

Conservation is their competitive edge



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Continuous no-till (24 years) lowers the cost of corn production by 15% and boosts long-term soil organic matter for Rodney (left), Ken and Roy Rulon, Arcadia, Ind.

Rulon Enterprises focuses on soil health, low costs (\$3.89-per-bushel corn) and shrewd sales to grow its future.

By Susan Winsor

We've always expected \$4 corn," says Ken Rulon. "Our cost of production, including a return to our owned land, is \$3.89 per bushel." It would take a 30-bushel yield increase for Rulon Enterprises to

cover the 15% higher operating cost of conventional tillage, he adds. Rulon Enterprises capitalizes on advanced, environmentally beneficial practices to build soil health and sustainable profits. The family's emphasis on soil health and disciplined, financial management and marketing makes them extremely competitive in today's lean environment. The operation, in the family

since 1869, includes Ken, his brother Roy and their cousin Rodney. Continuous no-till lowers the Rulons' cost of corn production by 15% and boosts long-term soil organic matter. A full array of conservation and progressive agronomic practices builds soil productivity, leverages nutrient costs and retention, and cuts overhead. The farm is a training site for Indiana Natural Resources Conservation Service employees and hosts numerous conservation tours.

Ken tallies cover crops' bottom line based on six-year Purdue University-affiliated fertility and conservation research plots compared to conventional tillage and agronomy.

The Rulons also invest heavily in continuing education. And specialized management roles ensure well-honed, focused expertise. Ken oversees grain marketing, risk and financial management. Roy manages farm operations, equipment and employees. Rodney handles GIS analysis, tiling layout plans and agronomic practices such as variable-rate nutrient and seeding formulas.

Tillage

"Strip till doesn't work for us because we get 38 to 40 inches of precip here annually," says Roy. "Erosion down the tilled strips is horrendous."

No-till (for 24 years), pattern tile drainage and increasing soil organic matter are the Rulons' weather hedge. "If water stands for more than 20 minutes, you lose 30 to 50 bushels per acre in corn," Roy says.

Agronomics

"Our yield goals range from 90 bushels to 300, based on soils' productive capacity and breakeven analysis of each zone's maximum economic return," Rodney says. Goals hinge on profit metrics rather than on the highest yield.

Variable-rate nitrogen, phosphorus and potassium levels are based on 20 years of detailed farm records and on-farm replicated strip com-

Do the math

Rulon Enterprises' cost of production is 15% below its conventionally tilled counterparts.

Per-acre savings from Rulon never-till system	
Equipment and operating, fuel savings from no-till	\$41
Savings of not owning, operating and maintaining chisel plow, field cultivator, vertical-tillage equipment and high-horsepower tractors	
Reduced fertilizer costs from less leaching and erosion	\$29
Increased soil organic matter delivers a 5-bushel yield increase at \$5 per acre, and \$4 corn, based on 24 years of no-till	\$20
Conservation Stewardship Program incentives	\$10
Total cost advantage is \$100 per acre over similar, conventionally tilled operation	\$100 per acre

Data is based on University of Minnesota and Purdue University figures and Beck's Hybrids no-till plots. Purdue University data shows that a 1% increase in soil organic matter delivers 12 to 15 bushels of corn, and the Rulons conservatively figure one-third of that at \$4 corn.



The Rulons plant corn directly into cereal rye with a half-inch cutter and Dawn closing wheels, applying 12.5 gallons per acre of 28% N off to the side of the seed. The rye here has two weeks' more growth than normal due to planting weather delays. It was sprayed the following day. This field yielded 188 bushels per acre — a 4-bushel increase over the no-cover-crop control plot.

parisons at various nutrient levels. By varying N rates as needed, and basing P and K rates on 1-acre grid soil testing data, the Rulons average 181 and 59 bushels per acre in corn and soybeans, respectively. They have soil-tested on 1-acre grids every fourth year since 1992 (five georeferenced probes per acre).

Total applied N ranges from 115 to 220 pounds per acre, beginning with 30 pounds of 28% N at planting and the rest sidedressed with an Exactrix direct-injection applicator when corn is knee-high. The whole-farm average is 168 pounds per acre.

They also apply variable-rate

lime and gypsum based on 1-acre grid soil test results, and they tissue-sample growing crops to avoid deficiencies.

Cover crops

Cover crops joined the Rulon strategy in 2006 to help reduce erosion, increase soil organic matter, anchor nutrients and break up soil compaction.

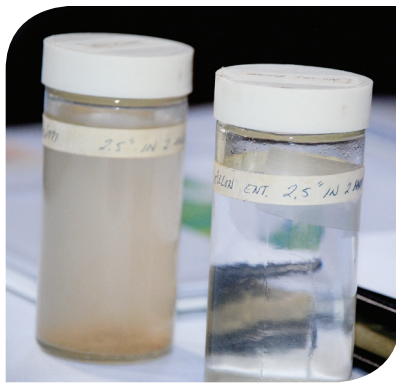
They normally plant a mix of oats, tillage radish and crimson

clover after soybeans following a September harvest with a 15-inch Great Plains planter, alternating rows by species. Oats and radish capture excess nutrients after the growing season and die over winter, leaving clover to counter soil compaction into the spring. They continue to experiment with cereal rye after soybeans, and the following spring plant corn into standing cereal rye.

