

## Developing a system for draft horses at Saugeen River CSA:Part II

As a continuation of the experiments in draft horse work, I wanted to share how we are currently (2015) working with the horses on the farm. Anne and Eric Nordell have an amazing DVD recording of a slide show they gave in 2007 called “Weed the Soil, not the Crop.” They do a better job of describing their system than I could do, but I’ll share how I adapted their system to our farm. Also, very timely, a new book on vegetable cultivation with horses just came out while I was trying to work out the system, *The New Horse Powered Farm*, by Stephen Leslie, and that really helped.

So I knew I wanted to try to shift from the raised beds I had been working with for the last 20 years, to have crops in rows. First thing I found out was that 36” is the narrowest the McCormick-Deering cultivators can go, so that is what I ended up trying. I had to experiment with ways to prepare the soil for planting, and then how would I mark out the 36” rows? In the spring we are usually pretty busy, so it can be tricky finding the time to do different experiments. I tried using a light disc or spring tine harrow to make the final seeding space. But it just left us with a field of more or less broken up soil. Some of it was suitable for direct seeding small seeds, but a lot of it was not great and I wasn’t happy at all with it. This also didn’t answer the question of marking out the rows. We ended up using a string and posts to mark out the rows that we would either transplant next to, or push the seeder beside. I knew it was not the ideal, but we needed to get the jobs done, so just started with that. This at least gave us nice, evenly spaced, straight rows.



The next step was to figure out cultivating with the horses. I have to admit, I was a bit nervous about this, since it would be essential to keep the horses walking exactly where I wanted them to, or else they would trample the crops. My experience at this point was based on plowing, and knowing that when there was a furrow, the horse would very naturally walk in the furrow, which was only 12” wide, so I knew they could do it. I thought it would be best to wait until a crop was big enough for both me and the horses to see before trying to do some cultivating. The first crop that would be big enough was the garlic. My first experiment was to try to walk a single horse between the rows, using a cultivator that is designed to be pulled by one horse. We did it, but I knew I wanted to eventually use a team of two horses with the McCormick-Deering, which would do two pathways at once. My Belgian team had some experience cultivating corn, so thought they might be able to do this too. So the cultivator was set at the right spacing, and I gave it a try. The horses really didn’t get it! They walked in the path, or on the garlic, it really

didn't seem to matter to them, even though the rows were pretty clear, and the crop was fairly tall, they stepped on quite a few garlic plants. The main problem seemed to be that they wanted to walk further apart than 36", which amounted to both horses trampling both rows on the outside of them. After a couple passes of the same thing, I tried to not get frustrated, since the horses, especially when trying something new, are very sensitive to the driver's emotional state, and would get nervous if I got frustrated.



I got the inspiration to try to tie the inside driving lines each in a knot, to shorten them, so that as I pulled on the lines, the horses would be drawn closer together. And to my relief, it worked! We finished the garlic, and I headed back to the barn with one of the greatest feelings of accomplishment I've had in years! This was a very big deal for me, and I was so exhilarated! I knew this was a triumph for the farm and would transform the way we do

things. What was not resolved, though, was how to cultivate crops that are very small and hard to see.

The Stephen Leslie's book had some articles by Anne and Eric Nordell elaborating on some of the techniques they covered in their slide DVD. They talked about a "horse guidance system" that helped them to drive the horses between rows to do very articulate cultivating. This involved in the initial ground preparation, creating small furrows between the rows that the horses naturally want to follow. This allows the driver to focus on the crop without all the attention going to driving the horses. The McCormick-Deering cultivator has a foot steering mechanism that allows you to follow any slight wiggle in the row, enabling some precise cultivating. The Nordell's showed how they had modified their equipment to make these rows, and what it actually involved was creating little single row raised beds. This was great, as it brought me back to the raised beds that I love for growing vegetables.

