

'For the family farm to stay around, things have got to change'

SOIL from Page 1

The idea is to mimic Mother Nature — leaving soils intact, maintaining living roots at all stages of production, reintroducing animals into the farm ecosystem and replacing monocultures with diverse plant communities in the fields.

Advocates predict it could ultimately save many farms by providing an economically sound alternative to the current trend of growers getting bigger to maintain a scale of efficiency in the face of rising input costs.

At a no-till conference in the winter of 2010, McIntyre listened to presentations by Ray Archuleta — the go-to expert on soil health at USDA's Natural Resources Conservation Service — and Gabe Brown, a North Dakota farmer known for sustainable farming, having improved organic matter on his farm by 5 to 6 percent on average.

By incorporating what he learned from Archuleta and Brown, McIntyre developed a system that has allowed him to eliminate losses due to wind-blown seed, increased soil organic matter by up to 1 percent, reduced chemical applications, conserved water, boosted yields and saved roughly \$100 per acre on fuel, equipment and other costs.

His system is flexible but generally works as follows:

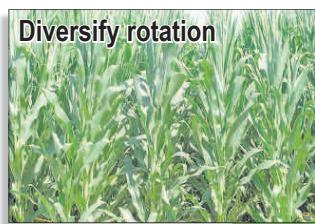
- After wheat harvest, he direct seeds a multi-species cover crop of plants raised solely to nurture the soil and build organic matter.

- In early November, his cattle graze the cover crop at high densities and, using temporary fencing, are moved to the next paddock when 30 to 50 percent of vegetation remains. Intensive grazing, which mimics natural movements of bison herds, limits soil compaction, controlling weeds and evenly distributing urine and manure to better feed soil microbes.

- The following spring, McIntyre chemically controls the cover crop and plants corn and a mixture of plants raised to symbiotically help the cash crop. These so-called companion crops — usually clover, hairy vetch, turnip, radish and peas — are grazed in the fall, along with the corn stubble, and regrowth keeps roots in the soil through winter as a de facto cover crop.

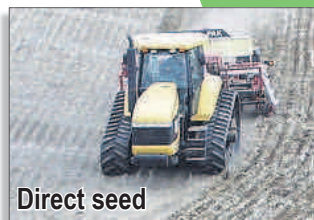
- He then repeats the cycle with peas or another crop. His

Changing up crop rotations further breaks disease cycles and improves soil health.



Diversify rotation

The following spring, a new no-till cash crop is planted along with a companion crop intended to help the cash crop grow.



Direct seed

In the fall, controlled, high-density grazing takes about 50 percent of the cover crop. Soil compaction is limited and manure and urine add nutrients.



Graze livestock

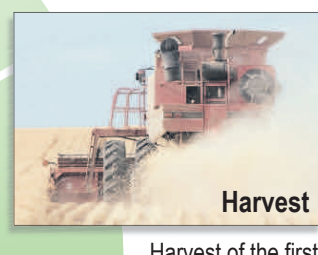
Keep it covered: Soil health practices

Soil scientists and farmers are pioneering a holistic approach to growing crops that's designed to restore soil health. USDA's National Resources Conservation Service emphasizes five key principles: keep soil covered, avoid disturbing the soil, keep plants growing year-round, diversify crop rotations and integrate livestock grazing.



No-till cash crop

After terminating the prior season's crop, a new direct seed crop, such as wheat, is planted.



Harvest

Harvest of the first cash crop leaves stubble in the field.



Cover crop

After harvest, a direct seed cover crop, such as clover, hairy vetch, turnips, radish and peas is planted.

Sources: USDA NRCS; Capital Press research
John O'Connell and Alan Kenagal/Capital Press

soils are never devoid of plant life.

He acknowledges the system requires a lot of work and careful planning, especially the intensive grazing.

"I just tell everyone what the cover crops are doing and what the animals are doing is a huge benefit, and I'll spend that labor all day long to get that benefit," McIntyre said.

Though he still uses some commercial fertilizer on his corn and wheat, he's switched to compost on alfalfa, often mixing in grasses as a companion crop.

Among the benefits are more worms. In some of his fields, he counts up to 20 worms per shovel of dirt, compared with fewer than five when he started.

He's begun sharing his soil-health practices with other Idaho farmers. Last summer the Idaho Center for Sustainable Agriculture hosted a grazing conference on his farm.

"For the family farm to stay around, things have got to change," McIntyre said. "We have to do better, and we have to be better stewards of the land."

His brother, Brian, was once skeptical of McIntyre's

abrupt change in management. Now, however, he has joined the staff of Alexandre EcoDairy in Crescent City, Calif., where he helps to implement practices such as management-intensive grazing of cropland. At the dairy, Brian explained, alfalfa is often grazed uncut in the field.

"Why bale and haul feed and haul manure back into the field when a cow has four legs?" Brian asked.

The cure for sick soil

Archuleta, the NRCS soil-health specialist, believes most U.S. farmland has become "sick" from decades of tillage and treating the symptoms of soil deficiencies instead of the underlying problems.

