



WIDE ROWS: There's plenty of space between these rows compared to a conventional 30-inch corn row. Bob Recker is looking for ways to keep yields in 60- and 90-inch corn rows competitive with those of 30-inch rows, while still preserving the "opportunity space" in between for cover and companion crops. PHOTOS BY GIL GULLICKSON

Wide-row corn widens opportunities

BY GIL GULLICKSON

FROM A DISTANCE, a cornfield near Parkersburg resembles all others, with golden leaves rustling in the breeze of a bluebird fall day.

When taking a closer look, though, the field flips conventional corn production on its head. Lush multispecies cover crops and companion crops blanket 60- to 90-inch spaces between corn rows in numerous randomized and replicated plots.

"This isn't necessarily ready for prime time," says Bob Recker, owner of Cedar Valley Innovation in Waterloo, who's testing these concepts. Corn rows spaced 60 to 90 inches apart run counter to the norm of 30 inches or even narrower spacings.

Still, the wider spacing creates what Recker deems an "opportunity space." Wider rows permit more sunlight to penetrate the

corn canopy, which boosts photosynthesis and subsequent growth of interseeded cover crops. This can spur livestock grazing opportunities both in-season and after corn harvest.

Furthermore, wide rows may boost income by enabling cash companion crops

"My current thinking is that at the 60-inch level, twin row is a good configuration because it gives a bit better plant-to-plant spacing in-row." — BOB RECKER

to grow simultaneously with corn. Cover and companion crops also bring perks such as better soil structure and improved nutrient cycling.

"It's a hard pull to really improve the soil, but we are making a difference," Recker says.

INTERCROPPING SPURS INTEREST

This strategy is rooted in strip intercropping trials, in which Recker rotated between four and eight rows of corn with four or eight rows of soybeans.

"What I noticed is that you'd have a row yielding 400 bushels per acre that was always next to the soybeans in a strip," he says. "The sun passing over would bathe the plant with sunlight from top to bottom. The second row would get a little less light and yield 300, maybe 320 [bushels per acre]. And the third row with even less light would yield 220 bushels [per acre]."

He reasons this occurred because more sunlight triggered more photosynthesis and, ultimately, more yield.

Recker's not alone in this finding. Studies at the Precision Planting Institute farm in Pontiac, Ill., examined strip-cropping corn and soybeans in narrow strips, often either 20-foot- or 50-foot-wide al-

ternating strips. Results from 2021 to 2023 showed all alternating corn strips tested were more profitable than conventional full-field corn.

"I told a friend of mine that these outside rows were capturing more sunlight," Recker says. "He told me, 'If that's the case, why don't you plant corn in 40-inch rows the way we used to? This would give the corn more room to capture sunlight.'"

Forty-inch spacings didn't work on Recker's 30-inch row planter. However, he slid planter units farther apart to create 60-inch spacings on his planter.

Fully expecting a train wreck, Recker was surprised at the results in comparing 60-inch to 30-inch spacings.

"That field south of La Porte City [Iowa] came out dead even in yields, compared to how the hybrid yielded in 30-inch rows," he says.

In 2018, he worked with 12 farmers in

on-farm trials. On average, corn planted in 60-inch rows yielded within 95% of 30-inch rows.

YIELD HIT

Still, corn can't stand alone in wide-row systems without a cover crop. A North Dakota State University 2020 trial showed a 17% yield reduction for corn planted in 60-inch rows with no cover crops compared to corn planted in 30-inch rows.

"Without a strong cover crop, our research has shown weed management can be a challenge," says Brady Goettl, an NDSU Extension soil scientist. "I think this challenge is only going to increase as more herbicide-resistant and aggressive weeds move into the area."

Even cover crops are no guarantee that yields won't drop if corn is planted in 60-inch rows compared to 30-inch ones. An analysis of Practical Farmers of Iowa trials from 2018 to 2021 shows that on average, with a cover crop, corn planted in 60-inch rows yielded 13% below corn grown in 30-inch rows.

It's not likely that corn planted in 90-inch rows will ever close the yield gap with 30-inch rows, Recker says. He says he's more optimistic about 60-inch twin rows. An example is one where a 6-inch gap forms a twin row, with a 54-inch gap between the twin rows.

