

Farmer Profiles: Two Organic Grain Farm Case Studies

By Susan Tallman, CCA,
 NCAT Agronomist
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Contents

Randy and Lisa
 Hinebauch 1
 Duane and
 Chantra Boehm 3

Video tours of the farms profiled in this publication are available online. Watch them at:
www.youtube.com/watch?v=ZsrwvmzanRI (Hinebauch Farm Tour)
www.youtube.com/watch?v=ZotQ3xdIHURU (Boehm Farm Tour)

Randy and Lisa Hinebauch Chinook, Montana

This case study is based on a farm tour sponsored by the Montana Organic Association on June 13, 2009. A video of this farm tour is available at www.youtube.com/watch?v=ZsrwvmzanRI.

Randy and Lisa Hinebauch farm 10,000 acres of organic grain near Chinook, Montana. Average annual precipitation at this location is 13.2 inches.

The Hinebauchs started farming organically in 1987 and have gradually added to their acreage since. Some land they own, and some they lease. Two-thirds of their farm was in sod before they started breaking it for farming. Their farm is split into two main areas, with fields located both south and north of U.S. Highway 2. The south fields are better than the north fields, with deeper topsoil and fewer rocks.

Rotation

Randy's typical rotation is spring wheat, fallow, winter wheat, and spring peas for green manure. He alternates between winter and spring crops to help with weed control. The additional fallow time before spring-wheat seeding gives him the opportunity for one or two additional tillage passes.

He plants HiLine spring wheat because it tends to canopy quickly. This variety is susceptible to the wheat stem sawfly; however, the Hinebauchs have yet to have sawfly problems. Randy buys seed from a local supplier in Havre, Montana. He seeds his spring wheat at 100 pounds per acre on 7.5-inch spacings. In 2009, the planting date was anywhere from April 1 to May 22. The



Field of organic spring wheat, Hinebauch Farm.

Photo: Susan Tallman, NCAT

average yield of his spring wheat is 45 bushels per acre, with 15% protein and 59 pounds per bushel test weight.

For winter wheat, he plants the Morgan variety. He usually seeds his winter wheat at 90 pounds per acre on 7.5-inch spacings. He gets 60 bushels per acre in his south fields and has had winter wheat with protein as high as 16%. He sometimes flexes his winter wheat in the rotation if he is getting noticeable wind erosion in the late summer. In these conditions, he feels that it's better to plant the winter wheat and hold the soil rather than to follow his rotation strictly. The 2009 crop of winter wheat looked thin because of a lack of moisture in May.

Green Manure

Randy uses Sirius spring peas as his green manure crop. He has tried lentils, alfalfa, and chickpeas for green manures, but he finds the best success with peas because they are easier to terminate. He found clover difficult to terminate and had problems with winterkill in alfalfa.

In 2009, he seeded some of his peas around April 8 at several different seeding rates. One field was

seeded at 95 pounds per acre on 7.5-inch spacings. In another field, he experimented with seeding rates of 120 pounds per acre and 180 pounds per acre but didn't see a difference in results between the two. He did have some soil crusting, so the stand didn't come in as thick as he would have liked. Also, he estimated that the 2009 peas wouldn't produce a lot of nitrogen because of spring frosts and cooler-than-usual temperatures. He thought the nitrogen nodules on the pea roots were not as plentiful as they should have been.

Randy planned to terminate the peas by June 20. According to the guidelines set by the USDA Risk Management Agency for his crop-insurance policy, he had to plow peas in by then for the field to qualify as summer fallow. The main reason for the early plow-down guideline is to save moisture. Randy finds that if he waits until July to plow the peas in, they will have used too much soil moisture. In a normal year, he plows down the peas at first blossom. To conserve soil moisture, after plow-down he seals the ground up with a cultivator and then doesn't till again until the fall. Likewise, he finds that when he harvests the peas at maturity for grain, they take too much moisture from the soil. Every time he has done this, he has paid for it the next year with decreased wheat yield.

Moisture

In this area, subsoil moisture is of critical importance. Checking subsoil moisture with a Brown probe or a shovel is an essential part of soil-moisture management on the Hinebauchs' farm. On June 13, 2009, for example, the probe went down to about 28 inches on the south fields, which means the topsoil was dry down to 28 inches. At the same time, the winter-wheat

field on the north side was visibly drier than the south fields. One turn with a hand shovel there revealed powdery soil with very little water.

