Cleaner and Greener

At the same time corn farmers produce record crop after record crop – and discover new ways to use those crops – they've changed how they grow it, too.

In other words, the way things were done 20, 10 and even five years ago simply don't apply any more. Things change: management practices, equipment, technology, science. It all comes together in a tractor cab, which, in some cases, is as wired (and wireless) as a business park.

Today's farmers have adopted conservation tillage on millions of acres of land – and continue to expand the use of these no-till and minimal till practices. The benefits for the environment are significant. No-tilling means remnants from the previous year's crop are left untouched. Not only does this improve the soil over time, but it significantly reduces soil run-off during snowmelt or heavy rain. In fact, the U.S. Department of Agriculture noted America's corn farmers have cut soil erosion 44 percent in two decades by using these innovative conservation methods.

Yet eliminating run-off keeps more than just soil in the field where it belongs. It also keeps crop nutrients in place and holds moisture in the soil during the growing season. Plus, by traveling across the field less often, farmers use less diesel fuel. Using less fuel means using less energy – and the energy used to grow a bushel of corn has fallen 37 percent because of this and the adoption of other technologies.

It all ties together well – but it's not the whole story. Conservation tillage is an option for more farmers today because of technological advances. Corn plants that are resistant to safer herbicides means controlling weeds in a no-till field is more efficient and less harmful to the land – and people. Seeds that resist insect damage mean fewer insecticides are needed to protect the crop, and that means fewer passes across the field. These technologies are made possible through advances in biotechnology.

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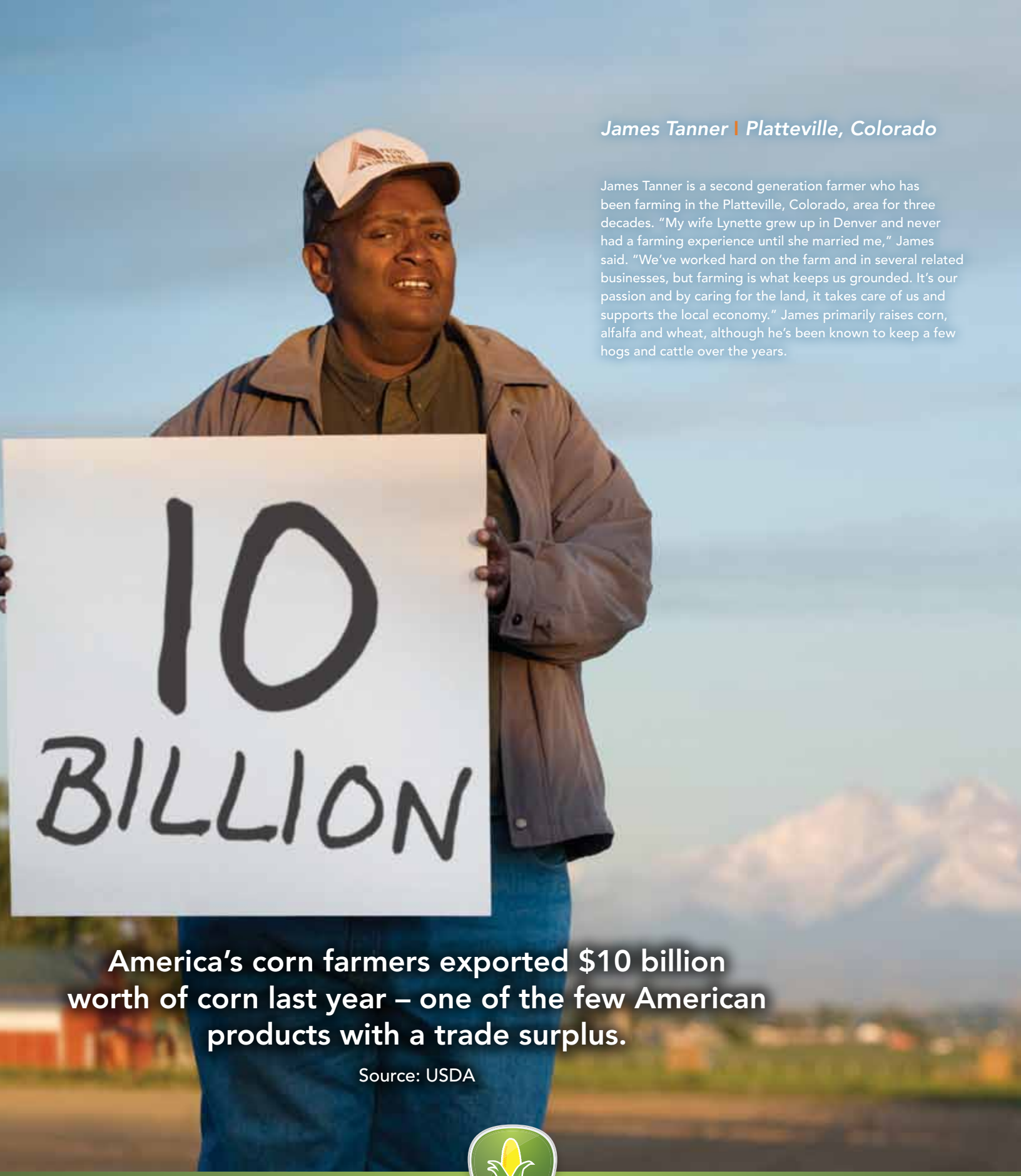


