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Next Issue Deadline:
July 15, 2007

President's Letter

by Deb Foote

It's a darn good thing that I am not growing a crop for income. If I was, I would be in trouble big time. My roses (okay, so there are not many BC rose producers) have aphids, white fly, rust, black spot, and downy mildew. I think that covers the spectrum of major annoyances for rose growers. The big question for me is how do I deal with all of these problems and do so organically (I simply cannot subscribe to using chemicals in my garden PERIOD).

This is the first year in 23 years that I have had any kind of a garden. Oh, I have toyed with ornamental gardens and landscaping, especially in the 10 years that Garth and I have been home owners in Surrey, but our property is only about the size of a postage stamp, so the projects have been minor in comparison to what I have the absolute joy of "contending with" this year. Yes, despite the aphids I find being close to the earth, and watching the transformation that comes daily with a perennial garden, is pure joy.

Over the winter Garth and I purchased a lovely property on beautiful Mayne Island. While we are not on the waterfront, and do not have a view of the ocean, this is our little piece of heaven! So much so in fact, that I have organized my work in such a way that I am here for approximately three quarters of the month, thus having the maximum amount of time to fight aphids and the like, and also to bask in the glory of the beautiful garden that came with our sunny home here.

Mayne is blessed with a Mediterranean-like climate, especially in these days of climate change. I am thinking of visiting the farm over on Vancouver Island that cultivates citrus and sub-tropical plants to see what I can add to my already interesting array of plants. From what I've been able to ascertain one can grow just about anything here. There is a rich agricultural history dating back to 1890's, including a period of time where Mayne supplied the Vancouver area with a major volume of tomatoes. We have 4 IOPA certified organic operations that provide the island with abundant produce, meats, and processed products. Both of the grocery stores on the island carry local and organic products. At least three of the four restaurants offer local product on their menus. There is a tiny, but accommodating, natural foods store that will special order products as requested, and the farmer's market is the place to be at 10:00 AM on summer Saturdays. Sounds ideal, if only I could deal with the aphids!

By now you are aware that Kirsten has left the COABC for an exciting new opportunity with her Alma Matter – UBC, at the Okanagan Campus. While we are sorry to see Kirsten go, and will miss her contributions to the organization over the 5 years that she was with us, we are happy for her and wish her all the best. In the meantime we are very fortunate indeed to have Kristy managing the office. I should also point out that the executive of the board is in the process of assessing the staffing needs of the COABC and recommendations to the board will be forth coming. At this point we have settled a contract for the administration of the Organic Sector Development Program and the Organic Environmental Farm Planning Program.

We are pleased to announce that the successful applicant is Paddy Doherty. Paddy brings to the position many years of experience with the BC Organic sector and a degree of dedication and passion that is hard to match. Paddy is committed to working with project proponents and to seeing that the fund is utilized to the benefit of the organic trade. Watch for some exciting new initiatives to come over the next few months.

Back in the winter, at the request of the board, Paddy Doherty and Anne Macey approached the BC Ministry of Agriculture for funding to establish an Extension Service for the Organic Sector, among other things. In mid-April we were informed that we would receive funding to the tune of $100,000. There was a formal announcement made at the Canadian Health Foods Association Natural Products Expo in Vancouver. Since that time we have developed and circulated a

job posting for the position of Organic Extension Officer. We anticipate the announcement of the successful candidate in the next issue of the Grower.

As you are aware Organic and Local are getting a whole lot of press these days. It seems that every week I am hearing something in the news, or reading it in the paper. Since we received the grant from the BC Ministry of Agriculture, I have had numerous calls form the media, and Kristy has been steering calls to myself and others as well. There has been no better time to be an organic farmer in BC. You are in high demand. Of this there is no doubt. I do not imagine that many crops are being turned under these days (well okay it's a little early in the season for that, but you know what I mean).

The challenge as always lies with our rural sisters and brothers finding a way to get their crops to the urban markets. That is a topic in and of itself, for another day!

There are big challenges still ahead for this growing season. While we always welcome the snow pack over the winter as it ensures water in the spring, this year has been an exceptional year. Flooding is anticipated and for some farmers in the Fraser Valley concern is high and preparations well in hand. It is my hope that the snow melt is slow and steady, and that none of you have to contend with any major problems.

Happy planting
Deb

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.

Farewell from Kirsten

Hello Everyone,
I thought I would take this opportunity to say 'goodbye' to everyone that I have met (and everyone that I haven't, for that matter) in the COABC family. In my almost six - I was one month short in the end - years that I worked for COABC I got to work with some of the most compelling, inspiring, and likable people I have ever met- it was truly a privilege to be a part of the organic movement, one where those involved are genuinely interested in making the world a better place.

Though I have moved on to a place (UBC Okanagan) that really suits the needs of myself and my family at this point in my life, I will really miss the wonderful people I have met through COABC, and I hope that you might miss me just a little bit too.

It has been an honour, and I thank you...
Kirsten

Editor's Note

Many thanks are needed for this issue of the *BC Organic Grower.* The journal draws from a list of writers and experts to write on important issues and standards of the COABC and it is these passionate people who make the journal what it is. Thank you.

In the last few months I have corresponded with more people who donate and dedicate their time to such a worthy cause than I have ever seen. All because they "believe" so much in what they are doing. The hard work and devotion was evident at the AGM - so many people gave so much of their time and a thanks needs to be said to everyone involved - especially to Barb Sheppard and Rebecca Kneen.

The *BC Organic Grower,* hopes to be an educational tool as well as a way of spreading the words of the organic movement. Each issue will continue to offer informative articles covering organic news items of importance.

We also like to keep you updated on current events and new decisions. We do welcome everyone's submissions and would love to hear your thoughts. For more information on how you can contribute to the journal please contact the COABC office or myself.

Cassandra

Announcement

Your Local Farmers' Market Society (YLFMS) currently runs three summer markets in Vancouver: two on Saturdays and one on Wednesdays. A new Sunday market is planned for 2007. 100% of the product sold is LOCAL and the current number of farm vendors cannot keep up with consumer demand. YLFMS is looking for more farmers, especially those that have cole crops, tree fruits, Asian vegetables, pork, poultry and eggs, as well as value added products like wool, sausage and more.

Farm based sales totalled over $1.5 million in 2006, with farmers averaging between $1,500 and $2,500 in a 5-hour period. Total attendance each week in 2006 was between 5,000 – 7,000 customers.

YLFMS is entering their 13th successful season. With the public's increased desire for local food, 2007 promises to be their best year ever.

As farmers are busy YLFMS has developed policies that support farm vendor collectives as a way to share the responsibility of being at the market, while at the same time, increasing the range of products available for sale. This way farmers can sell at the farm gate and participate in lucrative urban markets. Please contact them to learn how their markets can work for you. Application forms are available on line at www.eatlocal.org.

Contact:
Roberta LaQuaglia, YLFMS Market Manager
roberta@eatlocal.org
t- 604.879.3276
f- 604.253.3276

Your Local Farmers Market Society
2-1163 Commercial Drive
Vancouver BC, V5L 3X3

Pick Green Manures for Energy Efficient Nitrogen

By Brenda Frick

Green manures allow producers to improve their energy efficiency in a relatively simple and inexpensive fashion. Nitrogen fertilizers made from natural gas account for up to 30% of the energy use in modern agriculture. Replacing such fertilizers with green manures improves the energy efficiency of the farming system.

How much nitrogen can be gained by green manuring? Martin Entz from the University of Manitoba recently told producers at a ProCert Organics meeting in Regina that a good ball park figure is that about 3% of the biomass of the green manure is nitrogen. For instance, if the green manure produced about 3000 lb/ac of dry green material, it would yield about 3000 x 0.03 or 90 lb/ac of nitrogen.

Green manures break down slowly, releasing about 60% of their nitrogen in the first year, and 20% in the second year. An additional 20% of nitrogen goes into what Entz refers to as the nitrogen bank, for long term soil building. This means that the 3000 lb/ac green manure in the example above would provide about 54 lb/ac in the year after green manure, about 18 lb/ac in the year after that and about 18 lb/ac for long term soil building. The green manure in Entz' example would provide enough nitrogen for a 30 bu/ac wheat crop, followed by a 15 bu/ac flax crop, without generating a nitrogen deficit.