Randy doesn't like to seed winter wheat after his green-manure crop of spring peas because the peas take up too much moisture to allow wheat growth in the fall. So in a normal rotation, he grows the peas as green manure only before the spring wheat.

Weed Management

Just as on any farm, weeds are always an issue. Randy's most troublesome weeds are wild oats, tansy mustard, and cheatgrass. There are no major Canada thistle or field bindweed patches. Randy's fields look relatively clean and do not have significantly greater weed pressure than a conventional grain farm.

Randy tells the story of one field where he had a large infestation of lambsquarter. It looked really bad, but they were able to harvest the field before the weeds went to seed. They sent a lot of green weeds through the combine, but the field still yielded 53 bushels per acre. This story illustrates that farmers have to be able to tolerate some weeds in organic production—the presence of weeds isn't always harmful, as long as they are controlled prior to setting seed.

Haying is an effective way to control wild oats. The first year that Randy grew an organic crop, he planted spring wheat. The field had a bad wild-oat problem. So he hayed it when the wild oats were in the boot stage and knocked them back significantly. In another field, he had 40 acres in alfalfa for 10 years. Because of the repeated haying, there are no wild oats in that field to this day.

Randy likes using spring-seeded crops because they give him time for extra tillage before seeding. This extra tillage acts as a control on cheatgrass and wild oats. He will plant early and forgo the extra tillage if there are no wild oats in the field. On the other hand, he never plants winter wheat if his ground is weedy because then he wouldn't have the opportunity to do spring tillage for weed control.

In one field of spring peas, he managed to make an extra tillage pass at the edge of the field before seeding. In the photo at left, you can see the difference this made in weed control. The tilled area has no tansy mustard, while the untilled

Spring peas with an extra tillage pass on the edge. Photo: Susan Tallman, NCAT





Toolbar with coilpackers. Photo: Susan Tallman, NCAT

portion has a noticeable amount. While tansy mustard and lambsquarter are common weeds on Randy's farm, they don't really concern him because they can be controlled well with tillage.

Randy doesn't try to keep his fallow fields pristine at all times, but he does till when a significant flush of weeds comes on. However, there is one primary rule he follows: never let weeds go to seed.

Another technique he uses for weed control is to design his fields as large blocks instead of narrow strips. He gets a lot of cheatgrass on the edges of fields where one crop meets another. Block farming helps control this by minimizing the amount of edge.

Tillage

In addition to using blocks, Randy works his tillage in a different direction each time, at various angles to the edges.

Randy has two 380-horsepower Caterpillars as his primary tillage tractors. He uses a 50-foot chisel plow with harrows as his main tillage tool. Randy also uses an offset disc for deep tillage. He works his fallow ground five times. He uses the shovels and harrows on the first two passes, then adds the rod weeder attachment for the next three. He also uses coilpackers ganged to the main toolbar one time before seeding each year. He finds that more than one use of the coilpacker makes the soil structure too fine.

With both tractors running, he can work 60 acres per hour. For seeding, he uses an air drill and can seed 320 acres each day. At harvest, he runs three combines with their rotary headers as high as possible.

Although some say you can harrow wheat up to five days after seeding, Randy never does. He feels that the harrow takes out too many wheat

seedlings, and it's better to utilize fallow and pre-plant tillage than to do any in-crop tillage.

Fertility

Randy uses AgriGro Altra to inoculate his wheat seed as a starter fertilizer. He uses his wheat protein levels as a gauge of fertility. When his protein levels fall, he knows it's time to add a green manure crop in the rotation.

Best Practices: Soil Testing

Regular soil testing should be a part of an organic farmer's nutrient-management program to help identify soil-fertility problems and track soil organic matter trends over time. For more information, see the ATTRA publication *Nutrient Management in Organic Small Grains*.

Duane and Chantra Boehm Richardton, North Dakota

This case study is based on a farm visit in July 2009. A video tour of this farm is available at www.youtube.com/watch?v=ZotQ3xdiHRU.

Also, listen to Duane on the ATTRA Organic Small Grains Webinar. www.attra.ncat.org/video/#small_grains

Duane and Chantra Boehm farm and ranch about 4,000 acres near Richardton, North Dakota, where the annual precipitation is 14 to 15 inches. They are excellent business managers who have crafted their organic farm to meet their goal of improving profits.