"Natural ecosystems are self-healing and self-regulating, the same thing as your body," Archuleta said, adding that unhealthy soils hinder a plant's ability to synthesize protein. "If you have low soil integrity and soil function and don't have enough diversity in the system, those can be pathways for pests to dominate."

Archuleta has seen many farmers make tremendous progress in recent years, incorporating practices such as

cover crops, companion crops, management-intensive grazing and no-till farming.

He believes the next step entails linking those practices together, as McIntyre has done. Using soil-health tools in concert increases benefits exponentially, he said. Farms as large as 10,000 acres have reported savings on fuel, water, chemicals fertilizer and equipment once they "truly understand soil health," Archuleta said. Their weed and disease pressure also drop, while their beneficial insect populations increase, he said.

"You're creating synergy. It's no longer 1 plus 1 equals 2. It's 7 or 8," Archuleta said.

One of Archuleta's disciples in Idaho, NRCS agronomist Marlon Winger, taught 33 workshops to 3,000 producers around the state this year describing how healthy soils function.

Healthy soils contain clumps and air pockets, which provide habitat for beneficial microorganisms and facilitate gas exchange and water infiltration.

Livestock provide an alternative to tilling stubble and cover-crop growth, recycling nutrients in their manure while

enabling growers to capitalize on the feed value of cover crops.

Winger said tillage, on the other hand, is like "building a factory only to burn it down." He explained tillage wakes up bacteria that feed on organic matter, causing soil pores to collapse and stimulates weed production.

Unbelievable results

Since implementing a cropping system encompassing soil-health practices, Darin Williams has switched from planting corn and soybeans genetically engineered to withstand herbicide back to conventional seeds.

Williams, of Waverly, Kan., dispensed entirely with post-planting herbicide use, thanks to the dramatic soil-health improvement he's enjoyed.

He took a leap of faith after hearing a presentation by Gabe Brown, promising his concerned father he'd switch back to more popular methods if the system failed to produce results in five years.

His conventional corn and soybeans have far exceeded his county's average yields.

"Everybody around here

thinks I'm blowing smoke, or it rained more on my field, or I put on extra fertilizer when nobody was looking," Williams said.

His system has also provided supplemental income streams. Last season, he sold 75 percent of his crops at a premium to buyers interested in GMO-free feed. Williams also directly markets cattle used to graze his crops at a premium as grass-fed beef, and he raises eggs, broilers, turkeys and sheep, believing grazing with a diversity of animals adds different nutrients to soil.

Growing potatoes

Center, Colo., grower Brendon Rockey has modified the system for use in potato farming, implementing several practices to offset the soil disturbance following each spud harvest.

Rockey, who raises specialty spud varieties, said yields are the same and quality is improved while expenses are much lower.

"We have sat down with some other growers and compared our costs with theirs, and we are spending \$500 to \$600 per acre less," Rockey said, though even a spreadsheet itemizing expenses often fails to convince his skeptics. "I love hearing people tell me I can't do what we're currently doing."

Rockey is an innovator in companion crops, planting buckwheat, field peas, chickpeas and chickling vetch in the same rows as potatoes for nitrogen fixation and other soil-health benefits. Between spud rows, he seeds flowering plants to attract beneficial insects that control pests. In fields not planted to potatoes, he plants a 16-species cover crop mix, selected for management-intensive grazing.

"We are not organic. We are biotic farming," said Rockey, who won the National Potato Council's environmental stewardship award in January. "It's nurturing all living things within the complete system."

His soil organic matter has increased by as much as 1.8 percent in 20 years. Rockey, who has started a side business to educate farmers interested in making the transition, is scheduled to speak in Idaho Falls and Burley, Idaho, and Ontario, Ore., in February.

This farming movement hasn't been lost on the industry's largest companies.

Oregon's wolf population has grown from 14 to a minimum of 77

WOLF from Page 17

Kayli Hanley said in a prepared statement. "We will be following this story closely."

The investigation began when a tracking collar worn by OR-21, a female, emitted a mortality signal, ODFW spokeswoman Michelle Den-

nehy said. The female wolf and her mate were found dead.

The pair had pups that would be about five months old and weaned at this point, Dennehy said. The pups hadn't been seen as of Wednesday morning, but wolves are secretive and the pups should be free-ranging

by now, she said. It's unclear how many pups the pair had.

Oregon's wolf population grew from 14 in 2009 to a minimum of 77 at the end of 2014, according to an annual ODFW report released last spring. The report estimates Oregon could have 100 to 150 wolves in one to three years.

Program coordinator Russ Morgan said the state probably has 90 to 100 wolves as of last spring; 77 is the number that were documented at the end of 2014. The report said wolves occupy only about 12 percent of their potential range in Oregon.

Oregon's population has

improved to the point that, as called for by the state's management plan, the ODFW commission will consider removing it from the state endangered species list. A commission meeting on the issue is scheduled for Oct. 9 in Florence, with a follow up hearing in November in Salem.