In areas with sufficient moisture, forage or grazing crops might be included for green manure. Several years of alfalfa, if the hay were not removed, would allow a greater build up of nitrogen and thus allow for a greater number of feeding crops to follow.

In areas with moisture limitations, farmers may feel that they can not include a green manure crop. They may feel that the moisture of two years is required for a single crop. The recently published Canadian Organic Standard recommends green manures. Is this a mistake for drier regions?

Studies at Swift Current suggested that although green manures need to be carefully managed to avoid depleting soil moisture reserves, they still have an important role in cropping systems for the semiarid prairie. Wheat crops that followed an annual legume green manure yielded better than wheat crops following black fallow in wet years. In dry years, leaving the green manure until full bloom depleted moisture for the following crop.

Timing the green manure plow down can be a balancing act. Allowing the green manure to reach full bloom maximizes the amount of nitrogen it will produce. It also maximizes moisture use. In a dry year, earlier termination, at 10% bloom or even before, will reduce moisture loss. Nitrogen will also be reduced, but in a dry year this is less important.

In dry cycles, green manure crops can be included in a successful rotation by paying careful attention to techniques that enhance water retention. Tillage for incorporation can dry the soil and reduce the residues that trap snow. Alternative methods of termination may be possible. Undercutting with a Nobel blade or other wide blade cultivator can allow standing stubble for snow trap. Crop strips can be used to trap snow. Non tillage techniques such as mowing, rolling or crimping may be possible for the termination of annual legumes.

The benefits of green manures may be greatest where moisture is abundant and thus nitrogen is most likely to limit crop growth. Substantial benefits can also be achieved in dry areas if care is taken to retain and build moisture reserves.

Brenda Frick, Ph.D., P.Ag., is the Prairie Coordinator for OACC (the Organic Agriculture Centre of Canada) at the College of Agriculture, University of Saskatchewan. She welcomes your comments at 306-966-4975 or via email at brenda.frick@usask.ca.

Compost Tea and Its impact On Plant Diseases

by Mario Lanthier

Is compost tea a useful tool to fight plant diseases on organic farms? The answer is "maybe", based on scientific research published recently.

Reports available for many years indicated that foliage sprays of non-aerated compost tea can control rose powdery mildew [1] and grape powdery mildew [2]. A thorough review of the topic was published in 2002 by researchers at Oregon State University [3]. The survey of 47 studies indicated effective control of mould (Botrytis cinerea), tomato late blight (Phytophthora infestans), apple scab (Venturia inaequalis) and grape powdery mildew (Uncinula necator). Persons interested can find a copy of this article on-line.

More recently, aerated compost tea has being promoted as an effective tool to control rose powdery mildew [4] as well as grape powdery mildew, leaf anthracnose, peach leaf curl and cherry brown rot [5]. The claim has been disputed by scientists who failed to control powdery mildew of grapes and apples [6].

Compost tea to control powdery mildew

In 2006, the Rodale Institute in Pennsylvania reported on a $150,000, 2-year study that examined applications of aerated compost tea for control of various leaf diseases in field-grown pumpkins, grapes and potatoes. The recipe for aerated compost tea was reviewed by Soil FoodWeb Inc. in New York [7].

Results were erratic for powdery mildew. In pumpkins, there was no impact in 2003 but 80% disease reduction in 2004. In Chardonnay grapes, regular applications of compost tea resulted in 50% decrease in disease incidence on grape clusters in 2003 but had no impact in 2004. The researchers concluded that "compost tea alone does not seem to be a viable tool to suppress powdery mildew on pumpkins" and recommended disease management based on the selection of disease-tolerant grape cultivars.

"The best part of compost tea is the compost" commented Paul Hepperly, the team manager for the Rodale Institute project. "In potatoes, we found advantages to compost tea only when soil did not receive compost." [8]

Shown is Elise L. Brun in the orchard of a cooperating grower near Cawston, B.C. Aerated compost tea was sprayed on the foliage at weekly intervals from April to July in an attempt to prevent powdery mildew. Results indicated a significant impact from the commercial fungicide Kumulus, but inconsistent control with compost tea.

In 2005, the Organic Food and Farming Education and Research program of Ohio State University reported on a 1-year study that examined various products in organic squash production. Aerated compost tea was prepared with the commercial brewer "SoilSoup". Powdery mildew was significantly lower following sulphur treatments, but there was no reduction from compost tea applications [9].

The claim that aerated compost tea can prevent powdery mildew remains anecdotal. For powdery mildew, this author agrees with a comment posted recently on a web discussion group: "As hard as I search, I still have not found an article on disease suppression supporting aerated compost tea." [10]

Compost tea to control other diseases

In 2004, researchers from the U.S. Department of Agriculture in Oregon reported that a drench application of compost tea was effective to suppress damping-off of cucumber (caused by *Pythium ultimum*) grown in soiless greenhouse media. However, the results were inconsistent when *aerated* tea was prepared without additives, and results were also inconsistent when *non-aerated* tea was prepared with or without additives [11].

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Botrytis mold growing on a plant part
This disease is common in many agriculture crops such as greenhouses, vegetables, tree fruits and berries. It typically infects weak or dying plant parts and later spreads to healthy tissue. Scientific research indicates that compost tea is effective in prevention of Botrytis mold.

The most consistent disease suppression was obtained from aerated compost tea fermented with kelp and humic acids.

Kelp and humic acids alone did not suppress damping-off, but triggered disease suppression when added to any of three different types of compost (yard trimmings, vermicompost, or a proprietary blend of tea compost). Diluting the finished tea with water, or imposing heat treatment (to kill live micro-organisms) significantly reduced suppression, indicating the impact was related to microbes but not nutrients.

The authors suggest an *aerated* compost tea becomes "disease suppressive" when made without molasses and containing a bacterial population of 7 $\log_{10}$ Colony Forming Units (CFU) / ml of solution.

In 2006, the same researchers reported on the impact of compost tea recipes against grey mould (caused by *Botrytis cinerea*) of geranium. For *non-aerated* compost tea, only 31% of teas tested suppressed grey mould. The most consistent and significant disease suppression came from teas made of composted chicken manure or composted yard waste. Increasing fermentation time from 7 to 14 days significantly reduced disease. Adding nutrients or stirring during fermentation did not help with disease suppression [12].

In this project, the *aerated* compost tea was prepared with commercial brewers from "Growing Solutions, Inc." or "Soil Soup, Inc.". Only 17% of teas tested suppressed grey mould, but 67% of tea batches significantly reduced disease when made in the presence of kelp and humic acid. Addition of an adjuvant (such as spreader or sticker) prior to application significantly reduced disease levels compared to aerated tea or adjuvant alone, possibly from increased attachment to the leaf surface.

In 2003, scientists at Ohio State University prepared *non-aerated* compost tea from either composted cow manure, composted pine bark or organic farm compost. The water extract was sprayed on foliage of tomato plants and tested against bacterial spot (caused by *Xanthomonas vesicatoria*) [13].

In laboratory assays with transplants, a foliage spray 24 hours before disease infection resulted in a significant reduction in bacterial spot severity. There was no difference in efficacy between teas prepared from "younger" or "older" compost (curing of 3 to 16 months) or compost to water ratios of 1:1, 1:3 and 1:5. In field production, there was no difference between weekly and biweekly sprays of compost tea. Efficacy was marginal and considerably less than standard copper hydroxide sprays at weekly intervals.

Finally, in a recent study at Penn State University for management of apple scab (caused by *Venturia inaequalis*), a post-harvest foliar application of *aerated* compost tea significantly reduced spring ascopore production compared to the water check [14].

Home-size compost tea recipe
From W.F. Brinton at Woods End Laboratories Inc., Maine. See the website http://www.woodsend.org/compostteas.html.

1) Use well-aged compost, at least 4 months old.
2) Put in a large pail or barrel outdoors between 15 and 20^{O}C.
2) Add water, 1 part compost to 5 to 8 parts water (i.e. 1 cup of compost to 5 cups of water).
3) Stir daily for five days. The strong smell should slowly dissipate.
4) On the fifth day, pour through a sieve or a cheese cloth.
5) Spray on plants in periods of disease outbreak, or drench the soil at the base of the plant.
6) Do not spray edible plant parts to be harvested in the following 2 to 3 weeks.

