

natural systems agriculture



The Transition from Conventional to Organic Farming



In 1999, John Finnie was a conventional zero-till farmer and "if it weren't for the complete reliance on fertilizer and chemical, I'd still be doing it." Seeking a better way to farm without relying on external inputs, the Finnie's decided to convert the buffalo, beef and grain enterprise to organic, because "conventional agriculture treats the symptom of the problem, not the cause".

John & Carolyn, Martin and Tricia Finnie.

Crocusview Farms

1200 ac

Kenton, Manitoba

Harding to Newdale clay soil

Precip: 371 mm/year

2004 acreage:

Peas and Oats

Peas and Barley

Flax

Spelt

Chickling Vetch

Alfalfa and Grass Forage

Hemp

John Finnie farms 1200 ac with wife Carolyn and children Martin and Tricia at Crocusview Farms, several miles east of Kenton, Manitoba. Previously a long-term zero-till/conventional-input farmer, John experienced poor returns in 1999 and 2000 despite high input costs. At the same time, son Martin expressed an interest in farming the property organically in the future. After discussions with John's sister and husband who the Finnie's operate with, both families decided to begin the transition to the organic certification.

Despite seasonal and market adversity and local skepticism during the transition, John feels increasingly comfortable with what he is doing and more confident that he will succeed. 2004 is his first year with no chemical or fertilizer bill.

Driven by organic marketing opportunities and a desire to get off the chemical/fertilizer "treadmill" which seemed to require increasing inputs to maintain production, John now has a sense of empowerment to be self-sufficient, while experimenting with the new system has renewed his enthusiasm for farming. There have also been significant environmental improvements at the paddock- and farm-scale.

After commencing the transition to organic in 1998, 'Crocusview Farms Ltd' was 1/3 certified in 2004 with 2/3 in the first or second transition year to be fully certified by 2006. The Finnie's chose to progress slowly in the relatively high risk venture, learning from mistakes on small areas and gradually adjusting to the new mindset. John is more confident of making the system successful this year than in difficult 2003 season.

Crocusview Farms Ltd. Enterprise



Spelt grown by John for the first time in 2004 for the non-allergenic grain market.

The Finnies farm buffalo, beef and grain on Harding and Newdale clay soils with 371 mm average annual precipitation. The Harding clay topography of rolling hills with little lying water is characterized by eroded knolls with low organic matter after black summer-fallow practiced in the past caused erosion of the topsoil.

The grain, perennial fodder and livestock enterprise in 2004 includes crops of: peas+oats, peas+barley, flax, spelt, fall rye, yellow peas, chickling vetch, industrial hemp and alfalfa+grass forage.

John's current rotation is 2 years of forage followed by 2 years of cash crop with the forage undersown in the second year. He is considering tightening this to 1:1 forage:cash crop by reducing the perennial component and using more annual green manure crops which can be utilized and incorporated by grazing stock. John also sees less risk in sowing peas+oats for green feed than alfalfa+grass, and can produce more biomass from one cut of green feed than 2 hay cuts which require early summer rain for maximum productivity. Most importantly, he can eliminate the major tillage (and possibly erosion) event coming out of the perennial phase, and insure the crop as "green feed" or a "mixed grain crop".

Extensive Use of Legumes

"We have been led to believe that the soil isn't capable of producing a crop and it requires additives, but legume companion crops are perfectly capable of producing enough nitrogen for a good crop." Fortunately, John's high pH soil seems to be well suited to pea crops and other legumes with mycorrhizal associations to access more P. John intends to use mycorrhizal inoculant in the future to improve this capacity.

John has previously grown red clover for seed, and green manure in 2003 but the low microbial activity in the dry season resulted in little immediate benefit. It has been established under numerous crops for the 2-year pasture phase.

In 2004, John is growing a chickling vetch seed crop for the first time. As a companion crop it is not as competitive as peas, but John believes it could work well in a mix with less competitive flax or as a green manure.

Yellow peas have been sown in 2004 with oats and barley. John sees many benefits of growing legume/cereal mixes because "the more options you have the better". John's pea+oat fields have recovered well from several grazing events in 2004, but the mix can also be cut for forage, combined if the cash crop is yielding well, or green manured for soil nutrition.