Investigators confirm wolves killed 76 sheep, 36 cattle and two goats from 2009 through 2014, plus several sheep this year so far. Ranchers believe wolves are responsible for many more livestock deaths. They say grazing cattle often simply disappear.

More than 100 Oregon ranchers signed voluntary conservation agreements

GROUSE from Page 1

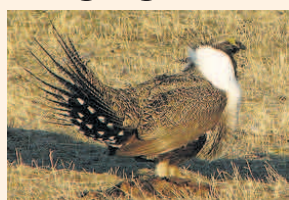
Ash said during the Colorado ceremony.

Although disagreements and lawsuits over federal agency land-use plans persist, the decision is a relief to most ranchers, farmers, loggers, miners and energy developers in the 11 Western states where the bird lives. Many producers feared an endangered species listing would shut down or complicate their ability to make a living.

But with Oregon ranchers providing a key early model, producers, private landowners and public agencies adopted agreements most believe will protect sage grouse habitat while still allowing work on the land.

More than 100 Oregon ranchers signed voluntary conservation agreements with USFWS in which they took steps to improve habitat in exchange for 30 years protection from additional regulation even if the bird had been listed. Private landowners in other states followed suit, and public agencies such as the BLM revised their management plans.

Sage grouse



The greater sage grouse is the largest grouse in North America, ranging throughout western U.S. sagebrush country into southern Alberta and Saskatchewan, Canada. This species has been withdrawn as a candidate for protection, according to the U.S. Fish and Wildlife Service.

Binomial name: *Centrocercus urophasianus*
Appearance: Large, ground dwelling bird, as much as 30 inches long, weighing up to 7 pounds.
Habitat: Sagebrush-dominated regions at elevations of 4-9,000 feet.
Diet: Sagebrush leaves, buds, and associated insects.
Life span: 1 1/2 years on average
Greatest threat: Habitat loss
Source: U.S. Fish and Wildlife Service

Capital Press graphic

Jewell had expressed optimism for several months that such work would make a difference.

On Tuesday, she said the decision means "a brighter future for one amazing, scrappy bird that calls the West home."

She said pressure on wildlife from climate change and population growth aren't going away. But she said the sage grouse decision points the way to solving such problems.

"I'm confident we have shown that epic collaboration, across a landscape, guided by sound science, is truly the future of American conservation," Jewell said in the video announcement.

Reaction outside the ceremony was mixed.

A coalition of sportsmen's groups praised the decision, saying thriving sage grouse populations are an indicator of sagebrush ecosystem health and of the many other animal and plant species linked to it.

"Now, we must remain invested in sustaining the health of this bird, and the landscapes that support it," Mule Deer Foundation President Miles Moretti said in a prepared statement.

The Western Energy Alliance, however, said USFWS made the right listing decision

but took the wrong path to get there. The group said BLM and Forest Service land-use plans continue "top-down, centralized management" and exaggerate the impact of energy development on sage grouse.

The conservation group Center for Biological Diversity, meanwhile, said the decision was based on "half measures and generally weak management plans."

"Greater sage grouse have been in precipitous decline for years and deserve better than what they're getting from the Obama administration," spokesperson Randi Spivak said in a prepared statement.

The conservative Public Lands Council released a statement criticizing the decision. It quoted U.S. Rep. Rob Bishop, House Natural Resources Committee chair, as saying it was a "cynical ploy."

"The new command and control federal plan will not help the bird, but it will control the West, which is the real goal of the Obama administration," Bishop said in the news release.

Southeast Oregon rancher Tom Sharp said the Fish

& Wildlife Service "got it right."

Sharp, an early backer of voluntary conservation measures in Harney County, said the decision was a three-way win: For the sage grouse, for ranchers and others in agriculture, and for conservation and environmental groups. Sharp said he was proud to see private landowners and ranchers step forward to participate.

He agreed some of the sage grouse regulations on public land will pose difficulties for ranchers and others who operate on BLM or Forest Service land. "This is where I think conservation and environmental groups should recognize they had a win in the application of those new regulatory measures," he said.

Private landowners now have an obligation to follow through on conservation measures, Sharp said. Watchdog groups will be quick to challenge if they don't, he said.

Sharp said assuring ranchers' privacy was key to gaining their acceptance of conservation agreements. They worried the agreements with a government agency, USFWS,

would make their land and herd records open for inspection by environmentalists or others.

The 2014 Legislature took care of that by passing HB 4093, which created a public record exemption for written sage grouse conservation agreements between ranchers and local soil and water conservation districts. Districts in eight counties act as intermediaries between ranchers and the wildlife service and develop site-specific management plans for sage grouse. Reports available to the service refer to ranches by number, not by name.

"It was a concern and it would have been a barrier had we not in Oregon gone forth and passed (the legislation)," Sharp said.

Sharp owns two ranches about 50 miles apart in Harney County. He manages up to 125 beef cattle on about 1,000 acres, rotating them off the land in summers and feeding them hay in winter. He's credited with coining what became some ranchers' slogan during the process: "What's good for the bird is good for the herd."