The bottom line

There is strong scientific evidence that aerated compost tea can prevent a number of plant diseases such as damping off and Botrytis mold, but it is not effective against powdery mildew.

For best results, start the tea with high quality compost, for example a mixture of farm compost and vermicompost. Add kelp and humic acid during brewing. The procedure aims to extract and grow beneficial live microorganisms found in the compost.

Results are not as good with non-aerated compost tea. Again, using high quality compost is critical to obtain success. The procedure aims to extract antibiotic compounds found in the compost.

Until further research anchors the rates and application techniques, growers should use compost tea as a supplement to sound cultural practices and organic-approved spray applications.

Understanding modes of action

Different types of compost tea behave in different ways when applied to plants. A solid understanding of these modes of action is crucial to make successful use of compost tea against plant diseases.

Preparation of non-aerated compost tea favours the extraction of antibiotic compounds that play an important role in suppression of plant pathogens.

One study examined compost tea that inhibited apple scab. When the compost was sterilized before fermentation, the tea was not disease suppressive. However, when the compost was not sterilized but the finished tea was autoclaved, the tea retained its disease suppression properties, indicating the disease suppression properties did *not* come from live micro-organisms. The inhibitory agent was determined to be a low molecular weight, heat stable, non-protein metabolite produced by micro-organisms during fermentation [15]. A similar conclusion was reached by another group who compared efficacy of finished tea against autoclaved finished tea for space and nutrients. For other pathogens, such as powdery mildew and rust, spore germination and plant penetration can occur in the absence of exogenous nutrients, and microbial competition would *not* prevent pathogen growth [18].

Soil management may offer a long-term prospect for suppression of leaf diseases such as powdery mildew. Specific sol microbes colonizing plant roots can induce plant production of defence-related proteins, resulting in increased resistance to foliage diseases [19].

Compost tea for organic farming
Shown is Shepard Smith, then an organic vegetable grower in Oregon. He is seen inspecting a commercial machine for aerated compost tea. The white container is a reservoir for water and compost and is equipped with a pump to deliver constant air during the brewing process.

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Types of compost tea

Non-aerated compost tea describes procedures where compost is mixed with water and left to stand for many days with minimal disturbance. It is also called "compost extract", "compost slurry" or "steepage".

Different methods were recently reviewed [20]. In the 1980s, a team of German researchers made "watery fermented compost extract" from compost mixed with water in a ratio of 1:5 to 1:8 in an open container, stirred once then allowed to sit for 5 to 8 days. The end product was filtered to remove large debris and the liquid extract used immediately.

The recipe was slightly modified by other researchers, including Elad and Shtienberg in the 1990s (compost:water ratio of 1:5 with a 10-day extraction period [21]) and Al-Dahmani *et al* in 2003 (compost:water ratio of 1:5 placed in a plastic container and stirred twice during a 7-day incubation at 20 to 22°C [12]). Woods End Research Laboratory in Maine recommends fermentation in wooden barrels at 15 to 25°C for 3 to 8 days with 2 or 3 stirs using a rod or rotating bar. The end product is not stirred for 8 hours before filtration (to avoid clogging spray equipment), decanted through a 200-mesh sieve (75-micron) and mixed with a proper wetter / sticker agent to ensure full plant coverage [22].

Actively aerated compost tea is a more recent technology where the mixture of compost and water is supplied with active aeration, for example with an aquarium pump. The first "compost tea brewer" was conceived in 1993 and today different models are available for purchase [23].

The high oxygen concentration stimulates population growth of aerobic microbes, which helps disease prevention, nutrient cycling, retention of micro-nutrients, soil structure, and decomposition of plant-toxic materials. By contrast, these beneficial microbes may not survive in *non-aerated* compost tea because of anaerobic conditions [4].

Basic procedures for *aerated* compost tea are readily available [24]. Instructions for the construction of a home-made unit are posted on the website of the Pennsylvania Department of Environmental Protection at http://www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/Tea/tea1.htm [25].

B.C. research on powdery mildew

Weekly application of *aerated* compost tea is not effective to control powdery mildew in apple trees. That was the conclusion of a research project conducted in 2004 in the Similkameen Valley [26].

The trials were placed within newly-planted apple trees near Cawston, B.C. Five treatments replicated four times were distributed in a randomized, replicated block design. Plot size was 10 consecutive trees. Treatments were applied with a hand-held back-pack to the tree foliage during the morning, at weekly intervals between late April and early July (ten applications). Actively aerated compost tea was prepared with a commercial brewer using local well water and a package of compost plus additives supplied by the brewer manufacturer. Tea was applied shortly after preparation in a spray solution of 10% dilution. Disease incidence was left to occur from surrounding areas. Rating was done on 800 leaves per treatment [27] and results analysed for treatment significance.

Disease incidence was moderate at the first orchard and low at the second orchard. The commercial fungicide Kumulus resulted in a significant reduction in powdery mildew at both sites. Compost tea alone, or spreader alone, resulted in a significant reduction in powdery mildew at the first site, but had no measurable impact at the second site.

Preparation of aerated compost tea
Shown is Sonja Peters with a 5-gallons commercial brewer. In non-aerated compost tea, compost is added to water in a large container and let to ferment for 7 to 10 days. In aerated compost tea, air is forced into the mixture to stimulate growth of beneficial microorganisms.

Table 1. Mean % leaf surface occupied by powdery mildew on young apple trees following 10 weekly applications from late April to early July 2004 (each result is the mean of 800 ratings) [1]

Treatment	Rate	Orchard # 1	Orchard # 2
		Rating on 30 June	Rating on 8 July
Untreated control		7.5	0.20
Grower standard [2]	20 gr / 10 L water	5.6 **	0.06 **
Compost tea [3]	1 L / 10 L water	6.8 *	0.20
Spreader only [4]	10 ml / 10 L water	6.5 *	0.19
Compost tea + Spreader	As above	7.3	0.16
Standard error		0.22	0.013
Significance [5]		* signifies $p<0.05$	** signifies $p<0.001$
		** signifies $p<0.001$	

1: Data analysed by Dr. Ben Coleman, Okanagan College, Kalamalka Campus. Variability between group means was examined with F-test ($p<0.05$). Significance between treatments was determined with pairwise comparaison (Tukey's HSD).

2: Commercial fungicide Kumulus containing 90% sulphur

3: Commercial 5-US capacity brewer and ingredients from K.I.S. (Keep It Simple Inc., www.simpli-tea.com)

4: Commercial product "Superflow" from BiozAgri Products, Oliver B.C. (www.raingrow.com)

5: Stars indicate a significant condition between the treatment and untreated, Tukey's HSD

Funding for this project came from the Certified Organic Associations of B.C. (the Organic Sector Development Program) and cooperating organic farmers (J. and G. Dhaliwal, L. and G. Sellmer, J. and R. Mennell, S. and W. Mennell, L. Edwards and B. Mennell).

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Eating Locally

by Jen Gamble

The Eat Local movement is gaining momentum with the concern about global climate change. Food miles, a major contributor to theses changes, and the reduction of them are becoming a focus for the general population. This increased desire for a lighter environmental footprint creates a unique business opportunity for the organic producers of BC. Organic products have long been seen as the best food choice for the environment. This status can be not only maintained but increased with the promotion of the local organic products. By combining local with organic, a much more powerful environmental difference is created and thus a great marketing opportunity.

Contrary to many reports, local organic products are available, as is clearly evident from the COABC membership list. This means that consumers need not choose between local and organic but can have both. As demand continues to climb for locally grown organic products there is room to increase production. The organic sector can capitalize on this market trend especially with the help of local food action groups.

There is an increasing number of consumers searching for ways to spend their money in a more environmental manner. Local and organic production fits nicely into this expanding market. By offering these consumers an avenue to satisfy their conscious, the organic industry can continue to flourish.

These emerging conscientious consumers need to be connected with their local producers. This gap is where food action groups can make a big difference in the marketplace. The ability of these grassroots groups to reach the consumer should not be underestimated. They are often a mixture of funded and volunteer personal from within the community. Shuswap Food Action is one of these groups that has been promoting local producers through various events.