"My current thinking is that at the 60-inch level, twin row is a good configuration because it gives a bit better plant-to-plant

spacing in-row," Recker says. "I'm not a big fan of 60-inch singles because the plants are crowded. With twin rows, the plants have less competition for light, water and nutrients."

The wide gap between twin rows still permits cover and companion crops to be grown, adding additional income opportunities. Growing high-yielding and high-quality cover crop forages could offset a corn grain yield hit of 12.6% incurred by planting corn in 60-inch vs. 30-inch rows, according to a 2023 University of Minnesota analysis.

HYBRID HURDLES

Sixty-inch row corn faces a hurdle in that most modern hybrids are bred to perform under 30-inch row spacings. Brent Wilson is working as a Corteva Agrisciences agronomist with Noah Taylor, a Bouton, Iowa, farmer, to determine which hybrids perform best in wide rows.

"What we've found is about half of the hybrids yield worse in 60-inch rows, and half of them yield better in 60-inch corn," Taylor says. "There's no clear-cut answer yet."

"It's not clear as to what characteristics make corn respond better to wider rows, such as vertical or broad leaves," Wilson adds.

Although it's too early to determine which hybrids fit this system, hybrids that pivot their leaf angle show promise.

"I am always impressed at how the same hybrid can take advantage of sunlight by altering leaf angle in response to available sunlight," Wilson says.

"My bias from experience in other corn cropping systems is that those hybrids that are best at converting sunlight to starch tend to win across multiple environments."

AHEAD OF ITS TIME

Before retiring, Recker worked at John Deere as an engineer for 41 years. He and colleagues worked on an autonomous tractor project that received patents in the late 1990s. For years, nothing happened in this space.

"But here we are in 2024, talking about unmanned tractors," he says. "We were way ahead of our time. We may be way ahead of our time with wide-row corn."



TWIN ROWS: Bob Recker says twin-row, 60-inch spacings show the most promise of bringing yields competitive to those in 30-inch rows. Twin-row 60s provide more spacing within the row. This lessens competition for light, water and nutrients, he says.

5 tips for better wide-row corn planting

Are you thinking about planting corn in 60-inch single or twin rows? Consider these five factors to help ensure success:

1. Adjust planter setting for seeding. A planter set at 33,000 plants per acre in 30-inch rows needs to be adjusted to an equivalent 66,000 plants per acre in 60-inch rows, says Bob Recker, owner of Cedar Valley Innovation in Waterloo.

"With a precision planter, it's pretty easy," says Wendy Johnson, a Charles City, farmer. "You just shut off every other planter row."

It's more difficult with mechanical drive planters.

"A lot of them won't go that high, as they run out of gas at around 50,000 plants per acre," Recker says. "Oftentimes, the double-digit yield losses [with 60-inch rows compared to 30-inch ones] are caused because planters cannot plant above this level. Some people will try two-pass planting where they come back and plant into their tire tracks, but this gets messy."

2. Manage weeds. "This is tricky while growing two crops at once," says Brent Wilson, who works on such projects with BW Agronomics. "A farmer is limited to contact herbicides applied before cover crop emergence."

After that, it's up to cover crop competition to control weeds.

"The key is to get the cover crop established and catch a rain so it starts growing and competes with the weeds," Johnson says. "With all the rain we received this year, this really worked well. But if you don't get rain, the weeds can take over."

Consider a field's history. "I would be concerned to do this in a field with known weed problems, or one that has had an issue with perennial weeds," Wilson says.

3. Plant a multispecies cover crop. A mix of grasses, brassicas and legumes lets the cover crop adapt to changing conditions.

"Some cover crop species grew, while others wilted this year as soil conditions changed from wet to dry," Wilson says. "One component of the cover crop might be favored [due to changing condi-



COVER CROP COEXISTENCE: Cover crops such as sorghum and other grasses can be a valuable component of a cover crop mix in 60-inch row corn. However, challenges exist in balancing the competition between cover crops and corn.

tions], but you at least have something growing."

4. Reduce competition between crops. Two crops growing simultaneously can create competition. Although cover crops are important, it's still corn that pays the bills, Wilson says.

