

ACORN

ATLANTIC CANADIAN ORGANIC REGIONAL NETWORK



ACORN Organic Conference Notes 2009 February 26-28, 2009 Truro, NS

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2009 ACORN Organic Conference Notes

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Choosing and Using High Tunnels

with Av Singh and Josh Oulton

There was a lot of hype about High Tunnels around 50 years ago. They were originally used in the mid-west states and were an interest in Asia 20 years ago. Today 90% of strawberries in Europe are produced under tunnels.

They are solar heated greenhouses (hand ventilated, same as hoop houses – they are not cold frames)

The purpose is season extension, not winter growing.

Unique – can be high (15 ft – small fruits trees, high enough for tractors)

Can control water – need irrigation systems

Advantages:

Low cost structure for high value crop – strawberries, peppers, tomatoes, raspberries.

Wind and sun protection (shade cloth), increase soil and temps,

In Kentucky they went from zone 6b to 8a with high tunnels (here zone 5a/b) and with 2 sheets of plastic you can add 186 to 227 days to your growing season (extension).

For us, with single layer we increase temperature by 3-4 degrees and we get 40 more days.

Disadvantages:

Higher daytime temperatures can cause more work; must ventilate, it isn't free protection (have to do other things like throw on row covers), hot temperatures for tomatoes can increase spider mites, declined pollination (bumblebees are heat sensitive), increase the need for irrigation etc. In terms of weather, they are not thunderstorm proof – you need to watch the weather. Pack it all away for winter, as the metal structure is not strong enough to deal with snow.

Cost comparisons:

Can be \$2.50-4 per square foot.

25% cost for end walls (lumber, etc.)

Greenhouses cost 5x more for infrastructure (metal/glass/plastic)

Location:

Location is less of an issue than with greenhouses.

It is important to consider drainage and wind location and orientate for wind ventilation (to reduce disease due to poor ventilation). A 6 mm plastic can last for 4 years in UV intense places, some in Canada can last up to 8 years with proper care.

Side-walls at 5ft add more ventilation, while lower side walls creates more heat.

In terms of Organic production this method is not necessarily mobile (unless on skids like Elliot Coleman). They can be considered fixed structures with good fertility, organic matter content, where the drainage of soil important (use raised beds for organic systems if you don't have the best drainage). It provides a high value crop, so you don't necessarily use green manure (use compost to amend soil) and remember the site choice is important.

Other notes:

You need a post pounder to set up metal.

In Spain the ends are open and sides closed, and bird netting is used.

April is the month to roll down plastic.

Haygrove tunnels:

In 2004 with AgraPoint, tunnels for sweet cherries were tried. 6 years old now, they are having trouble with birds and splitting and rot from rain. Ultimately it has been a great success, compared to total loss outside; only covered up when cherries are green (tunnels are only up for 1 month). You have to start small (you get 15 years from cherry tree).

Next year they will have 1 acre of haygrove zucchini and okra, tomatoes, seascape day neutral strawberries, raspberries (series 4 tunnel), and 1 acre of grape tomatoes and habanero peppers.

- Use row cover too to help protect plants in April.
- May 24th is the 1st pick – and picked into November.
- There is easier management and picking because of the protected environment.
- Use trickle irrigation for total control of moisture, with no overhead moisture.
- Feed heavy at first for tomatoes, then starve them.
- Can have control over shape of hoops (bend tops and sides) depending on needs.
- Put in hoops in spring (not in June)
- The doors need to be straight.
- Use high tensile wires to secure hoops, use ropes between hoops (more important part of tunnel – adds strength).
- Keep tightening during hot days, half hitch to hitch on hoop.
- Clips are important too.
- Pull plastic over; this takes 15 minutes with 4-5 people.
- Doors can be rolled-up, not tight because they flap, they can cool the tunnel down in spring and fall, streamline doors better.
- Push snow off in winter.

Installation:

- Bending – 90 hrs (3 days, 3 ppl)
- Anchor – 30 hrs
- Hoops up – 30 hrs
- Braces – 60 hrs
- Total 210 hours @ \$10.00/hr = \$2100.00

Annual costs venting every day, etc.:

- Skinning – 80 hrs
- Rope tighten – 48 hrs
- Venting – 84 hrs
- Hibernation – 80 hrs
- Total 292 hrs @ \$10.00 = \$2920.00

Challenges:

Stress of when to skin and de-skin

When and how much to vent

Bugs

Dealing with trickle (not fun)- - depends on soil type

Strawberry plants got downy mildew, tomatoes died of late blight outside, but not inside the tunnels

Pricing:

Based on three bay 200 foot tunnels

haygrove = \$0.81 sq ft
tunnel pro = \$2.09 sq ft
plastic tech = ?

Cost difference between tunnels and field:

- \$9000 to cover an acre of plastic – with strawberries it could pay back in 5 years
- 16,000 quarts to the acre in June and September
- Payback changes year-to-year depending on weather.
- Tunnels can provide a buffer to unexpected conditions like cool wet summers.

Small-scale alternatives: 20 x 60 used for small-scale -- 2 inch plastic tubing

More notes:

- Cost of irrigation system: \$600 trickle tape Dubois (does 3 acres), then they need lay flat header tape.
- Good for crops – trickle (clean lettuce, not splashing), the drier the plants, the less disease pressure
- Applied apple pumice to keep organic matter up, lots of manure, compost and tea application all keep the soil rich.
- Soil amendments (compost and manure) are applied in spring.
- By mid-April start harvesting radish and lettuce, beans were planted in April.
- Heavy rain goes between tunnels; put holes for somewhere for the water to go, good drainage is key.
- Tunnels level out maturity of tomatoes.

To conclude, Av showed Vermont extension videos on High Tunnels.

To see pictures go to: <http://www.acornorganic.org/pdf/haygrovepresentation.pdf>

Starting the Transition to Organic with Rupert Jannasch

Cover crops/Green Manure:

- Vetch is slow to establish and difficult to incorporate but well suited to acidic soils. It is good at nitrogen fixation and weed control.
- Fields that grow over with weeds can be green manure as long as you mow before the weeds flower.
- Brassicas cleanse the soil but there is a problem if you grow brassicas as vegetables in your garden regularly, as they all attract similar pests.
- Pearl millet cleanses the soil and provides weed control.
- Clovers are effective underseeding vegetable crops. (Elliott Coleman talks about underseeding and intercropping in his book the New Organic Grower and these techniques are great for market gardens.)
- With municipal compost you need to mix in plant matter -try grasses and oats.
- With green manure keep in mind above and below ground mass. It is good to have reaching roots and underground mass.
- Manure is essential for soil fertility. Compost loses valuable carbon through steam and can burn.
- Windrows and manure, takes longer and keeps nutrients. No heat so doesn't kill weeds or pathogens. Don't need to turn it.
- Manure can be used at various stages (of age); raw, it feeds nutrients to the plants and aged, it feeds the soil/soil micro-organisms.
- There are other options for nutrients: fish waste, sawdust, etc.
- New research is ongoing.

- Trucking costs are often prohibitive.

Application Form (organic accreditation)

- Have a good set of farm maps
- Organic plan: usually the application form is accepted as your organic plan but this depends on certifier.
- The organic seed search is becoming important. You must demonstrate that you looked for organic - even though it's sometimes not available, especially with preferred varieties and hybrids. Make sure your seed is untreated. There does exist organically treated seed. First figure out what seed/characteristics you want, then look for them organically. Cover crops are generally available but maybe not in the Maritimes.
- How much detail? You want to establish a good relationship with your certifier and inspector so be complete, don't skim over or skip questions.

Inspection visit

- Length of visit varies with each farm.
- Generally do not have to show financial records but they may want to look at invoices and trace the product back to the field.
- The audit trail shows how every crop purchased was grown, where on the farm, what was applied etc.
- Set up a good book keeping system.
- Transition year depends on circumstances of farm and certifying body. New standards mandate a 12 month transition period from date of application. US standards are less stringent.

Getting into greenhouse vegetable production:

- Consider work, water and weeds. A lot of work and ongoing weed control.
- Make sure the greenhouse is versatile. Consider height, airflow and what crops you'll grow in there.
- Size- what equipment can you use inside? Small can be awkward.
- Airflow- roll up sides
- Watch overwatering. Increase in humidity leads to an increase in chickweed.

More thoughts on organic production:

- For fertility Rupert uses aged manure, gypsum, poultry compost.
- Standards on manure are changing, becoming less stringent. Need more information on what is allowed, different certifiers, different answers. Ask OCIA.
- Animals do not need to eat organic feed.
- Be careful of GMO feed and antibiotics.
- If there is not enough organic manure, first use organic, then transitional. Be aware, certifiers are talking about compost requirement for manure.
- Wait 90 days before harvesting edible crops after spreading manure.
- Parallel production is allowed. (Rowena and Roxanne say parallel is not allowed but split is. As long as it's not the exact same crop/appearance).
- Be very careful to keep crops separate, and grow different looking crops.
- For permitted materials look at the Canadian list, don't rely on suppliers.
- Perennial crops- don't rush. Do proper tillage and soil preparation.
- Blueberries- have lots of upfront costs. You can do it in pieces. Rupert uses sawdust as mulch.

Remember that having a farm certified organic does not necessarily mean it is functioning biologically!

The best indicator of how your farm is functioning biologically is to watch how weed flora changes. Transition usually takes 3-5 years biologically. If you are not fascinated by soil biology don't become an organic farmer.

You need to include livestock and develop your own market. You need to think about buffer zones (8 meters), about winds (and what is happening upwind) and think about ground and surface water. We also need more kids on farms; they should be part of the organic plan.

Alternative On-Farm Energy: A Farmer Panel **with David Cozac, Gus Swanson and Achim Mohssen-Beyk.**

David Cozac:

Big Sky Farm is off the grid in New Brunswick and relies on solar power for all its electricity.

- When they started in mid 1990s, there was little support for alternate energy in NB
- Found support in US, also used solar equipment

They use 2 kinds of solar power:

- Passive (large south facing windows in their house allow solar gains)
- Direct through 12, 4x1 foot panels
 - System includes panels, wire down to inverter, 12 6volt deep cycle batteries, and a meter to monitor the system.

Learned energy conservation while working abroad.