James Tanner | Platteville, Colorado

James Tanner is a second generation farmer who has been farming in the Platteville, Colorado, area for three decades. "My wife Lynette grew up in Denver and never had a farming experience until she married me," James said. "We've worked hard on the farm and in several related businesses, but farming is what keeps us grounded. It's our passion and by caring for the land, it takes care of us and supports the local economy." James primarily raises corn, alfalfa and wheat, although he's been known to keep a few hogs and cattle over the years.

America's corn farmers exported $10 billion worth of corn last year – one of the few American products with a trade surplus.

Source: USDA

CORN FARMERS COALITION

Oliver family | Smithfield, Virginia

Fourth generation farmers Jimmy and Pamela Oliver operate a diverse family farm with Jimmy's cousin, J.V., near Smithfield, Virginia. In addition to corn, the Olivers grow wheat, soybeans and cotton while producing strawberries, sweet corn, butter beans, tomatoes and more to sell in their grandfather's "ole country store."

"We work together as a family producing a variety of crops while caring for the land," said Pamela. "The land is our most valuable resource and conservation farming practices like no-till help ensure we're protecting it and the environment so our children, the fifth generation, are able to make a living here, too." The Olivers also apply energized carbon on their land, a process that enriches the soil and provides another environmental benefit.

90% of all corn is produced by family farms.

Source: USDA

CORN FARMERS
COALITION

Farming by 'prescription'

If you're familiar with a GPS – a global positioning system – unit that lets you know if you should turn left or right, you have an idea of what farmers have access to in the tractor cab.

What farmers use, however, is much more precise – from 6-7 inches while moving across a field all the way down to less than an inch accuracy. This precision agriculture technology does more than just provide directions – it actually steers the tractor or harvesting equipment, keeping it on track while the farmer monitors the other pieces of technology and goings-on. It reduces overlaps in the field, which are wasteful because they use more seed and nutrients and require more passes in the tractor.

Along the way, an on-board computer keeps track of everything through an entire growing season – from how many seeds are planted on every acre, to where crop nutrients and other inputs have been applied to how many bushels are being harvested at the end of the year. All this data is available via a thumb drive or wirelessly to a home computer.

What does that data provide? It lets the farmer see how a field performed – what parts of the field had high yields and what parts didn't. When combined with soil sampling, which checks the nutrients available to plants in different parts of the field, custom fertilizer applications are possible.

This means a farmer applies more nutrients in some areas that need it and less in others. The goal is to have only what is needed by the plants in the right place every season. If a farmer has advanced technology in his planter, he can even control how many seeds are planted in different parts of the field – more seeds where yield potential is higher and fewer where it isn't.

