Summer 2007
Volume 10, Issue 3

British Columbia Organic Grower

COABC, 3402 32nd Ave. Vernon BC V1T 2N1
Canadian Publications Mail Agreement #40047167

Journal for the Certified Organic Associations of BC

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BC Organic Grower

is received by all members of organizations belonging to the Certified Organic Association of British Columbia. BC Organic Grower is published quarterly by COABC.

We welcome letters to the Editor (300 words maximum) and articles (1000 words maximum). We reserve the right to edit for length.

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Cover: COABC owned
Layout & Design:
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Next Issue Deadline:
September 15, 2007

President's Letter

by Deb Foote

By the time this issue hits your mail box we will be into the last few weeks of summer. I have to ask though, what happened? Did I fall asleep and miss something? There were a few days where I could dip my feet in the ocean without fear of catching pneumonia, but they seemed few and far between. Even so, I have managed to get a little colour on my skin, but my bones are still cold.

My routines over here have included a visit to the Farmers Market every week. While I have missed the variety of fruit that I could purchase at the White Rock or Trout Lake Markets, I have enjoyed the offerings of the Mayne Island growers. I mentioned last issue that there were 4 organic growers here, and 3 of them represent the vast majority of fruits and vegetables sold at the market each week. I did get to the Ladner Village Market once this season and will likely see one of the Vancouver Island Markets when I attend a family function in late August. Variety is the spice of life, they say!

The summer has been busy at the COABC; along with the regular activities, the personnel committee has been very active. In July we completed the hiring of the Organic Extension Agent and, as you will see later in the issue, we selected Rochelle Eisen for the position. While Rochelle seems an obvious choice, it was not an easy decision for the personnel committee. We had over 25 applicants for the position, many of whom had degrees, not unlike Rochelle, but at the end of the day there was no one who had the level of knowledge of the BC Organic sector that Rochelle has.

Later in the month interviews were conducted for the administrator position, which was advertised in the Vernon papers and at the employment centre. This yielded over 70 applications! With Kristy's help we winnowed it down to about 15 people, and then further short-listed them to 7 candidates who had experience working with volunteer boards. These folk were interviewed over a two-day period by Kristy and me, and we then reported to the personnel committee. We were both impressed by Karen Fenske's resume from the start, and she also provided excellent written references. We were even more impressed after the interview, and were pleased to have the support of the personnel committee in moving forward with hiring Karen. Welcome aboard, Karen!

While all of this hiring was going on, the office had been functioning without an administrator. Given my flexible schedule, I was able to step up and support Kristy by handling many of the details that Kirsten used to take care of. At the point in time where we should have been organizing the Organic Harvest Awards, I was well occupied with other matters. The executive met during that time and discussed the ramifications of canceling the event, given the circumstances, and agreed that we should cancel for 2007. It was not an easy decision, but I knew that the volunteer capacity of the COABC was limited in the summer, and that we needed to focus on the hiring issues at hand.

I am pleased to announce that the COABC 2008 Conference and AGM will be held at the Mary Whisper Centre in Sidney on Vancouver Island between Feb 29th and March 2nd 2008. IOPA will be the event host, and Lee Fuge will be the conference organizer. If you have suggestions regarding workshops or plenary, I am sure Lee would love to hear from you. You can email Lee at leefuge@hotmail.com.

Happy Harvest, Deb (organicdeb@shaw.ca)

Editor's Note

Summer is my favourite season - the weather is hot and the fresh food is bountiful. New fruit and vegetables seem to be ready every other day and entertaining guests seems to be that much easier.

This is my third issue of working on the *BC Organic Grower* and hopefully you have found articles that have done more than entertained. I have learned a lot and hopefully ironed out all of the kinks and wrinkles. The Editorial Board of Paddy Doherty, Hermann Bruns, Rebecca Kneen and Rochelle Eisen have been tremendously helpful, as has Kristy, Rob, and Karen.

In this issue we put some faces to the people from the COABC office, some of whom you may have spoken to on the phone and never got a chance to meet. They are a driving force and know all the answers to your burning questions.

Please remember that if you have an idea or article that you think needs to be discussed in the *BC Organic Grower* please contact the COABC office or myself.

Cassandra

Greenhouse Production Workshop

Kootenay Organic Growers Society held a one-day intensive Greenhouse Production Workshop for its members on Saturday, March 10.

The day started with seed germination and their requirements ie. Light, water temperature and stretch control and progressed on to Pest Management (including a 25 minute video on parasitic insects) to a hands-on session using pen meters for measuring pH and EC, and soil testing and finishing off with a discussion of growing media for different purposes.

The course instructor, Mario Lanthier from CropHealth Advising and Research, kept members on their toes with "brain-storming" and "pairing and sharing" sessions. His enthusiasm, humour and explicit explanations kept us all informed, entertained, and wanting more.

Participants, spurred on by Mario's enthusiasm, were quick to fire questions at him and the atmosphere throughout the day was one of total immersion and relaxed concentration on what was being taught and learnt.

Mario also provided us with handouts on:
1) Potting Mixes for Certified Organic Production
2) Organic Greenhouse Vegetable Production
3) Integrated Pest Management for Greenhouse Crops

These can be found on ATTRA's website for those who would like to check it out.

It was a great day with members leaving the workshop with thought-provoking ideas and perhaps a little more understanding of the nature of our chosen profession.

Kootenay Organic Growers Society would like to thank Mario for his efforts for making the day a success and also to the Regional Seminar Series (COABC) for the partial funding which allowed us to make this all happen.

Meet the COABC Office

Karen Fenske - Administrator

This is a great opportunity to introduce myself and share a bit about the Administrator's position. I was thrilled when Deb Foote, President, called me to let me know that I had been selected to be the Administrator for COABC. Being able to work with a dedicated Board, people who are passionate about what they do, and an organization that continues to grow, fits me well.

As Administrator I will be overseeing COABC projects and contracts, supporting the Board by implementing motions, fulfilling administrative functions and developing policy, as well as providing relevant and accurate reporting and communications to stakeholders. I look forward to contributing in a variety of areas as we reinforce core COABC operations for the future.

My background includes a B.A. in Merchandising: Retail Management from Ryerson and over 20 years of work experience. Though I come to the position with a wide variety of experience including business administration, marketing and PR, accounting and budgeting, human resource management, fundraising, and event planning, I specifically enjoy all aspects of organizational development including communications, strategic planning, change management and leadership development.

Over the years I have fulfilled a variety of leadership roles including being a Board member for a private school, a Planning Commission Member for the City of Port Alberni, a Tribunal Member for HRDC, as well as an owner of my own sewing school and Organizational Development Consulting practice.
I am originally a prairie girl from Winnipeg, but have spent the last 15 years in Port Alberni. My husband and I, along with our two children moved to Vernon this past February to be close to the ski hills and to enjoy the sunny weather. The facts that there are so many things to do in the Okanagan, and that we are so close to other interesting places affirms our choice of a new home.

I am thrilled about acquiring new knowledge, as well as being able to contribute to the effectiveness and sustainability of the COABC. I look forward to meeting as many of you as possible. If you are in Vernon feel free to stop by the office to share your experiences.

Kristy Wipperman - Office Manager

I was born and raised in the Lower Mainland. My education is in Hotel and Restaurant Management and my previous work experience was in an administrative role within the food service distribution industry. In 2003, I relocated to Vernon to be closer to family. In my spare time I enjoy walking, hiking, fishing, and playing guitar.

In January 2005 I was excited to be hired on as the part-time Office Coordinator for COABC. At that point my duties consisted of handling phone calls and emails, managing the database, and being the administrator for the Accreditation Board. In March 2006 I was promoted to Office Manager. In this role I took on the additional responsibility of the bookkeeping duties. I've definitely learned a lot in the past 2-½ years and look forward to an exciting future here with COABC.

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Meet the COABC Office

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Rochelle Eisen - Extension Agent

The Certified Organic Associations of B.C. (COABC) is allocating grant funding from the Ministry of Agriculture and Lands to create a new Organic Extension Agent position. This position will provide resources and support to existing, start-up and transitioning organic operations in B.C.

The Minister of Agriculture and Lands, Pat Bell said, "It is important that British Columbians have a choice at the store, market or farmer's gate." This new service is a step towards fulfilling this goal.

Rochelle Eisen has been hired for this one year position, which commences on September 1, 2007. She has worked for the B.C. organic sector since 1989 and has diverse experience in all areas of organic operations. She will be devoted to increasing the capacity of the BC organic community by researching and providing information on organic production systems, standards, materials, and brand name products, answering questions in seminar and one-on-one formats, and working with a variety of stakeholders on needed projects.

The COABC continues to work in a variety of areas which will ensure that the organic sector flourishes and expands to meet rising consumer demand for organic products and having Rochelle on board as the Organic Extension Agent capacity is a significant step in right direction.

Rob Korbynn - Webmaster

I started working with COABC in 2003 as webmaster. I have done a couple of the revisions to the website that has resulted in its current look and feel.