When you start an alternate energy system, you have to size all your needs to decide how large of a grid you will require.

- They are able to power all their household needs with the system (lights, TV, radio, computer, kitchen), however with the present 1500 W inverter, a vacuum cleaner will strain the system.

It is necessary to overcharge the system at least once per year to equalize the batteries

There is the option of joining the power grid system while still generating your own power, however when the whole grid shuts down you are also affected.

The house was designed with a custom wood stove and furnace (includes an oven, the hot water heater)

- They typically burn only 2 cords of wood per year (half of that is for heating)
- The layout of the house is open concept to facilitate heating, and they have basic 6'' cellulose insulation.
- Windows are double paned and argon filled.

In 1994, the system cost approximately \$6500 to start up.

Achim Mohssen-Beyk:

Achim is an organic farmer from Price Edward county in Southern Ontario.

The cheapest way to have renewable energy is through conservation.

They live beyond power lines in Ontario.

When they started they made lots of mistakes (including hiring a consultant).

- As in all farming ventures, with renewable energy everyone is constantly learning

Energy

- Easiest way to become self sufficient is to cut consumption

- Open curtains, unplug unnecessary appliances, change old bulbs and appliances
- By the time you get off the grid it will be easy if your consumption is low

Their grid was designed by an engineer unfamiliar with farming.

- Wind and solar components contribute to a 1.6kW system
- For the price of a medium size car you can go off the grid

4 years ago insurance was difficult to find for their farm.

Farmers can use their land to produce energy.

The idea that the Canadian climate is poor for alternative energy is false.

- Solar panels are actually more efficient in cold weather

Most of the equipment you buy for a system requires improvement in some way.

- Particularly wind generators
- You can do this yourself, don't always trust the experts and give it time

It is not currently legal to cross lines with neighbours.

- Any excess has to be sold into the grid
- This is a big obstacle to sustainability

Doing things small scale is better, however they found the conversion to biomass/biogas difficult to accomplish on a small scale.

We need independent people and communities producing their own power.

Gus Swanson:

Pictou NS, Eco Equipment

Gus designed a furnace that burns hay pellets.

Typical wood pellet burning furnaces get plugged up by the sand content in hay

New furnace automatically removes sand

Hay pellets are durable, will last for over 2 years, burn efficiently, and meet EPA standards.

- Reed canary grass is mostly used in hay pellets
- They have a low moisture content and are easy to transport
- 1 Tonne of hay pellets is around \$200 and equivalent to \$600 worth of oil
- Grass can be produced locally, with lower costs of production, little transformation costs to turn into fuel, little transportation needed
- Hay is broken down to 4-6" lengths, dried, passed through a hammermill and then a pellet mill with no binder needed

Wood pellets are currently under-supplied.

The new furnace can also burn wood pellets if desired.

The furnace is only 14 inches around by 45 inches high.

Planning the Family Farm Succession Plan with John Anderson

*Part of a private company called the Canadian Farm Business Council (visit farmcentre.com)
Farmcentre.com is an award-winning, trusted management resource for farm business managers and other in the agriculture industry. It is updated daily by the Canadian Farm Business Management Council (CFBMC).*

The Canadian Farm Business Management Council (CFBMC) is the only national organization in Canada devoted exclusively to developing and distributing advanced farm management information.

Supported by Agriculture and Agri-Food Canada and a growing number of private partners, the Council is fulfilling a significant role in nurturing a thriving Canadian agriculture industry.

Succession-What is it?

A planning process

- the how
- the management

It is a process that takes a long time before the technical, legal and accounting mechanisms are enacted.

It is a process that happens over a long period of time- how long depends on each case.

Very few farms have any plan in place, especially in the Maritimes and it is therefore a very important issue to address.

70% of all second generation farms fail (who do not have a plan in place).

90% of all third generation farms fail (who do not have a plan in place).

WHY?

- they did not plan for succession in a timely way
- family dynamics
- it is often viewed as a waste of time
- people often mix up decisions based on personal/family reasons rather than business practices.

Big business decisions have to include all members of the family.

It is impossible to make it without senior generation involved. Mostly because of all the capital required.

Management Transition has evolved:

- Personality profiling
- Lifestyle,
- Professional Exchanges
- Professional facilitation teams
- Non-family members
- Best management practices
- People that want to come back to the land

The Biggest challenge is COMMUNICATION.

- Vision is key-looks long term
- 5-10 years- too often not taken into account
- Fears of take-over
- going to lose the farm
- going to go out of business
- do we work to live or live to work?
- the new generation takes time to relax, have family goals, seek new opportunities

Must open lines of communication

- define goals and objectives, assess expectations

Examine:

1. Business side of things to teach
2. Communicate
3. Strategic Planning
4. Financial management
5. Restructuring (tax/legal)
6. Insurance protection
7. Retirement planning

50-70 thousand dollars to meet the needs of one small family

Expectations of take-over could be unrealistic. You may need to wait or take BABY STEPS.

Acknowledge:

-influence of the family circle

-income of business

-difficulty of creating a farm plan

-that sons'/daughters' work is not hired hand, input and thoughts respected. A raise (maybe, has to be viable) raise=more work, probably

BUY IT! No give-aways - makes little economic sense.

Consultation and farm plan from this firm can range from \$6-25,000. Government can pay half

April 1st look up *growing forward* used to be Ag policy framework

Provincial programs are different. ACOA-government funding.

Recommended Book: Managing the Multi-Generational Farm

*See John Anderson's detailed materials posted here:

<http://acornorganic.org/pdf/JAsuccessionplanning.pdf>

Growing Great Greenhouse Cukes

with Cindy Rubinfine

We have been learning to grow GH cukes since 2001. In our part of the world the heat and protection of the GH make a huge difference in yield, quality, and length of harvest for this crop.

Seedless GH cukes are relatively easy to grow. If you have a GH that can be kept at over 18 degrees economically, and that you can exclude pollinators and cucumber beetles from, this crop is well worth the effort. For us, they bring in some cash relatively early in the season. They are popular with our customers, and command a good price until field cukes become available – around mid August in our area- so we try to have them by mid June.

They are the least hardy crop we grow. GH cukes will be set back at temperatures below 18, and can be actively damaged at temperatures of 14 and below. They can tolerate temperatures as high as 35 and more.

GH cuke seed is generally expensive. Fortunately, germination is usually close to 100%. We have not found it worthwhile to grow field cukes in the GH. Choose gynocious (all female), parthenocarpic (sets

fruit without pollination) types to get the fancy seedless thin skinned varieties. Our customers are diverse. They like the long English cukes like Carmen and Tyria, American style cukes like Sweet Success, and we have been asked for mini English type cukes as well, so we will trial Piccolino this year. Most sources recommend planting only one seed per cell or pot, and our experience bears that out. In late March we start our transplants on a heat table in our cellar. We tapped into our hot water wood furnace with a mixing valve, and we start our seeds over warm water pipes, under 40 watt regular cool daylight fluorescent lights. We keep the temperature around 26.

Most people start cukes in 72 cell trays and transplant the seedlings into 3 to 4 inch pots. We start ours right in the 4 inch pots. I have sometimes found it difficult to transplant in a timely fashion, and cukes can suffer serious setbacks from becoming potbound.

To avoid damping off, we keep them warm. The first watering of the seeds is done with kelp in warm water, and after germination I actually water once with diluted chamomile tea. It does seem to have fungicidal properties. We never water the seedlings with cold water. After the first week, the plants are watered with Gardener's Dream liquid fish, and Acadian Seaplants soluble kelp, each once per week, and we water as needed to keep them from getting dry- usually 2 or 3 more times per week, with plain water. We also spread the plants out on the table so that they don't touch each other. This helps prevent the plants from becoming tall and spindly. When they have 4 sets of true leaves, they are ready to go out in the GH, usually in about 5 weeks. We don't harden them off much, just turn the heat down a little on the table. They don't hold well in the pots, so timely transplanting is important.

The Fall prior to planting here, we worked 40 lbs of lime into each of the beds. Cukes thrive in soils with a ph of 6.8 to 7. Last Spring we worked 20 lbs of rock phosphate, 10 lbs of kelp meal and eight 5 gallon buckets of well composted manure into each bed. The growing beds are 3' x 60'. We plant our cukes in a single row down the middle of each bed, about 18" apart. We heat the GH with a woodstove, with a horizontal airflow fan behind it. We do arise in the night to feed the woodstove! We aim to keep the daytime temperature around 25 degrees or so, and close to 20 at night.

These plants are in the GH a relatively long time. It would be difficult to have the soil provide all the nutrients needed for continued growth and production. After the plants have been in the GH a few weeks, and are each clipped to their strings, we topdress with a bit more compost, lay a dripline on each side of every row (2 lines per bed) and mulch the beds with a mixture of grass clippings and hay. We water at least 3 times per week for 2-3 hours at a time. Each bed gets approximately 330 liters of water per watering. As we begin harvesting cucumbers, we also begin to fertigate through the drip irrigation. We feed fish and kelp each once per week, and Epsom salts several times in the season. This year we will also try compost tea - but not through the drip. Other growers do foliar sprays, and they work well too. It is important to spray at the right time of day, so the leaf pores are open. Cool early mornings work well. We avoid foliar spraying because I don't like to wash cucumbers - sprays can make them look a bit mottled and dirty.

Once the cukes are planted in the GH, timely pruning is a crucial component of a long term high production program. We learned the hard way some years ago that if you let the plants run they will produce rampant vegetative growth, turn the GH into an impenetrable jungle, produce less saleable fruit and impair air circulation- thus paving the way for disease. They differ from field cukes in that plant growth can be almost unbelievable in terms of both quantity and speed.

Most growers agree that the first 10 fruits should be pruned right off, along with the suckers, to get plants well established. We clip the plants to nylon tomato twine with tomato trellis clips, and remove

all suckers as soon as they appear. There are many manuals that offer detailed pruning instructions, and some methods are detailed in the handout. We fight to stay on top of pruning, scheduling in a few hours for it every week.

