

# Direct Seeding: the Early Years

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## Introduction

My wife Glenna and I are the third generation on a century old homestead located at Laird, about one hour's drive north of Saskatoon. We have three children, Jennifer-15, Thomas-13, and Kathleen-10. Glenna has a full time teaching position at Stobart Elementary School in Duck Lake and our kids keep themselves and us active in the areas of sports and music. My community involvement includes being a councilor for the RM of Laird #404, the treasurer for our church, and a minor hockey coach.

I started farming together with my father back in 1983 on a part time basis and joined him full time in 1986 after completing the Agricultural Machinery Technician course at Kelsey Campus in Saskatoon. In 1994 Glenna and I moved to the farm, while Mom and Dad moved to their new home in Rosthern. Over the years our farm has grown to a 2000 acre Pedigree Seed and Commercial Grain operation. During that time many changes have occurred, one of the major ones being the move to Direct Seeding.

## Previous Equipment and Rotations

As was mentioned in my introduction, I started farming together with my Dad just out of high school. By this time Dad had already embraced longer rotations, so 4 or 5 crops before summer fallowing was not out of the ordinary. Canola, peas, and lentils were the chosen broadleaf crops while hard red spring wheat continued to be the main cereal grown on our farm.

Our list of equipment included 3 cultivators (a different shank spacing for each job required), a rodweeder (perfect for trash management in summer fallow and for killing wild oats on cereal crops if used at the proper time), harrows for straw distribution, a packer bar attached to one of the cultivators for pre-seeding tillage, a good old fashioned 1976 JD LZB Hoe drill, and an even older Pool sprayer with a 400 gallon galvanized tank and wheelbarrow tires on the booms.

Our list of operations in the seeding operation included one or two passes with the harrow, banding a liquid fertilizer blend of NPKS as required in either the fall or in spring, another pass with the harrow, as many pre-seeding tillage passes as were needed to allow us to get through with the hoe drill (sometimes this included a pre-seeding burn off courtesy of Eddie Lite), and finally, the seeding operation itself. This would usually be followed by either the rodweeder on cereals or the harrow packer or harrows on pulse crops. We felt the last operation was necessary to smooth out the field for sprayer and the harvest operations.

Tractor hours were racking up and I didn't like the number of operations necessary to get the seed in the ground. From time to time, some pieces of land would become prone to wind erosion. I couldn't stand to see our biggest asset blowing around. Our equipment needed to be replaced but the direction we should go was in question. Minimum tillage was the goal, but how far could we push that ideology on a limited capital budget.

## **Seeding Equipment**

By the early to mid nineties a few farmers in the area had started experimenting with direct seeding. Some used disc openers, others hoe drills, and still others used air seeders converted to air hoe drills. After watching my neighbors I felt that some sort of hoe opener would be the best for our soil. In 1996, I ventured into direct seeding by installing Atom Jet openers on our 20 year old LZB Hoe drill. These openers allowed the drill to penetrate the untilled ground evenly and allowed the seed to drop straight to the bottom of the furrow where it was placed on firm ground. To this day, I believe that the most even germination I have ever had was on a wheat field seeded into flax stubble with this outfit. Notice that I said FLAX STUBBLE: that's right, NO TRASH. Trash clearance on these drills was less than ideal. I also wanted to be able to seed and place my fertilizer at the same time since I didn't like the extra fertilizer operation. There was some research available at the time that suggested we could get better fertilizer utilization if the fertilizer was placed closer to the seed than to the competing weeds.

New equipment was too pricy for me but used air tanks weren't that expensive. We already had the liquid bandwagon and a well used deep tillage cultivator. A farmer named Neil Wagner from Hague was manufacturing and selling kits to convert your air seeder into an air drill. This conversion used the existing shank to place fertilizer. A separate unit bolted to the shank allowed the seed to be placed in paired rows while mounted packers provided packing and independent depth control. So in the spring of 1998 Dad and I mounted these units on the JD 1600 cultivator. Shank spacing was increased from 12" to 14" to accommodate the extra length of the openers with the mounted packer wheels. Some shanks were place further to the front to make a fourth row to allow for better trash clearance. That spring I direct seeded my entire crop for the first time.

*Lesson # 1: "Whatever you knew about seeding with the hoe drill does not apply to this unit!"*

I was used to having to dig with a jackknife to find my seed placement but with this unit you could sweep away the dirt with your finger. What I thought of as a lack of packing has turned out to be one of the most beneficial aspects of the conversion. I have been able to seed right up to water, with no plugging problems, and still be able to achieve a solid stand right through to harvest. This has also been noticeable on some saline areas where we used to have trouble with establishment after being seeded with the hoe drill.