My interests in the organic industry stem from my own experience growing up on a hobby farm, in the Kootenays, where we tried to be as natural in food production as possible.

I am an expert in anything to do with computers, with 25 years of experience in the computer industry, including many years of programming most recently moving into internet applications.

Regional Seminar Series has a bit more cash to give away!

Interested in demonstrating the latest farming techniques or equipment to farmers? Looking for some financial support to get this kind of hands-on event off the ground?

The COABC's Organic Sector Development Fund has enough funds left to sponsor a few more regionally oriented seminars. These events must demonstrate something new that can help producers increase their organic productivity. If you have an idea, and a CB or a regional production group who will help coordinate the event, talk to Rochelle Eisen to see if you qualify for financial assistance.

250.547.6573 (h) 250.306.7980 (c) or via email rare@telus.net.

Preparation and use of composts to prevent plant diseases

By Mario Lanthier

Can composts help prevent root diseases? The answer is definitely "yes" and this has been known for many years. Can composts applied around the roots help prevent diseases above ground, for example leaf diseases? The answer is tentatively "yes", based on recent scientific research. A good understanding of this natural process opens a fascinating and exciting world in horticulture!

A study was published earlier this year in Phytopathology, a peer-reviewed scientific journal of high credibility[1]. Tomato seeds were placed in different peat-based potting mixes, either with or without the beneficial microbe Trichoderma hamatum 382. Five weeks after seeding, the leaves of emerged plants were sprayed with a solution containing Xanthomonas euvesicatoria, the cause of tomato bacterial spot.

The results: plants grown in a mix amended with Trichoderma had significantly less foliage disease than the control mix. The researchers identified 45 genes in the leaves that were expressed differently between the two treatments. Placing Trichoderma in the potting mix induced genes that are associated with biotic and abiotic stress. Microbial activity in the root zone triggered the production of proteins inside the plant that helped prevent a leaf disease!

"Lightly decomposed organic matter (derived from plant residues or organic wastes) likely drives general suppression in field soils" conclude the authors of a literature review published in 2004 and available on the web[2]. Suppression is sustained with the degradation of less decomposed coarse and mid-sized Particulate Organic Matter (POM) fractions, a size of organic matter comparable to the soil structure in the forest litter[3].

Composts are not created equal for prevention of plant diseases. In an article published in 2006, researchers have summarized current thinking on this topic[4].

Most composts can suppress root diseases.
Common beneficial microbes out-compete pathogens for food and space around plant roots. This mechanism (direct competition) is very effective against Pythium and Phytophthora.

Some composts can suppress damping-off diseases.
Specific microbes found in quality composts attack plant pathogens and feed on their content. This mechanism (mycoparasitism) is very effective against Rhizoctonia and Fusarium.

Few composts can suppress leaf diseases.
Specific microbes must be placed near the plant roots to protect against leaf diseases. This mechanism (Induced Systemic Resistance) stimulates defensin-encoded genes.

I. PREPARING DISEASE-SUPPRESSIVE COMPOST

Composting is the biological decomposition of organic waste under controlled conditions.

Usually, three phases occur during composting[5]:
-An initial hot phase of 1 or 2 days, during which the smaller material is rapidly degraded.
-A period of many weeks when temperatures reach 45 to 65 degrees Celsius and most microbes are killed.
-A final curing phase when temperature declines and the material is re-colonized by microbes.

Materials properly composted will reach the hot temperatures required to kill the microbes responsible for plant diseases[6]. However, materials not composted properly may still contain pathogens. If kept wet for too long, the latter materials could trigger root and stem diseases[7].

The curing phase is important for natural disease suppression. After reaching peak heating, different micro-organisms naturally colonize the piles. They include many parasites of root rot pathogens, such as *Bacillus*, *Flavobacterium*, *Streptomyces* and *Trichoderma*[8].

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Two specific factors will help those wishing to prepared disease-suppressive compost.

Maintain moisture on the outside of the pile. A film of moisture must be present on the surface for microbes, especially bacteria, to successfully colonize the piles during curing. Moisture content of 40 to 50% is necessary for microbial colonization that will induce disease suppression. Compost that is stored dry (less than 35% moisture) become conducive to Pythium diseases[8].

Select composts produced near a forest. Final quality is improved by colonization of beneficial microbes native to the area. Such composts are routinely testing positive for the presence of Trichoderma, a beneficial fungus commonly found in the humus layer of the forest floor[9].

Composts produced properly are usually naturally suppressive to *Pythium* and *Phytophthora*. The pathogen spores in the soil or potting mix cannot germinate and infect the host plant because of competition from the high number and variety of beneficial micro-organisms found in the compost. The same mechanisms are probably at play in soils of organic farms, where soilborne diseases are less prevalent[5].

Natural suppression of diseases caused by *Rhizoctonia* is more difficult. It is a rapid colonizer of fresh organic matter and thus escapes general competition, described above to suppress *Pythium* and *Phytophthora*. Suppression of *Rhizoctonia* requires proper composting of organic matter to reduce the food resources available to the pathogen, and also natural recolonisation by specific microbial antagonists. However, this natural recolonisation is random and often inconsistent. To achieve consistent suppression of *Rhizoctonia* diseases, the material must be augmented with specific microbial products[3].

In Canada, commercial products made from naturally occurring soil microbes are available. They are excellent against specific root diseases. The products Mycostop (*Streptomyces griseoviridis*) and Rootshield (*Trichoderma harzianum*) were reviewed in a previous article in this magazine[10].

Watering of compost piles Adequate moisture is the key to proper composting, and a critical factor to obtain a finished product that is high quality and suppressive to plant diseases. Rainfall is usually insufficient to ensure adequate moisture, especially during summer months. Water must be added so the material readily forms a ball when pressed in the hand.

Other products will soon be commercially available, such as disease-suppressive strains of the bacteria *Bacillus subtilis* and the fungus *Gliocladium c.*[11].

These products are approved by OMRI (Organic Materials Review Institute) and thus allowed for use by certified organic farmers[12].

Composting on a small site
Composting can be done on small farms and does not require large, expensive equipment. A basic recipe is to mix fresh ground brush (or leaves) with grass clippings or poultry manure. Maintain adequate moisture, turn if practical, and reasonable material should be ready in a few months.

III. INDUCING RESISTANCE TO LEAF DISEASES

More recently, researchers have identified composts that can suppress leaf diseases. In this type of disease suppression, specific micro-organisms found near the roots trigger the production of pathogenesis-related proteins that form physical barriers at infection sites on the leaf[13].

This mechanism has been called "Induced Systemic Resistance" and in effect increases the natural disease resistance of the plant. It is different from "Systemic Acquired Resistance", a process where defence proteins are produced *before* the challenge by a foliage disease[2].

Scientists are currently looking at these "fortified" composts and their efficacy to reduce foliage diseases[15].

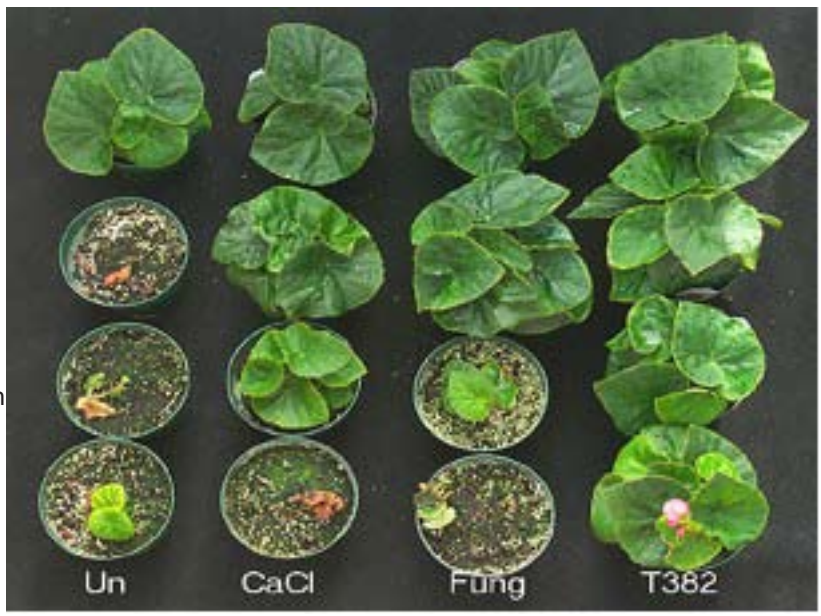
Early results are encouraging. A group of researchers at Ohio State University recently concluded that composts used as one component of growing media in container production, when "fortified" with *Trichoderma hamatum* strain 382, suppressed many foliar plant diseases: leaf blight of cucumber caused by Phytophthora capsici[16]; bacterial leaf spot on vegetables, caused by Xanthomonas campestris[17]; leaf blight of begonia caused by Botrytis cinerea[18].