We have two cables, about two feet apart, running the length of each bed eight feet above the ground. The strings that we clip the cuke plants to are tied to these cables, with an extra eight feet of string to use when the plants are lowered. The strings for alternate plants going down the row are tied to opposite cables to give more growing room for each plant, and better air circulation. This is known as a V cordon. When the plants grow up to the cables we lower them. This is done by undoing the slip knot at the cable, letting the plant down several feet (very carefully), and moving the string down the cable several feet. All the strings on one cable are moved in the same direction down the bed, and the strings on the other cable are moved in the opposite direction. When a string reaches the end of its cable, it “turns the corner” at the end of the bed and starts down the other cable in the opposite direction. All of the lower leaves are also pruned off at that time.

We use high-tensile electric fence wire for the cables because it is strong, rust-resistant, and not too expensive. It’s very important to build a sturdy frame at each end of the greenhouse for attaching the cables. A good crop of cucumber or tomato plants is HEAVY and exerts a lot of pull on the cables. The endwall framing of most greenhouses isn’t strong enough to withstand this pull. Anchor 4” X 4” uprights at least three feet in the ground, and use a 4” X 4” cross member for the cables to attach to. It’s OK to attach the cross member to all of the vertical framing members of the endwall for extra strength. An alternative method is to simply build the endwall itself with enough strength to take the pull.

Once harvest has begun, cucumbers should be picked almost every day. They can become overgrown and unsaleable overnight. After we pick, we cool the fruit in tubs of cold water, air dry them briefly, and pack them into plastic bags in picnic coolers. If you have a proper vegetable cooler, the cukes should still be either bagged or shrinkwrapped to prevent transpiration and wilting. Surprisingly, the cooler should not be TOO cool! Cukes prefer temperatures of 10 to 12, rather than colder. If stored in a cooler close to 0, they can develop pitting and soft spots.

I would like to conclude with some comments on pest control. In a cuke house, even a bee is a pest! If the flowers are pollinated, fruit can develop a soft bulbous end, seeds, and some varieties will develop a bitter taste. We screen our cuke houses with regular window screen attached under the rollup sides. It comes in rolls of about 100’x 5’. So far, this has excluded pollinators and striped cucumber beetles, without impairing air circulation. Window screen will NOT exclude aphids, spider mites and other tiny pests.

Common pests include spider mites. They thrive in hot dry conditions. Bare soil facilitates their movement. We have not had spider mites, and we feel this is because we mulch the growing beds and encourage the growth of clover and grass in the pathways between the beds. We have experienced cotton aphids: *Aphis gossypii*. We controlled them with *Aphidius coleman i-* a parasitic wasp, and *Aphidoletes aphidomyza* - a midge. Cotton aphids in cucumbers can increase 12 fold in 7 days, so scout for pests every single time you are in your GH! The earlier you discover a problem and act, the less damage will be done, and the better your chosen intervention will succeed.

If you choose as we do, to use biocontrol rather than sprays, tailoring your predators and parasitoids to both the specific pest and to temperature, daylength, and humidity will give the best results. It is important to identify aphids down to the particular species- different predators and parasitoids prefer different species of aphids. Introducing biocontrols promptly is important too. We always scatter plantings of carpet of snow sweet alyssum throughout our greenhouses to provide a nectar supply for

beneficial insects. Adult parasitic wasps live on pollen and nectar, and other beneficial insects consume nectar in their breeding phase. We try to maintain a continuous population of beneficial insects so that we don't have to keep re-introducing them.

Growing Great Greenhouse Peppers

with Mike Rabinowitz

Varieties:

Sweet: Ace*, Antohi, Banana Bill, Gypsy*, Jingle Bells, Orion, Paprika Supreme**, Sweet Chocolate

Hot: Early Jalapeno, Pretty in Purple*, Riot*, Super Chile**

*productive **outstanding

Seedlings: The first peppers were started on February 28 under fluorescent lights in a cooler room converted for sprouting in the winter at the Organic Farm located in Portugal Cove, Newfoundland. The lights were the exclusive source of heat. 48 packs were used. We started more peppers in April using a greenhouse in a greenhouse. The growing medium was Pices in a Blue Bag potting soil, an organic mix. Germination rates were very high for all varieties and the peppers tolerated the very cold spring much better than the tomatoes, cucumbers, or eggplant.

Planting in Greenhouse: We planted four rows of peppers in one greenhouse between June 14 and June 28 even though the temperatures outdoors exceeded 10C on only three days until July 2. Rows 1 and 2, and Rows 3 and 4 were two feet apart. Rows 2 and 3 were three feet apart. When we found some room in a second greenhouse, we planted two additional rows of peppers in mid-July. The rows were two feet apart. Peppers were planted 18 inches apart in all rows. Strings were tied to posts located just outside each pepper row and used as supports. The peppers were secured to the strings using twist ties. The greenhouses were fertilized as the remainder of the farm, for 1000 sq feet - 1.5 kg Potassium Sulphate, 2 kg kelp, 6 kg organic alfalfa meal, 2 kg Envirem certified manure pellets, 1 handful of lignite (lime if necessary).

Greenhouse Temperature: We used no heat source other than the sun. Small pepper plants were covered with plastic soda bottles in June for additional heat.

Mulches: none

Irrigation: Soaker hoses for drip irrigation, 1 line per row, about 3 times every 2 weeks.

Fertigation: Foliar Spray, Envirem salmon emulsion, once per week

Pests: Foliar Spray, Envirem salmon emulsion, once per week, keeps the greenhouse free of aphids and white flies. No other pests.

Pruning: Remove broken branches and diseased leaves.

Harvests: as necessary, air cool in cooler.

In 2008 about 11 weeks, 150 peppers per week from 6 56 foot rows.

In 2007 about 13 weeks, 130 peppers per week from 4 56 foot rows.

Additional Comment: This information is presented to encourage home gardeners and farmers to grow peppers because a large variety were easy to produce over a very cold summer in an unheated Newfoundland greenhouse when almost all tomato varieties failed. The spacing used was based on recommendations for growing peppers outdoors in warmer locations. Growers that have heated greenhouses and want to engage in year long production of sweet peppers are urged to read the information on the Government of Alberta website noted below.

Useful References:

Growing Greenhouse Vegetables publication 371 Ontario Ministry of Agriculture www.omaf.gov.on.ca

Handbook of Vegetable Pests. Capinera Academic press

Knowing and Recognizing the biology of glasshouse pests and their natural enemies

ohioline.osu.edu/hyg-fact/1000/1618.html

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/opp2873](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/opp2873)

Record-Keeping for the Organic Audit and Integrity with Rowena Hopkins and Roxanne Beavers

Keep in mind and be respectful of the fact that the inspector doesn't make decisions, they only observe and record.

There are two aspects of inspection: farm/site and recordkeeping.

Be familiar with the relevant standards.

Contact COG and ask for a copy of the guidance document that has the standards and interpretations.

Planning:

Organic System Plan- done before, stating intentions

- update annually
- consistent procedures
- description/history of farm
- planned production
- practices and procedures
- monitoring practices

Farm Records- done during and after

- ongoing, variable data, dates, quantities etc
- tables, charts, graphs

The key is to put the work into the system plan (details of operations etc.) and then you can just refer to it in the records.

The Organic System Plan includes:

Field Maps

- boundaries, buffer zones, adjacent land uses
- to scale
- orientation

- prevailing wind direction
- Consistent numbering/naming system (that you actually use!)
- Important landmarks: buildings, roads, ponds, watercourses
- Can use google maps or surveys

Plot Plan

- Description of bed
- What's being grown, how much
- Try and keep it consistent, if not, keep records

Field History

- What has gone on: what crop planted, what amendments
- Tracks activity
- Can put date of last prohibited substance (keep 5 years of records)

Rotation Plan

- Need to show that you have thought about it
- Consider factors (root depth, pests, nutrients etc.)

Input Documentation

- Make sure you have product labels and source documents.
- Record substance, purpose, composition and source

Seed Search

- show you have purchased organic seed where available
- show you've looked in at least three places that are known to sell organic seeds

Farm Records

- Ongoing – maintain for 5 years
- Record specific data,
- Demonstrate that the Organic System Plan is being followed
- Identify Organic Control Points (points of risk of contamination)
- Include any changes to the Organic System Plan
- Enable traceability of your products

Traceability

- documentation control procedure to trace product back to field/amendments etc.

Practical Record Keeping

- clear, logical, consistent, complete, easy to retrieve

Types of Record Keeping:

farm journal/activity log (day to day)

- can be a calendar, record daily events eg: plowed field 1, turned compost: temperature was...
- paper or computer

input records: everything coming into farm, introduced/added

- compost mix- what is in it

- purchased products and livestock – NEED RECEIPTS!
- if it's something you do all the time, MAKE A FORM
- Seeds, seedlings, rhizomes, bulbs and tubers, bushes and trees
- Newly acquired livestock
- Fertility inputs
- Manure and compost
- Soil amendments
- Row covers and screening
- Purchased beneficial insects
- Foliar amendments
- Bacterial inoculants
- Green manure seed
- Biodynamic preparations
- Pest control products
- Powders and sprays
- Weed control products (incl. mulch)
- Ingredients for processed products.

process records- something you do

- Weed control
- Pest and disease control
- Fertility (foliar and soil amendments)
- livestock records
- medical treatments
- harvest or slaughter records- how much, who, total labour
- clean out logs for trucks, equipment
- processing and packing
- transportation
- consolidate at the end of the year for annual data

monitoring records – things you observe, test results

- soil tests
- compost/manure test
- tissue sampling
- weather
- water test
- animal health records

inventory records: # livestock, grain, equipment

- livestock numbers
- grain bins and silos
- storage crops
- planting seed (good for ordering purposes)
- processed foods and storage crops
- processed product ingredients
- have a form and keep track of in/out. Keep a running total

sales/output forms: receipts, market records

- label: use lot number (can be date of harvest)
- receipts
- delivery slips
- invoices
- market records

- bills of lading
- scale/weigh tickets
- record of sales- do an annual summary

all letters: communication with farmers, customers, suppliers etc. that demonstrate organic integrity where farmer is not in complete control of a product/process

- borrowing, leasing or lending storage, harvest and transportation containers, equipment and trucks
- Communication with neighbours if they are not organic. Get detailed letters signed, eg: “I don’t spray on windy days...”
- Prior land use
- Written agreements with custom harvesters

Common Mistakes in Record Keeping:

- incomplete/late paperwork
- not annually updating plans
- no organic seed search
- not keeping field activity log up to date
- not recording clean-up activities

To see hand-out from presentation visit: <http://acornorganic.org/pdf/recordkeeping.pdf>

OACC Presents: Can organic agricultural systems provide food security in Atlantic Canada? with Ralph Martin, and comments from the audience (marked *)

To see the power point presentation visit: <http://acornorganic.org/pdf/RMlandfood.pdf>

The OACC is a small core of researchers in Truro, providing a national link to organic knowledge and research from universities and Ag-Canada. They include knowledgeable people in organics and give web courses as part of university curricula; linking organic knowledge with the symbol of the earthworm.