Combined, all of this technology and know-how is referred to as "prescription agriculture," because farmers calculate and then prescribe everything from crop inputs to seed placement at multiple points across a field. The plan is carried out with the assistance of the on-board computer, which controls, based on the prescription, how much fertilizer is applied as the tractor moves across the field.

> America's corn farmers have cut soil erosion 44 percent by using innovative conservation tillage methods.

Thanks to these and other innovative fertilization methods, it's estimated that American corn farmers are producing 85 percent more corn per ounce of fertilizer applied today than a couple decades ago.

What does the future hold?

The advancements made over the last few years in how farmers grow corn are just the start. While the accomplishments are incredible, research continues for new ways to reduce farmers' environmental footprint while growing yields.

The understanding of conservation tillage, the timing and placement of nutrients and more will grow over time. Production methods like cover crops are gaining interest and advanced hybrids will offer new opportunities to produce more corn with fewer inputs.

One example is drought tolerant corn hybrids, which are just starting to come to market. These hybrids allow corn to yield better when stressed by a lack of water – times when Mother Nature

Ken, Joe and Evan Davis | Leesburg, Ohio

Technology means more with less

Like a growing number of U.S. farmers, Ken Davis uses a global positioning system to assist in planting seeds and applying just the right amount of fertilizer on his fields.

It helps produce more corn without increasing input costs from chemicals such as fertilizer or herbicides, said Ken, whose farm is outside Leesburg, Ohio, a town of 1,200 surrounded by the checkerboard squares of dozens of other family farms.

Four generations of Davises have farmed this land, going back to 1932. Yet these days Ken, who has a master's degree in agriculture, has a leg up: New technology means larger yields every year with less of an environmental impact.

Ken figures the fields he's already cultivating using GPS are saving him 10 percent in fuel, seeds and pesticide. He'll also be doing less tilling of his corn, which saves about 40 percent of the fuel he needs to plant and harvest his crop, disturbs the land less, prevents erosion and keeps greenhouse gases in the soil and out of the air.

"Every year," Ken says, "corn farmers are proving to the world that we can, and are, producing an abundance of safe, healthy, nutritious food, feed and fuel, and we are doing it while improving the quality of our environment, our communities and our economy. Next to our creator and our family, the land is a farmer's greatest asset. Only by caring for the land can we hope to reap any reward."

brings on the heat and rain is lacking. It will also allow farmers in more drought-prone areas around the world to produce more consistent crops.

