



# ***News from Agri-Inject, Inc.***

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## **Just Add Water**

*Kentucky corn producer realizes greater profits in a drought year by embracing irrigation and related technologies.*

**J**oel Armistead likes to push the envelope. After suffering through drought conditions in 2007, the Adairville, Ky., farmer installed his first center pivot, boosted plant populations to an all-time high and provided the best possible fertility and pest protection to his inner circle corn crop. The result: Armistead broke the 300-bushel yield barrier for the first time in Kentucky with a 305.9 bushel-per-acre test sample within his irrigated circle.

And, oh yeah, he won the 2008 National Corn Growers Association (NCGA) Corn Yield Contest in Kentucky.

"I figure we recouped about two-thirds of our costs for the pivot and accompanying injection equipment within the first year, since we experienced a second drought in 2008," says the 47-year-old old life-long farmer. Armistead produces 1,600 acres of corn, wheat and soybeans with his father, Raymond, and son, Zach, who graduates from high school this year.

Early adapters of many innovative agricultural practices, the Armisteads have been no-tilling corn for 15 years and went 100 percent no-till on all crops three years ago. Generally, they rotate corn with double-cropped wheat and beans, but with rising corn prices, they plan to plant more corn after corn this year. In fact, escalated corn prices and the fact their home farm sits on river bottom land impelled them to invest in the center pivot in early 2008. They will add a second pivot in 2009.

Though tobacco was the long-time king in the rolling hills of south-central Kentucky, the high-value crop experienced a decline in acreage in recent years. "Irrigation has traditionally not been a normal course of farming in this part of the country, except for tobacco," says Ken Moore, owner of Tuckasee Irrigation in



*(Left to right) Len Stolz, of Agri-Inject, Inc., Ken Moore, of Tuckasee Irrigation, and Joel Armistead, of Armistead Farms in Adairville, Ky.,*

Russellville, Ky. "But things have changed a lot in the past few years. With higher corn prices, medium to large farmers are really getting on the irrigation bandwagon."

After selling Armistead his T-L center pivot in late 2007, Moore installed it in March 2008. "Putting in a center pivot is like working a jigsaw puzzle," adds Moore. "You have to consider what the water supply is, how far away the

water is, how the field is shaped and how you'll access it. Each field is different – Kentucky fields are not all squared off like they are in Nebraska and Kansas! We use a satellite program and measure the field with laser technology before we even order the equipment.”

### Red River Water Supply

Moore installed Armistead's pivot on a 125-acre field at a horseshoe bend in a branch of the Red River, which the farmer planned to use as his water supply. Planting on 30-inch rows, Armistead seeded several GMO Roundup Ready hybrids, including the DeKalb 63-42 variety which won the corn yield contest. He tried six different plant populations, ranging from 26,000 to 38,000, to measure response.



*The difference between the irrigated corn within the circle of Armistead's center pivot and the outlying nonirrigated corn was apparent in mid-August, when this photo was taken.*

“We decided that once the crop was irrigated, it would not be under stress, so we could push plant populations to strive for higher yields,” explains Armistead. “Of course, higher populations require more fertility, but we were able to handle this through the irrigation system, as well. We bought two injection systems from Tuckasee, one for fertility and one for injecting insecticides and fungicides.”

The Agri-Inject equipment he purchased from Moore, the Fertigator and the Insectigator, were

not the injection systems he originally planned to install. But a late-spring visit from Agri-Inject representative Len Stolz convinced Moore and Armistead to switch systems at the last minute. “The Agri-Inject systems are good, simple pieces of equipment that really work well,” notes Moore. “We like simple machinery that is easily installed and doesn't break down.”

In fact, the injectors were so easy to install that Armistead wired and set up the Insectigator himself, with Stolz confirming his calibration over the phone. He began using it the day he installed it. Next, he installed the Fertigator, with help from an electrician. Engineered for easy maintenance, the systems have accessible fittings, right-angle check valves and easily changed filter assemblies.

Armistead applies mostly liquid nitrogen to his corn crop, through tanks on the planter and on the tractor, for both irrigated and non-irrigated acres. Irrigated acres receive extra nitrogen over dryland acres, because he is able to apply it later in the season through the irrigation system.

He applied a total of 255 lb. of nitrogen per acre on his irrigated field, injecting 24 gallons of 32 percent nitrogen through the Fertigator in three separate treatments. Beginning on July 7, he applied the nitrogen at eight gallons per acre, following with two similar applications and finishing on July 14. “We had borrowed a smaller trailer with a 1,000-gallon tank, so to get the right amount of nitrogen, we had to go over the field multiple times,” Armistead explains. “This year, we have a bigger tank that will put on a heavier dose of nitrogen at one pass. I've also now learned that university specialists are recommending we put the nitrogen down before the corn tassels.”

### Tackling Pest Control

Armistead tackles pest control from several different angles. First, it's built into the seed, with his GMO hybrids. Secondly, he sprays a few ounces of insecticides over the top of the

ground as a postemergence treatment. Thirdly, with his center pivot, he can add pesticides whenever necessary. Last year, he applied a tank mix of Hero insecticide at 4 oz. per acre and Headline fungicide at 6 oz. per acre in early July.

