New Money-Making Options With Trees

Farming is tough business for small farmers when livestock prices drop, forcing them to make some important choices. Do they keep their livestock and continue feeding the animals until the price per pound goes up? Or do they sell at the lower price and take the loss?

Now, Agricultural Research Service scientists at the Dale Bumpers Small Farms Research Center in Booneville, Arkansas, are developing other options for small livestock producers caught in this economic bind.

"We're looking at profitable alternatives to help small farmers deal with price fluctuations," says ARS forester Catalino A. Blanche. "Agroforestry is one way farmers can get the most use out of their land. Although other countries use agroforestry systems, it is a fairly new idea in the United States."

The two types of agroforestry being studied at the Booneville center are called silvopasture and alley cropping. Silvopasture is growing trees, cattle, and grass on the same land. Alley cropping is growing crops between tree rows. The idea is that farmers can use their land to make supplemental income during livestock down markets, without sacrificing their main source of income or losing profits.

Silvopasturing

"If farmers grow trees on their land, the trees will eventually generate a profit for them. If they introduce the right tree species into their pastures in the right manner, it can improve their income by as much as 300 percent," Blanche says.

Selecting the right tree species depends on several factors, including climate, soil conditions, vegetation, product type, and acreage. Black walnut, pecan, loblolly pine, and slash pine are the leading tree species in the southeastern United States, because they are best suited for the region's weather and soil conditions.

"These trees are being introduced in traditional Arkansas farms and pastures to increase profitability and sustainability," says Blanche. "People are concerned about the environment and giving back to the land. Agroforestry does this.

"Trees also provide shade. This is important, because some cattle species eat less when it is hot. This causes them to lose weight, which results in an economic loss for the farmer," Blanche says. "Providing shade for the animals can mean a 15 to 20 percent weight gain, based on research in the tropics."

But cattle should be turned into a silvopasture only after young trees are well established, about 3 or 4 years after planting. And a sufficient number of trees should be planted to avoid soil compaction from too many cattle seeking relief from summer heat underneath too few trees.

SCOTT BAUER (K7825-2)

Field corn planted between rows of loblolly pine provide fodder and intermediate cash flow while the trees grow to maturity. Animal scientist Michael Brown (left) and agroforester Catalino Blanche check a corn row for yield and quality.

Extra income from grazing can be about $3,400 a year for a 50-cow, 200-acre pasture—the average farm size in Arkansas. And by planting 60 acres of the 200-acre pasture with trees over a 30-year period, extra income could be increased to about $5,000 a year, he estimates.

That's one way to generate added income. Blanche points out that trees can also be used for pulpwood, timber, and pine straw production. [See "Pine Needles—a Hot, New Commodity," *Agricultural Research*, May 1996, pp. 16-17.]

Although agroforestry seems promising, Blanche is studying a critical issue for the Midsouth—the ability of a tree to coexist with, or even tolerate—other vegetation, such as legumes, bermudagrass, and fescue grasses. Tall fescue is one of the most dominant grass species in the Midsouth area and the major source of winter browsing for animals.

"Controlling competing vegetation while trees are getting established is important for best seedling survival and growth. This must be factored into the tree selection equation, if we are to successfully develop an appropriate agroforestry system," says Blanche.

Alley Cropping

Another profitable alternative for the farmer with limited acreage is planting crops between tree rows. "Alley cropping gives farmers an alternative income while they're waiting for their trees to grow. They could grow and sell corn, for example, in addition to raising livestock. This offers them more immediate payoffs," says Blanche.

Designing the right tree row configuration to provide optimum light and selecting the right crop are

both important for overall productivity of a given piece of land.

"We have tried single-, double-, and quadruple-tree-row designs with wide alleys between them, to see which works best for different situations," Blanche says. "If grasses are grown between tree rows, then the double-tree-row configuration might be better. We don't have a clear explanation, yet, of why we get more forage per acre with this configuration than the other two," he says.

The double-tree-row design involves planting two rows of trees close together and then leaving a 40-foot-wide alley before planting the next two rows, and so on.

As for which crops would work best in agroforestry systems and provide the best economic benefits for the farmer, Robert D. Webster, an agronomist at the Booneville lab, is looking at a wide range of alternative crops. These include corn, muscadine grapes, and plants with natural chemical compounds used in industry, medicine, and as dietary supplements.

SCOTT BAUER (K7827-8)

Near Booneville, Arkansas, ARS forester Catalino Blanche is testing pine straw mulch to see how well it holds in soil moisture and improves blueberry yields at the Sunnyland Berry Farm owned by Linda Bradshaw.

SCOTT BAUER (K7826-7)

ARS forester Catalino Blanche (left) and grower Robert Carruthers examine wheat straw mulch applied to reduce soil moisture loss and irrigation costs.

"We have identified more than 100 species for their potential agricultural success, economic value, and acceptance by small farmers of the midsouth region," says Webster.

"I planted 41 species of herbs between single rows of 5-year-old pine trees—including ginseng, *Panax quinquifolia;* sage, *Salvia officinalis;* thyme, *Thymus serpyllum;* St. Johnswort, *Hypericum;* and chamomile, *Matricaria recuttia,* to name a few—to compare the yield and possible return," he says.

"The results aren't in yet, but the data will help us to characterize these herbs, define cultural requirements, and compare yields and the economic potential of these species in an alley cropping situation for midsouth geographic areas," says Webster.

Do trees and salsa mix well together? Webster has also planted jalapeño peppers, the main spice in salsa, to test its success as an alley crop. Salsa just happens to be a top-selling condiment in the United States, right up there with catsup.

A crystal ball to predict the future? Not yet—but it's on the way. The Agroforestry Economic Model, a software program developed jointly by the New Zealand Forest Research Institute and ARS, assesses the future value of planting certain crops.

"I put in such information as farm size, number of livestock, the tree type I plan on using, and what crops, if any, I plan to plant," says Blanche. "The computer estimates how much money I will make, based on current market information. If I have 200 acres of land and I want trees, cows, and corn, the computer can predict a cashflow estimate for my business venture," he adds.

"Agroforestry offers great potential to the small farmer, and the model allows evaluation of a wide range of scenarios and options—taking away much of the guesswork and helping the farmer to make easier choices and smart business decisions," says Blanche.—By **Tara Weaver,** ARS.

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