

The Oil Drum: Campfire

Discussions about Energy and Our Future

SnowBear Farm – Ten Thousand Hours and Counting

Posted by [Jason Bradford](#) on December 16, 2009 - 7:12pm in [The Oil Drum: Campfire](#)

Topic: [Environment/Sustainability](#)

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This guest post from Jim Dunlap (Oil Drum name Wyoming) is a progress report on the development of his farm in Virginia.

A year ago I wrote a lengthy article for [Oil Drum - Campfire](#) describing the beginning of my conversion from a career of professional life often an desk to one of a farmer. Due to the interest and spirited responses to my article of last December I thought that Oil Drum readers might find it interesting to know what has transpired this past year on the farm and what I think I have learned. If you get lost a bit I would recommend reading the previous article.



Background

For a variety of complex reasons (which continue to evolve as this experiment continues) I have come to believe that our future world will require a significantly larger number of farmers than it has today. The short term causes of this need can be found in energy issues as often discussed on TOD and in the status of our financial system/consumer economy, while the primary long-term driver is the onrushing freight train of climate change. I believe that we have unwittingly raced

into a civilizational dead end and need to quickly retrench and reconfigure our place in this world (although I do not expect this to happen). I am convinced that we cannot avoid massive change nor probably catastrophic upheaval. I do have hope we can adapt. With this in mind I have chosen to move forward and work towards a possible future. Many of us must learn small scale farming. Farming needs to become more local and it needs to be performed as ecologically as possible (sustainable farming being something of an oxymoron). We need to grow our numbers of farmers and reduce their average age from approximately 60 to a more demographically supportable age. We will need to reclaim land from suburbia and the pet horse industry. Who is going to do this? Well, for one, I am.

A quick bit of additional background to add to last years data; whether it clarifies or obscures what I am doing is open to one's interpretation I guess. I am 55 years old and a retired CIA officer. I was formally educated as an electrical engineer and spent my entire professional career with the United States Government. I have traveled the world extensively and have directly witnessed some of the highs and lows of the human race on this earth (more lows than highs I am sorry to say). I am of an analytical bent imposed upon an operational background. I have expended significant thought and heavily researched the issues, mentioned above, which have brought me to my conclusions. I performed the due diligence, to the best of my ability, which such serious concerns demand. I am convinced and, thus, my duty is to act.

Year Three

Production

When one compares the below production figures for this year with those presented in last years post it is critical to remember that the farmed acreage was significantly greater this year than last. I had about 2 acres in vegetable crops this year (as opposed to 1 in 2008) and about 1 acre in fruit this year (roughly the same as last).

During the growing season this year we raised 35 different vegetables, 4 herbs and various fruit/berries. For reference: in 2008 we grew 23 different vegetables and the fruit/berries. With the extra acre in production this year we naturally grew a lot more produce than last year. However, the difficult and unusual weather during the year mostly wiped out our fruit production and adversely impacted many of the other crops. The only fruit we grew in any volume this year was blackberries and pears. The rest did not survive the weather.

For 2008 I estimated that sold production was about 1 million calories of food and that total production (to include that sold, what we consumed, what had to be thrown away due to it not selling, donations to the poor, and that composted due to its not being deemed of sufficient quality for sale) was 2 million calories.

For 2009 I estimate that sold production was about 2.9 million calories and that total production was 5 million calories. We are getting better at this.

FYI: The total calories of production of produce of any kind that were edible are naturally higher than the above sold production numbers indicate. A lot of product never gets harvested due to its quality not being sufficient for sale in the current environment, lack of labor to harvest and/or insufficient markets to sell the product at. This may change in the future.

Energy Use

For 2009 the farm consumed the following energy inputs (actual thru end of Nov and estimated thru end of Dec):

Total Fuel: 1067 gallons
673 gallons – Gasoline/Vehicle – Pickup and Van
217 gallons – Gasoline/farm tractors/mowers/weed eaters, etc
31 gallons- Diesel for tractors
87 gallons – kerosene for greenhouse heater
59 gallons – propane for greenhouse heater

Electricity, \$60/month May to Nov – primarily for AC for refrigerated vegetable storage room but also consumption due to the presence of farm workers

Numbers for 2008 were respectively:

Total Fuel: 950 gallons
681 – Gasoline/Vehicle – Pickup
200 – Gasoline/farm tractors/mowers/weed eaters etc
17 - Diesel for tractors
52 – Kerosene for greenhouse heater

Electricity aprox \$30/mo

Of particular note is that the largest component of my farm’s energy use is transportation fuel that is almost totally consumed in delivering product to my markets. This year’s transportation fuel number of 673 gallons was 8 gallons LESS than it was in 2008 while the product delivered was approximately three times higher.