Duane says, "I think about my income statement, not my yield. How much is in my pocket at the end of the day? High yields don't necessarily translate to better returns."

The Boehms raise certified organic cash crops such as wheat, rye, oats, buckwheat, and milo on about 1,000 acres. The other 3,000 acres are devoted to hay and pasture for their herd of 200 to 300 natural beef cattle. The cattle are not certified organic.

Duane was raised in the area and started farming conventionally in 1972 with 320 purchased acres and several hundred rented acres. In the early 1980s, money was tight. Interest rates were very high: about 18% for chattel and 14% for land. The Boehms operated on borrowed money and were close to broke. Land values went up, so

the bank said they could borrow more, but that didn't help. They knew they weren't profitable and were eager to make a change.

Duane had to get a job in town while working the farm at the same time. By then they had two young children and were looking for anything to help cut costs. They looked into no-till, organic, and other options. When he heard about the price premiums for organic grains, Duane became interested. At that time, organic wheat was selling for \$4 per bushel, and conventional wheat was in the \$3-per-bushel range. The Boehms were also concerned about the connection between human health and food quality and didn't want the chemical exposure associated with conventional farming. They also knew that minimizing inputs would help their bottom line.

They started their transition to organic production in 1986, converting all of their owned crop and pasture acres at the same time. After they realized that organic production was more profitable, they made the transition on their rented crop land. There were a couple of years between the owned- and rented-land transitions that gave them time to learn and to convince their landlords that it would work.

For the past 20 years, since becoming certified organic, they have always had some parcel of land in transition. As they purchase more land, they transition it to organic.

There are extra challenges with this system of ongoing transition, such as maintaining adequate records to prove that the conventional and organic production are sufficiently separate. Storage is a concern as well because separate storage is needed for organic and conventional crops. The Boehms meet these challenges by keeping records and having adequate storage bins for both organic and conventional crops.

By switching to organic production, the Boehms have moved their farm business from low profitability to high profitability. Organic production has decreased their input costs while increasing the price they get for a bushel of grain. Organic farming has allowed them to stay on their farm, make a living, and purchase more land.

The Boehms track their profitability using a farm business-management tool from North Dakota State University. This tool compares operating budgets of real organic and conventional farms and ranks them according to their profitability.

When the Boehms first started using this comparison tool, they were in the low-profit range. They now rank in the high-profit range.

Farmers in North Dakota can find this tool at North Dakota Farm Business Management. www.ndfarmmanagement.com

Another tool that Duane uses to gauge profitability is the University of Minnesota 2008 Organic Farm Performance Report. www.fnbin.umn.edu

Fifteen years ago, the Boehms owned only 20% of their land. Now they own two-thirds of their 4,000 acres and rent the rest. They own most of the cropland, which is certified organic. They also own pastures and hay fields that are managed organically but not certified. Most of their rented land is in pasture that is also managed organically but not certified. While Duane believes that organic management is best for the pastures, and his bottom line benefits from not using additional inputs, he chooses not to pay the certification fees for the pasture because he is not raising certified organic beef. He finds there is not enough profit margin for organic beef compared to conventional beef to warrant the extra time and effort for certification.

Business Operation

The Boehms don't try to maximize production; they try to maximize profit. They have no employees, which makes a significant difference in profits. Duane and Chantra do most of the work themselves and are both in their early sixties.

They do hire some custom hay cutting and a custom hauler to bring hay from the field into the farmyard in the fall. They also hire trucks to move their cows to pastures about 25 miles away from the main farmstead.

Duane and Chantra raise all their own chickens, eggs, and beef, and live in a modest house. They do not take out an operating loan every year, and they use older equipment. Their tractors are not the newest or the shiniest, but they get the job done. As Duane says, "You don't know someone's bottom line just by looking at their place."

After 38 years of farming, they recently purchased their first new tractor, a 110-horsepower New Holland for baling hay and feeding livestock in the winter. Their main tractor for tillage is a 1981

280-horsepower Versatile, and their biggest operating expense is diesel fuel.

Half of the Boehms' farm income comes from their crops and half from their livestock operation. One of their business strategies is to reduce their risk by spreading it out. They figure that not every market will go bad at the same time.

When Duane talks of good management practices, he mentions several specific things, including good record keeping, clear goals, planning, pre-paying loans, and evaluating capital purchases. Before the Boehms make any capital purchase, they ask, "Do we need it?" and "Will it improve the bottom line?" If the answer to both questions is "yes," they make the purchase.