Organics is: “Healthy food from healthy soil”; balance and wholeness; quality (of food and soil) over quantity; organic food is higher in minerals and essential amino acids and vitamins, and consumers’ tastes are a major reason for choosing organic; antioxidant levels are higher and more mineral dense, as well as lower in nitrates.

Reduced pesticides of organics in two senses: 1. an accumulative effect and 2. an interactive effect. Like our bodies, chemicals can accumulate and interact with systems. Studies show children on organic diets (at 75% organic food) vs. non-organic diets have urine samples showing 9x lower levels of organophosphates. Pesticides are however, still used in organic agriculture. For example, vinegar is a pesticide.

This forecast will look 7 generations back (circa 1830s) and seven generations forward: compare your great grandchildren and your great grandparents as spanning this time period.

Joseph Howe (1830s): bring power to people less to monarch in Nova Scotia.

1830s in perspective: about 1 billion people in the world, 130 thousand in NS; before oil.

Compare to today: 7 B people, 913 thousand in NS, and we burn 85 M barrels of oil a day around the world.

Future: Issues will include: oil, climate change, resource conflicts, populations and rising sea levels.

*In terms of politics, politicians are vulnerable and at risk of losing support if they step out of line with the status quo: thus, we must support those politicians who do stand up for these issues.

Land will have a four-fold demand, the 4-“F”s: Food, Fuel, Feed, and Fibre.

This forecast has the following assumptions:

-Maritimes: about 10% of food from sea (>0.3% global average)

-Imports and exports will be low (*today: 7.2% of food \$ go back to farmers, where NS grows about 15% of its food)

1. Feed: Maritimes has much land that is shallow and on steep slopes, where if land is not covered, it will be lost to erosion. Therefore, soil must be covered. This is the ideal land to use as feed for animals, or grow forages for animals.

2. Fuel: If about half the land in NS will be required for the other three “F”s, the rest can be used to generate fuel. This could be in various forms, such as grass pellets, converting sewage to biomass, other biofuels etc. Energy could still be derived from other sources, such as wind, solar and tides.

3. Fibre: Examples of possible fibre crops include: Flax, trees, cereals, straw, wool (which currently has an exorbitantly low price in a world that may soon require more natural fibres, of which wool is an excellent one) and other animal fibres.

4. Food: If each person requires about 0.5 hectares, that means that 1M people in Nova Scotia in 7 generations will require 450 thousand ha. Today, we farm 400 thousand ha with only 140 thousand ha in crops and livestock; 1.1M ha are considered class 2 or 3.

*Future farming may not be able to farm the same kinds of land in the same ways that we farm them now; other forms of labour may be required; this may be especially true on these steep slope land surfaces; oil-based machinery may be rare or obsolete.

Of the 1.1M ha of class 2 or 3 land in NS, about 25% is lost to roads and urbanization. This means that the forecast will allot 825 thousand ha: half to food and feed, and half to fuel and fibre. This assumes a low population growth.

Major shifts in a short period of time are not impossible: for example, WWII saw car factories rapidly converted to arms manufacturing plants with an entirely new workforce (i.e. women).

Today, our agricultural systems depend on nitrogen fertilizers: about 40% of people in the world depend on the Haber-Bosh process for basic food; by 2050, that could be 60%. Agriculture budgets about one third of its energy budget to nitrogen fertilizer. Driving tractors is not as big a consumer of energy as nitrogen fertilizer.

We can, however, reduce this nitrogen (and hence energy) dependence by doing the following:

1. Legumes can provide nitrogen, especially in forages.
2. Reduce meat consumption; human inedible foods can be fed to livestock
3. Reduce waste. For example, Sobeys claims to discard about 40% of its produce due to rejected quality on the shelf.
*discarded foods can (and were) fed to animals like pigs
4. Recycle biomass; sewages?

Phosphorus is deficient in most organic crop farms, where livestock farms have a P surplus. Inorganic P is from mines, and is not recyclable: thus is exported out. Mycorrhizae and other microbes can be used to make P available, however if P is exported in harvested crops, it is still in debt. Manure from conventional farms may be contaminated with pharmaceuticals and GMOs. This manure however, could

be used for non-food crops. A Swedish process can extract P from sewage, so that sewage can be useful. Edmonton also has a pilot product to do the same thing (*energy intensive?)

Other major issues in the future will be yields and price of food.

Malthus: with an increase in population without an increase in food, populations will be forced to decline. However, we have dodged this logic by using unsustainable food production systems at the expense of resource depletions (esp. oil, organic fertilizers and aquifers).

Thus the question: how will we feed the world in the future? However, seeming as we consume more than we need, how much feeding will be required? Our food system is tightly tied to oil consumption, and without it, conventional food production may not be capable of feeding the world.

The impact of fat and meat consumption of food production cannot be underestimated: perennial crops must increase with the increase of land per person. Without meat, the need for land per person will decline rapidly. However, in the Maritimes, land for forages is essential in part because of the need for soil coverage, and ruminants are the most efficient at digesting these types of crops.

The future will require both local and organic foods. But is local less efficient? In the UK, they found that importing NZ lamb had a net lower energy input than consuming local lamb. This was due to the high dependence in the UK sheep pastures on high-energy N-fertilizers.

The new food question will be: How will *we* eat food in *our* sustainable communities? Michael Pollan: "Eat food, not too much, mostly plants." (Why "Eat *food*?" Because many foods have un-foodlike additives!). Other issues will be: fellowship, preventing and reusing waste, nutrition, wholeness, flavour etc. Sustainable communities have rich soil, clean air and water, healthy food and healthy people. Observe results to observe consequences. Honour farmers. Council of All-Beings. Earthworms are a part of our community. Consider the 7 generations in the past and the future.

Farmers must work together with consumers; Institutions buying local foods; gardens; Teikei system (Japan): a good example of producers working closely to supply consumers and meet their demands, where the food makers balance their amounts with the food producers and vice-versa, sticking-by each other. Feeding ourselves is a communal activity, and should not be seen merely as "Aggies" feeding hungry people.

Farmer's Markets allow us to know our farmers. There is enhanced food value in fresh food, and we are supporting alternative food systems. We need to bring local food to schools, hospitals, universities and create a demand and stable market for local farmers. Visit: www.localfoodplus.ca. This involves preserving. Eating local means keeping what we grow in-season for the off-season. There exist opportunities for community kitchens, shared cool storage, preserve-your-own shops and a revival of pantries.

Audience Questions:

*Will our capitalism-based economy fit this vision? Responsible government, like Howe's vision, can still incorporate capitalism. Is there a critical mass that can change this capitalist mode of production? Corporate control, media control etc. Bingham woods: If we withdraw support, we can give resources back to community.

*Maine declared it will be 80% self-sufficient by 2020. Is this a good challenge for NS? Politics can adapt very quickly when pushed: for example, the US bank bailouts. Networks at local level: need for food, build networks to secure our food as individuals.

Barter system: we as individuals have other services to offer for food. Combine with new system, barter something with the community enables it to support itself.

Growing Great Greenhouse Tomatoes **with Tim Livingstone**

Basic categories of tomatoes:

Beefsteak, cluster and cherry

Make sure to get a variety suited to the length of the crop.

Transplants:

-start in a very small sized tray, lower fertility soil seems to work best for tomato germination – for example Jolly Farmer’s Plug Mix.

-temperature around 25 Celsius; gradually turning down to 19 degrees after 60%-70% of emergence

-let dry down between watering, keep uniformly moist, but not water soaked.

-shock transplants a little bit when young

-4 inch pot at next stage: for this stage use raingrow fertilizer 4-2-3

Grafting:

-grafting is done when the plant is very young.

-top of one is grafted to the root of another

benefits include:

-allows use of a very strong root system with a top of your choice and better production

-can use a root system with disease resistance not present in the cultivar you want to grow

-in some cases you can grow two tops from one root system.

-grafting tomatoes is a practice being implemented in Quebec heavily.

Growing:

-clippers he uses call sidecutter (slang = dykes) DISINFECT THEM OFTEN

-remove tops 8 weeks before last harvest

-story about putting worms into pots to give fertility: went from 3 to 300 in each pot.

-look for too much vegetation which is caused by too warm a temp and too much light

-Light and heat are interrelated

-like to cover with vermiculite so seed is covered but not buried too deeply.

-can also use the growing mix to cover the seed. This won’t allow as much air in, but is easier to determine if plants need water.

Spacing and Planting:

-very important to space sufficiently so that the leaves of the plants do not touch

-can start to pot but normally will end with about 7 plants per square meter.

-want to plant when the flowers are opening

-this will help get the plant in a fruiting mode

-planting too early will promote vegetative growth and can lead to blossom end rot (BER) and other problems.

Pruning and Training:

- remove all suckers once per week
- twist and/or clip to twine 1-2 times per week
- remove bottom leaves (only remove

Fertilizing:

- Nitrogen and water amount may help to regulate the balance of the plant
- Also, high potassium can be used to keep growth in check
- Lots more information on specific nutrients in “Growing Greenhouse Tomatoes in Soil and Soilless Media” published in 1991 from Harrow, Ontario Research station and written by A.P. Papadopoulos
- In general, environment is as important or even more so than fertilizer...

Balance:

Vegetative versus Generative Growth: vegetative refers to the plant’s tendency to grow leaves and green matter, generative refers to the plant’s tendency to grow fruit.