The Eat Local Challenge put forward by Shuswap Food Action is a good example of this ability. Residents embraced the opportunity to show support for the local growers and processors. Over 250 people registered to eat a certain percentage of their diet from local sources. For two months, participants focused on the amount of local food they consumed. The local media was also enthusiastic in covering the challenge which helped to create wide spread support for the local producers. The awareness this raised spurred many to make lasting changes in their diet. One challenger commented that because of the challenge she realized there were a number of local products that were easy options. When she made these small changes, the amount of local food in her diet increased substantially. With this success, she's decided to make these permanent changes in her life. There are many others who have also decided to continue purchasing the local products they discovered as a result of this challenge.

Another aspect of the Eat Local Project that has connected the public with their local producers is the Eat Local Directory. Updated this past winter, the directory is available online at www.shuswapfoodaction.ca. Having a reference like this makes eating locally more manageable for the consumer. People are much more likely to support their local producers if access is simplified. The directory is a quick reference point for finding local products.

This season, in addition to the directory, a seasonality chart has been created as a guide. With a tool like this, the consumer is more aware of the coming produce and when the produce in the store can not possibly be local. Through a chart like this, the average person can become more connected to the seasons and their food.

Work like this is being done by food action groups all over the province. Input from all aspects of

the food system, especially producers, is very important for food security. This can also be a beneficial relationship for producers as creating public awareness and promotion can increase business. Becoming involved in local food groups gives producers a voice in the groups activities and creates a better understanding of the food system within the group itself. Food action groups can be a bridge between producers and new customers.

Researchers Find That Wild Bees, Considered Pests, Spur Honey Bees' Flower Pollination

by Emma Radovich

A new study may make farmers and gardeners change their perception of wild bees from a nuisance to a farming tool.

Honey bees are five times more efficient at pollinating sunflowers in areas where wild bees roam, according to a study released yesterday conducted by a researcher from UC Berkeley and one from UC Davis.

Pollination is the process of moving the pollen grain from a male flower's anther, where pollen is produced, to a female flower's stigma. The stigma, which is connected to an ovary, is where pollen is received.

Honey bees typically fertilize three seeds each time they land on a sunflower, researchers found. However, when native bee species interrupt flight patterns, the honey bees can pollinate up to 15 seeds. If a honey bee meets up with a wild bee, the honey bee becomes skittish and is more likely to fly erratically, collecting more pollen from male flowers. The bee then accidentally bumps into a female flower, resulting in more fertilized seeds, said Claire Kremen, assistant professor of Environmental Science, Policy and Management.

"(Honey bees) are literally doing a beeline from male flower to male flower," Kremen said.

According to the study, the influence of wild bees accounts for an additional 40 percent of sunflower pollination on the part of honey bees.The researchers surveyed 16 sunflower fields near Davis beginning in 2001 and recorded around 22,000 bee visits, said lead researcher Sarah Greenleaf, postdoctoral scientist of plant pathology at UC Davis.

Before a sunflower's bud opened, the researchers would cover the bud with a mesh bag, Greenleaf said. After the flower opened for pollination, the bag was removed while the scientists waited for a bee to land.

"We would stand there waiting for up to three hours!" she said.

Once a bee pollinated the sunflower, the researchers covered the flower again and came back a few months later to count the number of seeds produced.

Honey bees, which were originally imported from Europe to produce wax for candles, are the most important agricultural pollinators in the United States, Kremen said. But since the introduction of parasitic mites more than 40 years ago, the honey bee industry has suffered.In recent years the number of honey bee colonies in the United States has been on the decline, but the newly released study has the potential to offset the decline in the number of honey bee colonies by making the existing bees more productive, Kremen said.

The study found that wild bees play an integral role in the honey bee industry, primarily owing to their ability to prompt honey bees to pollinate more seeds, Greenleaf said. Unlike honey bees, wild bees are not bred or sold. It is up to farmers to create a wild-bee-friendly environment if they want to benefit from their ability to influence the pollinating patterns of honey bees, Greenleaf said.

"Wild bees are out there providing this free service," Greenleaf said.

Farmers looking to increase wild bee populations could plant hedgerows and use bee-friendly farming techniques which include reducing pesticide use, Kremen said.

"It's really important that we diversify our sources of pollination," Kremen said, pointing to the need to keep wild bees around beyond the sunflower season.

Castrating Bulls Using Local Anaesthesia: A First-Hand Account

At Vale Farms Ltd. (Okanagan Valley, British Columbia), the Ruechel and Hladych families produce certified organic grass fed beef and are proud of the humane handling techniques they use for their livestock.

Recently, they decided to extend this approach to their method of castration. They knew that castration was a necessary management procedure on their ranch, but believed that they should be carrying out this procedure in the most humane way possible. In March 2006, they experimented with castrating 26, 550-pound, 6-months old bulls using a local anaesthetic, and had positive results.

Process

An hour before the veterinarian arrived, we began the process by herding the bulls through the chute twice without handling them. Given that the calves had never been handled before, we wanted to give them a chance to get used to the chute and squeeze first. This saved us time once the veterinarian was on-site because the calves flowed through the system quickly and calmly.

The bulls were split into two groups of 13 prior to the vet's arrival. The first group was run through the chute to receive the local anaesthetic. Once in the squeeze, the vet requested that we put a 'tail-jack' on them in order to keep the bulls from kicking and to restrict movement-allowing safe and accurate placement of the anaesthetic. A proper tail-jack involves grasping the tail with both hands and positioning it so that it is pushed/pulled in a straight fashion directed over the back.

A 2% lidocaine plus epinephrine solution was then administered to each animal, ensuring that the testicles and scrotum were insensitive to pain. After they each were injected, we brought them through again for castration.

The veterinarian used a Newberry Knife to cut open the scrotum and then an emasculator for the castration. The emasculator employed several crushing edges to discourage bleeding from the blood vessels within the spermatic cord. Due to the size of the animals the instrument remained in place for a sufficient time to stop any significant bleeding. Then a cutting edge completed the procedure. To ensure a painless surgery, the group size was deliberately small, ensuring that if handling problems ensued the local anaesthetic would not have an opportunity to wear off. The procedure was repeated with the second group.

The entire process lasted 2.5 hours. It took approximately a minute and a half to give the injection and 3-4 minutes to castrate. Sorting the bull calves from their mothers and from the heifer calves was time consuming and can be improved upon with an upgraded sorting alley.

Outcome

Overall, the anaesthetic seemed to work quite well. The bulls did not appear to be in pain or stressed and showed few signs that they were aware of what was happening. One downside to using the anaesthetic was that the bulls resumed play fighting and mounting each other right after castration. We were worried that these behaviours would cause excessive bleeding and/or delay healing. Next time, we will likely set it up so that the castrated calves can immediately have access to a large pen with the cows and some feed, in order to distract them from playing in the holding pen.

After castration, we returned the calves to their previous environment with the cows and gave them extra hay to encourage them to eat. The next morning, there was no evidence of any stress or bleeding.

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Cost
Total vet cost was $591.71 or $22.76/head. Since we direct market the beef, the added vet cost tacked on $0.06 per pound of meat sold.

Other Thoughts
Castrating our bulls at 6 months of age rather than at birth reduces stress around calving not only for the calf, but for the whole herd, which is left undisturbed. We have experienced a few other benefits of having minimal interference during our summer calving season, such as decreased dystocia, fewer abandoned calves and reduced stress for the rancher. We like to see the cow and newborn calf having space and peace so they can establish that critical bond after birth. This procedure seems suitable for a smaller operation, but castrating a hundred or more bulls would be quite an undertaking.

We should note that we had already tried finishing intact bulls, as is common in European feedlots with ample space provided. However, as we grass-finish our animals, we were not able to get the same meat quality and fat cover as in our steers without castrating.

Overall, we were quite happy with our experience, and as an added incentive, this technique qualifies our operation for membership in the SPCA Certified program. I encourage other beef producers to test out this practice in their own operations and share their results.

Veterinary Comments
Veterinarians have the expertise to mitigate pain in animals when surgical procedures are carried out and whenever possible ought to do so. The

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handling facility allowed good restraint and enabled the castrations to be done on standing animals without risk to bulls or operator. Subjectively the bulls appeared 'no worse for wear' subsequent to castration in this manner and engaged in normal behaviours upon release.