Certain cover crops fuel crop competition. "Cereal rye is a big challenge because it is so competitive with corn," Wilson says of the grass. It's better-suited for use outside of the growing season, he adds.

Farmers can use cover crop seeding date to manage competition issues.

"You have to find that window where corn is established and growing quickly enough to get ahead of the cover crop," Wilson says. Interseeding the cover crop around the V4 [four-leaf collar] stage is a good place to start, he says.

"If you wait too long, the corn gets supercompetitive," he says. "If you plant too early, the covers can be detrimental to corn yield."

A 10- to 15-inch "crop zone" consisting of just corn and no cover crop also deters competition. "This provides some safety in preventing the cover crop from hurting the corn," Wilson says.

5. Place fertilizer close to corn rows. Going as close as possible to the row helps ensure that corn receives the fertilizer it needs and not the cover crop.

Wilson has observed that midrow sidedressed N often leads to robust cover crop growth at the expense of corn growth. "Strip-tillers might have the best advantage [for this system], as they tend to band the biggest percentage of total nutrients right with the corn row," he says.



How these twins win wide-row production

BY GIL GULLICKSON

EVEN AS THE sun set on a steamy August day, Joe Breker couldn't stop talking about how the light benefits the corn he plants in 60-inch twin rows.

"When the sun comes over the top this time of year, it shines from the top of the plant all the way to the bottom," said the Havana, N.D., farmer. Rather than bathing the entire plant in light, the sun would coat just parts of a plant in conventional 30-inch spacings, he added.

The impact is akin to the edge-row effect — a phenomenon where corn in rows on the edge of a field yields more than corn in rows within the field. More sunlight drives additional photosynthesis and ultimately, more yield, Breker said.

Breker noted some yield potential is lost due to more plants crowding within a row in wide-row spacings compared to 30-inch ones. "But at the end of the day, the yield seems to be about the same," he said.



COVER CROP HEAVEN: The wide rows permit more light to penetrate the corn canopy, resulting in thriving cover crops.

The wider spacings also permit more sunlight to penetrate between rows than 30-inch rows. This allows multispecies cover crops between rows to thrive and provide myriad benefits, such as soil microbial stimulation and erosion control.

TWIN-ROW PERKS
Breker has grown wide-row corn across the farm for five years. He started with single-

row, 60-inch spacings, but also evaluated paired rows spaced 2, 4, 6 and 8 inches apart.

"There are benefits to having paired rows, because the plants aren't on top of each other," he said. Less competition among plants for light, water and nutrients occurs, he added.

"The other interesting thing is that with single [60-inch] rows, the cover crop can actually get too much light," he said. "It can start to compete with corn for water."

In his evaluation, 2- and 4-inch paired rows yielded 4 bushels per acre better than 60-inch, single-row corn yields. Meanwhile, corn planted in 6-inch and 8-inch paired rows yielded 8 bushels more than corn planted in single 60-inch rows.

"I went with the 6-inch twin rows, because there was no yield difference, and they harvested a little nicer than the 8-inch rows," he said. The 6-inch twin rows are flanked by 54-inch spacings, into which he interseeds cover crops when corn

reaches the V4 to V5 stage. Broadcasting is not a fertilizer option in this strategy.

"You want to fertilize the corn, not the space in between," he said.

During corn planting, he applies liquid pop-up fertilizer. At interseeding, four of the drill's six openers seed cover crops while the openers closest to the corn rows apply liquid 32% nitrogen.

"I'm sidedressing the corn 8 inches away from the row at a time of year when the corn needs it," Breker said. The spacing strategy matches his 60-inch-center harvesting equipment. Two rows are empty on his 12-row, 20-inch combine during harvest.

"The other rows suck in corn like crazy," he said. "There's no ear bounce, because there's so much material going through them. We can go a mile and a half faster than we did when we were on 30-inch rows. We also have all this green cover to drive on, which helps in wet falls. It's just like sod."

Wide-row corn spurs grazing opportunities

Noah Taylor wanted to do something different.

"I wanted to get a leg up on just raising corn and soybeans, something that would give us extra margin" says the Bouton farmer.