Production/Energy Ratios

I have used the same methodology to calculate total calories as detailed last year. The results are impressive (to me at least). Once again these figures are sold production. Another interesting number, in survival terms perhaps, is Total Production to energy consumed, but that is more of a topic for a different post. FYI: there is great room for improvement in the area of sold production as having more labor and sales outlets would generate much greater revenues from the same amount of crops.

2009 Results – Sold Production

Produce Type	cal/lb	lbs	calories
Vegetables	145	20,000	2,900,000
Fruit	272	300	81,600
Total cal			2,981,600

2008 Results- Sold Production

Produce Type cal/lb lbs calories

Vegetables 145 6500 942,500

Fruit 272 500 136,200

Total cal 1,078,700

Production per Gallon

For 2008: 7.4 lbs Production per gallon of fuel

For 2009: 19.0 lbs Production per gallon of fuel

Labor Issues

For the first 2 years of farming I was the sole worker (with small amounts of assistance from my wife – approx 10% of my hours). This last year I intended to have one full time worker in addition to the time my spouse could spare. The issue of hired labor has proven to be a hard lesson in one of the ‘gotcha’s’ of small scale vegetable farming. A few items for illustration purposes.

I advertised for one full time worker for the season; 50-60 hours per week, Mon – Sat, all farm labor duties, etc. The first worker signed up for the season and lasted 2 months. He decided he wanted to work 40 hr wks, not on weekends, only was interested in greenhouse work and was bothered by having dirt stained hands. This kid grew up on a large cotton farm. The next 3 workers were laid off landscapers from the local area. One worked one day and did not return. The other two I fired for lack of effort, talking/texting on cell phones while working and not showing up for work on time or for entire days. The next worker showed up after driving clear from Massachusetts, and did not even work a full day. The next worker was a dream. A 17 year old 6 months out of Mexico (US Citizen – but non-English speaker) who worked rings around me and more than twice as hard as the best of the others. He had to return to high school at the end of August. The last worker was a recent college graduate who had failed to find work after graduation. Nice person but not a very hard worker and kind of depressed.

I have heard from many other vegetable farmers that it is very difficult to find good farm workers among young Americans. Most farmers want to train and use young Americans as they recognize that our future is dependent on finding our replacements, but the core requirement is to get the work done efficiently. Almost all of the small farmers I know, however, are heavily dependent on immigrants to get the heavy hauling done. Why is this the case? It may be because young Americans are not willing to work hard, as I frequently hear stated, but I am not so sure. I believe it may be because most young Americans do not know “how” to work hard. In my limited experience they have simply never been trained how to work hard physically. I tried to explain to them how my father taught me to work hard when I was young and just got the minimum wage stare in return. I would tell them that, even if you are 20 years old, if you work hard physically all day for 10 hours you will not be going out to the movies at 11 pm during the week because you will be asleep before that time. It just did not sink in. My parents thought my generation was getting soft and told me so. It seems that the current crop of youngsters is mostly clueless when it comes to hard times and giving 100% effort. I suspect that they are going to get to learn how to perform the hard way.

Another annoyance was that none of the American kids I hired spent any time thinking about what they were doing and trying to become better at it, as on the last day they were here they still had not adequately learned the tasks we were doing, nor had their ability to work harder/faster improved. The Mexican boy was completely different and worked like his life depended on it from minute one. He was smart. He never wasted time. He immediately found something to do when he was done with his last task without being told; he learned my way of doing things within a day or two (rather than arguing about it); he was always thinking ahead to the next thing to do, would jump right in and take something over if he could see that he could do it faster than I could, was never late, never wasted time, etc. I was amazed. I paid him much better than the others as well.

