



The *New* American Farmer

Max Carter

Douglas, Georgia

Summary of Operation

- Cotton, corn, peanuts, soybeans, winter wheat and rye on 400 acres
- Conservation tillage, cover crops, innovative rotations

Problem Addressed

Severe soil erosion. In the early 1970s, the soil on Max Carter's farm was on the move. It blew away on windy days and washed away during rainstorms. Like most farmers around him, Carter cultivated each of his double-cropped fields nearly year-round, turning over the soil and breaking up its structure to eliminate weeds and prepare seed beds. He burned the crop residues left on top of the soil before each planting so the "trash" wouldn't clog his disk or harrow. Turning and burning were considered normal practices, even encouraged by farming experts at the time, but they caused Carter's loamy sand soil to erode away.

Background

Twenty-four years ago, Carter decided he'd had enough. After days of planting when he couldn't even see the front wheels of his tractor from all the smoke and dust, he vowed to find another way. "I looked at all the carbon going up in smoke, and I knew it wasn't right," he says. "Too much was leaving my land."

He retained his double-crop rotation of wheat, corn, cotton, peanuts and soybeans, but decided to quit burning the residue on his fields and find a way to plant into it. By eliminating burning and consolidating tillage and planting in one field trip, Carter also hoped to shorten the time between harvesting one crop and planting another.

"If I could get the planting dates moved up to within a week of combining, I wouldn't lose so much moisture at a critical time of year, and I'd give the second crop more days to reach maturity before frost," he says. "Ten days can make a big difference."

Carter opened his farm to field days and research experiments on no-till systems; his latest collaboration looks at how to reduce chemical use in minimum-till systems. Suddenly, farming became exciting to him again.

After years of figuring out the equipment, rotations and management techniques that would allow him to double crop his land with almost no disturbance of the soil, Carter is now considered one of the modern pioneers of conservation tillage in the South, with other farmers and researchers emulating his methods.

Focal Point of Operation — Rotations and cover crops

Since no one in his area had tried planting into crop residue without tilling, Carter had to figure out his own equipment and systems. The first year, he modified his planter with fluted coulters to create a small bare strip ahead of the seed drill. With this strip-till rig, he planted soybeans into wheat and rye stubble and found that it worked to his satisfaction.

Two years later, he bought one of the first no-till planters in the area. This four-row rig featured serrated coulters to cut the residue, followed by shanks that ripped 14 to 16 inches into the soil to provide aeration and stability for the roots of the next crop, and an angled pair of tires to firm the soil for the seed drill or planter. Although he has made numerous adjustments since, Carter still uses this piece of equipment today.

As he fine-tuned his system, cover crops became an important part of Carter's rotation. Even after 24 years, though, he doesn't have a set formula; he makes adjustments every season depending upon the markets and weather.

Lately, Carter has rotated winter wheat and rye with his summer crops of corn, cotton and peanuts. He either sows clover right into the corn by air in August, or drills it into the corn stubble after harvest. In spring, he plants the corn with his no-till rig back into the clover, then "burns" the clover down a week or two later with an herbicide. This same system works with cotton and peanuts.

When he rotates his summer crops with winter wheat or rye, Carter uses an old drill to plant the winter crop directly into the cotton stubble. A week or two later, he mows the stubble with a rotary mower and lets the residue from the summer crops cover the ground. After the winter crop is harvested, he comes back with the no-till rig to plant another crop of cotton, corn or peanuts.

"There is very little disturbed ground in this system," Carter says. "Yet, within a few



Keith Richards

Max Carter demonstrates the residue he plants into as part of his no-till system designed to conserve soil.

weeks of planting I've got a beautiful stand."

He's planted peanuts into corn stubble in May or into wheat stubble in June without much affecting his yields.

Economics and Profitability

As long as he can keep his yields stable, Carter defines profitability in his system by the amount of inputs — fewer inputs equal more profit. Diesel fuel, equipment maintenance costs and chemical costs have decreased, which has helped his bottom line. And if yields stay comparable to what he got when he conventionally tilled — and he has every indication that they will — he'll do what's best for the soil.

"I get about 45 to 50 bushels of wheat or

soybeans per acre, and two tons of peanuts per acre in a good year," he says.

Last year he averaged nearly two bales of cotton per acre. By lowering his input costs all around, Carter says, he can keep his operation in the black.

Environmental Benefits

Carter didn't realize all the benefits he would reap when he first quit tilling his soil. Most importantly, his practices have stopped the soil from leaving his farm.