*Lesson #2: "Seed at least one half inch into moisture, even if that means you have one and a half inches of ground covering the seed."*

This is how I ended up seeding my canola after consultation with Neil. The dry soil on top sealed in the moisture and since the soil was quite loose, the canola had no trouble pushing through. Seven days later you could see the canola emerging nicely and the seed was still covered with one half inch of moist soil. Some earlier seeded cereals had been seeded too shallow and germination was uneven.

Direct seeding with the hoe drill had always meant seeding shallow so you didn't pack too much ground over the seed and risk even more packing with a sudden rain. This had happened to me in the two years I had tried to direct seed with the drill so I was going to make sure that it didn't happen with this unit. Back to lesson number one. I really had to start from square one on what I thought was proper seed placement.

I continued to seed with this unit until the farm expanded and I felt that additional capacity was needed. In the spring of 2004 I rolled onto the field with a larger unit, this time a 41' JD 610 Seeding tool and a 1900 Air cart with brand new Peacock Precision Seeders mounted on 15" centers. The floating hitch has helped to even out the seeding depth going through draws and water runs, while the wider shank spacing and full 4 row frame have helped with trash clearance. This is the unit I am still using and plan to use for some time. After all, if your neighbors are hiring you to custom seed for them, you must be doing something right.

### **Trash Management**

We had always relied on tillage and/or straw removal to prepare for the seeding operation. The move to direct seeding meant we needed to find other alternatives. A Redekopp Fine Cut chopper rotor was installed in the 7720 along with longer stationary knives. A chaff spreader had been added a few years earlier. This unit was an improvement but it didn't seem to be enough of an improvement in heavy cereal crops. A harrow operation still seemed to be necessary and I felt that the current tine harrows were inadequate. After demonstrating a heavy harrow I made the decision to upgrade from the tine harrow bar. At the same time I was looking for an improvement in seed quality and ease of cleanout between Pedigree crops. A TR97 with a Redekopp chopper was purchased to replace the JD 7720. The change from a conventional to a rotary combine was another improvement in trash management.

My present trash management operations will include a pass with the heavy harrow on cereal stubble in the fall if time and weather permit. Canola stubble may or may not be harrowed depending on how well the variety stood during the growing season. Heavily lodged cereal crops can usually be managed by a second harrow operation in the spring. My goal during the harrowing operation is to allow the seeder to pass through the field without creating any piles. I want to see a black row behind every shank on the seeder. Having a black row helps the soil in the seed row to warm up quicker and I feel that it improves emergence enough to warrant the harrowing operation. Initially I harrowed the fields after seeding to smooth them out a little. In more recent years I have abandoned this practice except on fields seeded to peas. Pea fields are either rolled or harrow packed depending on trash cover and equipment availability. Emergence appears to be more uniform on fields that aren't harrowed after seeding.

### **Weed Control**

One of the initial hurdles to overcome in the first few years of direct seeding was the idea of spraying a field when it appeared that nothing was growing. (Actually, I still have a problem with this one.) It seemed like such a waste of time and money, that is, until the misses started to show up in crop. Starting out with a clean field is essential, especially for crops that offer little in the way of competition. I have found that you can sometimes get away without a burn off if you are seeding a cereal or pea crop early in the year, however, timing of the in crop herbicide will have to be moved up a bit. In some cases, a light harrowing was able to deter shallow rooted

weeds such as volunteer canola. The later in the year you seed, the more likely you will need to apply a pre-seeding burn off. In 2004, due to the cool spring conditions, we only applied a burn off on about 25% of our acres. In hind sight, it should have been more. There are a few guys in our area who say, “Don’t even look. Just spray!”

In 1998 and 1999 I experimented with granular Edge and Fortress applied on the field surface in fall. Control was actually quite good with both products, however, newer herbicides have proven to be more economical and with HT Canola’s moving to the mainstream on our farm, I have had little need to move back to these products.

Thanks to the use of Pre-harvest Glyphosate, thistle and quack grass are much less of a problem now than they used to be. I emphasize pre-harvest applications as some of the land that I recently started to farm had only seen burn off applications in the past. These fields had been direct seeded for approximately 10 years and yet patches of thistle and quack grass were still prevalent. In 2005, the worst of these fields was seeded to Linola with a pre-harvest glyphosate application penciled in well before seeding started.

