

# Organic Seed Corn

## *Closing the Organic Circle*

by Tim King

The National Organic Program's qualified requirement that certified organic farmers must use certified organic seeds can be viewed as a problem — or it can be viewed by farmers and seed companies who are truly committed to organics as an opportunity to take one more step toward a synthetic- and chemical-free agricultural system.

The initial trend by organic farmers away from treated seed to untreated seed is a step toward a truly organic agriculture, but a significant bit of ground must still be covered before the goal is reached, according to Maury Johnson of NC+ Organics in Lincoln, Nebraska.

"Farmers buying conventional untreated seed are supporting a system that relies on herbicides and pesticides in their seed production, makes extensive use of genetic engineering when developing new products, and has no real focus on the needs of organic farmers," said Johnson, whose company is a spin-off from the conventional seed-producing, farmer-owned cooperative called NC+. He explained, "Conventional untreated seed and organic seed are similar only in that both are untreated. Farmers buying organic seed help to support other organic farmers who happen to be seed growers, as well as organic companies. The latter can in turn invest in developmental and breeding work for the future improvement of products for organic farmers."

Johnson said that the requirement for organic farmers to use organic seed wherever possible puts farmers in a similar spot to the organic food and fiber buying public when it comes to cost. For years organic farmers have requested, and received, a premium price for their organically produced crops and products. The premium has been justified because value has been added, in the form of food and environmental safety, and because management costs tend to be higher for organ-



*Hybrid 3448, grown by NC+ Organics.*

ics. Now farmers have to face the same justification when purchasing certified organic seed.

"Those who ask why organic seed is more expensive forget that in the conventional system one of the primary goals is to reduce expenses by any means necessary," noted Johnson, whose company offers 25 certified organic hybrids ranging from 75- to 115-day maturities. "Pesticides and herbicides are used in the

conventional system and do lower some production costs. That helps make the price of conventional seed cheaper." Organic seed, of course, absorbs the cost of environmental protection, whereas conventional seed defers those costs to

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A VOICE FOR ECO-AGRICULTURE

August 2004 • Vol. 34, No. 8



*The Ehrhardts — Tom, Mac and George — of Albert Lea Seed House.*

health care institutions and government environmental protection programs.

In addition, the premium organic corn producers pay for seed is more than recouped with the organic premium they receive when they sell their corn, according to Maynard Kropf of Prairie Hybrids Seeds in Deer Grove, Illinois.

“Our organic hybrids are more expensive than our conventional hybrids,” said Kropf, whose company will have seven certified organic hybrids available in 2005. Yet he added, “If the organic farmer has good soil, and if they do a good job, they can harvest more than 170 bushels to the acre. Most of the guys we’re working with are able to grow that much corn and sell it for at least \$4.35 a bushel.”

Prairie Hybrid Seeds sells conventional hybrids for around \$70 per bag. In 2004 the price on organic seed corn, which ranges in maturity from 112 to 92 days, was \$94. Kropf expects an increase of \$2 to \$4 per bag next season.

The premium received for organic seed corn influenced the decision of NC+ and Prairie Hybrid to begin producing and marketing it. They expected a profit, and both got into the business just in advance of the approval of the National Organic Program. If NC+ Organic’s sales growth of 30 percent per year is any indication, both companies have done well with their ventures.

Although they are pleased with these successes, the decision by these businesses to go into organic seed production was

primarily inspired by their agricultural values.

“One of the reasons for getting into organic seed production is that we decided not to get into genetically modified seed corn,” explained Kropf. “We had a number of reasons for that, but initially the contracts demanded a very high increase in sales every year, somewhere around 40 percent annually. We didn’t like the idea of being tied to that. The licensing was also high, although that’s not as true now. We had also heard there could be health issues with GMOs. At the time we had been getting calls for untreated seed, and then farmers started asking for organically grown, so we thought organic seed would fill the sales gap left by our decision not to go with GMOs.”

Maury Johnson’s experience at NC+ was similar. When a couple of organic farmers who were also members of the NC+ closed cooperative approached the company about the possibility of growing organic seed, Johnson volunteered to do a feasibility study. Based on his research, he suggested going ahead. As a result, in 1999 he found himself heading up the company’s new division — NC+ Organics.

“At the time I felt that one of the biggest hurdles to growing organic seed

was figuring out production,” recalled Johnson, who has been with NC+ since 1984. “My experience at NC+ has been that we are pretty good over time at producing, although we’re not always as good at getting it sold. Initially I thought that most of our organic seed production would be corn and that we’d do it here in Nebraska.”

Johnson also foresaw the growth that organic agriculture — and NC+ Organics — has experienced in the last five years. Nevertheless, as with the management at Prairie Hybrid Seeds, the move to organic wasn’t a simple business decision.