Plant tested	Disease	Regular potting mix	Same mix plus *T.* 382
Myrica pennsylvanica	Botryosphaeria stem dieback	21 % killed	6 % killed
Pieris japonica	Phytophthora shoot blight	24 % killed	4 % killed
Rhododendron Roseum e.	Phytophthora shoot blight	84 % killed	72 % killed
Begonia cv. Barbara	Powdery mildew	1402 cumulative disease severity	100 cumulative severity

Efficacy of Trichoderma-fortified composts in nursery container production[2]

In a study published in 2003, only one of 79 commercial composts was found to suppress bacterial leaf spot of radish. Eleven micro-organisms were recovered that could induce systemic resistance, with certain strains of *Bacillus* and *Trichoderma* being the most effective[14].

To obtain consistent disease-suppression, beneficial micro-organisms must be introduced to the potting mix, mulch or soil amendment.



Using a soil microbe to suppress a leaf disease
The begonia plants were grown in a standard peat moss mix. Treatments were, columns from left to right, "Untreated", "Calcium chloride" (a fertiliser), "Fungicide" (a synthetic product) and "Trichoderma h. 382" (a beneficial soil microbe). The disease Botrytis was injected into the leaves at increasing levels from "none" (top row) to "lots" (bottom row). Note the dead plants for most treatments when placed under high disease pressure (bottom row), but absence of symptoms on plants grown with Trichoderma in the potting mix. Photo courtesy of Dr. Harry Hoitink, Ohio State University.

Several factors impact the ability of root-colonizing beneficial microorganisms to protect the plant from foliage disease. First, in many cases the disease resistance is inducted by activation of "resistant genes" present in the plant before the pathogen arrives. This pathway may not work in host plants that are highly susceptible to a specific disease or that lack the "resistant genes"[2].

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Second, the potting media or field soil must have food to support colonisation and growth of beneficial microorganisms. Recalcitrant materials resistant to decomposition generally sustain these beneficial activities. The "microbial carrying capacity" of parent material (carbohydrates in peat, lignin-protected cellulose in tree bark) determines the longevity of the suppressive effect[19].

IV. "RECIPES" FOR COMMERCIAL APPLICATIONS

The bottom line

Programs using disease-suppressive composts are now available for commercial production. These systems are effective in situations of low disease pressure. However, situations of high disease pressure still require the use of fungicides or other cultural practices[7].

Home gardens

Supply the soil with beneficial microorganisms and nutrients from composted products[20].
- Apply one inch of finished compost on the soil surface.
- Spread in the fall and leave on the surface over the winter to allow slow leaching into the soil.

Field production

Compost can be used as a general soil amendment[21].
- Compost application should not exceed 50 dry tons per acre, or 4 cubic yards per 1000 ft^2.
- In general, 50 dry tons per acre is equivalent to a 1-inch layer of compost containing 50% water.
- For best uniformity during top-dressing, the compost should contain less than 40% moisture.
- Only 8 to 12% of the nitrogen in the compost is available for plant growth the first year.
- Supplemental feeding with mineral fertiliser is necessary for crops with high nitrogen demand.

Balance compost application rate with nutrient content, soil testing and crop needs[20].
- Manure or biosolid (high nitrogen content): apply 2.5 cm deep; incorporate in top 10 cm of soil.
- Plant residue compost (low N content): apply 10-15 cm deep, incorporate in top 20 cm of soil.
- For plants sensitive to high nitrogen or salts, apply the materials several weeks before planting.
- For plants susceptible to root rot, apply the materials several months ahead of planting.
- Fall or winter application is preferred for leaching of salts and decomposition of fresh material.

Lightly decomposed organic matter likely drives general suppression in field soils[3].
- Biocontrol organisms are usually present but lacking the environment to support their activities.
- Soils low in organic matter content and microbial activity are conducive to root rot diseases.
- Higher application rate (20 to 30 dry tons/ha) can generate disease suppression the first season.
- Lower application rate (10 to 16 dry tons/ha) can generate suppression after two years.
- Long term low rate annual amendment is more economically and environmentally desirable.

Avoid application of "fresh" materials or immature composts[22].
- Non-composted materials may release nutrients favouring the growth of plant pathogenic fungi.
- Encourage breakdown of crop residues with poultry manure or incorporation ahead of planting.
- Green manures plowed into the soil need 10 to 14 days to decompose before planting.
- Mature composts must be applied 4 to 6 weeks before planting to prepare for disease control.

Nursery and greenhouse container production

Potting mixes and growing media are often suppressive to diseases caused by Pythium[3].
- Suppression comes from lightly decomposed organic matter colonized by a diverse microflora.
- Suppression lasts weeks for peat moss, 9 months for pine bark, and 2 years for hardwood barks.
- The process is aided by adding a mixture of biocontrol agents, or inundating with compost tea.

Specific microorganisms are required to prevent difficult diseases such as damping-off[16].
- Biocontrol agents can be inoculated into the compost during curing, after peak heating.
- Or, they can be added during preparation of the potting mix, after the addition of fertilisers.
- The process is systemic: disease control is transferred from one set of roots to another.

The bottom line

"The biocontrol-fortified and compost-based mixes may also prove useful for organic transplant production where the use of pesticides is limited."[17]

The growing media must be prepared with high quality materials[23].

- Peat moss that is light and fibrous has the potential to reduce root rots with suppressive effect up to 6 months. Conversely, fine, particulate peat fills pore space and may increase root rot.
- Pine bark is high in materials that resist decomposition and is used at 65 to 100% of volume.
- The product must be composted to avoid a short period of nitrogen immobilization and kept moist (50 to 60% moisture) during composting to avoid growth of problem fungi after potting.
- Hardwood bark must be composted before use. It has the best disease-suppressive properties of all composts and is typically added at 15% of total volume for root-rot susceptible crops.
- Composted yard wastes are better suited for landscape use. When used in potting mixes, they are added at 15 to 25% by volume. This compost does not cause nitrogen immobilization.
- Composted manures vary in nitrogen concentration. They offer control of soil-borne diseases when added at rates no higher than 15% in potting mix. They can also be used as top-dress.
- The final potting mix must be analysed for physical properties of air space and water retention. Air capacity must be above 20% for most crops and above 25% for crops sensitive to root rot.

Landscape mulches

A number of considerations are important for proper use of landscape mulches[24].

- Place a layer of decaying organic matter on the surface, cover with coarse wood chips or bark.
- Aim for a total thickness of 10 to 15 cm on heavy soils in regions with frequent rainfall.
- Aim for a total thickness of 15 to 20 cm on well-drained soils in regions with dry climate.
- A layer too thick (over 20 cm deep) may decrease oxygen flow and trigger root problems.
- Keep the mulch away from plant trunks to avoid wet conditions leading to stem rot diseases.

Use slightly immature materials that are likely inoculated with beneficial microbes[25].

- Avoid fresh mulches (sawdust or wood chips) which may be colonized by plant pathogens.
- Compost mulch products with grass clippings, manure or urea for at least 6 weeks.
- Maintain moisture at 40% water content during composting, storage and application.

Soil health and disease suppression

Can we relate soil health to disease suppression? "Yes", says Ariena van Bruggen, of Wageningen University, in the Netherlands. "A healthy soil is expected to be suppressive to diseases and pests." Dr. van Bruggen was speaking at the annual meeting of the American Phytopathological Society (scientists of plant diseases), held in late July in San Diego, California (see http://meeting.apsnet.org). She defined healthy soil as "a stable soil system with high levels of biological diversity and activity, low available carbon and nitrogen, and resilience to disturbance"[28].

Her research group examined the daily changes in soil microbial populations following disturbances. After incorporation of cover crop, manure or compost, soil microbe numbers increase rapidly in the presence of new substrate (food), then decrease as food is used. The up-and-down change in microbial populations is termed "oscillation", similar to the waves created by a rock thrown in a pond.

One study examined a grass – clover cover crop. Following soil incorporation, soil bacteria numbers increased daily for 5 days, followed by increases in bacterial-feeding nematodes, Pythium damping off and Fusarium flax wilt, all feeding on food residues generated by the increases in soil bacteria. Damping-off was highest 8 days after incorporation and lowest 35 days after incorporation. Healthy soils, such as those found on organic farms, have lower peak heights of bacterial populations and more suppressed Fusarium wilt than conventional soils.

Thus, cover crop incorporation results in a short-term "bloom" of noxious soil microbes, who feed on readily available food. Based on these results, the researcher recommended waiting at least 12 days before planting a field crop following cover crop incorporation.

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Making High Quality Compost[26]

Step #1:
Prepare a mixture of slow-decomposing and fast-decomposing materials.
Slow-decomposing materials include leaves, twigs and bark. Fast-decomposing materials include grass clippings, kitchen residues, garden refuse and animal manure. Mixing the two ingredients will ensure good composting and usually result in a pile within the standard target of C:N ratio between 25:1 and 40:1.

