactive system.
- **WINDBREAKS** are plantings of trees and shrubs designed to enhance crop production, protect people and livestock, and benefit wildlife, soil and water resources.

Source: USDA