

Great Lakes CSA Conference 2008

Real Horsepower for Organic Farms

*Session Presentation by
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Why Horses are Ideal to Power a CSA

- 1) They eat oats, hay and pasture that can all be grown on your own farm, and these crops are important components of a good crop rotation.
- 2) They give you back most of their feed in the form of easily composted manure to feed your crops. Have you ever found a use for used diesel exhaust?
- 3) They can produce baby tractors to replace momma tractors and extras to sell.
- 4) When you buy a horse you are supporting another farmer. When you buy a tractor you are supporting a transnational corporation.
- 5) It is not easy to buy a horse on credit, so you avoid interest payments. When the UN keeps track of starving bankers instead of starving farmers we will know we have our priorities right.
- 6) Horses are largely self-repairing. Have you ever tried to give your tractor 6 weeks off to get over a broken connecting rod?
- 7) Horses are modular power units. One horse can scuffle the garden, but when you have a heavier job you can hook, 2, 3, 4 or more together.
- 8) Horses have full time 4 wheel drive as standard equipment and they can exert, for very short times, 10X their usual pulling power to get very big rolling loads moving or to get you unstuck.
- 9) Horse machinery is often simple and easy to repair.
- 10) Horses can often get on the land a few days earlier and with less compaction than tractors.
- 11) You need to give horses rests in the field, so the farmers get time to think and dream and make notes and enjoy their farms and the nature around them.
- 12) Horses are pleasant to work with. They are quiet, intelligent, sensitive and alive.
- 13) Working with a rare breed can insure the survival of that breed, which has already served man for centuries and produce more income than a common breed.
- 14) Working with horses can give you a marketing edge by attracting members who consider horses attractive, interesting, and/or environmentally friendly.

Horses do have special needs in that they require a certain level of care year round. It also takes a higher level of management to work with horses than with tractors, although that is true of organic farming as well. Also, the labour required for a horse powered farm will be somewhat greater than for a tractor powered farm of the same size. Using larger hitches of horses can offset this to some extent.

The basic diet for idle horses is forage either in the form of hay or pasture and clean water. As soon as a horse starts to work you need to supply more calories and it is usually supplied with grain, because the energy density of hay is relatively low.

Pasture is a great source of forage, because the horses harvest it themselves and get essential

exercise in the process. The wandering horses also fertilize the pasture. We have found that fields in pasture have made the most dramatic increase in organic matter on our farm. The fine root systems of the grasses are very good at building soil structure and the organic matter. Horses need 1-2 acres of pasture per horse depending on productivity. Hay for horses must be free of dust and molds otherwise it may cause respiratory or reproduction problems. My general rule of thumb is a bale of hay per horse per day, but that can be reduced if your horses are smaller or hay is expensive. As a general rule you will need about 250 bales of hay per horse for winter-feed. You may need more if you have to supplement an unproductive or very dry pasture.

It is very difficult to estimate what amount of oats you will need annually, as it depends very much on the frequency and nature of the work the horses are doing and whether or not you are working pregnant or lactating mares. A starting point would be to allow one metric tone per horse per year for a horse working frequently.

The soil of Southern Ontario is very low in selenium. Selenium is one of the most important trace minerals required by horses. If you are depending on locally grown feeds, which have not been fortified with additional selenium, you may want to supplement your horses' diet. Feed dealers can get block or loose trace mineral salt with elevated levels of selenium. The requirement for horses is 1-2 mg. of selenium per 1000lbs. of horse per day.

For hard working horses loose salt added to their grain ration is better, because they can not get enough salt licking if from a block. Eg. T-M-SE Trace Mineralized salt with selenium from the Canadian Salt Company. This salt has 25 mg. selenium/Kg Feed 80-160 gr./horse/day.

Suitable Horses

The size and number of horses you will need to work your organic farm will depend on the size of your operation, the nature of the work and your personal preferences. If all you have is a 2 acre CSA garden, than a team of ponies may do all your work and eat a lot less feed. However, if you have a lot of heavy draft work to do, or a lot of acres to cover you may need the biggest draft horses you can find. Generally a draft horse can exert 10% of its body weight in a horizontal pull (the definition of draft) on a steady basis. Thus a 1000lb. horse could exert a 100lb. pull all day, but a 2000lb horse could pull 2X's that. The same horses can exert a pull of its own weight for a brief time to get you out of a tight spot. As an example, a plow cutting 12" wide under average soil conditions would require a draft of 378 lbs. Thus 1-1500lb. horses or 2-2000lb. horses could be expected to pull this plow. If the soil is clay or dry or the crop is alfalfa the draft could be much higher. If the horses are not well conditioned to work they will not be able to work very long without long rests and they run the risk of getting sore shoulders.

The general rule of thumb is 25 acres per horse so a fifty acre mixed farm could be operated with a team of 2, but having a spare horse is wise to lighten the load or take the place of a sick or sore horse or of a foaling mare.

Any breed can be suitable depending on your preferences and prejudices. I personally prefer a short, but heavy draft horse. Short because they are easier to harness on a daily basis and heavy because we have a lot of heavy work to do.