Step #2:
Place the materials in a pile for composting.
The materials should be chopped, shredded, split or bruised to increase their surface area. Place in a pile to trigger the "hot phase" of composting. For large sites, a pile 2 to 3 meters high and 2 meters wide will generate hot temperatures yet allow oxygen diffusion. For small sites, a wooden box 1 meter wide by 2 meters high gives good results. Other methods also work well.

Step #3:
Water, water, water.
Water must be added to the pile with an irrigation hose or sprinkler, especially during the first month of composting. Aim for 40 to 60% moisture content: half the weight of the material should be water. A simple test is to dig a hole into the pile and take a small handful: moisture is adequate if the material can easily be squeezed into a ball.

Step #4:
Turn, turn, turn.
The piles are turned to allow the material on the outside, where composting is slow, to be mixed into the middle, where composting is rapid. Turning is also the best method to regulate temperature and moisture. Turning is done often at the start of composting to regulate the initial hot temperatures, and less often after 2 or 3 months as temperatures stabilize.

Step #5:
Monitor the temperature.
Serious composters should invest in a temperature probe, a cost of about $200. Place the probe into the pile to verify core temperatures. The best composting occurs at 45 to 600C, usually reached without effort with proper start-up materials and moisture. Lower temperatures indicate very slow composting, and higher temperatures indicate burning to charcoal.

Step #6:
Test the finished product.
Simple recognized tests 27 include growing radish seeds for 7 to 14 days and compare germination and growth to a "standard" commercial product, or laboratory analysis of Electrical Conductivity or CO2 release over time. No testing is required for compost used months ahead of planting, or cured for 21 days with core temperatures remaining within 20 degrees C of air temperature.

Step #7:
Use it!
When done properly, cured compost is a relatively stable material of high quality for nutrients and biological activity. It can be used safely to improve soil quality and provide a long-term supply of nutrients. Large commercial operations use compost as a soil amendment or mulch on the soil surface, or mixed with other ingredients for greenhouse production.

Cover crop and disease suppression
After a cover crop is tilled, readily degradable plant materials stimulate the growth of noxious pathogens present in the soil, including those responsible for damping-off. As this population declines, more recalcitrant plant materials serve as food for beneficial soil microbes. Their population growth help protect plant roots from disease infection. Growers wishing to take advantage of this process should wait at least two weeks after cover crop incorporation before planting a field crop.

The "Top 3" common mistakes of composting

Common mistake #1: the piles are started with an improper mixture.

Is your compost pile sitting there and not cooking? Is your compost pile generating an awful smell that triggers complaints by neighbours kilometres away? Welcome to our club, for those of us who made the big mistakes and learned the hard way about compost.

Slow composting is often caused by an imbalance in the start-up mixture, for example when using too much bark, a "slow-decomposing" material. As a rule-of-thumb, a slow compost pile can be "jump started" by adding grass clippings at 10 to 20% by volume, or poultry manure at 5 to 10 kg per cubic meter (roughly 10 to 20 pounds per cubic yard).

Smelly compost is usually caused by improper watering. A common mistake is to let the piles dry up, then overwater them. Do not try this unless you want to be the center of attention in the neighbourhood. Good compost smells good, as long as ingredients are properly mixed and adequate moisture is maintained.

Common mistake #2: raw materials are constantly added to an active compost pile.

The compost is hot within days of starting, and these high temperatures help kill most weed seeds and plant diseases. So why do you add raw, sick plant material to an active pile? Why do you add plant diseases to a clean finished compost?

Proper composting procedure requires at least 2 piles. Gather the raw materials in a "building pile" as they become available. Once there are enough raw materials, the "building pile" can be modified into an "active pile" to trigger hot temperatures and proper composting. This pile is turned and watered regularly. While the "active pile" is composting, start a new "building pile" with raw materials becoming available. Ensure no physical contact between the 2 piles!

Common mistake #3: the compost piles are dry. Very dry.

Composting is done by microbes, especially bacteria and fungi. They are alive! They need water, just like humans and animals! So why is this compost pile bone dry? Why do you cover the piles with a tarp? Put water on those piles. Make sure the material is moist (but not wet!). Then you will get good compost.

Inadequate moisture is, by far, the most common mistake of composting everywhere. Water must be added to the piles with an irrigation hose or a sprinkler system. In British Columbia, rainfall is not enough to maintain adequate moisture, and barely sufficient during the non-stop rainfall of November to February in Coastal areas.

For Mario's article with footnote references please see the COABC website www.certifiedorganic.bc.ca. To contact Mario Lanthier: CropHealth Advising & Research, Kelowna, British Columbia, (250) 717-1898

In Mario's previous article that appeared in the Spring 2007 issue a section was missing on page 10 after: "A similar conclusion was reached by another group who compared efficacy of finished tea against autoclaved finished tea": *"(a process that destroys live micro-organisms), and found both teas to be as effective[11]. Other modes of action were confirmed where live micro-organisms play a role. In one study, heat treatment of finished tea eliminated disease suppressiveness for grape powdery mildew, bean mould and tomato late blight[3]. In another study, researchers induced plant defence responses with specific micro-organisms found in the start-up compost [16].*
With aerated compost tea, the mechanisms have not been clarified. The same modes of action as non-aerated compost tea may be at play, but conclusive research is currently lacking.

One critical factor is reported to be thorough coverage of the plant leaf surface[4]. In this case, beneficial micro-organisms out-compete pathogens for space and food on the leaf surface[17]. Pathogens "starve" because they cannot access amino acids and other molecules released during plant growth.

Effective disease control with aerated compost tea can be obtained for diseases that grow on the plant surface. Common plant pathogens such as Botrytis, Septoria and Alternaria, use nutrients found on the leaf surface during spore germination and surface growth. Beneficial microbes found in compost tea must be competitive..."
My apologies to Mario.

Growing the 100 Mile Diet: Ten basic concepts to explore 'possibilities' for 'eating local, buying local' food

By Sharon Rempel

In the 1980s we grandmothers and grandfathers were seeding the plants that have grown into today's organic movement. I recognize the same message in the **100 mile diet** that we were stating. "Eat local buy local." "Know the farmer, buy as close to home as you can." Some of us formed organizations that certified organic produce in our region. We wrote standards and certified our farmers. We got to know each other.

We also were conscious that what we bought from outside our region had to be evaluated for a few principles. Were the farmers being given a fair price for their crop? Was land being taken from people to produce the cash crop we were buying? Was the company ethical in their treatment of soil, people and the crops?

Many of us boycotted grapes for years because of the human rights violations with countries selling grapes in Canada. There was no fair trade label to give us some reassurance that farmers were making a good living and land conservation was practiced. Some of us gave up coffee and chocolate and other cash crops knowing farm land for growing essential crops was being taken away for our luxury foods.

Can an organic label really compensate the local farmer in a developing country when I consume a mango, banana, chocolate or coffee? I am not sure so I do not eat those crops when I am eating local.

The basic philosophy is not new but is in a new package. Grassroots organic philosophy has encouraged people to buy foods close to home. Perhaps this was originally based on the hope that the consumer and farmer would meet face-to-face.

This would allow the consumer to ask the farmer how he/she managed land and plants. What was organic and what was not would have been a decision between farmer and consumer.

The oil crisis has precipitated demand for a huge diversity of locally produced products. The term '100 mile diet' has grown to incorporate a vision of having fresh food and commodities produced within one's locale or region. This makes a lot of sense, but will require some very immediate assessment of what value local food has to a region.

On the west coast land values continue to climb. Farms are turned into subdivisions. As more people come to a region and as the demand for local products increases, who will be making the decisions that will allow local food to feed local people. How will grains and pulses be grown, harvested, and distributed, when people still put value onto green lawns and pastures for recreational horses to graze?

However, my heart is happy when I hear the next generation raising the call with the **100 mile diet**. Let's all join hearts, hands and minds to help create a food system that will feed us. We grandparents have brought the organic industry and the grassroot folk are strong. But when we die out, will the history of the roots be remembered?

In 1987 I was on the CBC Sunday Morning Food Show with host Bruce Steele. He asked me how I felt about being called the "lunatic fringe," which was what the organic movement was seen as, fringe and impossible.

My reply was, "it's a way of looking at local land and food issues that can only gain in popularity and in twenty years this should be mainstream."

In 1987 I began to grow a possibility. I grew heritage wheats including 'Red Fife' wheat. I started with one pound of 'Red Fife' wheat and today we are, from that one pound of seed, seeing fields of this glorious old landrace adapting to fields from coast-to-coast.

'Red Fife' is one of hundreds of heritage varieties of wheat that we can field trial as possibilities. There are 100,000 varieties of wheats that make bread. 'Red Fife' is one variety. Then there are dozens of varieties of spelt, durum, emmer, einkorn, kamut and other types of wheat. Same with all other crops.

Not all heritage crops will adapt to all regions. Nor do all hybrids adapt to all regions. But trying a new seed starts with a 'possibility' thought "What if that variety will adapt here?" Soon you begin to taste the end results.