The use of local anaesthesia has been shown by Dr. Joe Stookey at the Western College of Veterinary Medicine to reduce pain associated with surgical castration. More information on Dr. Stookey's work on castration can be found at: http://www.usask.ca/wcvm/herdmed/applied-ethology/articles.html

Farmer's Fungi Pays Dividend

by Mike Amaranthus, Ph.D. and Tonya Gordon

There is an awful lot of fungus in the world. There are an estimated 1.5 million species with a total biomass around twice that of all animals. Despite their widespread occurrence and diversity, this group of organisms is poorly understood. Fungi are famous for their effects on moldy bread, itching toes and degrading the foundations of our homes. While some people do acknowledge the importance of fungi to make bread, beer and blue cheese, overall they are vastly under-appreciated. Some soil fungi are incredibly important to sustainable agriculture for a very different reason. This article will shed some light on this particular "farmer's fungus" that pays big dividends.

Hidden from view beneath the soil surface in the farmer's field there is a relationship between fungi and plants that is fundamental to life on the planet. Fungi can't make their own food. They have to absorb their nourishment from living or dead organic matter. Organisms like fungi help assure the earth's resources recycle as they should. There is a particular group of fungi that does this by cooperating with important crop species.

In natural habitats, plant roots are a complex mixture of both fungus and plant. Mycorrhiza literally means "fungus-root" (see picture to the right). Nine out of every ten species of plants form an association with these specialized mycorrhizal soil fungi in order to thrive. Cabbages, broccoli, nettles and annual weeds are among the few plants that manage without. The plant needs the fungus and the fungus needs the plant. The fungus is responsible for getting the nutrients and water from the soil and, in return, gets carbohydrates from the plant. It is what we call a "symbiotic" relationship, one in which both plant and fungus benefit. The fossil evidence indicates that the relationship dates back over 460 million years and was critical to plants' early establishment on the harsh earth's surface.

What they are

The body of the fungus consists of very thin strands called hyphae. In healthy soils these strands grow into the roots of the crop and out into the soil, greatly increasing the surface area of the root system. The most widespread type of mycorrhizal relationship are the arbuscular mycorrhizae (formerly called "endo" mycorrhizae) and are formed by most of the plants used in agriculture. The fungus grows inside the roots of the host plant, and pushes hyphae out into the

soil. These fungi form their spores or "seeds" as individuals or small packets near root systems, just beneath the soil surface. Arbuscular mycorrhizae occur on more plant species than all other types of mycorrhizae combined and have been observed in roots of more than 1,000 genera of plants representing some 200 families. It has been estimated that more than 85 to 90 percent of the more than 300,000 species of vascular plants in the world form arbuscular mycorrhizae. These include most grains, vegetables, fruit and nut trees, vines and turf grasses.

What they do

The effect of the mycorrhizal relationship on the root system is dramatic. Most of the absorbing area of the root system is actually fungal hyphae. Hyphae are much thinner than roots or root hairs and are able to grow in the tiniest pores in the soil. A thimbleful of healthy soil can contain miles of fungal hyphae! As a result, the efficiency of the plant's nutrient and water uptake is increased enormously.

Often the farmer's soil contains an abundance of nutrients but delivery to the crop itself is limited. Mycorrhizae are particularly important in mobilizing phosphorus and other tightly-bound nutrients in the soil and transporting them back to the plant. Recent research has also demonstrated the critical role mycorrhizae play in nitrogen uptake and transport. In exchange, the mycorrhizal fungus gets sugars produced from the leaves, which provide the energy for the fungus to do its job and to propagate its spores for the next generation of mycorrhizae.

The relationship between the soil, plant and fungus is dynamic. In order to extract nutrients for the host plant, the mycorrhizal fungi produce chemicals and enzymes, which modify the soil structure and chemistry. The energy that plants pump down into the mycorrhizae is utilized by the fungal hyphae to maintain a healthy soil structure.

For example, glomalin, an important organic "glue" excreted by mycorrhizal fungi welds soil particles together in stable aggregates. The resultant soil porosity is essential for the movement and storage of air and water beneath the soil surface.

Water, everywhere?

Agriculture's need for fresh water is growing faster than nature can provide. It's quickly becoming one of the key resource issues of the

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21st century. How do natural areas provide for such luxuriant plant growth without irrigation? One important way is that mycorrhizal threads attached to the roots of colonized plants scour the soil resource absorbing water during periods of adequate soil moisture, retaining and slowly releasing water during periods of drought. Natural areas have achieved a level of drought tolerance that far exceeds agricultural areas in part because an enormous web of mycorrhizal threads act as a sponge protecting plant communities from extreme moisture deficits.

These mycorrhizal threads are much thinner than roots and can penetrate into the small soil pores and access pools of water that are unavailable to thicker roots. An extensive body of research has documented the importance of the mycorrhizal relationship for efficient water use and drought protection for a wide array of important crop species. Using mycorrhizal fungi to improve water use efficiency and decrease water input costs is a tool available to the farmer today.

Does my farm have fungi?

Some modern agricultural practices reduce the biological activity in soil. Certain pesticides, chemical fertilizers, extensive cultivation, compaction, organic matter loss, and erosion adversely effect beneficial mycorrhizal fungi. An extensive body of laboratory testing indicates that the majority of intensively managed agricultural lands lack adequate populations of mycorrhizal fungi. Farming extensive areas affect the mycorrhizal relationship in two fundamental ways.

First, they isolate the plant from beneficial mycorrhizal fungi available in natural settings and, secondly, they increase the need for water, nutrients, and soil structure by a healthy crop.
Once lost from a farm, arbuscular mycorrhizal populations are slow to recolonize, unless there is close access to natural areas that can act as a source of mycorrhizal spores to repopulate the affected area.

This fungi does not disperse its spores in the wind, but must grow from root to root, or be dispersed by animals. Close proximity to healthy

and undisturbed natural sites may be necessary to repopulate a disturbed soil. Farmers seldom have the opportunity to grow their crops immediately adjacent to undisturbed natural ecosystems.

How do I use mycorrhizal inoculants on my farm?

A farmer can enhance crop root growth, nutrition and yield and ameliorate many problems that result from intensive agriculture by inoculating with mycorrhizal fungi. Plants grew and thrived on this planet for millions of years without many of the problems facing farmers today. Nature provides the template. A more sustainable approach to crop establishment and growth includes using mycorrhizal fungi as an inoculant before, during, or following planting. The goal is to create physical contact between the mycorrhizal inoculant and the crop roots. The economic return for mycorrhizal inoculation can exceed the cost several fold due not only to increased yields but decreased costs associated with fertilizer and water inputs.

Farm fungi pay dividends

We live in exciting times. We now have serious tools to manage the land in more healthy ways and avoid practices that threaten our environment. We have done this by observing an area of the natural world that most have ignored and sharing it with farmers who can bring it to practical importance.

Mike Amaranthus, Ph.D., chief scientist for Mycorrhizal Applications Inc. has been working with mycorrhizae for 30 years.

Tonya Gordon is Sales/Project Coordinator for Mycorrhizal Applications Inc.

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Organic EFP Action

by Paddy Doherty

The Organic Environmental Farm Planning program continues until the end of 2007. Environmental Farm Planning may continue under the Next Generation of Agricultural Policy, but we do not know that for sure, and we do not know what form it will take.

There is still money available for beneficial management practices (BMPs). BMPs are projects you can undertake to improve the environmental quality of your farm. Typical BMPs are:

- **Deer and bear fencing**
- **Improvements to irrigation efficiency (drip irrigation)**
- **Riparian fencing**
- **Riparian remediation**
- **Wind breaks**
- **Planting trees in buffer zones or other areas**
- **Compost and manure storage facilities**
- **Fuel storage improvements**

The absolute final date for BMP applications to be delivered to the British Columbia Agricultural Council is November 30 2007. If you wait until November, you will be too late. The planning process takes some time, and if the Organic Environmental Farm Planning Advisors are overly busy, they may not be able to process your application in time.

If you are interested in taking advantage of some of these environmental support dollars, please give me a call at 250-747-3287 or email at paddy@quesnelbc.com. I've completed an EFP for our farm and it wasn't too hard—the planning advisors know what they're doing and will give you lots of assistance with the paperwork.

Paddy Doherty

Husky Mohawk Community Rebate Program

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.net.

Pesticides and the Law: New Tool Provides Support to COABC Members

by Andrea Wilkinson

Organic farmers are no strangers to pesticide issues, and with certification on the line, itís an issue that affects more than just farmers. Consumers are more concerned than ever about the proliferation of these chemicals, and are reaching for organics more often. But both levels of government in Canada have created an environment that is seemingly tolerant of pesticides, if not downright lax.