The newest weed to become a problem is not a new weed at all; dandelion. Low to medium rates of glyphosate will not control it when applied pre-seeding. Pre-harvest applications offer a much better chance of long term control, but are not an option on Pedigreed Seed Fields. In these situations I have found that an application of PrePass as a pre-seeding burn off can be really beneficial.

Another frustrating aspect to weed control, especially during seeding time, is the weather. Wind, cold, rain, and freezing temperatures can make pre-seeding burn offs next to impossible to accomplish on time. This factor has probably led to more *experiments* on our farm than I would like to see. If manpower is an issue, as it is in my case, custom spraying can help, but logistics have to be worked out well in advance. Dealing with the wind has meant that the last two sprayers I have owned have come with windscreens. They can be a big advantage on some days but that has to be weighed against the extra cleaning necessary when switching from one product to another.

### **Fertilizer Practices**

The placement of fertilizer with this seeder is far superior to the fall or spring banding that we were doing in the past. Weeds and wild oats emerging between the rows of fertilizer look sick, literally. Yields are being maintained or surpassed, even though we are currently using 10 – 20% lower rates of actual N than we were before we started direct seeding. Fertilizer blends are determined by the needs of the intended crop in conjunction with soil tests, field history, and overall budget. Soil tests dating back to 1995 show that the nutrient levels on our soil are being maintained and in some cases improved, even though we have been reducing the overall levels of fertilizer being applied. This past fall we took more in depth soil tests in an attempt to help us manage the ever growing fertilizer bill.

### **The Bottom Line**

This is perhaps the toughest area to address. If you were to ask me if switching to direct seeding could save your farm financially, I would have to say, “NO!” Only a string of good years

combined with excellent prices and lower input costs is going to do that. (Something we all hope for I'm sure!) However, I can site several changes which I feel have made an improvement on my farm.

1. *Soil quality has improved.* Comparing soil tests taken in 1995 to those taken last fall, we can see a full one to two percent increase in organic matter. I believe that this is part of the reason we are able to cut back on our fertilizer rates. The ground is mellower and water infiltration has improved to the point that is it takes a very heavy shower to create any long lasting water holes after seeding. The stubble cover not only protects your soil from blowing , but in can protect young seedlings from wind damage as well.
2. *Tractor hours are way down.* We used to put upwards of 400 hours a year or more on each of 2 tractors to seed 1200 acres. This past year I heavy harrowed 2000 acres in spring, and then seeded 2250 acres all with the same tractor. Spraying was hired out on a custom basis. **Total tractor hours: 221.** Given an average seeding speed of 4.2 mph I can cover approximately 20 acres an hour. A quarter section can be harrowed in just over 2 hours at 12mph. My land is spread out over ten miles so travel time has to be taken into consideration. Given the fact that my tractor has just over 3000 hours on it, at this rate it should be able to call my farm home for a few more years. Lower tractor hours also means less fuel used.
3. *More consistent germination and emergence.* With stubble left standing for snow trap and adequate trash management, moisture is left close to the surface. Some years are worse than others, 2002 comes to mind, but even in that year we had better emergence and better crops than those in the area that were not direct seeding.

Of course it wouldn't be fair to talk only about the positives. Some of the difficulties I have encountered in the process are:

1. *Machinery cost.* Before I headed down this road I read about selling or trading off your conventional tillage and seeding equipment on newer air drills and coming out on a breakeven basis. This certainly wasn't my case. But my circumstances were different in that equipment had not been upgraded for some time. I decided that if I wanted to keep farming I had to make a choice. That choice just happened to involve purchasing equipment that could be used for direct seeding.
2. *Getting a timely burn off while you are trying to seed.* I referred to this problem earlier. It can be extremely frustrating to watch the wind blow all day long, knowing that you have a short window of opportunity to get your seed in the ground. I have waited for the weather to clear or for the custom operator to get a field done. Sometimes, this means you change your plans and seed a different field first. At other times it may lead to those unsightly *experiments*. Eventually you just have to get the seed in the ground.
3. *Trash Management.* Although I feel this area has improved dramatically, I still would like to see refinements made. Each field has to be managed on its own and it seems that every year brings a different challenge in this area. My ultimate goal is to achieve

maximum moisture retention while allowing for positive trash flow through my seeding unit.

Overall, I feel that the move to Direct Seeding has been the right choice for my farm. That does not mean that I won't be open to new ideas. It simply means that until I see a better system of maintaining or improving soil quality, I'll stick with my present methods.