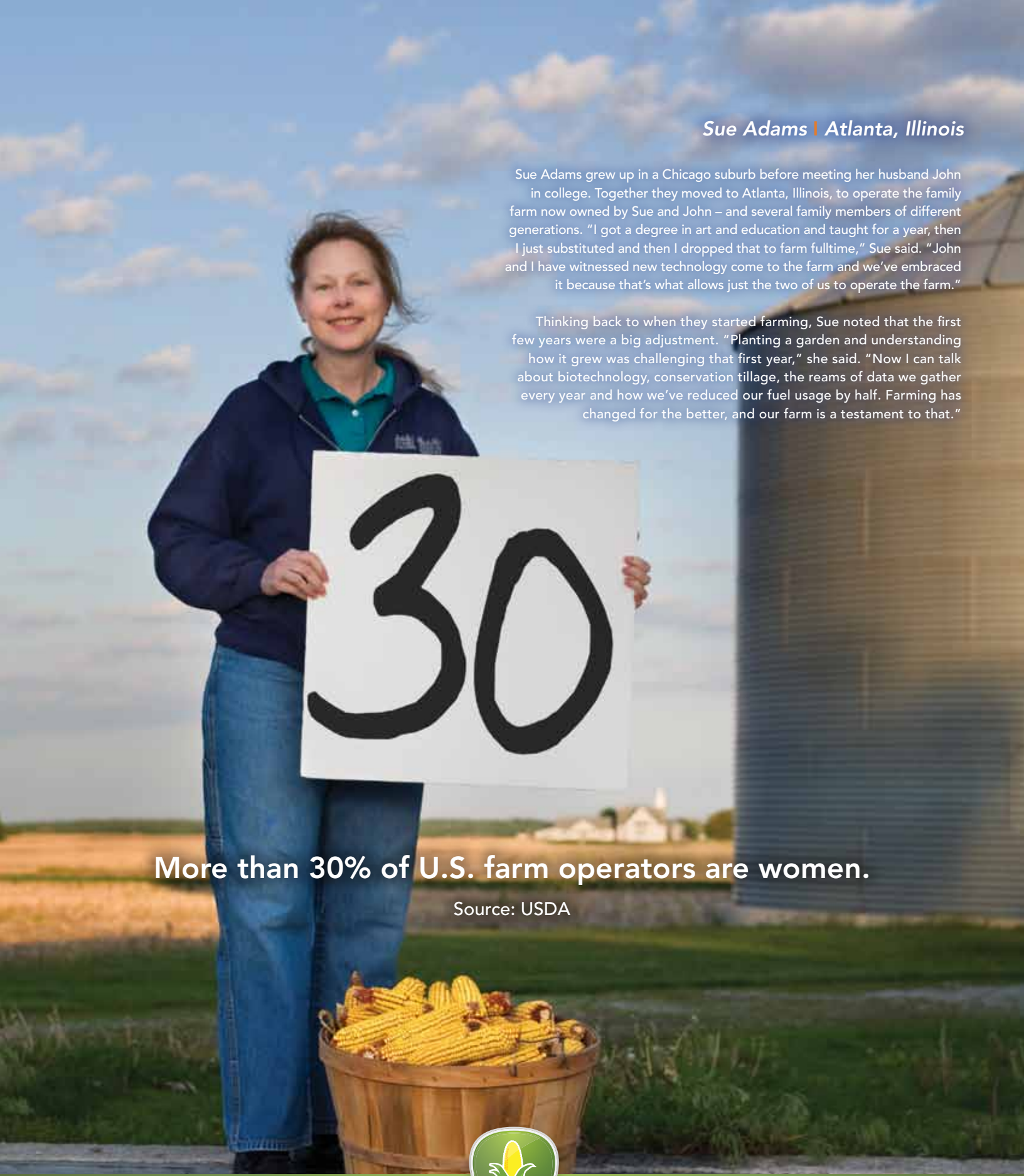
> There are more than 300,000,000 people living in the United States. Only 2,000,000 farm so the rest of us can eat – and of that number 300,000 are family corn farmers.

Actually, many hybrids grown today are already more drought tolerant than those grown 20 and 30 years ago because their roots have built-in insect protection. Strong roots allow plants to reach down farther for water and better take up nutrients.

All of this is important because the only water most American-grown corn receives comes in the form of rainfall. In fact, 87 percent of the crop is only watered by Mother Nature. The rest also receives rainfall, but is supplemented with some water via irrigation – although technology and know-how have significantly reduced the amount of water applied.

What else does the future hold? Well, it's pretty wide open, especially considering that scientists have decoded the corn genome. Researchers are essentially looking at a blank slate. It's exciting to imagine – the opportunities are endless.

> "Our collective definition of a 'good job' has evolved into something that no longer resembles Work, and that has detached us from a great many things, including our food, and the people who provide it."
> **– Mike Rowe at MikeRoweWorks.com**



Sue Adams | Atlanta, Illinois

Sue Adams grew up in a Chicago suburb before meeting her husband John in college. Together they moved to Atlanta, Illinois, to operate the family farm now owned by Sue and John – and several family members of different generations. "I got a degree in art and education and taught for a year, then I just substituted and then I dropped that to farm fulltime," Sue said. "John and I have witnessed new technology come to the farm and we've embraced it because that's what allows just the two of us to operate the farm."

Thinking back to when they started farming, Sue noted that the first few years were a big adjustment. "Planting a garden and understanding how it grew was challenging that first year," she said. "Now I can talk about biotechnology, conservation tillage, the reams of data we gather every year and how we've reduced our fuel usage by half. Farming has changed for the better, and our farm is a testament to that."

More than 30% of U.S. farm operators are women.

Source: USDA

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