Recently, the Pest Management Regulatory Agency announced its intention to allow farmers to sell produce with more pesticides on them in order to accommodate US farmers. This comes on the heels of changes to the legal framework governing pesticides at the federal, provincial and municipal levels.

Public, as well as COABC member concern, is well-founded. The negative effects of pesticides have been known for decades and have been recognized at the highest political and legal levels in the country. What then, can be done? West Coast Environmental Law (ìWest Coastî) receives many pesticide-related queries each year. In addition to calls from members of the public, they have received calls from organic farmers, concerned that aerial spraying of a pesticide, or run-off from pesticides applied on nearby lands, would jeopardize organic certification.

In response, the group, which has been providing free legal information and advice to British Columbians since 1974, just released a new tool: A Citizenís Guide to Pesticide Use and the Law in BC. While not specifically an agricultural publication, the Guide emphasizes what tools are available to the public to use laws to fight pesticide use.

Staff at West Coast felt that COABC members should be aware of this publication, if not for their own purposes, then to make members of the public and other citizen allies aware of it. As organic farmers continue to deal with the issue of pesticides, broader-based coalitions may have a better chance *of achieving law reform, and t*he Guide is geared to citizens that would make strong allies of COABC members.

West Coast offers another program that may be of use to COABC members. The Environmental Dispute Resolution Fund provides grants to community groups dealing with an environmental legal issue. The funds are used to pay legal fees (at a partial pro bono rate of $80) and related expenses. Over the years, West Coast has provided a number of grants to groups working on pesticide-related issues.

Last year, West Coast funded Salt Springers Targetting the Overuse of Pesticides (SSTOP). This group successfully challenged proposed aerial spraying to eradicate the gypsy moth, arguing that the proposed spraying area included several organic farms (which would lose their organic certification), a vineyard, livestock grazing fields and habitat home to rare species of butterflies. Members of SSTOP have worked over the years to identify, support and implement alternative methods of dealing with the gypsy moth, including training with Ministry of Forest officials to identify and tag egg masses as well as hanging traps to catch the pests. The Ministry of Forests withdrew their application for aerial pesticide spraying and worked with SSTOP to implement the alternative methods.

Copies of the Citizenís Guide to Pesticide Use and the Law in BC, as well as information on the Environmental Dispute Resolution Fund, are available on the West Coast website at www.wcel.org. You can also call 604-684-7378 (1-800-330-9235) or email admin@wcel.org for more information.
- Andrea Wilkinson, West Coast Environmental Law

Colony Collapse Disorder: Do We Harvest What We Sow?

by Gunther Hauk

The crisis that we now face with the honeybee is, in this writer's opinion, of no less significance than global warming. Much more than we can imagine depends on the presence and vitality of the honeybee population.

Once this insect was revered as a sacred animal, along with the cow and the scarab beetle, all of which were known to create fertility, a thriving flora and fauna, throughout the land. Not only agriculture, but our very lives depend on these animals. Today reverence has given way to a single-minded emphasis on the economic returns they can provide; how much milk, how much honey, how much pollination service can I get out of the cow and the honeybee?

Along with this change of attitude, several crises in beekeeping have arisen. In the 1960s there were inexplicable losses of colonies in Europe. With the advent of varroa and tracheal mites and with the spread of American foulbrood, great losses had to be endured. By the mid-1990s one could read estimates that here in the United States the number of colonies had dwindled from 7.5 million down to 2.5 million. In 1996 the New York Times published an article titled "The Hush of the Hives."

The way these crises were handled was no different from how we tend to take care of human illnesses today: we always look for the silver bullet, the imaginary salvation fabricated by Hollywood. The chemical industry offers one chemical to combat mites, and another against foulbrood. By now we should know that solutions such as these are not only short-lived and bring with them unwanted side effects, but they also upset the delicate balance of interdependence in the household of nature.

For some years now our efforts have been intensified to breed the bee: one that can lead us to do with her whatever we desire. Thus an ad in beekeeping journals a few years ago stated: "We asked the bees what would make them more profitable"…! This "superbee" would be able to cope with mites, hive beetles, viruses and bacteria, and would stand up to all the environmental poisons: insecticides, pesticides, herbicides and fungicides.

We have become accustomed to focus on these attackers of the honeybee as the enemies that have to be conquered. We do the same when we blame other individuals or other nations for our problems, without first questioning our own attitude, beliefs, and practices. In the case of the honeybee, it is our farming practices and our beekeeping methods that must be scrutinized if we are to reverse the calamity that is threatening.

In the last 150 years many critical inventions have permitted beekeeping to become commercialized, so that apiaries can be run like factories. Colonies are trucked by the thousands from one monoculture to the next. Queens are bred artificially and exchanged like the batteries in a cell phone, with one difference: the rate of exchange is much faster. In our efforts to create the superbee we don't shrink from artificially inseminating queens – an impressive technical feat, but one that is completely against the bee's nature. We raise millions of queens merely to kill them on their eighth day of embryonic development so that we can harvest royal jelly. Why? To save a wrinkle or two at best.

Thousands of tons of corn syrup or sugar syrup are fed to US colonies so that we can harvest practically all of the honey instead of the surplus. No one asks what this does to the honey bee's metabolism, the delicate balance between the acidity of its digestive tract and the alkalinity of its blood. For simplicity's sake we also gave the bees plastic foundations upon which to build their honeycomb: not only as a place where honey is stored, but also where the brood is raised. Perhaps we humans will also have wombs with plastic inserts in the future and call it progress.

Our beekeeping has turned thoughtless, careless, ruthless. Oh yes, we do love our bees – as long

as we can get a lot out of them. We treat the honeybee like all other animals in the factory farming model, all of which have experienced disastrous declines in their vitality as a result. The Holstein cow, for example, pumped full of high-protein feed, hormones and antibiotics, will give almost twice as much milk as she normally would, but instead of living 20 years and having 15 calves, she now has a life expectancy of 3-4 years and an average of 0.9 calves in our dairy factories.

Beekeepers have been sucked into a conventional agricultural paradigm: produce as much as possible as cheaply as possible, regardless of quality or the lack of life-sustaining practices. Consumers, too, are too often concerned only with getting food as cheaply as possible, without any thought for the farmer's or beekeeper's ability to survive on his or her earnings. The current crisis, little as we wish to acknowledge it, is a direct result of this kind of thinking.

Are there any solutions to the honeybee crisis? There are, but none that are easy and quick. The attitude that readily sacrifices wholesomeness for a quick monetary return results from the fact that we actually know very little about life processes and the laws that govern them. A return to humility and reverence for the mystery of life, an admission that, clever as we are, we still have much to learn if we are not to destroy ourselves, is the first step in a truly effective response.

After 33 years of beekeeping, it is my firm conviction that we must take a hard look at what we ourselves are doing to simply try to wipe out one or the other "enemy." The mites, bacteria and viruses that plague our colonies all have a purpose: to get rid of what is weak and sick. What is making the honeybee weak and sick, if not our own treatment of her?

Our first questions, then, should be: What practices only serve my comfort and economic return but thwart the honeybee's life instincts? What do I do that weakens and stresses the colony and thereby adds to the lowering of the immune system, leaving the animal susceptible to any of the above-mentioned attacks? (See this author's Toward Saving the Honeybee for a more detailed analysis and positive suggestions.)

The second question is a broader one and has to do with the monocultures we are producing as well as the poisons we put into the landscape, into our agriculture, our lawns, and use in our households. Environmentally benign and sustainable practices are a must if we are to protect all of our animals and our fellow human beings from the rise of illness and weakened life forces.

We ourselves can experience how stress, poison, food without nutritive quality, and/or lack of appreciation for our essential being all work together to bring about the weakening of our immune systems. We are then open to all kinds of viruses, bacteria and fungi.

This has happened to the honeybee. Although some scientists have recently theorized that mites, viruses and bacteria have compromised the honeybee's immune system, the exact opposite is true: We have undermined her immune system with stress, poisons, GMOs and evermore-industrialized beekeeping methods. In turn, external "enemies" whose task in nature is to get rid of what is sick have been given new opportunities to do their work. This is a thought that will not be accepted readily by professional or even hobby beekeepers since it demands radical rethinking and re-evaluation of what we have accomplished in the last century.