For next year I will return to the well for American workers, but I am going to try and be much more selective. I want to find 2 workers who are really motivated to learn this type of farming; hopefully they will have some experience and ideally they would be a couple. And I am going to try to hire the Mexican boy again for the summer. Plus my wife intends to join me full time on the farm as she has decided that she really likes the lifestyle and has all sorts of plans on how to add to our operation. So that means 4-5 full time workers next year. A big change. And probably some big headaches!

Labor for 2007 – Approx 3000 hours

Labor for 2008 – Approx 3300-3500 hours (spouse included)

Labor for 2009 - Appox 3300 hours, spouse 800 hours, hired labor 1400 hours for a total of about 5500 hours

Equipment Issues

For three years I have used the type and scale of equipment (2 wheeled walk-behind tractor, small power equipment and heavy use of hand tools) recommended in the very popular Eliot Coleman organic farming books. I have come to the conclusion that this scale of equipment is not suitable if one is trying to operate a profitable farm as opposed to operating what most would consider a large personal garden. By ‘operating a farm’ I mean that one is trying to grow an amount of food well in excess of one’s family needs and to try to generate a workable income. A ‘family’ feeding operation can exist and persist with significant inefficiencies, especially in the presence of a large number of family members, but a profitable farming operation must be highly efficient in order to turn a profit. My presumption is that large farm families with many children, structured along the traditional lines of the past, are not only going to be much less common, but are not desirable in any sustainable sense. The only other farmer that I know who was using this same type of small equipment has evolved to larger more capable machinery.



The 2 wheeled (walk-behind) tractors are excellent machines for certain tasks (tilling, running a flail mower and limited rotary plowing), but are not capable of efficient work at many required farming tasks; among them being furrow plowing, as they are not capable of rolling the sod over to speed its rotting nor are they capable of flipping over large rocks; cultivating, as it is not possible to exert sufficient steering control over the machine to cultivate close enough to the crop rows; pulling a transplanter; bed forming; root digging, as the machine is not powerful enough to pull a root digger even when loaded with substantial amounts of wheel weights; etc. One's opinion may vary on this issue if the soil they have to work is very soft and largely rock free. That is not the case here in Virginia.

For my operation there are 3 core farm efficiency issues: weeding (cultivating), bed preparation, and transplanting. None of these activities can be efficiently performed using small scale equipment. It is either not powerful enough, accurate enough or just does not have enough weight and HP. A large amount of hand labor is required and with the problems in finding good workers and the cost of such labor it seems better to use human labor on tasks that generate greater return on investment.

Future Equipment – Year 4 and beyond

I have purchased a 45 HP Kioti DK45S tractor with creeper gear

I will purchase the following this winter:

Spader with power harrow

Bed former/drip tape/plastic layer

Transplanter – water wheel

Rotary Mower (Bush Hog)

26' by 60' greenhouse

Current Equipment

1994 Chevy pickup
2004 Ford van
11 HP Diesel BCS 853 2 wheeled tractor
Flail mower
Tiller
Rotary plow
Tool Bar with cultivating teeth
Root Digger
Troy 20 HP garden tractor and wagon
MTD 25 HP riding mower
Troy Built rototiller
MTD rototiller
Stihl weed eater
Cub Cadet mulching mower – 20 inch push
Wheel Hoe
Stirup Hoes 2 ea
Rakes
Shovels
Mechanics tools – large set
Carpenters tools – extensive set
Plumbing tools – medium set
Electrical tools – extensive set
Chain Saws, axes, mauls
10' by 40' greenhouse
Large shop
Refrigerated room
Large wash room
Misc - lots

Profits (or Not?) and Costs

Last year I chose not to discuss revenues as I considered it, at the time, to be extraneous to the subject at hand. I no longer consider that to be the case and wanted to offer some comments on this issue as it does directly impact those who might consider attempting to transition to this occupation.

If one is embarking on even very large scale family gardening where the goal is to provide their family's total sustenance then scaling for profit is not the point. Rather keeping expenses to the absolute minimum is critical, otherwise you are better off financially going to the supermarket. In this world using mostly hand tools, physical labor and maybe a tiller is all that is necessary.