John is widely intercropping with peas to replace N fertilizer and chooses the pea variety to match the competitiveness of the cereal crop. He sees many synergies from the mix, e.g.: cereals support peas for harvest, peas repel grasshoppers from cereals, the mixed residue is an excellent combination for post-harvest baling. John would even consider putting a 3rd crop in the mix, as long as the seed is separable. He has his own seed cleaner on the farm which he wants to improve because it is proving integral to the operation to separate mixed crops, provide clean sowing seed and screenings for feed.



Industrial hemp grown under contract in 2004, undersown with red clover and tall fescue.



Oat and yellowhead pea mix which John has used for grazing, green feed, grain and green manure.

The Role of Livestock

John originally thought that a large livestock herd would be an integral part of his transition to the organic system to graze and control weeds on the 50% of the farm not in crop each year. However, a combination of poor cattle prices, undeveloped bison markets, and John's success controlling weeds with highly competitive crops

has made him think that livestock are a less important component and he is considering selling the cattle.

John was strip-grazing cattle on alfalfa until he lost two with bloat and is hesitant to use anti-bloat products which may jeopardize the organic certification of his livestock in 2004. Instead John would prefer to use bison because they are more winter-hardy, require less human input for feeding and are less damaging to waterways. John is trying to determine the average buffalo carrying capacity for the farm because the 2003 drought resulted in insufficient feed for the breeding cows and therefore a poor calving rate. He is considering using annual ryegrass as a cover-crop for grazing.

Tillage Practices

John's previous zero-tillage practice really suited his farm with its highly erodible landscape. The moisture conserving technology produced more even crop growth over the light hills and heavy gullies. In fact, John says, "if it weren't for the complete reliance on fertilizer and chemical, I'd still be doing it now". With this history, John would like to think there is a marriage between zero-till and organic systems, and is actively seeking ways to reduce or eliminate the need for full cultivation which he sees is the biggest hurdle in the organic system. This was evident in 2003 where the most tilled land was the most unproductive.

The fields are most susceptible to erosion after the forage phase when a full cultivation is required to remove the alfalfa and grass. This is a major driver for John to replace these crops in the rotation with annual green manure and pasture species. He would also like to experiment with green manure crops which are not incorporated but mulched on the surface for weed control and moisture conservation. While this may require an offset disc machine to seed into the residue, John sees it would have the benefits of "zero-till without chemicals or fertilizer".

Ideally, John would only like to conduct a light tillage with knife-points and weed-rod in the fall or early spring to prepare the seed bed. He is still trying to determine the exact machinery requirements for the new system to be successful. He will continue to use his zero-till knife-points due to the accuracy of seed depth placement. The seeder has packers and harrows for closure and weed kill, but John is considering adding a rod-weeder to the back of the seeder in lieu of the glyphosate knockdown. John uses a 2-pass seeding system, sowing 75% of the conventional rate of seed in the first pass, and a further 75% seeding rate in a second, shallower pass at right-angles. This creates a more competitive canopy with fewer gaps for weed invasion, and two passes with the knife-points destroys most weeds. John places more

emphasis on growing competitive crops than cultivating weeds, and prefers to use green fallow crops than black summer-fallow.

John would also like to experiment with in-crop tillage between row crops but doesn't currently own the necessary machinery. He also requires a disc machine to incorporate green manure crops and is interested in a chaff collector to prevent weed seeds recharging the seed bank at harvest, especially mustard.

Soil Nutrition



John in vigorous fall rye crop after compost in 2002 and poor pea+oat mix in 2003.

In addition to the high legume component in John's rotation, he composts manure over the summer and spreads it on fields in November, concentrating on the eroded knolls. Currently, it takes approximately a year to see a crop response to the compost but John hopes the benefits will be more rapid as the organic system builds. The microbial activity responsible for biomass breakdown is also largely impacted by climate and John recognizes it would have slowed during the dry 2003 season.

If John sells the cattle herd, he will lose his composted manure source, but leave the buffalo in the fields to fertilize naturally. In the meantime John is having "compost tea" and manure water from the feedlot analyzed for as feasible foliar applicant, and is interested in using dried or slurry manure as a fertilizer at seeding. Organic soil tests in 2004 looked promising for fields coming out of buffalo pasture into crop. Although the P levels were relatively low, they should not impact yield, and John will continue to monitor these sites.