“I felt some empathy for what I understood about organic farming,” said Johnson, who is now on a mission to promote the value of organic seeds. “The organic approach was very heavily in favor of the family farm, involved little or no use of petrochemicals, and minimized inputs. From a religious point of view I feel like we have an obligation to be good stewards of God’s creation, and I felt like organic farming was shooting in that direction. The other thing about this is that I know a number of farmers over the age of 40 who, for one reason or another, either can’t or don’t go out and invest big money for land or equipment and are caught in a vicious squeeze. They are trying to figure out how to make farming work because they really enjoy it, but if you’re a modest sized conventional farmer it’s really tough. It seemed to me that organic farming offered an opportunity for those folks.”

Putting your principles out into the field of day-to-day reality is quite a challenge, however. Even though Johnson was able to rely on many years of experience, as well as the wisdom of an experienced seed-corn production company, he made plenty of mistakes.

“There were so many things I didn’t know at that time,” he said. “I’ll never forget when we were doing six hybrids in 1999, here in Nebraska, and the producer called me in October after the harvest. He was telling me about the yield, and I was just crushed. I couldn’t believe it was such a small amount. We had insect damage, and there were a number of other factors that had not worked at all well.”

One of these factors was planting late in an area dominated by conventional corn. The result, in Johnson’s estimation, is that every ear worm in the county came

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August 2004 • Vol. 34, No. 8

to snack on his organic corn. He described the insect pressure as “tremendous.”

“I also made a couple of mistakes getting pollination arranged correctly,” he recalled. “The average field size was about 10 acres. In those small fields it is difficult to get enough pollen flowing for good pollination. Sometimes you can get by with it, but it really helps when you can plant a somewhat larger field, even up to 25 or 30 acres. But at the time I think our original goal was probably only 2,000 bushels, and field size was affected by that.”

One of the other things Johnson discovered is that the market that had worked for NC+ Organics’ parent company wasn’t the right market for the new venture. NC+ focused its product development on the southern corn belt and longer-maturity hybrids. But, as Maury discovered, half of the certified organic corn acreage is in the northern end of the corn belt (a breakdown of organic acreage is available online at [www.ers.usda.gov/data/organic](http://www.ers.usda.gov/data/organic)).

“At least 50 percent of the corn acres are in Minnesota, Wisconsin and Iowa, so 50 percent of the maturity you need to service that market is under 100 days. We weren’t growing anything like that. That was an eye opener,” he says. “We still have some longer-season corn, but our goal is to have 50 percent of our products with a season of under 100 days. Of the longer-season corn we now have, two-thirds of it is under 110 days.”

One of NC+ Organics’ valued customers is Albert Lea Seed House, owned by the Ehrhardt family, located just north of the Iowa border in Albert Lea, Minnesota. Mac Ehrhardt is proud of his selection of NC+ Organics hybrids. He sees NC+ as pioneers in the organic seed production business and leaders in the industry today, although that didn’t stop Ehrhardt from developing his own organic hybrid, one that would be particularly suited to his Minnesota and northern Iowa customers. Working with Gaylord, Minnesota, farmer and agricultural consultant Doug Gunnink, Ehrhardt set out to develop the Viking line of organic seed corn.

The first time Doug Gunnink raised organic hybrid field corn, he harvested seven bushels per acre of seed. Gunnink noted that conventional seed growers har-



*Seed producer Bob Mantey checks growth to determine if it is time to plant the pollen parent seed corn.*

vest about 30 to 35 bushels per acre of hybrid seed corn.

“I was pretty embarrassed when I took it down to Mac at Albert Lea Seed House and told him it was all I’d grown,” said Gunnink.

Ehrhardt, however, knew it wouldn’t be easy to grow certified organic hybrid seed corn, so he wasn’t surprised by the first harvest.

“Most of the people in the seed-corn production business don’t know anything about organic agriculture, and most organic farmers don’t know anything about seed corn production,” explained Ehrhardt, whose seed company carries 10 certified corn hybrids. “You have to combine two fairly complex sets of knowledge into one production system. Doug’s a good organic farmer, and now he’s learned a lot about seed corn production.”

To get started, Ehrhardt worked with Gunnink to choose inbred parents to cross and create a hybrid that would do well in an organic system. One of the major challenges is that there are almost no seeds of inbreds available that have not received fungicide treatment. The organic market

is still so small, the companies simply aren’t very interested, Ehrhardt said.

The second challenge was to find inbreds that would work in an organic system.

“In general, you want a vigorous, taller hybrid to give you some weed shading, and you want a hybrid that’s adapted to a wide variety of soil types,” Ehrhardt said. “You also want a hybrid with pretty good ear flex, because most organic farmers are not planting at 34,000 plants per acre. They tend to plant at medium, and sometimes lower, populations, so they need an ear with the ability to grow larger when the fertility and moisture are available. At lower populations you can make up yield by having a larger ear. Many modern hybrids tend to have fixed ears, so you’ve got to plant them thick. Finally, you want a high-test hybrid because a lot of organic farmers want milling-quality grain.”