They do participate in government programs and receive about 5% of their income through them. The EQIP program has helped them develop pipelines and stock-watering systems for their livestock operation. They insure their crops through the federal crop-insurance program. They have a 10-year history of yields, so they have data to back up any claims. They do pay 5% more for crop-insurance premiums, just as all organic farmers do. However, if they file a claim, they are reimbursed at the conventional market price.

The Boehms are starting to think of retirement and would like to lease their land and live off the income. They want to keep the land organic, but the nearest other organic farmer is 40 miles away. Their close neighbors aren't interested in organic certification, and their crop operation is smaller than their neighbors'. Duane admits that organic production requires more management time for tillage, crop scouting, and marketing.

When asked why his neighbors aren't interested in organic farming, Duane says, "Until we go around showing our balance sheet, no one will notice. People judge your success in farming on the newness of the house and the machinery."

Rotation

When Duane talks of his rotation, he says that flexibility is the key. He couldn't really list a specific rotation because it changes with fertility and weed-management needs. His cash crops are spring wheat, rye, oats, buckwheat, and white proso millet, with alfalfa and sweet clover as green manures.



*Field of organic buckwheat, Boehm Farm.
Photo: Susan Tallman,
NCAT*

Diversity is a key component of their rotation. Duane tries to alternate between grass and broadleaf crops as well as between spring-seeded and fall-seeded crops. He chooses taller varieties that have quick, early growth to compete with weeds. He also prefers to plant crops with multiple uses. For example, oats can either be hayed or harvested for grain. Having this flexibility gives him more options should there be unusual weather or pest problems.

Duane grows the Jerry variety of oats, usually as a hay crop. In 2009, however, he was growing oats for seed. Likewise, the Boehms grow their own wheat, rye, buckwheat, and millet seed.

Duane does have a small patch (about 30 square feet) of Canada thistle in his oats and will use alfalfa to bring it under control. He underseeds his oats with alfalfa. He estimates his oat crop will yield 40 bushels per acre, and after the oats are harvested, the alfalfa establishes itself as a hay crop. The alfalfa stays in for three to five years, with one cutting per year that yields one ton per acre. After several years of alfalfa, the Canada thistle patch will hardly be noticeable.

Duane is one of the few organic growers who grow cereal rye for grain. He grows the Dacold fall-seeded variety and has had no problems with ergot. He estimates the rye will yield in the upper 40-bushel-per-acre range. Cereal rye is known to come back as a volunteer weed, but Duane uses tillage to keep rye under control after the crop year. Once the rye is harvested in the fall, he discs in any volunteers. Before seeding in the spring, he makes two shallow tillage passes with a chisel plow or Noble blade to cut down any other volunteers. He then plants a warm-season crop with a late planting date, such as proso millet or buckwheat.

The Boehms use the Parshal variety of spring wheat and estimate their yield will be about 30 bushels per acre. The protein levels of the wheat vary between 13.5% and 16.5%.

The Boehms also grow some buckwheat and use it as a late-seeded broadleaf crop in their rotation. They use the Mancan variety.

Soil Fertility

Best Practices: Maintaining Soil Fertility in the Long Term

Nutrients leave the farm whenever grain is harvested and sold. For long-term sustainability, these nutrients must be replaced with some type of fertility addition. For more information on monitoring soil fertility and sources of nutrients, see the ATTRA publication *Nutrient Management in Organic Small Grains*.

The Boehms collect cattle manure from their wintering pens and apply it at a rate of six to eight tons per acre. Because their acreage is so large, they can spread manure on only 5% of the tillable land each year. They rotate the application across their lowest-producing fields. The manure is not composted, so is considered “raw manure” under the National Organic Program regulations, although it does age in the wintering pens over the summer before it is applied in the fall.

The Boehms’ soils are mainly sandy and sandy loam, with organic-matter levels of about 3%, which is very good for a coarse soil. When the Boehms first switched to organic production, their organic-matter level was about 2%. So over time, their organic-matter levels have increased. However, Duane estimates that his no-till neighbors probably have higher organic-matter levels than he does.

Duane says that his rye crop looks thinner after wheat than after summer fallow, which may be due to the nutrients in the wheat straw not fully decomposing. Duane uses any marginal land for hay production and not for cash crops. Saline seeps are not an issue on his farm.