Often you get a small of quantity of seed, put it into the ground, and in a few years you are feeding your community with the results of your efforts and swapping the surplus for crops that others are growing. But it starts by experimenting with varieties, not just crops. Get as specific in the variety choice as you can.

When you bring the People, Plant and Place together you just never know what will grow. Anything is possible. That is the miracle of the seed.

Ten steps to Growing the 100 mile diet

1. Identify the foods that are your food choices; don't exclude what you can find today within the 100 mile range at this stage. Remember possibilities.

2. Identify what's currently being grown within the 100 mile radius and also start searching for people who are passionate about the crops not being grown at present.

3. Then break the 'food' into 'possibilities'. For example 'wheat' is not just 'wheat'. When we consider the heritage variety 'Red Fife' that's a landrace variety of bread wheat. But there are hundreds of varieties of bread wheat to try that might be 'possible' to grow in each region. And then there are pasta or durum wheats that can be blended with bread wheat for various kinds of food including pasta. Same idea happens with the various types and then varieties of corn, millet, beans, etc.

4. Identify people who know about each of the possibilities you might want to source. You might start looking in the Seeds of Diversity Canada (www.seeds.ca) and your local 'Seedy Saturday' seed exchange site of small seed companies. Ask them about their local experience with your possibilities and very likely they will have a good source of seed.

5. Identify sources of seed for the possibilities and then get the seed.

6. Identify places where you can grow the seed. You may not have land yourself but who can you partner with to have your seed grown out? Experiment with what grows in your region.

7. Can you develop a CSA (Community Shared Agriculture) model in your community that will include the 'possibilities' in each week's food basket?

8. Once you have identified the 'possibilities' that grow well in the region, and found the seeds, and found the land to grow the seed, and a method to distribute the food (WOW!) then you are ready to enhance the taste and nutritional content.

9. Grape growers and wine makers have developed ways of developing a 'taste palette' for each 'possibility' that has proven itself in the region. Why can we not do the same to expand the amino acid content, the foundation of proteins that provide nutrition and food qualities in all the foods we eat?

10. Celebrate the seasons with community celebrations around the seed. There are the spring rituals for a fertile and prosperous growing season and blessing the seeds of new possibilities. Then the weeding and the summer heat to bring maturity to the possibilities. Then the new seeds form and also the fruits of the labor. Harvest these fruits that are proof and remembrance of the abundance of the Mother Earth. Share the abundance and prepare for a period of rest and reflection and dreaming about next year's 'possibilities'.

 Sharon Rempel. Sharon teaches people about developing community food systems and conserving agriculture biodiversity. She's the founder of the 'Seedy Saturday' and the 'Red Fife' wheat movements. Email: slrempel@shaw.ca and website http://members.shaw.ca/oldwheat

Haskap Research Bears Fruit with Organic Potential

by Brenda Frick, Ph.D.

Haskap is poised to hit centre stage as the next exciting offering from the University of Saskatchewan Fruit Breeding Program. This unique fruit shows promise from the growing, harvesting, processing and marketing sides, and it has the potential to be grown organically. "Haskap" is the name given to this small fruit by prehistoric peoples in Japan. Other names include edible honeysuckle, blue honeysuckle and honeyberry. The species is native to Russia, northern Japan and Canada.

The Canadian prairies seem to be an ideal place to grow haskap. The hardier varieties are cold hardy to -45C, and even the open flowers can survive -7C temperatures. In areas much warmer than Saskatchewan, the flowers may open unseasonably early, before the pollinators are out.

The flavour of haskap has been likened to blueberries, perhaps in part because the fruit looks something like an elongate blueberry. Unlike the blueberry, haskap skins melt in the mouth. Seeds are very small, so they too go unnoticed. Both these qualities make a superior processed product as well as enhanced fresh eating.

University of Saskatchewan fruit breeder Bob Bors has crossed the tastier Japanese varieties with the more winter hardy Russian varieties to develop a whole range of possibilities. Different selections vary in sweetness, tartness, and juiciness. Ultimately, different cultivars may be preferred for fresh eating, drying, jam making, wine making and so on.

The haskap program at the University of Saskatchewan is the only one in Canada, one of only two in North America, and it is still in the early stages. Over the last 5 years, six Russian varieties and seedlings have been released to give producers something with which to experiment. The fruit from these varieties is being used to develop new products such as ice cream, gelato, pie filling, sundae topping, salad dressing, vinegar, and wine. Fruit development is progressing hand in hand with product development.

New varieties have recently been developed. 'Borealis' has the best flavour, and largest fruit size, but fruits are somewhat delicate. This may be a good choice for the pick your own market and for home gardens. 'Tundra' also has good flavour, but has a more attractive shape and is a bit sturdier. It may be better suited for the individual quick frozen market. Newer and better varieties are in the pipeline, to be released in the near future.

Haskap bushes are best planted in the fall, and may yield fruit in the first year after planting. They mature quickly, and by the 3rd or 4th year, they may be producing 4-6 kg of fruit. Bushes grow to roughly 1.5 m, and do not sucker. Plants have few insect or disease problems, so can easily be grown organically. Fruits shake off the bushes, allowing for mechanical harvest.

Several issues remain. Rick Sawatzky of the University of Saskatchewan fruit team warns that "there's a lot we just don't know yet'. The most established bushes in the program are less than a decade old. Some selections are only now coming into their second year of production. Researchers are working with producers both to further the reach of this meagerly funded program, and to bring varieties to producers in the speediest possible fashion. Producers considering haskap are cautioned to move slowly, and join together to share the risks of a new industry.

Research has uncovered a number of risk factors. With haskap, two or more unrelated varieties must be planted together to ensure pollination. It is advised that plantings be surrounded by shelterbelts; haskap branches tend to be brittle and can be damaged by wind. Birds such as waxwings love haskap. Producers with small holdings are advised to use bird netting over bushes as they come into fruit. In larger plantings, an earlier flowering variety planted as a trap crop, may attract birds away from the main crop. Mildew has been seen on plants in late summer. Fruit production is over by this time, and plants are generally dormant when the disease presents. Only some of the plants in the breeding program have shown

mildew, and the new varieties have been found to be resistant in the field. The U of S fruit program will be incorporating disease screening into their selection process for future varieties.

People in Japan have long valued the medicinal effects of haskap, with one juice product marketed as the "golden remedy for the eternal youth and longevity"; modern reports suggest haskap has beneficial effects on blood pressure, cardiovascular disease, gastrointestinal disease and even malaria. The fruits are high in vitamin C and antioxidants. Linda Matthews, part of the fruit team at the University of Saskatchewan, oversaw an antioxidant study of haskap. Haskap were high in anthocyanins, "as good as blueberries, and blueberries are the market king".

A sizeable market exists for haskap. Although the fruit is highly valued in Japan, its traditional growing areas are being reduced by population growth. The fruit team at the University of Saskatchewan is working with the University of Hokkaido and with buyers in Japan. The flavour and health benefits of this unique fruit suggest that a significant new market may also be found closer to home. Hopefully this excellent new product will arrive at our local markets in the near future.

For more information see http://www.haskap.ca/index.htm. Brenda Frick, Ph.D., P.Ag., is the Research and Extension Associate for OACC at the College of Agriculture, University of Saskatchewan. She welcomes your comments at 306-966-4975 or via email at organic@usask.ca.

Managing Nitrogen on Organic Farms in BC

By Robert Dixon

Nitrogen is one of the most limiting factors to crop production on small farms all across BC. Of course it limits production on large farms too, but they can reach for a pail or a bag and get nitrogen that way whereas certified organic growers are supposed to use natural cycles to build organic matter in their soil and release enough nitrogen for good yields.

My direct experience as a senior organic inspector with 17 years experience has shown me that managing nitrogen is an area that organic growers want to know more about.

The problem is there is no one thing that you can do to get a reading that tells you how much material to add to your field to have enough available nitrogen for your crop. The processes that tie up, deplete and build up available nitrogen are too complicated to assess that way.

What is needed is a rough guide that gets better with experience the more it is used. This is more like an experienced chef who uses an old familiar recipe as a guide to mixing the ingredients in the right amounts and the correct order. That is what building organic matter in your fields is like - more like baking then filling your gas tank.

The Carbon to Nitrogen ratio is a good way to understand the mysterious and unseen processes which turn organic matter into stable humus that leads to strong crop yields. The best way to get an idea what is going on in your soil is to look at the composting process, which is just a fast-forward of the slow moving forces at work in farm fields everywhere.

To make compost that heats up fast and reaches a high heat stage for days, as required in the USA National Organic Program and current COABC organic certification standards, you need to get the C/N ratio just right, at about 30 parts carbon for each part of nitrogen. Carbon material is dried weeds that have been pulled out of the garden, the stems of plants, tall grass etc. while nitrogen comes from grass clippings, fresh manure, sawdust chicken litter and manure, blood meal or mulched leaves (my favourite). So you learn by experience how much of these two types of materials to combine and how wet they have to be.