So, after the ground is prepared flat, a scuffler with 5 x 12" sweeps goes through and marks the small furrow pathways. The two outside sweeps are angled slightly more so that they dig in, making the furrow. The wheels on the scuffler are set at 36" and the outside sweeps are also set at 36", so all you have to do is to keep one wheel in the furrow that was already made and that automatically lines up the next furrow. This is the most important part that has to be done precisely, since this is determining how the beds will be laid out.



The next step is making the bed. This is another McCormick-Deering set with hilling discs and a small cultipacker, and once again, sweeps on the outside set at 36". This is already now very easy. Since both horses now have a furrow to follow, they almost drive themselves (almost!). All the driver has to do is to keep the unit in the middle. This leaves us with a nice planting surface, either for direct seeding or transplanting. We first experimented with using a string down the middle

to mark off the rows straight, but eventually found we didn't really need it, since we could just follow the middle of the bed pretty easily.

Now that the beds and pathways are already marked off, cultivating is so much easier. The horses follow the furrows laid out for them, so it's just a matter of using the foot steering to follow the row. So I got one more McCormick-Deering and set it up for cultivating, with six small sweeps, the two outside ones set again at 36". The two gangs of sweeps on either side of

the row have a lever that can be moved in and out, even on the fly if you want, to accommodate wider or narrower crops. For the very small crops, I set up rolling shields that block the soil from being thrown on to the small plants. Once the crop gets big enough, the shields can be taken off.



Having this set up really was a great step forward for weed control. We could

regularly go over the ground, getting weeds before they even emerged. The real advantage with the horses is that you can drive them on the soil even right after a heavy rain, something I would never be able to do with a tractor. This cultivating after a rain also keeps moisture in for the crop, but dries the surface to prevent weeds from germinating. Eventually, as the crop fills in, the weeds don't get so bad, although we still had to do a bit of hand weeding, but not much. But there are several elements that the Nordell's talk about as part of this system that improves not only weed control, but also moisture retention and soil structure.

With half the vegetable operation in rest each year, and half in production has many advantages. One of the advantages (that I have finally started to really understand) is also alternating cultivation depth. The idea is that during the production year, we try to cultivate quite shallow.



This conserves moisture, but also keeps most of the weed seeds deeper where they won't germinate. In the rest year, during fallow periods, if we cultivate deeper, it brings the weed seeds up, where they can be easily killed by an additional quick, light cultivation. Following this, combined with intensive cover cropping during the rest period, has created an environment where weeds are not a major problem for us, whereas with our previous system, weeds were our biggest challenge. This took only one season of implementing this system to notice a major improvement, making vegetable farming seem much more

sustainable as far as labour goes!

The horses get so accustomed to this system that they are pretty easy to handle. This is great, since if an apprentice shows the ability to control the horses well enough, they can also try cultivating. It is still exhilarating, as everything moves pretty fast, and there is the consciousness that if you steer too far off, you can wipe out a row of vegetables! It is incredibly satisfying work, though, looking behind you after doing a pass and seeing the worked ground around the crop and the row still standing!

One thing that I am still experimenting with is pre-making the beds the year before for any section that is all planted by the end of May. In August of the year before, we go through the process of making the beds, like in the pictures above. But after marking out the furrows, we hand broadcast peas and oats, which get covered by the final bed

forming step. The oats and peas grow to a very healthy height before being killed over winter. This saves a great deal of work in the spring, when we are so busy and the weather is so variable. All that needs to be done for these pre-made beds to prepare for planting is to go over them



again lightly with the sweeps, and remake them. I still have to work on dealing with the cover crop residue for the earliest seedings. But this already saves the work of having to plow and cultivate first before planting, but also really limits the weeds that can germinate in these early crops.

This system is working well, and just needs to be tweaked here and there. The main task that I still need the tractor for is incorporating crop residue once the crops are finished. I will be trying to find a heavier disc that the horses can pull that can deal with more vegetable debris than what I have now.