Monitor this all through the crop and make what adjustments you can:

- track the vigour of the plant
- colour and thickness of the head
- is the head tight or unfolding well?
- flower colour
- strength of flower cluster
- flower opening – make sure flower opens well
- length from head to opening flower head (less than 10cm indicates too generative)
- signs that your plants are too vegetative: too vigorous growth in the head of plant, thick curling leaves, lighter colour
- signs that your plants are too generative: thin head of plant, flowers too close to the head, flower cluster weak
- well balanced plant: thinner but well-formed head, dark colour, flower cluster forming well below the head

Balance Growth vs. Fruiting:

If it is too vegetative:

- increase 24 hour average temperature
- increase difference between day and night temps
- remove a leaf per cluster, but only 1-2 leaves at a time
- decrease nitrogen may help but this is likely not your best choice

If it is too generative:

- decrease 24 hour average temperature
- decrease day temperature
- may help to increase nitrogen fertilization

Final Planting:

Spacing: typically figured on number of plants per square meter of greenhouse space including aisles.

- normal is 2.4 – 2.7 plants per square meter (4 – 4.9 square feet per plant)
- vary this based on variety, season, etc.

Arrangement: double row 0.6 – 0.8 meters apart with 0.9 – 1.2 meters of aisle between the double rows.

Spacing in row is varied to get required number per square meter.

For presentation visit: <http://acornorganic.org/pdf/tomatopresentation.pdf>

Cost of Production 101

with Mark Bernard, Lori Kittilsen and Jamey Coughlin

The Cost of Production (COP) will be different on every farm.

What is the cost of production budgeting:

- Consists of estimating the costs associated with an enterprise and the expected revenue
- Provides the farm manager with a tool that will help with decision making ie. crops that grow, ways to market crops.

Why don't people know COP of their farm:

- not knowing how to do it, understanding input costs
- don't want a reality check
- time issue
- lack of discipline
- another task, demand on farmers

What is profit?

- what's left
- also what is your expectation – what are you looking to make?

COP historical – the year in review

COP budgeting – looking forward – planning and decision making

- Direct variable costs (seed, fertilizer, feed, etc.) = DVC
- Indirect variable costs (still change, but not as much – labour, fuel, utilities etc. = IVC
- Fixed costs (insurance, taxes, depreciation, etc) = FC

Revenue – direct variable costs = cost margin

Revenue – DVC and IVC = gross margin (pays for FC)

Gross margin – fixed costs = profit

Profit has to pay for things, you need to put money away for future costs which leaves us with the net profit in the end.

Costs of going organic:

- cost of certification
- lower fertilizer inputs
- lower yields
- more time on tractor, etc.

What this could mean on the farm:

- increased costs
- not getting premium if in transition
- new markets, customers (marketing)
- impact cash flow
- more people, purchases, etc.

- equipment purchases
- equipment sales
- multi-year investments

Case study: mixed market garden:

Record keeping on spreadsheet

- plot, crop, activity, time, tools, inputs, purchases, \$, sales, date, who, notes, (set tractor rate, labour rate)

Mark Bernard – uses FCC field manager pro – instant updating of software from the field

- Calculating by sales points can allow a comparison and help you decide where to sell.
- 5-yr projection can help to make the decision to go organic
- 2 units of measure: Unit produced or production unit

Setting price for profit:

Are you a price setter? Don't set according to neighbours – they could have different COP than you!

Margin (% difference between price and cost divided by cost) vs. mark-up (% difference between price and cost)

Handout on Margin and Mark-up:

Price = 100%	Margin = Price – Costs/Price...	Margin = 30%
Costs = 70%		
Margin = 30%	Mark-up = Price – Cost/Cost...	Mark-up = 42%

1/costs (.7) = 1.42

Use one or the other – understand the margin and mark-up to set price.

Margin represents profit (mark-up doesn't)

Ex. If margin is 30%, mark-up is 42% - be careful of which one you use to set price.

To do COP:

- Need complete and accurate financial records
- Know your profit targets
- From historical records calculate your COP by enterprise
- Establish Cost of Production targets looking ahead!
- Monitor and manage

Resources:

ACORN organic path: www.acornorganic.org/organicpath

OMAFRA Guide to COP Budgeting:

www.omafra.gov.on.ca/english/busdev/facts/08-055.htm

BC Planning for Profits Enterprise Budgets: www.agf.gov.bc.ca/busmgmt/budgets/

Canadian Farm Business Management Council: <http://www.farmcentre.com/farmbudget/>

To see the power point presentation visit: <http://acornorganic.org/pdf/COPpresentation.pdf>

OACC Presents: Organic Rotations Impact on Greenhouse Gas Emissions with Dr. Derek Lynch

“Agriculture, generally is multi-functional and organic is more multi-functional than most systems”. - MacRae et al, 2004

= more biodiversity, landscape and aesthetic benefits, holistic

Organic standards and policies - new regulatory framework introduced 2009:
5 out of the 7 main principles relate to environmental benefits and the use of renewable resources.

Lynch says, “the production system is the product.”
(based on “the medium is the message”, so agriculture is at least the service, if not the product)

Measurable benefits of using organic methods:

- biodiversity -soil carbon storage -energy use
- nutrient loading -soil health -water quality -GHG emissions

OACC farmer survey (oacc.info/research):

This study shows that on-farm collaboration (farmer with researcher) is the most appreciated form of research.

The top ten research priorities/interests amongst farmers:

- 1) soil fertility through crop rotations
- 2) consumer education on organic products
- 3) soil quality through beneficial rotations to solve specific problems
- 4) plants and ecological interactions
- 5) plants and ecological interactions based on crop rotations
- 6) improving and adding soil life
- 7) soil quality and its effect on food quality
- 8) plants/weed control through crop rotations
- 9) pesticide reduction to protect the environment
- 10) preventing parasites in livestock

- Consumer education is important - people are willing to pay more and buy organic because of its lack of negative aspects (chemicals, GMOs etc), as well as its impact on our bodies rather than understanding what exactly it means, and what the environmental benefits are.

- 80% of organic consumers buying because “its healthier for me.”

- Is the statement “organic farmers are motivated by belief, not profit margin” (P.Untermann) still being upheld? Discussion on how the commercial aspect of organic farming has grown and products are being labeled as organic without taking into consideration the environmental impact of such large and costly operations.

- Various studies that discerned the positives of organic farming over conventional:

Bird Counts and Diversity On Organic vs. Conventional Farming

Freeman & Kirk, 2001. Biol. Cons. 101:337-350

Soil Carbon Storage:

Teasdale et al. 2007. Journal of Agronomy. 99:1297-1305

(study done on a 9-year rotation. Results found there was more carbon stored in the organically farmed soil, than on a conventional no-till farm)

-Discussion surrounding the importance of nutrient loading

Organic farms more likely to have less manure and forage imports because they use legumes, bedding, feed, minerals, generally more emphasis on using what is available.

Therefore, farm nutrient surplus is also lower on organic farms than on conventional - this helps to protect waterways by avoiding eutrophication.

-Testing soil health by counting the levels of *Folsomia candida*, a beetle used by the Can. Govt to measure the levels of heavy metals in agricultural soils. One day they hope to be able to use this beetle alone, as a quicker way to test the comparative health of soils (inexpensive and fast method, but not entirely reliable).

-Studied a rare 5-year crop rotation with potatoes (usually only 3 -4 years long) to test earthworm levels. Found that the longer, organic rotation allowed time for the worms to regenerate and re-establish themselves in the field, with the population growing into the millions per square meter. This will create a much healthier and active soil, as well as increasing organic matter and nutrients.

- NO₂ emissions also studied by capturing the gas with a balloon, set above certain areas in the fields. They were taken from fields rotating clover and timothy with potatoes. The organic fields were releasing 4.4 kg of NO₂ while conventional fields had a rate of 11.6 kg. The crops had comparable and acceptable yields as well.

Conclusion:

Organic agriculture is distinct and has much information to offer us on how we treat and react to the environment/ecological processes.

How can we channel and use all these benefits?

Seedy Saturday Workshops

Grafting

with Mike Hutton

Rootstock is the part that goes into the ground to root. Scion wood is the piece that determines the type of fruit you would like to grow.

There are three types of grafting: whip, cleft or bud.

Graft before it buds out (April/May).

Whip: usually used for small trees

-Cut the two pieces of wood diagonally.

-Notch vertically down into rootstock and up into scion wood.

-Fit together.

-Wrap something around it to hold them together (he uses plastic wrap but you can use -elastics etc)

- Seal with wax, cut off all air.
- Plant immediately, usually takes a month to spread. In dry weather it will take longer

Cleft: Better chances – twice the chance of survival

- Cut the rootstock down the middle the depth of your knife.
- Take two pieces of scion wood that are each half the diameter of your rootstock with about 3 buds on it.
- Cut scion wood in a V shape and stick them in to the cut you made in the rootstock.
- Make sure the bark is touching because it allows the flow of nutrients
- Also make sure the wax gets into the space between the scion woods.

Bud:

- Cut bud off with a bit of bark around it
 - On rootstock cut a T and peel bark.
 - Slide bud in, fold bark back.
 - Tape it, wax it.
- Can grow seeds from apples for rootstock
 - Make sure scion wood is first year growth
 - Get from someone who has apples that you like
 - Rootstock and scion wood has to be of the same species.
 - Cut off buds that grow below the graft
 - Tape is called flat twine from Lee Valley.

Starting Seeds for the Garden with Don Kerr

Potting mixes:

- want water retention and drainage.
- Should be loose and fairly light.
- Peat moss, perlite and a bit of sand.
- Sand makes it easier to deal with roots when transplanting.

More notes:

- Keep an eye out for mold, remove diseased seeds because mold will spread.
- Ensure adequate ventilation and airflow
- Grow transplants for 4-6 weeks, not all veggies are good for transplanting.
- Good: tomatoes, peppers, eggplants (need longer warm period), squash, zucchini, broccoli, cauliflower.
- Frost free date around here- end of May
- Pests to look out for are aphids and spider mites
- If you start early, may outgrow containers
- Keep records – date started, observations, germination date, new container date...
- Ease into transplanting- move pots/trays outside during the days (called hardening off)
- Try to water the soil rather than the leaves of the plant.

Saving Seeds

YOUR seeds are the best seed for you. They are local and customized.

Roguing: taking out seeds that look abnormal/discolored

Threshing: banging a dry plant (beans, pea) against the sides of a clean garbage can

Winnowing: pour from one can to another in a wind and the pods/fluff will blow away in the process.