Regarding the strange phenomenon of Colony Collapse Disorder (CCD), in which honeybee colonies leave their homes and do not return,

I would suggest the following train of thought. When stress, poisoning, unhealthy food, and exploitative practices, coupled with lack of respect and esteem, all reach a certain level, the spiritual core, that part of a being that keeps the organism healthy, is compromised. When we look at an animal, we perceive its material body. Historical Native Americans, still clairvoyant, "saw" that spiritual entity that governs the animal's life instincts with complete wisdom. They called this spiritual being the "Great Bear" or "Great Buffalo." We would suggest that when the "Great Bee" experiences all these destructive forces, she withdraws from the physical entity.

When the spiritual center of the colony is thus weakened, the individual bee flies out and does not come back. There is really nothing to come back to. The Great Bee, which might also be called the group soul, cannot maintain the integrity of the colony.

Albert Einstein is reported to have said, "if honeybees become extinct, human society will follow in four years." And Rudolf Steiner, the great scientist and innovator of the 20th century, warned in 1923 that unless we change our mechanistic way of beekeeping, the honeybee might not survive the century. Seeing deeper into nature than most people, he stated that our very lives depend on beekeeping (refer to Steiner's book Bees).

Our own lives depend on whether we decide to take responsibility for our role in the decline of the honeybee. If we do, this crisis may become a true turning point in the creation of a life-sustaining agriculture.

Gunther Hauk is the Program Director of the Pfeiffer Center (www.pfeiffercenter.org) and will relocate this summer to southern Illinois, where he will establish a honeybee sanctuary on a biodynamic farm.

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Who Owns Red Fife?

by Sharon Rempel

Who owns Red Fife 'landrace' wheat? Who owns any of our heritage varieties of crops? Who actually 'owns' seed?

Red Fife is one of Canada's greatest treasures. Today we can find Red Fife wheat growing in fields and backyards across the country. In 1987 I started with one pound of seed from the Agriculture Canada Scott Research Station. In 2006 approximately 600,000 pounds was harvested across Canada.

By Canadian law wheat is a commodity, not to be sold with 'farmer' or 'variety' identification. But the Red Fife wheat movement is challenging the outdated way wheat is thought about.

Red Fife is a 'landrace'; there's genetic diversity within the population. The wheat looks uniform in the field but genetically has the resources to adapt very quickly to changes in climate, diseases, pests and soils. Red Fife fed Canada from 1860-1900, and was known as an outstanding baking and milling wheat.

Red Fife was crossed with Hard Red Calcutta to become Marquis wheat. The genetics of both Red Fife and Marquis are found in a large amount of modern wheat varieties. Plant breeders have developed varieties and charge royalties to sell repackaged heritage variety genetics in new combinations.

As an organic plant breeder my philosophy is to go back to the old varieties, the 'grass roots' (wheat is a member of the grass family) to find answers to modern food needs, and varieties adapted to organic farms and choose from within the population to develop varieties 'on farm' from within the original variety.

In Canada, only 'registered' varieties can legally be sold. Agribusiness interests dictate what criteria have 'value' for choosing a variety for registration.

This is a big picture issue. Globally, at United Nation meetings, farm groups from poor countries speak up about 'Farmers Rights' defined as being the farmer has the right to choose what seed he or she wishes to plant. Often their 'traditional' or 'folk seed' has been grown in their region for decades, or centuries. Their local food dishes might well have evolved using those folk varieties. Their culture has been defined by the food dishes and the relationship of the 'people, plant and place' of that region.

Also, the concept of conservation 'in the field' of a broad array of agricultural biodiversity has been recognized as 'important' by all countries in the world. Yet when we attempt to stand up for 'Farmers Rights' or 'on farm conservation of agricultural biodiversity' in Canada, we face the challenges we have encountered with Red Fife. This is no different that an Indian farmer's battle to grow a traditional variety of rice that the farmer feels is nutritious, grows well in the bioregion and meets consumer demands.

The farmer doesn't want fancy hybrid rice because they can't afford the chemicals to produce the crop. Some farmers know that the chemicals cause pollution and environmental effects and choose to grow varieties that don't need high inputs to produce a good crop (the farmer determines what a 'good' crop is, not an economist).

We face exactly the same issues in Canada.

1. Standardization and Uniformity. Under WTO and other global trade agreements only a few 'approved' varieties are of interest for global trade. These hybrids are supported under UPOV, the global union of plant breeders. In the 1980s, when Meech Lake issues gave Mulroony a good smoke screen, Plant Breeders Act (http://www.sice.oas.org/int_prop/nat_leg/canada/eng/LPVeA.asp) went into effect in Canada.

A few of us lobbied against what we saw as the beginning of government and industry monopolization and control of the seed and food system yet nothing was reported in the Canadian media about Plant Breeders Rights. So, in Canada, a plant breeder is allowed to get royalties from sale of a variety that he or she 'owns'. This breeder is the keeper of that variety.

Farmers are encouraged to buy fresh seed every year or two to keep up the vigor of the variety. The farmers who do save their own seed (which has always been a 'Farmers Right', to save seed that they wish to plant for next year's crop) is being threatened with 'Terminator' gene technology which will render the seed infertile. Under the royalties system it becomes illegal for a farmer to save seed of a crop, as we have seen happening with GMO canola. The contract is for one season, no seed saving.

The Government of Canada will receive royalties from the sale of GMO 'Round up Ready Wheat' forever because our tax money has been used by Agriculture Canada, who have been business partners with Monsanto for many years, to develop and test this wheat variety.

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Even though the so called 'business relationship' between Ag. Canada and Monsanto was terminated in January 2004, the final produce of 'Round Up Ready Wheat' has been paid for by Canadian tax money through our government.

Agriculture Canada's CFIA is now the regulatory body for all seed in Canada as well as the organic industry standards and certification and approves GMO applications.

2. Monopoly of who defines seed regulations in Canada. At some point in the 1990s the Canadian Seed Growers Association's website mentioned they were the voice of seed in Canada. Although the Seed Act and the CSGA seem to be one and the same, it has been difficult to determine exactly the legal relationships and boundaries of the Act and the CSGA. (research done for us by the Environmental Law Center, Edmonton)

The CSGA defines 'plant breeder' status in Canada. One makes application, and based on field experience and education the CSGA gives 'breeder' status. When I applied several years ago I received a phone call saying my application would not be approved. Basically I have never supported the concept of 'ownership' of a seed by anyone, nor have I produced a 'hybrid' that I as a breeder would register and 'own'. So I have not been given 'breeder' status in Canada. Yet I was the first overseas member of ECO PB, the organic plant breeders group based in Europe.

3. The concept of 'variety registration' and 'variety licensing' needs to be researched for Canada. When did this system come into effect? In the 'old days' variety names were read and approved in Parliament and recorded in the Hansard minutes. But upon what foundations was this system set up and has anyone ever looked at it from a 'market monopoly' point of view?

4. The Canadian Wheat Board attempts to regulate markets and control sale of wheat in the areas governed under the Wheat Board Act. That, the Seed Act and the CSGA seem to be closely linked. Farmers are challenging the monopoly of the Board.

5. There are some provisions for 'closed loop' variety registration but if we manage to take that for sale of "Identity of Variety and Farmer Preserved" heritage wheat then why can this not happen for the growth and sale of GMO wheat? The logical fear is that human nature is not ethical and very easily a non registered commodity can be dumped into the 'system'. How to ensure that this will not happen is a very big issue in Canada today.

6. When a variety is being field tested for 'variety registration' in Canada, the wheat is inspected visually in the field. The Government produced 'Field Handbooks' showing a wheat head and describing a variety have always been based on visual observations. Only when there are problems in the system or field is the wheat sample sent to the Canadian Grain Commission for testing.

In 2002 and 2003 we sent samples of 'uniform in the field' samples of Red Fife seed to the Commission for protein banding testing to try and understand what Red Fife 'is'. The one undated sample of 'Red Fife' at the Commission, and one accession from the Canadian Gene bank were identical. The two other Gene Bank accessions of 'Red Fife' plus all the samples from our fields showed a multitude of protein banding patterns.

Does this mean that human hands mixed samples or does it mean there is variability in the samples influenced by the growing conditions in the field and environment interacting with the genetics of the variety?