Green Manure

The Boehms use yellow-blossom sweetclover and alfalfa as their primary green-manure crops. One of these crops is planted every five years at a minimum.

They have had some trouble in the past few years with the sweetclover weevil, so they have stopped using sweetclover and switched solely to alfalfa for green manure. One strategy for controlling the sweetclover weevil is to plant new stands as far away as possible from second-year stands, which harbor the weevil. This requires some careful field planning. See the NDSU Extension *Crop and Pest Report*, May 2001, for details.

Further information on sweetclover weevil can be found at www.ag.ndsu.nodak.edu/aginfo/entomology/ndsucpr/Years/2001/May/24/04PR01pdf.pdf

These green manures are the central strategy for Duane’s ongoing organic transition. During the transition years, Duane plants alfalfa or sweetclover with a nurse crop, such as oats, in early May. He hays the crop the first year for income. He then lets the green-manure crop grow for another year or two and hays it again if possible. He works the green manure in with a disc in the fall and then plants his first organic cash grain crop in the spring of the following year.

In some situations, Duane is able to limit the transition time to only two crop years. Organic regulations require that no prohibited substances be used for 36 months prior to the first organic harvest. Thus, if the last synthetic application was in June of 2006, it is possible that the first organic grain crop could be harvested in August 2009, with only two transition crop years in between.

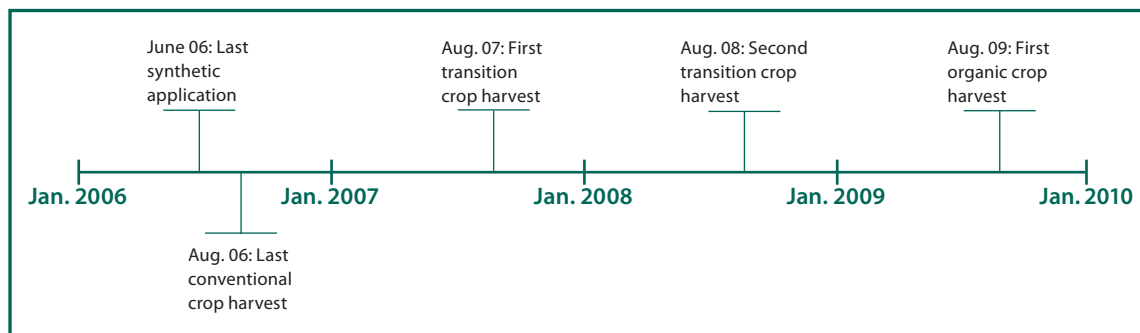
Tillage

In this part of North Dakota, most of the farmers use a conventional no-till system. These farmers do not use a fallow year for soil-moisture recharge since the no-till system provides improved soil-moisture reserves. However, summer fallow is still used for soil-moisture recharge and weed control in organic production.

Duane summer fallows his fields one of every three to five years. This number changes depending on the weather. In drier weather patterns, he summer fallows more often than in wetter periods.

The advantage of fewer summer fallows is increased annual crop production. However, the disadvantage is increased perennial weed pressure. Duane says that seasonal tillage and crop

Figure 1: Organic Transition Timeline



rotation control almost all of the annual weeds, but with less summer fallow, they get many more perennial weeds, especially Canada thistle and field bindweed.

For organic-matter retention and water conservation, Duane tries to minimize his use of tillage whenever possible. He grazes crop fields for weed control when he can, which saves him a tillage pass.

Their tillage tractor is a 1981 280-horsepower Versatile with a 33-foot toolbar, 9-inch sweeps, and 6-inch spacing. Duane also has a Noble blade implement that he runs at a very shallow depth (3 inches) on a very hot day for weed control. Duane does say there is some minimal soil erosion in his fields due to tillage. He's not happy about that but feels he isn't able to do much about it without completely converting to a no-till system.

Marketing

The Boehms differ from most conventional farmers in their marketing perspective. Duane says, "Whether it's crops or livestock, we view ourselves as food producers, not commodity producers." This perspective influences their marketing decisions. They believe their food is worth a premium and are willing to wait until they find a fair price.

The Boehms admit that marketing organic grains can be a challenge. They market directly to milling companies and do not use a broker. They regularly deal with three companies several hundred miles away.

Everything they sell is FOB the farm gate and goes directly to the cleaning plant. They choose to market their crop after it is in the bin and do not do any forward contracting. Because grain prices depend on the final quality specifications such as

protein and test weight, the Boehms do not know what they have to sell until it is harvested.