You build the pile around a stake hammered into the ground, then the stake is used to create an air hole so the pile can breath. Now the stake becomes a temperature gauge telling you how hot the pile is getting (I have measured temperatures of 180 F in a new pile, and with sterilization in an autoclave for surgical equipment is at 220 F, we are talking very hot!).

What does this have to do with nitrogen available to your crop in the field? Lots, because certified organic farmers have to make sure there is enough nitrogen for three separate, but linked, purposes:

1. Feed the soil life that will convert raw organic matter into stable humus, they will tie up a certain amount of N, so enough has to be there to get through this tie down period.

2. Replace what was taken from the soil through harvesting the crop and through tillage practices.

3. Provide for healthy crop yields this year.

Nitrogen from a pail only provides for the third item, growing a crop this year, but it does not maintain soil N and it does not provide enough to build up a reserve of stable humus. Using compost may or may not do more depending on how it was made and the quality of the materials used. Legume and grass cove crops are the most economical way for BC certified organic growers to provide enough N to their fields to meet all the above listed needs.

It is going to take time to understand how to use the C/N ratio to manage nitrogen on your farm so you might as well start now. Researchers in France discovered that, for their soils and climate, a ratio of 10 was good and provided enough nitrogen for good yields and also good fruit size (market grade) while at the same time not having too much nitrogen that would attract aphids.

They found that the Total Nitrogen of the leaves or fruitlets was a better predictor of yield then measuring soil available nitrogen.

To really make the C/N ratio work as a guide on your farm you must know three things:

1. The Carbon to Nitrogen ratio of a representative soil sample from your reference sampling area of a field -- 10 - 12 to 1 is good. This gives you a rough idea of how much nitrogen the soil might make available during the growing season.

2. You must understand the nitrogen requirements of the crop you are growing -- Heavy / Medium / Light

3. What is the C/N ratio of the materials you will apply to add nitrogen and how much are you applying? This is where it gets interesting because you have high Carbon material like sawdust with a C/N ratio of 100 - 200 and then high Nitrogen material like Grass Clippings with a C/N ratio of around 15.

Go to Cyber Help for Farmers on the COABC web site (certifiedorganic.bc.ca) to find numbers for different kinds of materials like a specific cover crop mix when it is disced down e.g. Vetch and Rye.

This is not a quick fix solution of managing organic nitrogen on BC certified organic farms, but it is a way to start, especially if you combine it with accurate crop yield records, recording of weed densities and groups per field and you use leaf testing for total nitrogen, that you can then compare with actual yields and market grades received from each field.

If that sounds like a lot of work, it is, but then if it helps make sure you are feeding the soil life what it needs to stay healthy, isn't it worth it?

Re-thinking Homeland Security

by Christine Matte

Staring into the uninspired pantry after a long day at work may seem like the low point of your day – but there are hundreds of thousands in Canada who stare into an empty pantry. Since 1989, the national total of food bank users has more than doubled to over 750, 000, 41 percent of whom are children.

Hunger is a growing problem both locally and globally, and the commitment of many countries to its eradication was articulated at the U.N. Food and Agriculture's World Food Summit in 1996 and in the resulting Rome Declaration on Food Security (see sidebar). Food security means the assurance that all people at all times have both physical and economic access to the food they need for an active, healthy life. It means the food itself is nutritionally adequate, culturally appropriate and obtained in a way that upholds basic human dignity. Embedded in that widely held definition is not just the prevention of hunger, but the use of a sustainable food system. Urban sprawl increases the distance between the hand that picks and the mouth that is fed – unless we urbanites can find solutions in a concrete jungle.

Lee Fuge, the operations manager of the Food-Roots Distributor's Co-op and co-chair of the CRD Food and Agriculture Roundtable (CR-FAIR) explains, "If consumers can be encouraged to start thinking of themselves as eaters – the ultimate beneficiaries of a food secure community – they might then be inspired to think about the food system and their place within it."

Thankfully Victorians, and British Columbians in general, are already sowing seeds of change. Over 30 percent of Vancouver Island urban farms recorded in the 2006 Census reported organic food production, and B.C. has the highest concentration of organic farms in a metropolitan area in the country. And the initiatives taking place in Victoria are aimed not only at reducing hunger, but also reducing the environmental footprint of that goal.

Susi Porter-Bopp, the Food Security Project Coordinator for the Fernwood Neighbourhood Resource Group (Fernwood NRG), sees Victoria as particularly placed on the issue. "You don't have to do much research before you start seeing that we only have about three days worth of food supply on the Island, because somewhere around 90 percent of our food travels at least two thousand kilometers to us," she explains. "The ties between food security and ecological sustainability are so clear when you think about all the fossil fuels it takes to maintain that way of life."

Porter-Bopp echoes the position shared by both the Dieticians of Canada and the findings of the 2000-2001 Canadian Community Health Survey of Statistics Canada. And for the Fernwood Food Security Group, it's community – and not a produce truck – that will be the vehicle of our agri-food future. Formed in March, the group has undertaken several projects that work towards access to food, land and community. "Most people focus on either food distribution, or individual household needs," explains Porter-Bopp. "But we wanted to do something community-oriented [that uses] the physical resources available to us and through both residents' skills and land."

This includes a demonstration balcony garden, a co-operative fruit tree project with LifeCycles and a community survey on available yard space for urban agriculture. Like the Bamfield Commons in VicWest, the community also has a perennial food garden called the Spring Ridge Commons where residents have access to herbs, artichokes, a variety of berries and other produce that grows freely. "Knowing that a large portion of residents live in apartments or rental units without access to land, we wanted to highlight space-saving food growing possibilities," adds Porter-Bopp, a goal that also makes their projects particularly relevant examples for downtown residents.

The balcony garden at the Fernwood Community Centre includes hanging baskets, vertical planters and bean trellises, all of which maximize space and were created from salvaged or donated materials (with the exception of the soil). The produce is used for the cooking program of Victoria Best Babies, and online guide and "how-

to" manual are currently in the works to help others see the possibilities in their own backyard, whatever that might look like.

All this summer cultivation will lead to the Fernwood Harvest in the fall, a residents-led canning and preserving extravaganza. Access to locally grown food, and volunteering information on the projects can be found at the weekly Fernwood Market. Ultimately, says Porter-Bopp, making a case for change should be easy. "Food is such a core part of our lives and happiness – it's at the heart of cultural interaction." And as long as we need food to live, we can contribute to food security.

This article originally appeared in the August 2-8 edition of **Monday Magazine** *and is reprinted with their permission.*

The Fruits of their Labour

Taking Another Look at Canada's Plan of Action for Food Security

Canada's Plan of Action for food security has given new meaning to putting money where your mouth is. But nearly 10 years in, and only eight years away from the World's Food Summit Deadline, we are still tilling some arid soil. Here's a recap of the proposed national commitments, and where we're really at with them.

Commitment One: An Enabling Environment
On the horizon is the Urban Agriculture Resolution, which recognizes and aims to support urban agriculture, edible commons and waste reduction and conservation efforts.

Commitment Two: Access to Food
According to the 2006 Progress Report, access to healthy food is affected by poverty. Some 50,000 Victorians live in poverty, while food bank use has increased 30-50 percent since 2002. Nationally, over 30 percent of food banks report they struggle to meet demand. And the cost of food rose 3.8 percent in 2006, according to Statistics Canada Consumer Price Index.

Commitment Three: Sustainable Agriculture
$1.2 billion dollars has been spent to "help producers maintain the steady and dependable supply of food products Canadian and international consumers need." But with just over two-thirds of the Canadian population now living in one of Canada's 33 census metropolitan areas, how far is that food traveling to get to Canadians? And while many say the total acreage of farmland is stable, average actual crops – not seeded or tame pasture – have decreased by about one million acres from 2001-2006.

Commitment Four: Trade
Expanding food producers' market access will stimulate investment and offer consumers a broader choice in foods, but choice can be a part of the problem. Adds Susi Porter-Bopp of Fernwood Food Security: "The days of eating bananas and mangoes every day year-round are over. Eating regional, seasonal foods is key."

Commitment Five: Emergency Prevention and Preparedness
Weather disasters and chemical contamination are the major threats, but our system is "under review to ensure its capacity to deal with terrorist attacks and other unexpected circumstances." With only 10 percent of our food supply produced on Vancouver Island, we are not prepared for an emergency where off-island transportation is inhibited.

Commitment Six: Promoting Investment
Off-shore competition and the strength of the Canadian dollar contributed to a national decline in vegetable production of nearly 7 percent in 2006. In short, we're buying more Mexican avocados than B.C. berries. Investing in production improvements, marketing and agri-food infrastructure to attract international investors seems misplaced in a domestic policy plan. Investing in community markets is proven to work: the Moss Street Market alone generates over $700,000 to the local economy.

Global Organics

by Stephen Leahy

Organic agriculture is a potent tool to reduce emissions of greenhouse gases, but also to alleviate poverty and improve food security in developing countries, many experts now believe. Organic agriculture's use of compost and crop diversity means it will also be able to better withstand the higher temperatures and more variable rainfall expected with global warming.