A good book is “How to save your own seeds” attainable from Seeds of Diversity.

With saving seeds think about what you want to select for: earliness/lateness in terms of growth or bolting, abundance (ex peas per pod), taste, look etc.

Programs for trading: Seeds of Diversity and Seed Savers Exchange

Specific instructions:

Garlic- in fall plant garlic clove root side down at 6 inch intervals.

A couple of inches of soil above and cover with mulch

Use raised rows to avoid water

Matures in august, harvest when plant is 3/4s yellow

Store somewhere cold and dry.

Peppers- grow until very ripe, take out seeds from inside to dry (for one day) Maybe good for one year of vitality

Storing seeds- something that breathes (paper bag) in side an old coffee can. Use natural drying agent

Careful of cross pollination

Self pollinating vegetables- pick within the row (not at ends), usually true to type.

Tomatoes- grow beyond ripeness. Mash it, let it ferment in a warm place until there is a coating of whitish, mold. After 3-4 days, peel that off. Add water. Viable seeds will sink to the bottom. Strain, rinse, dry on a tray

Lettuce – seed in the cottony part of the plant. Shake into paper bag

Biennials- parsnip, carrot, beets, turnip, leeks

1st year grow as normal food crop. Fall harvest. Lay them out and select (size, color, etc)

Leave some green top and store over winter- make sure you label them as food not to be eaten. Store in a barrel or Rubbermaid tubs, packed in wood shavings in root cellar.

In spring, plant the whole thing. Plant carrots a foot apart. Sends up flower stock, huge flowers almost like a bush. Going to need a dry fall (seeds are naked)

Use protection if possible, tunnel...

Collecting seed- use a clean garbage can, bend tops over into it, rub between hands and mature seeds will drop off.

Making the Connection: How to talk to Chefs with Allison Grant and Chef Shaun Goswell

Introduction of speakers: Shaun Goswell is the executive chef at the Hotel. He has returned to Truro after cooking in other parts of the world. Allison has been an active member of the restaurant sector and employee at Great Ocean. She’s also the coordinator of Atlantic Canada’s Organic Farmer’s Cooperative.

Introduction of farmers who are attending the talk: market gardeners, berry growers, beef farmers, bed and breakfast owners and herb farmers. Also in attendance were 2 representatives or “community connectors” from Halifax Farmers’ Market.

Allison: It is important to build long-term relationships with chefs. It is valuable to understand the restaurant you are approaching and their menu. Be able to recommend organic menu alternatives. Tell story about your farm, your product, the value of organic alternatives. Be sure to provide a time-frame window for when each product is available.

Initial contact should be phone call or connecting at a market etc. (Allison recommends calling). Don’t show up out of the blue. Get to the point. “I know this about the restaurant, I do this.” Suggest a later meeting point. Your value is that you can provide *fresh* product.

Show up with promotion material or a good well practiced spiel. Seasoned growers have their spiel solid. *Take a seed catalogue to first meeting – dream together. If you can, show up with clean samples. Be well dressed – this is like a first date, and be knowledgeable about what you have - including nutritional content. A fresh product delivered within 6-24 hours has a great deal of value and has the greatest nutritional value. Be prepared to educate the chef on the heritage breeds and varieties. This is your opportunity to invite them to your farm, invite them to do a little harvest.

Build the relationship from here. Show them the difference. Explain the growing season. For example, explain the berry season and its narrow window. Explain unique practices – organic in this case. Ask about storage when setting up your relationship. This will determine how often you will deliver. Find out how much they need per week during availability period. When making a production plan take into consideration your restaurants. Know how much you are able to yield, be conservative. Plant 40-50% more.

Shaun: For me the first impression is important. Being punctual with meetings and deliveries is crucial. Don’t be too formal. Be passionate. Give me your farm’s background and history. That fires us up. For a place that changes it’s menu every week it is important to have passion about products so that we can be fuelled creatively. Shaun approves of idea of getting to go to the farm with staff. This will inspire the staff to take more care with the products.

Billing should be established right away. Establish a contact person for billing. It is good to do this when the product is brought in and the appearance of the product and containers are in good condition.

Another note: Protocol is to address them Chef “Smith”. The titles Chef *and* Sous-chef create order.

Allison: This is a business arrangement. Be clear of your expectation of payment. Ideal for farmers is a payment on the spot, however it is not uncommon to wait 2 weeks to a month. Having clear invoices, the units, product and value is very important. Do not write like a doctor. Use a computer. Be prepared to be honest about the quality of products, or potential risks due to weather.

A lot of deliveries happen on market day because of farmers’ markets. Chefs prefer mid-week delivery because weekends are the busiest in restaurants. Appearance and perception is really vital. Reused boxes that are beat-up have a negative impact. Find out if there is a storage area where your reusable boxes can be kept.

Costs: Delivery charges should be included in the price. Make sure as a grower, you charge for delivery. Make sure as a host or restaurant that you know what delivery costs, know if you have the time to get it. Make sure the price is explained. Explain to ensure that special qualities and organics are clear. This way, the information can be transferred to clients as well. Be prepared to explain local value and freshness. It is becoming more widely understood that local is worth a little more money. Explain how the product as a whole has a longer shelf life and likelihood of greater proportion of useable products. In restaurants, equipment, staffing etc. have huge impact on profit. The reality for restaurants is that making 1-2% profit on meals is a well-run restaurant.

Shaun: Many chefs are stuck thinking about making up initial costs. However, there are chefs that have a wider vision. This may be a result of being influenced by their clients.

Allison: Know when a relationship isn't working. If a chef is regularly taking too little and you have put in time to build relationship to get them interested in what you have, know when to walk away. Maintaining relationship is important. Communicate your problems. Chefs can understand weather and uncontrollable elements, but be clear and straightforward.

Shaun: Know that chef relationships may extend beyond a given restaurant if the chef moves. At big places like the Holiday Inn they are required to use Sisco. However they do promote local producers and products. Be prepared to give a chef a brochure for their staff.

Allison: A price list and brochure is useful. This isn't about dumping food at the back door. Dine in the restaurants occasionally. Be prepared to promote your product and where it is. Promote the restaurants. Don't be shy about the business side of it.

Question: What about a restaurant that only wants part of an animal?

Answer: There are chefs that do take more parts. Places that serve soups, stews, and patés, are examples of kitchens that use more parts of the animal. Look for that on the menus. Know that their menu can be made to suit you as a grower. Educate them. Lasagna and burgers are good way to use more of animal parts. And finally, do not make them wait. Check your calls. Be consistent. Have your price list sent regularly to them by fax or email for efficiency.

Animal Welfare in Organic Systems with Jane Murrigan and Sue Cheeseman

Raising organic animals is all about providing CHOICES for the animals.

- water, shade, light, space inside, outside, food etc.
- well being both physical and mental are both taken into consideration
- there should be many different stages of life sharing the same area, problems don't occur so much because there is the space for everything to get along fine. Aggression comes from being too confined or hungry
- Free range is a possible option, have a protector dog around. Select a good breed but don't take them for granted. Just because they are a good breed with a hundred years of genetic instructions, they still need to be trained well or they can be very dangerous.
- Let animals do what they innately want to do (pigs want to dig, so let them dig!)
- treat all animals with respect and a mutual relationship will naturally arise

Predator control:

- Dogs are great. All animals fear dogs. They are a predator. Most farm animals are naturally preyed upon. Think about their natural hierarchy.
- mules, donkeys and lamas can all be great depending on your situation

Five Freedoms of Animals:

- freedom from thirst, hunger and malnutrition
- freedom from discomfort
- freedom from injury and disease
- freedom from fear
- freedom to express normal innate behaviors

- get to know your animals, name them (study done recently saying that those cows with names produce more milk than those not named!)
- production balanced with quality of life
- PLEASURE plays a huge role
- interactive relationship with other animals is vital to their health and happiness
- Organic systems are very flexible and like all aspects of farming there is never only one way of doing things.
- when isolating animals to see the vet or something, always bring another animal to isolate them together. Herding animals get nervous on their own.

Success is measured not by only production but lameness, behavior, feather covering, reproduction, tail biting, disease and mortality. That is how well you know you are doing.

Animal production has to be about enjoying animals as well as production for money.

Key Natural Behaviours:

- most of the animals are prey species
- they are afraid
- fear is a strong motivation
- herd/flock social structures must be recognized and understood.
- dominance and hierarchy also need to be understood
- panoramic vision to see predators, but they have low depth of field except pigs, they use their noses
- good light is important to see, if you want to guide them use light as a beacon, they will walk towards it.
- leaders in the pack: Which cows are the leaders? Know your animals.
- design accordingly with these things in mind
- pigs spend 75% of their time rooting, foraging and exploring. Let em do it!
- laying hens descended from jungle birds, cover and roosts are needed
- upside-down chicken is only frozen out of fear, not calm, doesn't agree with killing chickens upside down

OACC.info:

- Medication such as aspirin to relieve pain animal is having is a nice thing to do. (say post surgery/tramatic experience)
- handle chickens often to get them used to it
- good to stun animals before killing them
- work in low light to kill, keeps them calmer

Death:

- Kill on farm if at all possible, much less traumatic experience
 - do not ship if they are skinny or sick etc.
 - fear arises when in new place
 - if an animal eats they are relaxed. When transporting, use food to relax them even inside the trailer.
 - MOBILE ABITOIRES could and should happen- push for the regulations to be changed
- To see the power point presentation visit: http://acornorganic.org/pdf/Acorn_Animal_Welfare09.pdf

Organic Landscaping and Property Maintenance with Richard Wetmore

Richard was the first certified organic landscaper in Atlantic Canada. He has worked in the landscaping industry for 15 years and runs a small organic farm.