The time it takes to sell their wheat varies from crop to crop. They are usually able to sell their crops within a year of harvest. However, specialty crops with small demand can take longer. For example, their rye may stay in the bin for up to three years before they can get a good price for it. Duane says that he can always find a buyer, but buyers do not always pay what he wants to take. In that case, Duane will store the grain until he can get the price he wants.

Such a potentially long storage time for grains emphasizes the need for good bin sanitation, temperature control, and pest monitoring. Adequate grain storage is a key component of an organic-grain-marketing plan.

Good communication with your lender is also important. Bankers like to see contracts and are used to the conventional-grain-marketing model, in which a truck of grain can be hauled to the local elevator at any time and sold for the current price. The Boehms developed a good relationship with their lender early on and explained that it could take them several months to sell their crop. This helped their lender understand their cash flow.

Livestock

Although the Boehms' cattle operation is not organic, it is a key component of their farm system. They have chosen not to have organic livestock because they feel the profit isn't as attractive for beef as it is for crops. Also, they find that marketing organic crops is already a challenge, and adding organic livestock would be more complicated. They can sell their conventional livestock in the local market anytime, without waiting for an organic buyer.



The Boehms' hay field. Photo: Susan Tallman, NCAT

While the cattle are not certified organic, they are managed under conditions that allow them to be marketed as “Natural” or “Grass Fed.” They can also sell under the Certified Angus label, since the cattle are a cross between Angus and Black Simmental. Feeder cattle and culled cows are sold at the auction yard in Dickinson at an average weight of 1,200 pounds. Bred cattle are sold directly to other livestock producers.

The Boehms grow their own hay and forage and have about 2,000 acres of grazing land that supports 200 to 300 animals at a time. This averages out to about eight acres for each cow/calf pair. Most of the grazing land is in native prairie grass.

The hay land is in a mixture of smooth brome and alfalfa and is more productive than the native pastures. They estimate that about two acres of hay land is required for each cow/calf pair. The hay land yields one ton of forage per acre with a single cutting per year.

The native grazing land they own is managed organically; however, the grazing land they lease is not managed organically. They maintain 20 to 30 feet of grass buffers between the non-organic and organic pasture and cropland. Because their cattle are not organic, they are able to graze these buffer strips as an extra source of forage.

To control Canada thistle in his native-grass grazing land, Duane uses two beneficial insect species, the Canada Thistle Stem Gallfly and the Canada Thistle Stem Weevil (available from Biological Control of Weeds, Inc. www.bio-control.com). He has used these insects for several years and is starting to see a decrease in his thistle patches. Unfortunately, these insects can only be used in undisturbed settings, so crop or hay land is not a candidate for this weed-control option.

The Boehms use a twice-over grazing system, grazing five to six months on the native grazing land. Cattle are moved anywhere from every 10 days to once a month, depending on grass growth and pasture size. Grazing is started in a different pasture each year so that the grass is grazed at different times each year. Their pastures are connected to each other so that cows can be moved from one to the next with minimal effort.

They do have some pastures that are more than 20 miles away, so they hire trucks for help with that move. The group of cows that grazes this land stays there for five months.

Two-thirds of the Boehms' livestock income is from the sale of calves, with the other third from the sale of cows or bred heifers. They have chosen their cattle breed and calving time to match what their neighbors are doing. By doing this, they have a market for replacement cows.

Their cows calve in late March, but the Boehms are considering calving later to be more in line with Mother Nature. However, if they do this, they won't have a ready market for their bred stock. They currently keep two-thirds of their heifer calves over the winter and then breed them and sell to neighbors or keep them in their own herd. Calves are sold at 500 to 600 pounds.

Duane finds that selling bred heifers is more profitable than selling calves due to the tax advantages. Bred heifers are taxed only at the capital-gains rate, while calves are considered ordinary income and are taxed at a higher rate.

Resources recommended by the Boehms:

Northern Plains Sustainable Agriculture Society, www.npsas.org

University of Minnesota 2008 Organic Farm Performance Report, www.fnbin.umn.edu

North Dakota Farm Business Management, www.ndfarmmanagement.com

Holistic Resource Management, www.holisticmanagement.org

“Land, Livestock, and Life” by Allan Nation

Stockman Grass Farmer, www.stockmangrassfarmer.net

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