"Organic agriculture is about optimising yields under all conditions," says Louise Luttikholt, strategic relations manager at the International Federation of Organic Agriculture Movement (IFOAM) in Bonn, Germany. IFOAM is the international umbrella organization of organic agriculture movements around the world.

For example, a village in the Tigray region of northern Ethiopia that had converted to organic agriculture continued to harvest crops even during a severe drought, while neighboring villages using conventional chemical fertilizers had nothing, Luttikholt told IPS. Because compost is used rather than chemical fertilizers, organic soils contain much more humus and organic carbon -- which in turn retains much more water. "They can also absorb more water faster which means they are less likely to flood," she said.

It took more work to make the conversion to organic but it paid off when the drought stuck in the third year, according to Tewolde Berhan Gebre Egziabher, director general of the Environmental Protection Authority of Ethiopia. Tewolde, who pioneered the organic revolution in a number of communities in northern Ethiopia as a way of ensuring food security, reported that the early success has prompted government agricultural departments to adopt organic techniques.

Organic and other forms of sustainable agroecology do not depend on chemical fertilizers, so they must find other ways to enrich soil and keep it that way. That also means there are more minerals and other nutrients in the soil, so yields are generally good and food quality high. The added benefit is that organic soils hold much more carbon than soils farmed with conventional methods.

Rising levels of carbon dioxide in the atmosphere from the burning of fossil fuels is the principal cause of global warming. Plants absorb carbon dioxide from the air, and can put it more or less permanently into the soil under the right conditions. In a 23-year side-by-side comparison, the carbon levels of organic soils increased 15 to 28 percent, while there was little change in the non-organic systems, according to the Rodale Institute Farming Systems Trials conducted in Pennsylvania. If just 10,000 medium-sized farms in the U.S. converted to organic production, they would store so much carbon in the soil that it would be equivalent to taking 1,174,400 cars off the road, Rodale reported in 2003.

There's more Making chemical fertilizers like nitrogen requires huge amounts of energy, and tractors also consume large amounts of fossil fuel. In the United States, organic farming systems use just 63 percent of the energy required by conventional farming systems, David Pimentel of Cornell University in New York State found.

Going organic also offers a number of other environmental benefits, including waterways free of chemical pollution and improved biodiversity. In North America and European farming regions, expensive systems must be used to remove agricultural chemicals from drinking water. "Those external costs of conventional agriculture have to be paid by someone," said Volkert Engelsman, the CEO of Eosta BV, a European distributor of organic fruits and vegetables.

"Organic brings a wide range of social and economic benefits, making it a much better and more efficient way of farming," Engelsman said in an interview from Eosta's head office in Waddinxveen, Holland. For low-income countries, that means more jobs because organic farming is labor-intensive. It also values local expertise and traditional knowledge. That makes more economic sense than being dependent on the technical expertise of Western corporations, he said. Engelsman has just returned from India where organic farming is undergoing "explosive growth."

Faced with rapidly depleting soils, the Indian government is now supporting organic techniques because no amount of chemical fertilizer can improve the soil. In addition, water shortages, increased disease problems and higher costs of chemicals and hybrid seeds have forced India to rethink its agricultural strategy, he said. "It is more economically sustainable to invest in the soils of your land than to make the chemical companies richer," Engelsman told IPS.

The problem of global hunger is not about food production – it is about poverty and food distribution, since the world already produces enough food, he said. Engelsman agrees with the noted Indian scientist and environmentalist Vandana Shiva, that research into ecologically-friendly agriculture has proved that it is highly productive and is the only solution to hunger and poverty.

That view, once considered radical, is beginning to gain wider acceptance as hunger has increased under the globalized food production system. Ten years after the 1996 World Food Summit in Rome, where countries pledged to halve the number of hungry in the world by 2015, there were more hungry people in the developing countries today, said the head of the U.N. Food and Agriculture Organization (FAO), Jacques Diouf, in a statement. "Far from decreasing, the number of hungry people in the world is currently increasing -- at the rate of four million a year," Diouf said from Rome.

Finally the FAO is looking to organic to play a role in reducing hunger and alleviating poverty and will host a major conference in May 2007 in Rome. Many countries request FAO's assistance to develop organic agriculture, said Alexander Müller, assistant director-general of FAO, in a statement. "There is a need to shed light on the contribution of organic agriculture to food security," Müller said.

Many countries are already moving in that direction. Brazil's Minister of Agriculture Roberto Rodrigues has said he wants organic farming to grow from three percent of the country's agricultural output to 20 percent in the next five to six years. Last month, 308 delegates from the

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Philippines' farming sector agreed to shift to organic production, in part because it can help poverty alleviation in rural communities.

Studies done by International Fund for Agricultural Development (IFAD), a U.N. agency set up to assist the rural poor to overcome poverty, have shown that organic agriculture reduced poverty. In almost all of the countries where the IFAD evaluations were carried out, small farmers needed only marginal improvements to their technologies to make the shift to organic production. "Everyone is embracing organic agriculture now. And climate change will only boost that interest," Engelsman said.

Stephen Leahy is an independent journalist based near Toronto who covers science and environmental issues for the Inter Press News Service (IPS). For more of his work see: http://stephenleahy.wordpress.com/. *Reprinted from* **In Good Tilth**.

Organic Weed Control Solutions in Cranberries

Project Report to: Certified Organic Association of BC

Funding from:
The Organic Sector Development Program: An Agri-Food Futures Fund from the Investment Agriculture Foundation and Fraserland Organics
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December 2006

Abstract

A need for cost-effective weed control has been identified as a major concern among organic growers. Mechanical cultivation and hand weeding currently provide effective control, however high labour costs make hand weeding increasingly uneconomical. Trials were conducted in transplanted broccoli and cranberry in Delta, BC in 2006 to evaluate two naturally derived herbicides, corn gluten meal (CGM) and vinegar, as potential tools for organic weed management.

No significant differences in weed coverage were observed in cranberry plots on the assessment date two weeks after treatment.

Corn gluten meal did not appear to perform as well as hand cultivation in the studies presented. Along the broccoli field margin where soil moisture was high, the addition of corn gluten meal resulted in higher weed counts compared to the uncultivated control. Dependency on soil moisture conditions and inability to control established weeds may limit CGM application.

Significant yellowing, browning or bleaching symptoms were observed on both broccoli and cranberry plants in vinegar-treated plots, indicating phytotoxicity. Thus vinegar will need to be used with care to minimize the risk of crop damage. Further work to examine appropriate timing of vinegar sprays with other weed control options, such as mechanical cultivation, is needed.

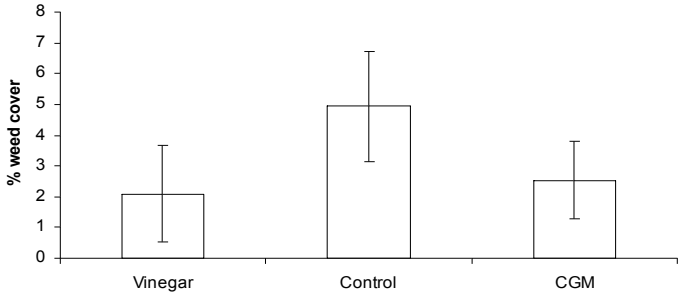
Figure 2. Phytotoxicity as a result of vinegar foliar spray.

Introduction

Cranberries (Vaccinium macrocarpon) are an important crop in the Lower Mainland of BC. While organic and non-chemical solutions to insect pest control have been developed, there are currently no effective organic weed management tactics, other than hand weeding which is expensive. Two naturally derived herbicides, corn gluten meal and vinegar, are potential tools for organic weed management.

Corn gluten meal (CGM) is a by-product of corn processing (McDade 1999). Previous research has shown CGM to have several growth-regulating effects on various weed species

Figure 1. Effect of weed control treatments on mean (±sem) percent weed cover in 1m2 cranberry plots.



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(Christians, 1991; Liu & Christians, 1994, 1997; Liu et al., 1994; Gardner et al., 1997; McDade, 1999; McDade & Christians, 2000). CGM inhibits weed germination by preventing the formation of root systems in plants (Christians, 1993). However, it has also been shown to decrease seedling survival in several crops through this same process (McDade & Christians, 2000). Vinegar (acetic acid) may also have potential as a natural herbicide (Chadran, 2003; Chadran et al., 2004; Coffman et al., 2004a, 2004b; Radhakrishnan et al., 2002, 2003). When applied as a foliar spray, vinegar acts as a contact herbicide destroying cell membranes resulting in tissue desiccation (Webbler & Shrefler, 2006). This process is non-selective and may damage both weed and crop depending on the application method (Coffman et al., 2004a, 2004b; Radhakrishnan et al., 2003).

In this study we compared the performance of corn gluten meal and vinegar for weed control in an established cranberry bog. In addition to weed control, phytotoxicity on cranberries was also evaluated.