7. Under the current system of Seed Registration there is a whole spectrum of 'seed' sold to farmers from 'breeder' line to 'pedigree' to 'foundation'. This somewhat pyramid scheme of seed sales ensures royalties to the 'owner' of the variety.

For our Red Fife seed to be a 'part' of the current system we would need to have a breeder (defined under CSGA guidelines) apply for Variety Registration. This breeder would 'own' Red Fife' and receive royalties for the sale.

Organic farmers don't think like this; how will Red Fife be received within the current system?

Farmers are being asked by Agriculture Canada to stop growing Red Fife. Will our farmers go to jail for growing Red Fife wheat and making a political statement?

8. Moral and spiritual grounds challenged. Life farmers around the world, many Canadian farmers do not support the concept of 'ownership' or patenting of life. It goes against our moral and spiritual beliefs. Has anyone ever challenged the system under spiritual beliefs I wonder or the concept of 'cultural artifact' conservation denied? How will we maintain this cultural artifact if it doesn't have a market for its sale if it can't be sold legally?

9. Foundation Red Fife. If we decide to have Red Fife registered then some seed will be chosen as 'foundation' seed. Will this be my 'Keremeos' strain, that started the whole Red Fife movement? Or the 'Blais' strain currently being sent out to new farmers from Marc Loiselle and others? Perhaps we can take a few seeds from the Gene Bank sample and grow them out to see if all the wheat heads retain the same protein banding after 3 generations in the field. I would suspect that this 'pure' sample will start to diversify exactly as the other samples have diversified in the field. But this should be tested.

10. If the ownership of Red Fife is challenged in court here are some of the possible claimants for ownership.

1. Descendants of the people who lived in Galicia area during the 1840s; they would have been the farmers who grew the grain that was shipped to Scotland and sampled by a man and sent to farmer Fife in Peterborough Ontario. Mennonite families like 'Rempel' can be traced to that locale during that time period and we could claim this as a part of our 'cultural identity'.

2. Descendants of Fife from Peterborough as their relative did the first 'on farm' seed selection, before the formal system of breeders was developed.

3. Agriculture Canada who got involved in distributing the seed across Canada in the 1880s.

4. People of Iran, Iraq and Syria who could challenge that the relatives of modern wheat originated in the Fertile Crescent so in theory they 'own' all the wheat in the world.

5. Descendants of the friend of Fife's who sampled the wheat in Glasgow and sent the samples to Fife. Without his intervention the variety would never be in Canada.

So who really owns any variety of wheat or seed? I'm a guardian of over 350 varieties of old wheats. I will never trade mark or patent any of these varieties.

Written by Sharon Rempel, Organic seed consultant, founder of 'Seedy Saturday' seed event (www.seeds.ca) and the Red Fife wheat movement, and coordinator of the Heritage Wheat Project (http://members.shaw.ca/oldwheat) email slrempel@shaw.ca address 3741 Metchosin Road, Victoria B.C. V9C 4A8.

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Letters to the Editor

Letters to the editor are welcome. Letters must be under 500 words. We reserve the right to edit for length.

To the Editor:

From June 20 to 22, 2007 an oral hearing will be held by the Assessment Appeal Board in Kelowna BC at the Best Western. The subject is land for bees. If the organic growers can support us in this fight then give us a call and send your representative to act as a witness. The assessor is confining our bees to 1/4 acre of agricultural land and does not allow for pasture, requiring us to pay residential tax property we use for agriculture. When we get old and cannot farm anymore they strip us of farm status.

This was one of the main issues: See Issue #9 available at www.mitegone.com under "BC Property Assessment" and "Main Issues."

-This is from the report of the Farm Committee Report on Farm Status for Honey Bees: We recognize two other problems at either end of a farming career, When starting out as beekeepers, we are not recognized as a developing farm by the assessment board & so do not qualify as a developing farm for any specific period. When retiring from farming because you are sixty-five or seventy years old, the assessment board has the power to increase your taxes because you are no longer farming, not because you want to but because you are too old. IS THIS FAIR?

If I were in the civil service, I would get raises with most regularity. I would have a pension plan (quite good I might say) holidays, etc, etc, and when I was fifty-five to sixty a good retirement. The same farmer doesn't have these benefits so what he is able to put away for his retirement is what he is going to have for retirement with no increases, so why should he be taxed off his land? Available at www.mitegone.com under "BC Property Assessment" - "Farm Committee Report"

Maybe your members can write to the government as well.

Yours,

Bill Ruzicka
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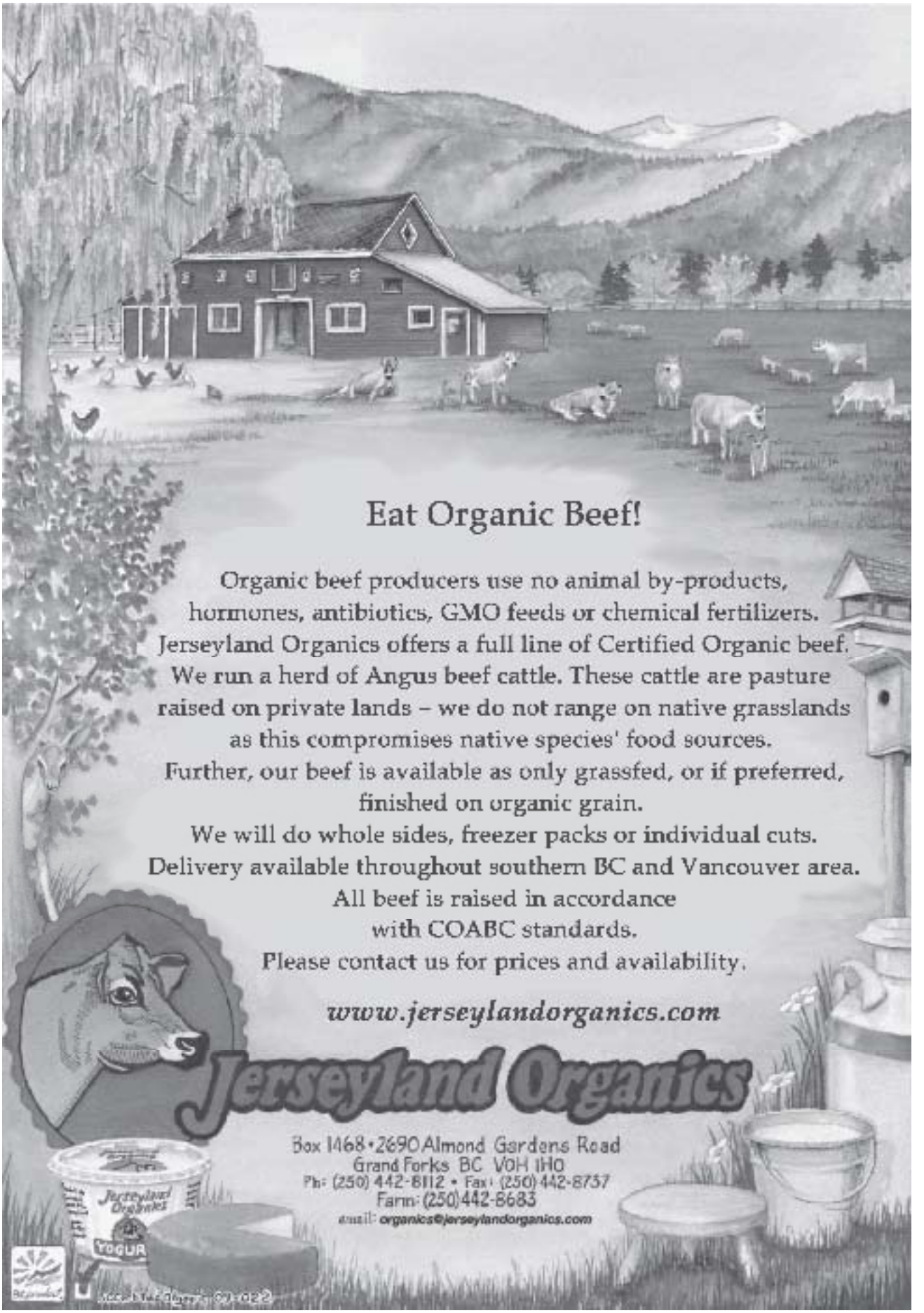
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