That "something" is planting corn in 60-inch rows and grazing cows on an inter-seeded cover crop mix following harvest. When fencing permits, he's grazed cattle on cover crops and corn stover until freeze-up or snowstorms occur. Until then, Taylor's cattle graze the cover crop mix of brassicas, legumes and grasses balanced with corn stover. The rows — double the width of conventional 30-inch spacings — permit more sunlight to penetrate the canopy and spur cover crop growth.

"We have the cows, and we need the

feed," Taylor says. "It makes a really nice cow ration." The manure from grazing also helps boost fertility and nutrient cycling, he adds.

Bovine banquet

Corn planted in 60-inch rows is gaining the most acceptance from livestock producers, says Bob Recker, owner of Cedar Valley Innovation, Waterloo. "When cattle come in, it's like a big bovine banquet," he says. "They love it, feasting on all the different [cover crop] species."

A 2021 Practical Farmers of Iowa trial showed nearly five times as much cover crop biomass for grazing resulted in 60-inch row spacings (2,113 pounds per acre) compared to levels found in 30-inch row spacings (432 pounds per acre.) The 60-inch spacing biomass is similar to levels previous cooperators in PFI trials incurred.

Grazing perked Wendy Johnson's interest when she met Recker at a field day where he spoke about wide-row corn and the resulting "opportunity space." This is the term Recker uses to refer to the area between



WIDE SPACES: Noah Taylor, Bouton, has been raising corn in 60-inch rows in trials and on larger acreages for four years. Perks include grazing potential following harvest GIL GULLICKSON

60-inch rows that can spawn such enter-prises as livestock grazing.

"I have cattle and sheep, so we started working together on trials with this system," says the Charles City farmer. "We picked a nine-way mix consisting of warm-season annuals, legumes and brassicas such as kale that grazing animals love."

Besides grazing cattle, her plans include grazing sheep in-season and cattle after harvest. Under such a strategy, sheep can graze cover crops in-season, as they cannot reach corn ears and trample down corn.

John Maxwell, a partner with Maxwell United in Maxwell, started grazing the farm's cattle on cover crops in 60-inch twin rows in 2023.

"Yields are normally about 20 bushels off of what our neighboring 30-inch corn fields are," he says. However, he adds grazing cows on cover crops and corn stover after harvest helps nix some of that yield sting.

"Plus, we don't have to add any commercial P [phosphorus] and K [potassium] on those fields," he says.

How to farm between wide corn rows

Did you ever wish you could grow two cash crops in one field during the same growing season?

These days, maybe you can.

Bob Recker, Cedar Valley Innovation owner, and Todd Whiting, Origin Technologies president, are testing ways to grow an in-season cash crop between corn rows spaced 60 and 90 inches apart. It's feasible due to the extra sunlight the wider rows allow for the companion crop, they say.

In one 2023 trial, they planted field peas in early May, two days after corn planting within the wide rows. They sprayed corn for weeds before field pea emergence.

"Due to favorable weather, the peas got ahead of the corn," Whiting says, "but both crops grew to maturity very well."

Since they grew the peas in small re-search plots, the duo hand-picked every pod at harvest on Aug. 1. Were it a commercial field, the 50-bushel-per-acre yield priced at the then-\$10-per-acre price could have grossed \$500 per acre.

Pea perks

Field peas have impressive attributes as a companion crop, Whiting says.

They tolerate shading by the corn. "Very few weeds grew in the rows until later in the year, when the leaves started drying up and sunlight started poking through," Whiting says. That's important, since they could not use herbicides on the field peas without damaging the corn.

Since this concept is in its early stages, the duo has concentrated data collection on field peas, not corn and resulting yields. They note 2023 weather that turned hot in August hurt

corn performance. By then, though, the first pea plantings had been harvested.

Potential exists for other companion crops, such as buckwheat and turnips. However, Recker notes this research is first focused on agronomics.

"After we get the agronomy part figured out, we need to examine the economics, such as what peas are worth versus corn," he says. "Then, we will get into the equipment question, such as what works best for planting and harvesting. What we've done so far is to encourage people to open their minds and trigger some thoughts."



PROLIFIC FORAGES: Additional sunlight making its way into the canopy through 60-inch corn rows spurs a mix of cover crops. GIL GULLICKSON

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