Some factors that led Richard to change over to organics:

- There are more chemical products being used on lawns/landscaping than is being used for agriculture.
- Herbicide (28:34) being used on Creeping Charlie was not effective. The plant had developed resistance.
- A customer had done a study and found significant amounts of 2-4-D residue in the buds of nearby deciduous trees, meaning that the chemical herbicide was not breaking down, but being taken up by the roots of other plants.
- Richard became more and more concerned about the harmful effects of chemical herbicides and by 1994 had stopped using them.
- An experimental patch of lawn was treated half with conventional products, and half with only worm-casting compost. The turf treated with worm-casting compost had no more weeds and was healthy.
- Cinch-bug's were apparently bothered by the application of compost tea and did not infest organically maintained turf.
- He experimented with an old field and found that field could be turned into nice-looking turf just by regularly cutting
-

Tip's for growing turf without chemical's:

- pH should be around 6-6.5 (use lime)
- Aerate soil, a plug aerator works well.
- Use lots of compost
- Worm casting compost is fine and granular,-very easy to spread topically.
- Cut grass often, preferably with sharp blades
- Over-seed, approx 100 lb/acre
- Apply compost tea in late spring/summer
- Check turf health and pH in the fall, apply more lime if necessary
- Mulch leaves and leave over winter (Richard used his mowing machine with a different blade to chop leaves and then spread mulch evenly)
- Vinegar and lemon juice can be used for weed control. If used extensively, pH will need to be corrected.
- Make use of native plants whenever possible.

Richard obtained organic certification by sending a detailed written request and plan to Maritime Certified Organic Growers (MCOG). Certification must be renewed each year.

Recommended website: www.organiclandcare.org

To see presentation handout visit: <http://acornorganic.org/pdf/orglandscaping.pdf>

Organic Opportunities for Wholesale in these Economic Times **With Cynthia Barstow, Seed to Shelf (President)**

The shares of food groups that wholesale is comprised of are not likely to change. It is the places that food is sold that will shift (supermarkets versus restaurants).

California produces 50% of the US fresh produce wholesale market

- Last week California declared a drought emergency, and farms may not receive managed water, on which they are dependent
- Could mean less production, and an opportunity for Canadian growers

Organics in an Economic Crisis

- Upper income households are now just as concerned as others about the slow economy. These people have traditionally driven organic demand (higher education and more income).
- Consumers are not reacting to direct threats (job loss), but to ideas about the economy in general
 - Food expenditures have dropped faster than any other time
 - But, more shoppers report cooking from scratch
 - Expect increases in sales of basic ingredients
 - Expect single serve and organic to decline
 - But, healthy foods to increase
 - How are organics perceived? Healthy!
- Restaurants have seen stocks fall close to 50%
 - But MacDonald's is up
- Generic brands have seen 30% increases, 23% of people expect to buy more of these.

Organics:

- Aug 2008: sales growth slowing, core buyers supporting growth, but new customers hard to attract
- Jan 28 2009: organic growth rates eased from 20-30% down to 5.6-9.9%
 - Some of this decline in growth was expected by the industry
 - It is unlikely to see actual declines in sales
- The core organic buyers, 21% of organic consumers, make up the majority of sales (80% of organic brand products)
 - Know your core organic consumers, the ones already devoted!
 - These people increased purchasing 12% through tough times. Same trend for mid level organic consumers
- Whole Foods (organic mega retailer in US) has stayed flat, not declining as expected

Food categories:

- Cream and Dairy, cookies, snacks and bars, fresh salad mix, eggs are all doing well
- Breakfast cereals are declining

Health:

- In the US, consumers are willing to forget their budgets to gain health benefits from their food. This is due to the expensive health care system.

Local concerns sometimes trump preference for organics. Consumers are confused about sustainability and they don't know what companies are sustainable! Consumers are beginning to ask what and why and are concerned about their independence, control of their lives and bodies. Home is the new destination, and nano-luxuries (ie. organic raspberries) are allowed.

What's your Back Story? – Who you are and your history is what consumers are looking for.
For presentation visit: <http://acornorganic.org/pdf/CB-economic.pdf>

Raising Sheep Organically with Akim Mohssen Beyk

Breed:

Tunsia is his preferred breed, lean and a nice all-round breed.

His story:

He started with 10 sheep...

- the first three years he was riddle with problems, often triplets, first one dead
- worked to better his genetics and bloodlines and thinks they are key to success and far less work.
- selected sheep to let grow big from the ones who gave 1 lamb, sometimes two. far less problems resulted.
- he feeds no grain, grass and brush instead (grain when switching from grass to hay for a short period of time).
- he likes to imagine himself as a sheep when he is with them to help understand their needs
- rule of thumb: if he doesn't feel comfortable to lay on the bedding, then the bedding is too dirty.
- learned all kinds of things from experience: end of season apples and carrots give sheep diarrhea.
- always fresh water
- the timing of weaning is decided by mothers and lambs, not him
- he waits at least 60 days before returning sheep to the same pastures as 60 days is longer then certain life cycle of a larva that gets into digestive system.
- does not allow them too graze too low because they are more susceptible to disease etc. (min 3 inches)
- no shade, except in extreme heat
- put into movable corral during the night (all seasons but winter). 2 donkeys stay in corral too.
- daytime put into sectioned off area. Area created by moveable electric fence. Moved every 2-3 days.
- waters through an auto water on a wagon.
- 1500L tank, no problem with algae

Shearing takes place in fall before the ram is introduced. Allows for easier penetration.

When mother rejects lambs what do you do?

- shave the accepted lamb so the rejected one seems more likely to thrive to the mom.
- also can put vicks on the nose of the mother so she cannot tell the difference between the two and can accept both.
- also can put the dog in the corral so that the mother protects the young.

-his philosophy is to kill any rejected or unhealthy animals right away because the likelihood of that animals causing more problems down the road are high.
-they are social animals and it is important to raise them with others and not isolate sick animals, if it gets to that point it is better to kill them.

-Whatever you do you have to find what works *on your farm*.
-Puts dead animals or carcasses at his furthest field for the animals. He feels getting rid of parasites and predators is impossible, you can only manage them.
-he has 200 sheep
-check hay for nutrient level
-he uses compost to inoculate old hay that he spreads on his fields.
-planting herbs for parasites etc is a great way to prevent and treat certain maladies.

Scaling-Up: Appropriate Equipment Selection for the Organic Farm with Roxbury Farm

*Jodi and Jon-Paul from Kinderhook, NY. www.roxburyfarm.com -click on Farm manuals
Organic and Biodynamic farm with vegetable market garden for 1000 member CSA and grass-fed animals.*

This workshop is about scaling up. One must ask many questions when it comes to equipment.

1. what is your personal goal with your farm?

Our personal goal was to not work too many hours in a day so we needed equipment. Choosing equipment doesn't only mean a tractor. For us, we needed things to supplement the limitations to our bodies. (note that our goal was not to fix equipment!)

More equipment with people on the farm = less work. It's a personal choice. Note that machines create different social situations on the farm.

2. what type of equipment do you need?

Ex: irrigation.

Don't forget soil compaction often caused by our equipment. One solution was sweet blossom-clover.

3. Do I have enough land

WE have 50% in and 50% out of production. At one point we were moving grass/cover crop and letting it rot into the ground. We incorporated sheep with our cover crop. We also need equipment to deal with the cover-crop (spader (less hp than chisel plough), flail mower). Example for less equipment needs: rye and vetch rolled it and let it breakdown naturally and disked in the spring.

4. Do I have to own each type of equipment?

No. Neighbours and friends can co-own or share equipment.

5. Is price of equipment part of the total system?

First off, what is my system? Example: if one uses a tractor with 72inch wheel span, then the equipment you use may cost more than a tractor with 42inch wheel centres –talking about market garden beds and creating rows on each bed. Try to make the equipment do several things.

When you scale-up, there are growing pains. Examples: size of tractor or your washing space for veggies might not accommodate your growth. Also might need to expand on labour.

Consider taxes and insurance too.

6. How to make decisions on equipment?

You might want transplants to get a jump on weeds so you might want a water wheel planter. You need the appropriate machine to get it done. Ex: with right equipment you can transplant 1 acre of sweet corn in 2 _ hours.

With salad mix: at one point we hand-picked the salad with 5 people, so we bought a salad harvester. When we buy equipment, we need to calculate. After the entire analysis for the salad harvester, it cost 23cents a pound for the machine and 24cents a pound for the manual labour. We should have calculated before making a decision on the equipment.

Machinery can help the crew however. With mulching, the crew hated mulching and we bought a shredder to shred and mulch round bales.

Getting good service with your equipment is essential. It costs more, but saves in the long run. However, if you are good at fixing equipment, you can get some good deals. With this philosophy, the best deals we get are with equipment where you can see all the parts (simple equipment like disks).

7. How do you pay for it?

We try and avoid dept and therefore interest.

8. conclusion?

It's personal. Depends on your goals.

Jodi now will talk about equipment.

For Basic starting farms:

Tractors –correct horsepower, skinny tires if doing veggies, high clearance, fertilization equipment.
Primary Tillage –celli spader (40hp+), match with your system (size of bed, etc.), not good for cover crops; imants spader good for heavier soils; chisel plough needs more hp and clogs; mouldboard plough is not good if repeated.

Secondary Tillage –rotavator/rototiller; bed shaper; perfecta II harrows;

Transplanting –row maker for planting; water wheel transplanter; bare root transplanter

Direct seeding –push seeder (with seed plate on the outside to facilitate changes); planet junior is 2x the price; broadcast seeder

Cultivation –williams toolbar (good for a variety of attachments); eco weeder; dutch hoe (hand); swan neck hoe (hand); wheel hoe (hand); use the book *steel in the field*

Mowing –flail mower (shreds and no clumps); bush hog

Irrigation –drip irrigation (monitor your soil moisture); stationary irrigation (big disadvantage moving pipes and struggling with pressure)

Scaling up!

Tractors –loader tractor; cultivation tractor, offset with belly mount

Secondary Tillage –perfecta II harrow; disk; bed shaper (bigger); plastic mulch layer

Transplanter –carousel transplanter; mechanical transplanter

Direct seeding –planet junior on 3pt hitch; grain drill (for cover crops)

Cultivation tools –basket weeder; stale seed bedding; spring how; s-tine cultivator; bigger spader; lilliston rolling cultivator; finger weeder; disk hillers for potatoes attached on belly;

Spraying equipment

Travelling irrigation reel –tremendous pressure loss.