Methods

Location of field plots and treatments applied

The study was conducted in a cranberry (var. stevens) field located in Delta, British Columbia. The field was a well established bog approximately 6 years old. Common weeds such as bog blueberry, blackberry, vetch, juncus, and various grasses all appeared in various patches throughout the field. Because weed pressure was patchy in this field, we located plots in two areas with relatively similar initial weed levels. 12 plots were located in each area of the field and were randomly assigned to one of the three treatments, CGM, vinegar or control. Each plot was 1m2 and a 1-meter buffer separated plots.

CGM was applied with a manual hand crank fertilizer spreader at a rate of 200g / m2 covering the entire 1m2 of each CGM plot. The vinegar was applied via a backpack sprayer at a rate of 1 part water to 3 parts vinegar. Weeds in each vinegar treatment plot were spot sprayed until runoff. Because plot assignments were random, some plots did not have any weeds in them and therefore were not treated. Thus the total number of replicates for each treatment was 8 for CGM, 5 for vinegar and 8 for control.

Data collection and statistical analysis of results

On August 4, 2006, initial levels of weed area coverage were recorded prior to application of the treatments on the same date. Weed area coverage was determined by the visual assessment of area covered by percent in each 1 metre square plot.

Weed area coverage was assessed 14 days after treatment on August 18, using the same methods as the pre-treatment assessment. Phytotoxic symptoms on cranberry foliage was also assessed on August 18.

Data were analyzed using standard statistical tests (ANOVA) using JMP® version 5.0.1.2. (SAS Institute, 2005).

Results

Prior to treatment weed coverage was similar in both locations of the field, where the study was conducted ($F_{1,22} = 0.063$, $p = 0.81$) thus we were able to pool data collected from both areas of the field for analysis of post-treatment results.

Two weeks after application, there were no differences in weed coverage among the three treatments (Fig. 1; $F_{2, 21} = 0.973$, $p = 0.394$). Symptoms of phytotoxicity were apparent in the vinegar treated plots only (Table 1, Fig. 2).

Table 1. Effect of weed control treatment on cranberry phytotoxicity

TREATMENT	NUMBER OR REPLICATES	PHYTOXICITY: PERCENTAGE AREA OF 1M2 (MEAN ± SEM)
unweeded control	8	0
Corn gluten meal	8	0
Vinegar	8	14.47 ± 5.15

Discussion/Summary

Weed control in an already established cranberry bog is challenging for several reasons. First any product sprayed on weeds can potentially damage the cranberries, as was the case with the vinegar treatment in this study. Second many weeds in an established cranberry bog are perennial. A single vinegar spray was not sufficient to suppress these weeds; however repeated applications of vinegar with a wiper applicator may be more effective in controlling established perennials over the course of a season.

Since the main mode of action of CGM is inhibition of root growth it is not surprising that this product had no effect on weeds with well established root systems. Further, CGM must be incorporated into the soil to reach the germinating roots weed seeds. Soil incorporation is challenging in an already established bog.

While the results of this study indicate that neither corn gluten meal nor vinegar by spray application were effective for weed management in an already established field, both may be potential tools for weed management in newly planted cranberry fields. Further, a product like vinegar may require repeat applications, by wiping, or higher rates in order to suppress perennial weeds in a well established bog.

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Canada's First Bread and Wheat Festival

Saturday October 27, 2007
Fairfield Community Center, 1330 Fairfield Road, Victoria B.C.

10 am – 4 pm. $5 (complimentary passes available for the financially challenged)

Profits from the event go towards funding local organic and heritage wheat project work.

Visit the website www.breadandwheat.com for a complete list of events, courses, speakers and workshops related to the Festival.

Tax receipts can be issued for donations towards the event; contact Sharon Rempel for details. To book a table, sing or present at the event please contact Sharon.

Why a Bread and Wheat Festival?
This is a day to celebration the cycle of seed at harvest season and to bring together our 'community' to celebrate wheat and bread. The foundation of our western world is rooted in grain. Bread is a food basic in all cultures. Wheat is a vital part of our culture yet totally taken for granted. Fortunately we are now seeing grain fields springing up in our region and a growing number of bakeries featuring artisan, levan and organic breads. Fans of eating locally grown foods and the 100 mile diet are ecstatic!

At the Bread and Wheat Festival you will be able to listen to the stories behind Canada's heritage wheat movement that honours 'Red Fife'. You can taste this amazing 1860's wheat in regionally produced artisan breads and pastries showcased at the event.

Meet farmers, millers and bakers working with local and national grains at variety and farmer identified levels.

Learn about the various uses of wheat…fuel, fodder and fiber as well as crafts, house building materials, religious celebrations, fertility symbols, artistic inspirations and weavings. Enjoy songs, music and stories that are part of our cultural heritage related to grain and bread.

Learn about the process of planting, cleaning, harvesting and milling wheat.

Understand the process of culturing and making sourdough levan bread.

Design your own bread 'taste palette'. Make wheat gum.

Festival Contact information: Sharon Rempel, email slrempel@shaw.ca and phone (250) 298-1133. A press package is available upon request.

Want to learn how to grow wheat?

Event coordinator Sharon Rempel has worked with heritage wheat for 20 years. She runs the Heritage Wheat Project and is an agricultural story finder and researcher. She is the seed grower and instigator of the Red Fife wheat movement and founded the 'Seedy Saturday' spring seed festival.

Sharon is teaching a one day course 'An Introduction to Local Grain Production Basics' October 28 from 9 am to 4 pm at the Fairfield Center. $75 (financially challenged scholarships available).

She's also teaching 'Small Scale Grain Production for Community Food Security' at Royal Roads University, Victoria November 30, Dec. 1 and 2. Contact Hilary at (250) 391.2600 ext 4475 to register.

Want to set up your own community Bread and Wheat Festival?

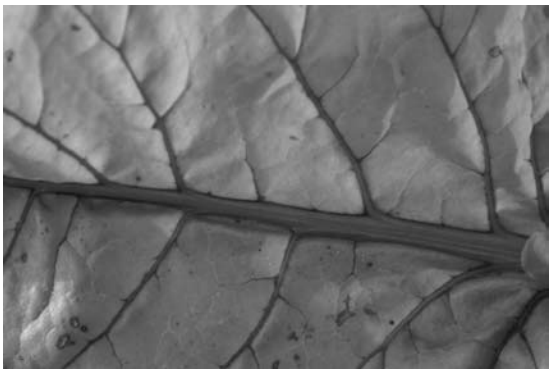
Sharon's preparing a package of 'how to design your own Bread and Wheat Festival as well as a sample press package. Available in early November 2007. Please check the website www.breadandwheat.com for details.

List your Bread and Wheat Festival on the website for a small administrative fee.

Plant Now for Sustainable Winter Cropping

by Nick Routledge

West of the Cascades, our focus on growing vegetables is almost exclusively limited to the Summer season, despite the cold months easily accounting for the longest harvest season of our year - the "refrigerator" period of late-November through late-February lends the extending hand - and a growing body of experience confirming that we are able to grow almost all but the hottest season crops here, year round, and most of them, exceptionally well.



Kale Kales are the bedrock winter vegetable of our bioregion. If you have tried kale in the summer and not liked it, you have been eating it at the wrong time of year - it sweetens markedly with the onset of cold weather, and farmers who have difficulty giving it away in the Summer months can't grow enough of it for local palates once the chill arrives.

Brussels Sprouts A defining cold season character, its habit is tailor-made to shed the worst Winter weather. We possess little in the way of access to Brussels sprout diversity in the U.S. with most catalogs not even providing a spectrum of early-, mid- and late-season maturities (which can span 100 days).

Sprouting broccoli Cold season broccolis are divided into two types: Fall broccolis harvestable through to the cooler weather of early Winter (make the switch from sowing Spring/Summer varieties to Fall varieties in mid-June), and over-wintering/sprouting broccolis harvestable in late-Winter through late Spring.

Cauliflower Northwest farmers may know less about Winter cauliflower than any other major vegetable crop, even as this crop is better suited to the coldest months than any other time of year. The finest varieties take some seeking out.

For Nick's comprehensive assessment of varieties, sources and culture of the major mid- and over-wintering Brassica crops sown May through August, see: www.seedambassadors.org/Mainpages/thefutureofwinter.htm.

Nick Routledge manages the nursery for the School Garden Project of Lane County in Springfield, OR, where he trials and teaches winter cropping. He can be reached at fellowservant@yahoo.com. *Reprinted from* **In Good Tilth**.

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COABC is involved with the **Husky Mohawk Community Rebate Program** in order to raise additional funds for the organisation. Husky forwards 2% of the loyalty card users' purchases to COABC in the form of a rebate. All COABC members were sent a card in 2005 and a small amount of members have been using the card resulting in an average rebate of $125 per quarter. We still need more help to raise funds using this loyalty program.

If you would like to receive a card or additional cards, please contact the COABC office at (250) 260-4429 or email us at office@certifiedorganic.bc.ca

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