Farming is another story. The purpose of this occupation is to grow large amounts of food so that others can work at other tasks. Doing one's part for The Division of Labor. After 3 years of using small scale equipment, inputting huge amounts of labor and having access to fairly lucrative farmers markets to sell my produce at, I think I can say with confidence that one cannot make enough money via the above methods to make this a viable occupation. At this point in time I am just about even in terms of expenses and revenues (not counting as the CPA's do - depreciation

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and all that- but in raw terms). This means that I have worked about 10,000 hours and my spouse has worked about 1100 hours for \$0/hr. That is not a typo. \$0/hr.

I am not counting as income the decent collection of equipment, tools and knowledge I did not possess before I started that could come in very handy in the future. But we are attempting to build an intermediate future that lands somewhere between the unsustainable present and civilizational collapse. So it is necessary to scale up the farm's capabilities without drifting into full industrial farming practices. I expect that in my "research/experimentation" process that I will try a number of the modern practices of vegetable farming used on 5-15 acre vegetable farms and see how they fit my needs/goals. Examples of these techniques would be plastic mulch (I am using straw at this time and will do both in 2010) and a heavy concentration on using transplants.

It is worth noting that my 2009 revenues were 2 1/2 times that of 2008 which were 2 times that of 2007. This indicates to me that I am learning and making progress even though I have not made a "profit" yet.

Costs: Home gardening can be done on the cheap. Even large scale home gardening can be done relatively inexpensively providing that one has the time and physical strength or a large family. Farming requires resources. Those resources can be partially counted in terms of family, paid workers, draft horses or slaves (the future anyone?), but it is certain that those resources will need to include lots of equipment and (dare I say it) machinery if the farmer is expected to generate enough extra product to allow others to perform their part of the division of labor. Equipment costs...a lot.

For this kind of farming to succeed in the future food is going to have to cost the consumer a lot more and a lot of other professions are going to have to give up their overpaid ways.

Health and Welfare Issues

Another factor pushing me towards increased mechanization is the physical toll that minimal equipment farming takes on your body. I have reached the age where, no matter how much effort one puts into maintaining strength, there is an inevitable physical decline year on year. Over the last three years I have noticed some of that decline and suffered a number of minor issues that I can attribute to aging. My knees and lower back cause me problems if I kneel or bend over for many hours while harvesting and weeding. This will only get worse and is a common complaint of vegetable farmers much younger than I. I have one shoulder that is very painful at times due to arthritis and one can expect the other to follow in due course. I have a partially bum hip due to an old work injury that flares up occasionally. I age ... unfortunately. Increased mechanization will allow me to extend the timeframe that I can perform the physical work of the farm. On the plus side I think that I can claim that I am much more physically capable than the average 55 year old and the positive impact of this occupation/lifestyle on ones mental health cannot be overstated.

Publications

These are resources that are very useful to someone working towards the type of operation I am running. Always keep in mind that what works for one expert grower on his farm in a certain part of the country may not work well in your circumstances. Some of the claims that people make in books leave so much of the rest of the story out that they may as well be making it up (Though I

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have seen it written I do not believe that one person can farm 2 acres of crops, harvest them and sell at markets and gross \$25K an acre. That is a 5000 hour/yr job).

Growing for Market – magazine
Johnny’s Seeds – catalog, has great info on growing various crops
High Mowing Seeds – catalog, great growing info as well
How To Grow More Vegetables – Jevons
Square Foot Gardening – Bartholomew
The New Organic Grower – Coleman

Though I have a lot of books on farming/gardening and have read many others, I have not found a really good book on how to farm. People like Coleman write books on advanced gardening and other farmers write books that are for experienced farmers. I do not think a high quality book on beginning farming exists. Most of farming seems to have to be learned by direct observation, hands on attempts and through trial and error. Planning skills are crucial. Crop knowledge is crucial. Markets are crucial. Everything is crucial.

The Future

One can always change their minds of course or have life decide to shove you down a different path, but I think this is it for me. I figure to run this one full out to the end. My wife is planning on ending her own personal life sentence in the business world and will join me in the spring. She has a lot of ideas and is very enthusiastic not to mention a workaholic too. It looks like full commitment with no intention of looking back.



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