Procuring Horses

In order of preference:

- 1) Buy privately from someone you know to be trust worth. Insist on actually driving the horses doing something you will ask them to do at home. That way you can quickly determine if they are suitable for the job and that you can handle them safely.
- 2) Buying horses at an auction is very risky. If the owner is there to talk to, it helps. If they are driven in the ring it is some assurance that they are trained, but “broke” can mean a wide range of levels of experience and training, from almost none to years.

Housing

Housing for horses can be as simple or complex as you desire and can afford. Essentially, horses require protection from only the most severe weather, cold winds, icy rains, and the sun in the summer. Most barns are built for the comfort and convenience of the farmer. Good feed in adequate quantities will protect the healthy horse from the cold weather with a layer of fat. Well-fed horses will have short hair even in the winter. Design a farm/barn system so horses can get lots of exercise either through working or access to a paddock. Standing for days on end in a tie stall or box stall is unhealthy for a horse. They are healthier in winter if they are housed in a cold barn, then they are not shocked when moved from a warm barn to a cold paddock. Well-ventilated buildings are best for horses to avoid respiratory problems: cold/dry rather than warm/damp.

Standing stalls work well for working horses. They take much less space than box stalls. Horses are easily harnessed since they are already tied. Standing stalls are easily cleaned and use less bedding.

Harness

The harness for a draft horse can be made of either leather or nylon. Leather is a natural material, beautiful and non-abrasive, but it is more expensive, heavy and when old, can fail suddenly and without warning. Nylon is a lighter, very strong, easy to clean and cheaper, but is abrasive, ugly and made out of petroleum.

A basic nylon bridle work harness for each horse will cost about \$500. Leather harness is about twice the price. A collar for each horse is also required at a cost of \$150-250.

Harness is relatively easy to find because the Amish and Old Order Mennonites have kept the craft alive.

Equipment

There is still old horse equipment available that can be bought at auctions, from dealers, or privately. Although the purchase price may be low, repair parts are often difficult or impossible to obtain. Horse equipment was often simple in design and can be repaired if you have the skills and tools.

There is more and more new horse equipment being manufactured as the supply of old equipment

is slowly exhausted. It is often built in small shops and of good quality and reasonable prices. Sometimes small tractor implements can be used with horses with little or no modification. A forecart is a two-wheeled cart with a long tongue that enables horses to pull vehicles or implements with short tractor tongues. Three point hitch forecarts allow the use of some 3PH equipment with your horses. Ground-driven hydraulic forecarts enable horses to pull equipment that need hydraulic cylinders for raising and lowering. Motorized forecarts enable horses to pull equipment that requires PTO power and/or hydraulics.

What can I expect to accomplish with horses?

With a team of 2-1500lb. horses you should expect in one day to:

Plow	1.5-2 acres
Harrow	8-10 acres
Drill	8-10 acres
Plant	8-10 acres
Cultivate	7 acres
(single row)	
Mow	7 acres
Rake	14 acres
Haul	
(on wagon)	1 ½ tons (20-25miles)

Four horses could accomplish twice as much with the same man labour, but would require implements twice as wide. This assumes a well-conditioned team, equipment in good repair and 10 hours in the field.

Orchard Hill Farm offers apprenticeships and 3-day draft horse workshops for people interested in learning to work with draft horses.

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Cost to Set Up Horse Powered CSA

Assume a 160 member CSA @ \$500/member = \$80,000 gross income

Land Base

Vegetables	5 acres
Cover Crops	5 acres
Pasture – 3 horses x 2 acres/horse	6 acres
Hay – 3 horses x 250 bales/horse @ 150 bales/acre	5 acres
<i>Total acreage required</i>	<i>21 acres</i>

Grain

(oats) –buy in- 3 metric tons @ \$270/metric ton \$810

Manure produced:

3 horses x 10 metric tons/horse = 30 metric tons

When composted 15 metric tons mature compost (Value @50/mt) \$750

Horses required

3 geldings or mares if wish to produce and sell foals \$1,800 - \$7,500

Fencing

(for 6 acres) 2 strand perimeter fence (polytwine)

single strand dividers including AC charger \$700.00

Vet costs

hard to estimate, may be nothing one year, but substantial the next – allow \$500.00

Hitching gear

Harness \$600 (used) -\$1,200 (new)

Collars \$300 (used) - \$600 (new)

Neck yoke \$30 (used) - \$60 (new)

Double tree \$60 (used) - \$117 (new)

3 horses evener \$70 (used) - \$135 (new)

Total *\$1060.00 - \$2112.00*

Equipment

(All vegetables planted with hand pushed seeder)

Plow Pioneer (new) \$1,500

Disc (used) \$100

Spring tooth cultivator (used) \$50

Harrows (used) \$30

Manure spreader (used) \$1,500

Roller (used) \$50

Seed drill (used for cover crops) \$100

Hay mower (used but rebuilt) \$600

Rake (used) \$300

Hay loader (used – to harvest loose hay) \$150

One row riding cultivator (used) \$350

Attachments: rolling shield (new) \$160

Furrow opener for planting potatoes and disc hillers (used) \$50

Walk behind cultivator (used) \$100

Potato plow (used) \$200

Wagon and rack (used) \$350

Total *\$5,590*

Total cost of horses, gear and equipment **\$8,450 - \$15,675**