At the lower end of a field with only 3-percent slope, a fence is half buried with eroded soil from when Carter used to till and burn. That is an image of the past, as no fences are being covered by soil today. The water in each of his two ponds is clear, unaffected by runoff, and the fish are plentiful.

Soil samples analyzed by USDA's Natural Resources Conservation Service also showed that crop residues had boosted the organic matter in Carter's soils. Since the higher organic matter improved his soil quality and water retention, he has been able to get rid of his irrigation equipment. Higher soil quality also provides more nutrients for soil organisms, and humus and fertility for the next crop.

Carter tries to keep chemical herbicide and nutrient applications to one pass, before plant emergence. Although Carter now relies on spot spraying rather than cultivation to manage problem weeds, his herbicide use has not gone up since he switched to no-till and cover crops. He is very careful when he applies herbicides, trying to mini-

mize chemical contact with soil or water.

Retaining a cover crop over the winter may be the reason Carter sees so many more beneficial insects on the farm. Regularly, he notices lady beetles, big-eyed bugs and predatory wasps so he recently eliminated his use of chemical insecticides altogether.

“It seems like as I cut back on insecticides, the beneficials just increased, and nature took over,” he says.

Carter also experiences no soil-borne diseases, which some no-tillers might expect from a wetter, cooler soil environment. He attributes that to his late summer plant date — around June 1 — because the soil is warmer.

Without the smoke from burning and dust from tillage, air quality has drastically improved around the neighborhood. And Max speaks with joy about the quail and other birds that have returned to his land, finding cover among the residue on his fields.

Community and Quality of Life Benefits

For years, Carter was considered a little unusual by his fellow farmers, so he kept a low profile about his farming practices. In fact, he did most of his real innovations on the fields away from the road so neighbors wouldn't bother him. All that changed about 12 years ago.

“I was ready to retire, but then this started getting really interesting,” says Carter, who has lived, then worked, on the farm since he moved there in 1941 at age six.

Today, conservation tillage is sweeping the county. There are 80 members in the Coffee County Conservation Alliance, an organization that Carter helped organize and served as past president. His farm is a showcase for conservation tillage, hosting numerous visi-

tors and field days, and he has been asked to speak at other events.

Part of the change is due to the support of county Cooperative Extension agent Rick Reed. Once the federal boll weevil eradication

By lowering his input costs all around, Carter can keep his operation in the black.

program got underway, Reed was awakened to the need to work with nature instead of against it. Trying to dominate nature by eliminating the boll weevil had just created a “bigger monster” with other pests, he believes.

Reed credits a strong core of innovative farmers, such as Max Carter, as the biggest factor driving more sustainable practices.

Carter likes to tell people that he got into conservation tillage because the old way was too much work, although one look around his well-kept farm will tell you that he's not afraid to put in some long days. The truth is, conservation tillage allows him to tend to other activities while his neighbors are out cultivating their fields during the winter and spring.

Transition Advice

It takes patience to make a system like Carter's work right. One spring, Carter's no-till planter couldn't cut through the 4 to 6 tons per acre of organic matter on his fields when he was trying to plant cotton. Instead of getting frustrated and setting fire to the residue, he changed from a fluted coulter to a wavy one. The adjustment

worked, and he got his crop in on time. Carter says one of the keys for all farmers is to constantly fine-tune their systems.

It also helps to share information with other farmers. Field days are invaluable, and groups like the Coffee County Conservation Alliance can provide support.

The Future

One criticism of a minimum-tillage system is that its dependence on chemicals instead of cultivation to control weeds harms the soil in other ways. Sharad Phatak, a researcher at the University of Georgia with whom Carter works, feels that many growers, even organic ones, are just trading one set of inputs for another in an attempt to improve their operations.

Phatak praises Carter for creating a system that is continually moving in the right direction. Based on his research and Carter's experiences, Phatak believes that most chemical pesticides and herbicides can be greatly reduced in a no-till system on all farms in south Georgia. He is working with the conservation tillage farmers of Coffee County to achieve that goal.

Meanwhile, Carter sees a brighter future ahead for those who follow him into conservation practices. “A few years ago I started reading everywhere that erosion is the farmer's no. 1 problem,” he says. “I thought I had lots of worse problems every day — a dead battery on the tractor or equipment broke down or something — but they were right. You can't farm without soil.”

■ *Keith Richards*

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