



CASE IN POINT

- LOCATION:** JCS Family Farms
Spread over six counties around Iowa City, Iowa
- CHALLENGE:** — Applying water at the appropriate time to deliver nutrients during corn’s rapid growth phase
- DEPLOYMENT:** — 18-acre pond for water supply
— 10 percent irrigated acres
— 7 Valley® Irrigation pivots
— 3 variable frequency drive pumps
— Tiled fields for recycling water
- EFFECT:** — Higher, more predictable yields
— Improved corn quality
— Better soil nutrient availability and utilization

Irrigation Delivers the Right Nutrients at the Right Time

Jim Sladek and his family own and operate JCS Family Farms, an ISO-Certified farm, which is spread over six counties near Iowa City in east central Iowa. They grow white and waxy corn for Quaker Oats and Cargill Starch, both in Cedar Rapids, Iowa. Iowa’s exceptional soil and reliable rainfall have historically helped farmers produce excellent crops. However, Sladek says the amount of rainfall isn’t the issue in his part of the country. Rather, it’s the timing of that rainfall.

Sladek consulted with his independent agronomist John McGillicuddy and his local Valley® dealer, Steve Sutter of Landmark Irrigation, to determine how much water it would take to make a real impact on yield. Together, they found it would take about an inch a week during critical stages of crop development, so JCS became one of the first farms to install any form of irrigation in the region.

“Most years we don’t run out of water here. That’s not usually the problem,” says Sladek. “We just don’t always get it when the crop needs it. Irrigation gives us control over that variable.”

Irrigation’s Effect on Nutrient Uptake

Corn is considered to be a nutrient needy crop. It needs to uptake nutrients such as nitrogen, phosphorous and potassium, during its rapid growth phase – early June in Iowa – and soil moisture must be adequate in the top six or eight inches of soil for the roots to be able to access those nutrients. Irrigation ensures that nutrients are available during that critical time period.

For example, JCS can increase nutrient uptake with irrigation during that rapid growth phase when the plant needs to store large amounts of potassium which it uses later to help maximize grain fill. Sladek says the goal is to have enough nutrients already stored in the plant to fill all pollinated kernels and avoid any tip back. According to Sladek, tip back is when pollinated kernels on the end of the ear abort and don’t fill.





“If there’s not enough water at the right time in June, we see the results in August,” he says. “By making sure we’re keeping soil nutrients available at the right time, we can maintain a healthier plant which lengthens the grain fill period, which in turn pushes yields higher.”

Real Impact on Yields

Getting the right amount of water at the right time was never more evident than the first year JCS started using pivot irrigation.

“In 2012, when we installed our first two pivots on two quarter sections, it just happened to be an extremely dry year,” Sladek says, “and our irrigated land produced 100 bushels or more per acre than our dryland acres. That difference was significant enough for the pivots to pay for themselves in one growing year.”

Those two pivots covered only five percent of JCS acres, but Sladek says he spent a disproportionate amount of time managing those 260 acres, as they held the thriving crops that year. He says it was just plain fun to watch.

“We’d just go out and look at that corn grow. It did incredibly well.”

Sladek doesn’t envision having the same yield disparity between dry and irrigated acres every year, but he does expect his irrigated acres to produce an average of 50 bushels per acre more than his dryland acres on a regular basis.

“That’s based on the nutrients we can deliver at the right time, which helps yield, especially through plant health. It’s not just about the amount of water,” explains Sladek.



Creating a “Closed Loop” Irrigation System

The considerable difference between his dry land crops and irrigated crops in that first year was enough to convince Sladek to find a way to add more pivots to his land. He designed an 18-acre pond, which holds 120 acre-feet of water that can supply five more pivots over an additional 475 acres.

“It was a very frustrating and time consuming process,” Sladek explains. “I learned a lot about working through the required permitting with County Planning and Zoning, local NRCS, Iowa DNR, and the Corps of Engineers. We finished the pond in December 2014, and the pivots were operational for 2015.”

During periods when the pond’s field tile recharge isn’t adequate to meet irrigation needs, JCS can recharge the pond from a nearby creek using a 20-horsepower variable frequency drive (VFD) pump. The pond itself features both a 40 HP and 60 HP VFD pump to supply the five new pivots, the farthest being two miles away.

“It’s extremely efficient,” Sladek says, “because the pump isn’t lifting water out of a well, and Landmark Irrigation designed everything to work together perfectly, from the pumps to the pipelines to the pivot flow.”

Another efficiency that also aids with avoiding nutrient loss is that the water from 90 percent of the irrigated acres on JCS Family Farms drains back into the pond, making it basically a closed loop system.

“Our land is tiled, so we capture both our tile and surface runoff and reuse it,” says Sladek. “It’s a more sustainable way to irrigate, we reduce nutrient and soil runoff, and we minimize the risk of flooding downstream.”

“There’s definite value there,” says Sladek, “and it’s a sustainable way to irrigate. It’s really fun to see how using irrigation in new ways can improve production, even in Iowa.”