Ehrhardt and Gunnink knew they couldn’t wrap up all those characteristics into one hybrid, so they made compromises. Then Gunnink went to work.

He had grown seed corn for open-pollinated varieties before. In fact, an open-pollinated variety Doug developed, called E-95, was available as certified organic seed from Albert Lea Seed House in 2004. Having grown E-95 for seed production, Doug figured he was ready to grow

inbreds for hybrid seed production. He was wrong.

“The inbreds are the parent plants you cross to make the hybrid,” he explained. “What they do with the inbreds is pollinate the plant back to itself for several generations. You end up with this runty little plant that breeders would say has “inbred suppression.” It doesn’t get much more than 4 or 5 feet tall, so it doesn’t canopy and shade out the weeds. It also needs extra nutrition. It’s a little like a calf that needs special attention.”

Although he used every organic weed control trick in his book Gunnink ended up with aggressive late-season weeds and undernourished plants. The result: His embarrassing harvest.

The next year he decided to add a couple chapters to his organic book of tricks.

“The first year I was afraid of using our flame weeder because there were male and female plants out there, and I was afraid I’d set one or the other back a little bit and disrupt pollination,” he recalled. “You need them to tassel and silk at the same time. After growing the inbreds for a while, however, we decided to let the plants get a little bigger and then hit them harder with the flame weeder. I do a lot of my flaming now around the first of July, when the plants are five and six leaves up. I can barely get through the corn when I’m hitting it hard. The corn stalk is at

least as big as your thumb, and then we’ve got these little grass and weed plants out there that still have these small stems. The flame going across the big corn stalk quickly can’t heat up the cells — it may scorch the leaves a bit — but on those little weeds it will rupture the cells.”

Gunnink flames two days in a row and then buries the weeds with a final cultivation pass. They are not heard from again after that.

To provide for the inbreds’ extra fertility needs, he turned to foliar feeding.

“I now use a starter fertilizer, plus I foliar feed the corn with some extra nutrients and Neem oil, for ear worm, five times,” Gunnink said.

The foliar nutrients include fish emulsion, kelp and any necessary micronutrients. When the corn is too big to get through with a tractor-pulled spray rig, a certified organic airplane is used.

With the added nutrients, improved weed control, and three years of experience, Gunnink’s hybrids are now near the yields achieved by conventional seed-corn growers. The varieties he is raising are performing well in organic production systems as well.

“A couple of guys have gotten 180 bushels per acre,” he noted. “Not everybody can do that, but it gives you an idea of the potential.”

Like Ehrhardt and Gunnink, NC+ Organics and Prairie Hybrid Seeds carefully study the inbreds available to conventional seed-corn producers. Maury Johnson at NC+ Organics said that his company plans to intensify its search for inbreds with traits that perform well in organic systems. Maynard Kropf, who calls that bundle of traits “toughness combined with ear flex,” said that Prairie Hybrid Seeds is always on the lookout for it.

“Every year we have the opportunity to look at just about every cross imaginable,” Kropf said. “Most of them will be trialed by parent seed companies for about two to three years, and depending on how long we’ve watched them at the parent seed company, we’ll try them here for a year or two before releasing them. In organics we look for a plant that’s able to take stress a little better and is a little tougher. It should

compete with weeds better and emerge from cool soil more readily as well a perform well in dry soil.”

Kropf describes at least one of his hybrids as a work horse hybrid.

“A racehorse-type hybrid continues to yield more when all conditions, such as weather and soil, are right, whereas a workhorse plant kind of plateaus, but yield doesn’t drop so much under adverse conditions,” he said.

There are, however, almost no certified organic “workhorse” inbreds available to seed corn producers. As Mac Ehrhardt of Albert Lea Seed House pointed out, there are actually very few untreated inbred seed sources.

“The single most important limiting factor to growing organic hybrids is that the inbred seed has to be untreated. This is a real problem, because the seed-corn industry is made up of people who really have no interest in organic farming. When you call them up and ask if they have any untreated LH176, they go “errr” because it’s just a big pain for them. They’ve never dealt with it. It’s a niche market. Orders like this tend to be small, and the single largest supplier of field corn seed genetics is Holden, which is owned by Monsanto. I don’t mean to gripe because I like the people there, but it’s just not a priority for them.”

Nevertheless, if the organic circle is going to be fully completed, farmers will need to accept the invitation of organic-seed corn companies. The seed-corn production industry also needs to begin the long and hard task of heeding its own advice. Although broader acceptance of organic seeds will have to come first, inbreds must eventually be grown organically. Then the opportunity presented by the NOP will have a chance to lead us into a truly organic agriculture.

*A list of organic seed corn producers is available from the National Sustainable Agriculture Information Service, phone 1-800-346-9140, website <[www.attra.org](http://www.attra.org)>.*

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