Following corn, the Rulons plant or fly on cereal rye and other cover crops.

They collaborate with Purdue University and the Conservation Cropping Systems Initiative to provide farm-scale cover crop plot data, including soil moisture and temperature data (through the white sensor shown in the cover photo).

Another investment in soil health and better soil structure is large-



These water samples offer visual proof of conservation benefits to landlords for Rulon Enterprises.

diameter pattern-tiling mains. They offset "erosion events," a 2-inch rain by Ken's definition. They have pattern-tilled 91% of their owned acreage with 33% larger-diameter tile mains (0.5-inch coefficients, not 0.375-inch), which reduces nutrient-laden runoff. Higher soil organic

matter also translates to 60% better water infiltration than conventionally farmed soil — handy during floods and droughts, NRCS data shows. On rented ground, the Rulons negotiate creative cost-share arrangements on tile installation expense, since both parties benefit.

Low-productivity grids and new farms receive poultry manure and municipal biosludge to help restart soil biology. They plan to experiment with biochar in the near future (see bit.ly/_BIOCHAR).

Risk management

Cover crops and soil resilience are just one part of the Rulons' risk-management strategy. Implementing crop-share lease arrangements on half of their acres, evenly distributing planting and being a high-price seller are three more.

Cover crop vs. N rate study, 2013

Avg. all N rates		Yield increase
189.5 bu.	Oats-radish	9.2%
176.8 bu.	Cereal rye	1.8%
178.3 bu.	Annual rye	2.7%
173.6 bu.	No cover	—

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The oats-radish mix was the consistent 2013 winner across five N rates, yielding 9% more, or 16 bushels, compared to no cover crop on average. (See the full data and N levels at bit.ly/1gBW3vU.) This data is consistent with the results from 2009 and 2011. All plots received 30 pounds per acre N at planting, plus five different sidedress rates. Each repetition of the plot was 12 rows wide and 3/8 mile long, for six years.

Sustainability, two ways

Rulon Enterprises' plan is to be sustainable, as follows:

1. Be a low-cost producer.
2. Increase soil organic matter. Twenty-four years of never-till and other conservation measures have increased organic matter to 3.5%, up from 2.4% in 1991.
3. Pattern-tille their Indiana clay soils with 0.5-inch coefficients to speed drainage. Standing water for more than 20 minutes costs 30 to 50 bushels, says Ken Rulon.
4. Be a high-price seller. Ken studies historic price patterns and trends to manage price risk, with a goal of selling in the top 10% of the annual range 75% of the time. "Grain prices vary 30% to 50% each year; costs do not," he says.

"We think these goals are required if you want your grandchildren to farm," Ken notes.

with General Electric, Ken's formal education and strategic vision of the larger economic future affirms the commitment to low-cost production and soil health.

Future

Over the next 12 years, Ken sees farm net worth stagnating or dropping, based on "the laws of supply and demand," he says. "Global acreage is up, and global economies are teetering on the brink of insolvency.

"For example, a theoretical typical crop farm (1,350 acres owned, 7,000 acres farmed) averaged a 39% annual return on equity between 1968 and 1981. That net worth has increased by 700% the last 13 years, based on \$8 corn and \$10,000-per-acre land. These advances historically end badly, like the similar 13-year advance that ended in 1981," he says.

"We envision a turbulent world ahead where currencies don't mean much. Success in farming has seldom been about production; mostly it is about keeping costs low and selling what you produce better than the average."

Change has never come easily for farmers; sticking with the tried-and-true seems to offer safety in a volatile world.

"Today's soil health practices have not caught on among those still tilling every fall," Ken says. "It's similar to when our grandfathers had to retire the work horses when tractors arrived; they shed many tears. Retiring shiny 4-wheel-drive tractors pulling field cultivators is just as hard today as selling the horses was back then." **ESD**

In a departure from the typical rush to plant quickly, the Rulons intentionally idle their planters if they've planted more than 35% of the crop in April. The benefits of broadening planting dates were realized with much higher yields during three consecutive dry Julys in central Indiana.

The ultimate risk-management tool began when Ken invited innovative thinkers to join a peer group. Today, more than 100 farmers and ag industry people on four continents subscribe to the Rulons' online peer group (www.rulonenterprises.com). A fee unlocks the details of their fertility programs, cover crop approach and marketing, plus "civil, online discussion about risk management and production techniques on real farms with respected peers from around the world," Ken says.

"We aren't innovators, just early adopters of what has worked for

pioneers like Dan DeSutter, Dave Brandt (see bit.ly/DeSutterDan and bit.ly/TnkQCT) and many others before us," Ken explains. "We are eternally grateful for those who've taught us, and those who trust us to manage their land sustainably."

To protect price risk, their written marketing plan locks in the price of inputs and outputs. They "merchandise grain to capture the carry when it makes sense, or delivers grain when it doesn't," Ken says.

"In order to make a difference in our average price at the end of the year, we sell in big chunks when prices are volatile. We're no stranger to six-figure margin calls. You have to be willing to commit to a big decision if you truly aim to sell in the top 10%."

He locked in 100% of 2014 corn at \$5.48 in 2012.

With a Purdue ag economics degree and 12 years of off-farm management experience, including four

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