

Farmer Builds High-Tech Tools, Saves Big Money

Iowa farmer Jim Poyzer uses his 30+ years of computer programming experience to build low-cost technology equipment for his farm at a fraction of what it would cost new.

For example, he built a seed meter test stand that evolved into a sophisticated planter monitor. His soil sampling is done using a phone app he designed to show him where to take samples on a 2 1/2-acre grid. And lately he's been working on an ultra-accurate RTK guidance system that will cost only about \$700 in parts compared to more than \$15,000 for a new one. He'll use it to plant over fertilizer that has been strip-tilled in the fall.

Says Poyzer, "Poverty is the mother of invention. If you aren't a big farmer, you've got to use tools that don't require spending big bucks. I'm building apps, monitors, GPS equipment, and more. It all works with the

smaller equipment that I can afford."

The key to Poyzer's success is open source software and his knowledge of the internet. He builds hardware that uses sensors, actuators and other electronic equipment to monitor and operate on data such as seed population, soil types, and yields.

His farming odyssey began when he turned 60 and bought a 180-acre farm, a small tractor, tillage equipment, and a planter. "I was reliving the joys of my youth on an Iowa farm, but technology was 40 years ahead of me," Poyzer says. He soon realized he could produce his own electronic equipment.

He used a microprocessor and about \$300 in parts to build a monitor for a 40-year-old Deere 7000 planter. It calculated seed drop on all 8 rows simultaneously. He refined the system into a variable-rate planting controller that gives him the ability to lower seed

population in poorer soils and save on seed costs. His solar-powered soil temperature and moisture probe sends data to his phone. He thinks that device might be useful to track growing degree days on his farm. Now he's building a liquid fertilizer flow meter with data sent via Bluetooth to his planter monitor.

"This is only my 9th year of farming and I'm still looking at it through the eyes of a computer programmer, but it sure is fun." His website carries a thorough description of how he built each of his projects along with a FAQ section on how they work. He's happy to share his work at no charge.

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Jim Poyzer's planter performance monitor supplies data to a tablet in his tractor and also to his cell phone.



This DuoRate controller allows Poyzer to variable-rate his seed population.

Illinois Brothers Specialize In Bin Bolts And Parts

Mike Davis says he and his brother Bob probably sell farmers more bolts, nuts and washers for grain bins than anyone in the country. "We started the business nearly 30 years ago when we expanded our own bin site. We bought good used bins, built a set of jacks to take them apart, and before we knew it we were in the bin business. We needed bolts and parts to put them back together, so we found our own supplier," says Mike. Now the inventory for Binbolts, Inc. takes up 9,600 sq. ft. inside their Illinois farm machine shed.

"July and August are the busiest times because that's when most bins are erected, but we actually have good sales in other months, too," says Mike. "We have customers across

the U.S. and some in Canada, who have their orders shipped to someone in the U.S. near the border."

Other items they supply include floors, flashing, seals, caulk, transitions, unloading equipment, fans, augers, wells, slides and just about anything else needed to rebuild a used bin.

"Most of our customers are buying bins that are 20 to 40-years old, so they need to be updated," says Mike. "We maintain a good inventory and can easily get new parts because we're dealers for 2 different bin companies."

For several years the brothers dismantled and re-built bins themselves, but Mike says,

"That hard work took a physical toll on us after more than 600 projects. Now we sell parts to people we've known and done business with for more than 20 years, and to some who are just putting a bin up for the first time.

"There aren't many questions we haven't been asked, or anything that we can't supply," says Mike. "Tell us what size bin it is, who made it, if possible, the equipment it has, and we can tell you exactly what you'll need and send it your way."

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The inventory for Binbolts, Inc., takes up 9,600 sq. ft. inside Mike and Bob Davis's Illinois machine shed.

Dairyman Designed New Grinder-Blower

A Pennsylvania dairy farmer and part-time equipment dealer combined a used stationary hammermill with a 2-stage forage blower to produce a versatile new machine that grinds high moisture corn and ear corn for his dairy operation. Ron Bender, territory manager for Art's Way, the company that's now manufacturing a production model machine, says it will grind corn and blow it into bags or a silo for storage.

"The farmer put a lot of thought and work into designing, building and testing the machine, and it really shows," says Bender. "He built it one winter using an Art's Way 26-in. hammermill and a 2-stage, 42-in. Gehl blower fan as the main components. He tested it for 2 seasons on high moisture corn and dry

ear corn with different drive options, different horsepower tractors, and different screens. It produces consistently-sized ground materials because fan air flow can be regulated to draw material through the screen. Consistent size feed is very important for dairy cattle."

Bender says the machine was built and tested so well that Art's Way made only minor changes and added decals and a few shields to meet OSHA requirements on their production model. It has 96 reversible knives in the grinder and can use 13 different screens from 1/8 in. to 2 in. An 80 hp. tractor with a 1000 pto can grind about one ton a minute with the machine.

"The grinder-blower is ideal for dairies and feedlots because it can grind ear corn and



New grinder-blower can grind ear corn and high-moisture shelled corn into consistent material sizes for better digestibility, making it ideal for dairies and feedlots.

high-moisture shelled corn into consistent material sizes for better digestibility," Bender says.

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Way Mfg., P.O. Box 288, 5556 Highway 9, Armstrong, Iowa 50514 (ph 712 864-3154; www.artsway-ag.com).

Shield Deflects Flying Beans

"I used to find soybeans laying on the feederhouse of my combine during harvest so I knew there were beans going over the back of the head onto the ground," says Waseca, Minn. grain farmer Dave Born. "I solved the problem by building a simple metal deflector that bounces flying beans back into the header."

Born says before he built the deflector he was probably losing a bushel of beans an acre or more. "It doesn't seem like a lot until a person sees what's on the feederhouse and then realizes there's 3 or 4 times that many already on the ground from each side of the header. With beans at \$9 a bushel or more, that's a lot of crop I'm not getting paid for." Born's solid deflector is made from 1/8-

in. thick sheet metal. Three sections of 2-ft. by 8-ft. pieces are bolted to the back of the header, supported by braces bolted to the top of the deflector and the header frame. Each piece has a 4-in. lip at a 30-degree angle on top to deflect flying beans back into the auger. The top 8-in. of the center piece is partially cut away for better visibility, so Born welded a secondary lip about 12-in. above the base on that section. He also installed 3 lights on top of the deflector for better night visibility.

"I know the setup works real well because there aren't any beans on the feederhouse, even in dry conditions," Born says. "I can't quite see the whole auger from the cab, but I can see all of the reel and the whole sickle bar. I'm sure the beans I saved in the first



Metal deflector has a 4-in. lip at a 30-degree angle on top to deflect flying beans back into combine auger.

day alone more than paid for my time and materials."

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