Organic Pest Control

Weeds

During the transition phase to organic certification, John utilized an alfalfa/grass mix undersown with the last conventional crop, or a mix of peas and oats for green feed or green manure. John now employs a wide range of weed control strategies to grow profitable crops without the aid of herbicide to control weed competition. John has problematic mustard, flixweed, thistles, quackgrass, red root pigweed, stinkweed where manure is spread and uses the following techniques:



John's flax crop has a high mustard burden, even after 2 years of alfalfa + bromegrass.

- Competitive crop choice: John aims to cover every inch of the field with the desired crop so there is no room for weeds to invade, although he was fortunate to have slow weed growth in the cool spring of 2004
- Pre-seeding tillage: using the cultivator or preferably knife points to physically kill weeds and prepare the seed bed
- Row configuration: John has had great success with his 2-pass crosshatch seeding
- Diverse seeding dates: In his words, "I've replaced my sprayer with my seeder", as John sows many different crops with different seeding dates through the season; e.g. peas early, flax after later weed flush and fall crops such as rye (aggressive and winter hardy). This interrupts weed seed cycles and also spreads the seasonal workload for the Finnies

- Increased seeding rate: John generally sows 50% more seed than conventionally recommended
- Intercropping: John widely uses peas as a companion crop and undersows red clover forage. This additional understorey out-competes germinating weeds
- Green fallow: provides weed control without the erosion risk of black summer-fallow
- Perennial forage in rotation: is physically competitive with spring weeds early in the season
- Hay crops: cutting annual or perennial crops for hay prevents weeds (especially grasses) setting seed
- Weed patch treatment: John will cut particularly weedy sections of fields for green feed
- Prevention: John is planning to purchase a chaff collector to remove weed seeds from the field at harvest
- Livestock: Initially a major part of John's weed control strategy, a large stock population is now less important, but John uses electric fencing to restrict access and reduce selective grazing

With good weed control and fertility, John is able to achieve 75% of conventional yields with none of the input costs except seed and labor. However, he only produced 50% in 2003 with the drought, poor fertility and weed control. In his words, "It all hinges on the weed control".

Insects and Diseases

John has fortunately had no disease issues, but had high grasshopper populations in 2003. He hopes that by sowing pea companion crops the cereals will become less attractive to grasshoppers while increasing soil fertility.

In A Nutshell...

To protect his own land from risk, John rented 400 ac of perennial hay land south at Sioux Valley to experiment with the organic system. Due to the perennial hay history it was immediately certified organic, and John proceeded to rent it for 4 years, producing a successful flax crop and two poor cash crops before returning to perennial hay. This was a good learning experience without exposing his own land to risk and the Finnies proceeded with the transition of 'Crocusview Farms LTD'.

John's driver towards organics was largely economic - to reduce the cost of production by eliminating external inputs and take advantage of organic market premiums, although John warns producers that marketing is their responsibility

which requires time input. John believes the farm is now in a better long-term financial position as he had no intention of buying more land due to lack of labor, and therefore had to make more money from the land by spending less on inputs and finding niche markets.

Subsequently, John has seen a healthier environment on his farm, attracting more birds and wildlife. While he is still determining the most efficient ways of operating, he sees there will be less time requirement, in addition to less health risk.

Advice to other farmers interested in farming with fewer chemicals:

John humbly says he can't advise other farmers - he has a lot of ideas but is still refining his system in terms of rotation and machinery. He has sought information from the Organic Producers Association of Manitoba (OPAM), publications and the Internet, experienced local organic growers, and buyers of organic produce particularly in Saskatchewan where there is a stronger organic movement. He has educated himself on soil biology which he found was neglected in the conventional system. While John found it difficult to accept his weedy crops compared to his neighbors', he has realized that conventional and organic farmers will always have a problem with wild mustard. He was disappointed with the lack of support and even criticism from the local community, but thinks people are becoming more receptive to new ideas. He has found the experience a steep learning curve and his transition was more successful by starting at a small scale to allow time for his and the community's thought processes to adjust.

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