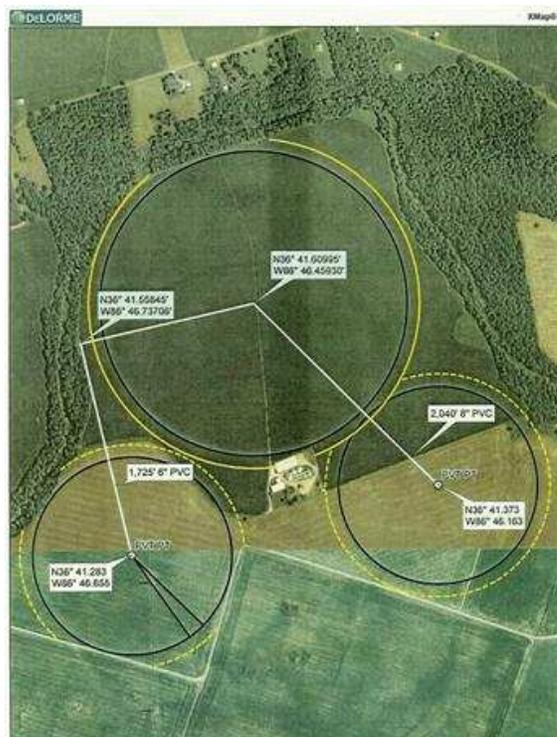
“The injection equipment saved me many trips across the field putting on extra nitrogen and pesticides later in the season,” notes Armistead. “We could never have put down postemergence pesticide treatments as late in the season as we did, when the corn was so tall. Studies have shown a definite yield advantage in putting on late applications. Without irrigation, the only real option is an aerial application, which can cost as much as \$25 per acre for the total treatment.”

Keeping careful records of all rainfall, irrigation levels and input costs, Armistead calculated he put down 7.25 inches of water on his irrigated field. He employed a river screen to keep silt and leaves out of the sprinkler system while he pumped water from the river. In addition, he utilized soil tensiometers to get an idea of available moisture, and watered accordingly. By pulling ears and counting rows, he suspected in mid-July that irrigated yields would be outstanding. In fact, he realized an average of 264 bushels per acre on his irrigated land, compared to only 113 bushels on his unirrigated acreage.

### Second Time Around

In 2009, Armistead will install a second pivot, using the same engine, the same pump, the same injectors mounted at the pump and the same site to draw water from the river. But his second device will be a towable pivot that can be pulled in a straight line across the field. “We’ll be able to cover over 100 acres more ground with this movable pivot,” he adds.

Under the fixed pivot, Armistead plans to conduct a six-variety test strip on half the field and plant all one variety on the other. On his test strip, he will lay out all planting passes ahead of time, start with one variety, then skip



Above: Armistead’s irrigation plan for 2009. The larger circle is his original pivot, installed in 2008. The two smaller circles show how the towable pivot he incorporated into his program this year will coordinate with the first pivot.

five passes to keep planting the same variety. He can then replicate it five more times with the other varieties. “My yield monitor can keep up with this too,” he says.

All things considered, Armistead realized a \$68,041.25 profit from his irrigated field. His profit totaled \$544.33 more per acre than the unirrigated land. This takes into account the annual cost of his 10-year lease on the center pivot plus all production costs. (See sidebar.)

“We used to plant the same field with the same seed and use the same fertility, pesticides and production practices,” adds Armistead. “Now we can use variable rates of nitrogen and pretty much everything else. We’re almost getting to the point where we are farming by the square foot instead of the field.”

*(This article originally appeared in the Aug. 5, 2009 issue of Southeast Farm Press.)*

## Cost and Profit Analysis (Armistead Farms, 2008)

### Costs for irrigated land, 125 acres

INPUTS	TOTAL COST, \$	COST/ACRE, \$	COMMENTS
Seed	6,755.00	54.04	38 bags (No till roundup ready corn)
Herbicide	6,880.00	55.04	
Fertilizer (w/trace elements)	21,986.25	175.89	166 N, 58 P, 52 K, 7Mg, 2.5 sulfur, .4 boron, 2 zinc
32-0-0 nitrogen solution	5,683.75	45.47	**Injected in pivot at 8 gal/acre 3 times 7/7 to 7/14
Headline & Hero	<u>1,140.00</u>	<u>9.12</u>	6oz Headline & 4oz Hero
	<b>42,445.00</b>	<b>330.44</b>	<b>Input cost per acre</b>
Irrigation lease costs	12,250.00	98.00	10 year lease payment
Fuel cost for irrigation	8,400.00	67.20	448 hrs x 5 gph x 3.75 for 7.25" of irrigation
		<b>165.20</b>	<b>Input cost of irrigation per acre</b>

### Profits for irrigated land

Yield 264 bu/acre x \$5/bu = \$1320 gross/acre

\$1320 gross/acre - (\$330.44 + \$165.20) total input costs/acre = \$824.36 gross profit/acre

### Costs for non-irrigated land, 35 acres

INPUTS	TOTAL COST, \$	COST/ACRE, \$	COMMENTS
Seed	1,891.40	54.04	Roundup ready corn seed
Herbicide	1,926.40	55.04	No till
Fertilizer (w/trace elements)		175.89	166 N, 58 P, 52 K, 7Mg, 2.5 sulfur, .4 boron, 2 zinc
		<b>284.97</b>	<b>Input cost per acre</b>

### Profit for non-irrigated land

Yield 113 bu/acre x \$5/bu = \$565 gross/acre

\$565 gross/acre - 284.97 input cost/acre = \$280.03 gross profit/acre

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### Net income increase for irrigated land

\$824.36 gross profit/irrigated acre - \$280.03 gross profit/non-irrigated acre =

**\$544.33 net income increase/acre for irrigated land.**

125 acres under irrigation x \$544.33 net income increase/acre =

**\$68,041.25 net 2008 income increase for irrigated land**

*\*\*Extra 85 N on irrigated not on dry land*