Other equipment –subsoiler for hardpan; plastic mulch lifter; hillside cultivator; stale seed bedder; bed shaper with fertilizer hopper; vacuum seeder; jiffy hitch system; hydraulic boom type sprayer;

Tractor options –economizer/reducer to run pto at idle speed to conserve fuel

Greenhouse equipment:

Winstrip trays

Flat fillers

Vacuum seeder

Plug popper for transplants

Harvesting and Picking house:

Root digger; beat lifter

Harvesting containers

Bulk harvest bins

Walk behind salad harvester; 3 pt hitch salad harvester

Insulated barn outside the sun

Horizontal drum –root washer

Bin dumper

Conveyer washer

Sorting tables

Rolling benches

Double task set-up

33F water

Bulk tank cooler (hydro cooling will take all the field heat out –better to preserve veggies)

Suggestions:

start small

10% of gross revenue should be reinvested into operation

To see an equipment resource list visit: <http://acornorganic.org/pdf/equipmentroxbury.pdf>

Retrofitting the Farm and Farmhouse: Practical Energy Conservation, Ideas and Examples with Julie Bailey

Measurement is the 1st step to understanding. You need an energy audit to make improvements.

- Collect energy bills (12 months) – electricity, fuel data (write down all that uses energy: motors, lights),
- Make an energy inventory. It is useful to make spreadsheet, then graph results to find out where energy is used.
- It is helpful to review the power bills every time
- Most people pay based on a residential rate
- Commercial and industrial also pays for ‘demand’ – could be half the bill (best to not run a lot at once)

61 % of farms are small so the energy bill is based on the home instead of entire operation. Focusing on home energy audit is a good thing.

EnerGuide :

- Low income, free and get \$400 upfront
- Grants for insulation can cover the majority of cost
- Can save 4 tonnes CO₂ per year
- Sustainable housing 1-877-722-2842
- New loan of \$5,000
- Homes of 25< can save 35% of energy costs

- 1st step: fix moisture problems before insulation
2 – seal air leakage
3 – energy star appliances
4 – use compact fluorescent lighting

- EnerCan gives energy efficiency rating

- Crack around exterior doors can correspond to a hole in the wall. Using weatherstripping can make a big difference.

- Insulate – high R-value is a good thing

- Cellulose – recycled newspaper

Tour of Julie’s house – her retrofitting project – warm heat and feet

- R10 on outside and R8 on inside R18 basement walls
- R40 1 foot of cellulose in attic, they’re now recommending R50 (also vapor barrier)
- Insulate attic (100 sqft), unused vapour barrier, cellulose doesn’t always act as well as vapour barrier – cost \$1300 if you do it yourself for cellulose
- Older homes you can’t get R20, but maybe R12 b/c walls not thick enough
- Basement insulation key (20-30% loss of heat) concrete same Rvalue as glass (=1)
- Air leakage through header space (sealer and insulated to frost line, a really good start), exterior good too, but harder to do
- Worth insulating floor? Yes if have extra money, but other ways might be more cost effective
- Insulate hot water tank and pipes

- Windows/doors – most expensive and relatively low benefit
 - o Consider going with good quality window
 - o R1 for single pane window (go for double or triple pane)
 - o Gases add R value can get R4+ krypton – getting more and more expensive
 - o Energuide gives \$60 rebate per window
 - o Windows help to reduce heat coming in from the sun (less need for air conditioning)
 - o Rvalue of windows less than walls so consider how many windows you have vs. wall area
- Heat recovery – 60-70% heat recovery (\$300-400) heat back to hot water tank instead of down the drain
- Gone from -14 to 68/100 on Energuide – burns 4 cords of wood
- If have to replace shingles – low income or seniors = there are grants – dept comm. services 902-893-5999
- Siding hides things (like rot)
- Insulate and seal basement – she put in new foundation (\$25,000) and infloor heating, landscaping huge amount of work afterwards, \$40,000 including insulation
- Have to cover outside insulation on outside of house, protect from sun and elements
- Header space insulation – spray foam Dow Froth pak (\$400 cost do-it-yourself) – becomes vapour barrier, insulation – good to cover up all insulation
- Spray foam is now soy-based
- Oil based paint on exterior walls can help with vapour barrier
- Solar hot water infloor heating – typical system costs \$5,000 – could be 75% rebate for farm business (15 % residential) – use plumber instead of system
- Solar air new system – good funding. Need another form of heat beyond solar
- Water system runs through wood cookstove, then solar, then electric water tank
- Don't put solar system on roof b/c can be covered with snow (put on a rack on the ground instead)
- Farm
 - o High performance T8 incandescent light can get 40% efficiency over T12 (recommended for barns 12 ft or less)
 - o Compact fluorescent 75% more efficient, less than 2 year payback for poultry barns
 - o Mercury issue: more Hg generated by NS power to produce power for incandescent than Hg in fluorescent bulb. Disposal should be to hazardous waste dump (hopefully province will bring recycling facility)
 - o LED technology great, but expensive
 - o Farm investment fund covers up to 50% of some costs of greenhouse heat curtains – can save 10% of E bills
 - o High efficiency furnace best if using oil
 - o Pellet systems for greenhouses
 - o Water fountains FIF has funding for energy free water bowls (uses water in the ground as heat source)
 - o Small wind turbine – payback 30 years
- Funding
 - o www.conservens.ca
 - o EcoEnergy retrofit (for industry)
 - o Eco-efficiency centre
 - o Farm investment fund
 - o EnerGuide
 - o Renewables: 50% funding available

Growing an Organic Farmers Co-op: the Quinte Model

with Achim Mohssen Beyk

- industries in today's models are falling apart
- Organic farmers have the same goals, yet we compete with each other for the same markets.
- Achim thinks we must find a solution to keep farms certified and in business. Co-ops are a good option and the one he is part of is working well.

The Co-op Achim is a part of:

- first started with 20-30 people interested and by the 3rd meeting had 15 or so. Similar thinking people were the remaining 15 people.
 - market research is key, you have to know who and where you are selling to.
 - the co-op model made sense, democratic and everyone has a equal vote regardless of size. Together they became an entity.
 - co-ops mimic a society/community. 1 person (one farm) = 1 vote
 - people working together are much stronger
 - it is a for-profit co-op
 - if the society or co-op does not serve its member then it is really worth nothing
 - coordinate production so no-one produces the same things. Planning session in the winter before anyone buys any seeds, etc.
 - everyone expresses what they want to grow.
 - one person volunteers to be a "market co-coordinator"
 - a market co-coordinator gets a place at a market and is in charge of administering the whole thing. The co-op buys the delivered products from the farmer at the agreed co-op price.
 - price determined by each farmer figuring out total costs of production and finding a price that will allow that to be paid for.
 - co-op pays for the market coordinator to go to the market and a certain cost per Km.
 - great benefits to having one person go to the market instead of five and the table is very colorful and diverse.
 - farmers bill the co-op and the co-op pays two weeks after.
 - no returning of products, they are the co-ops. Co-op takes the loss
 - have to calculate excess
 - market managers order how much they need.
- Advantages: some farmers do not want to be on the front lines selling, your product can go to numerous markets instead of only one.
- keep co-ops small, much more successful. Get too big also means losing that personal connection to customers.
 - Co-op margin is 25%, but not there to make money, there as a tool
 - members can enter and leave at will
- LAW is in the CANADIAN CO-OPERATIVE ACT
- can also have your own rules
 - thinking about starting a two year apprenticeship program. Get small piece of land on one of the farms to work themselves during the second year. Could buy, rent or own that piece.

Importance of Mission Statement or Vision:

- when problems arise can often be settled when referring to the mission statement.
- there must be trust but the whole thing has to be transparent so cheaters can easily be identified.

Holistic Heard Health-Theory and Practice

With Av Singh and Sue Cheeseaman

- Nutrition is key! The goal is to use preventative methods rather than cures.
- Livestock health can be accomplished with: healthy forage, quality water, good genetics, and appropriate nutrition supplements.
- Soil health and fertility are very important. Healthy foliage can provide livestock with quality protein, energy, medicinal compounds, vitamins, minerals and enzymes.
- Supplying pasture with sufficient nutrients can lessen livestock's dependency on grain.

Some soil health guidelines (based on the Malic 3 soil test system):

- pH 6.3-6.5, 3-5% organic matter – slightly lower pH is acceptable if there are high levels of organic matter.
- Nutrients (measured by % base saturation): Calcium 68%, Magnesium 12%, Potassium 3-5%, Hydrogen 10%, Sodium <100 lb/acre, Sulphur 25-50 ppm, Boron 1-2 ppm, Iron 50-100 ppm, Manganese 10-40 ppm, Copper 25 ppm, Zinc 6-12 ppm, Aluminum > 1400 ppm.
- High potassium will cause milk fever (should be about 2% of plant matter)

Plant Biodiversity:

Many native plants have high nutrient values and medicinal qualities. Dandelion, Comfrey, Stinging Nettle, Plantain, Chicory, Lamb's Quarters, Burdock and Cleavers are all beneficial. Animals will often go to specific plants for nutrients/minerals that they need.

Rumen Health:

Ruminants derive 80% of their energy through production of VFA's (acetic 60%, proprionic, butyric). Acidosis causes damage to kidneys and liver- causes suppressed immune system, impaired fertility and feet and leg laminitis. Using less grain feed generally lessens acidosis.

Water:

Water high in Calcium and Magnesium is good for animals. Water high in Iron is unpalatable. It is recommended to test water for high nitrates and heavy metals. There is some controversy over the benefits of providing easily accessible water; some say to provide water at least every 800 meters. Some research suggests that livestock have better saliva production when they go without water for regular periods (it is suggested to provide water only at barn).

Oxygen: Ventilation in the barn is important. Low levels of oxygen can increase the presence of viruses.

Sunlight is also antiviral/ antibacterial.

Exercise stimulates lymphatic circulation and improves to tone digestive and reproductive organs.

Homeopathic/Herbal Remedies:

-Arnica stops and prevents swelling and speeds the healing of any tissue damage. It's recommended to use before/during birthing.

-Eyebright extract heals eye infections (drops applied to eyes).

-Lavender and Teatree oils are antiseptic, dry wounds. Apply topically. Can be diluted with castor oil.

-Rescue Remedy (a Bach Flower Remedy) is effective in calming animals who have been stressed or shocked. Used before shearing and during birthing. Can be sprayed on nose – sticks to mucus membranes and is licked off. * Books by George MacLeod are highly recommended.