New Brunswick's Future Forests:
Learning from Organic Agriculture

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Who is Canadian Organic Growers?

Canadian Organic Growers is Canada's only national membership-based education and networking organization representing farmers, gardeners, consumers and the Canadian organic sector in general. Our national office is located in Carleton County, NB, with most of our work at the grassroots level done through our 13 regional chapters. There is currently a COG-NB chapter going through the initial formation stages. We focus on public education and networking through our quarterly *magazine Eco Farm and Garden*, website, internationally renowned publications on organic livestock and field crop production, our national directory of organics, and regular media appearances. However we also work regularly with policy makers and legislators advising on agriculture policy and organic standards. Since the early 1990's, COG has been collecting statistics on the demographics of the Canadian Organic Sector. These stats have been officially recognized and regularly used by Statistics Canada and Agriculture and Agri-Food Canada.

What is Organic?

Organic agriculture is not new. The methods of food production that rely on heavy machinery, chemical controls, and thousand-acre farms are the "new" systems, developing only in the past few hundred years. But people have been eating way before then, and organic systems are the ones that sustained food production throughout the ages. Today, the term "organic" has been used in many different contexts, and as such, has become misleading to many people. When using the term organic today, I am referring to certified organic production. What is Certified Organic? There are pages and pages of baseline standards that organic producers must follow, from field to table, but here are the basics:

1. **No synthetic chemicals:** There are chemical products that are allowed, but these are derived only from natural products such as plants or bacteria. These products are under restricted use, and are only allowed after a number of non-chemical pest controls have been attempted and failed.
2. **No Genetically Modified Organisms (GMOs):** A very recently developed method of plant and animal breeding, genetic modification has yet to undergo rigorous third party testing. Currently, the health and safety data used by Health Canada is generated primarily from the GMO company themselves, which displays a potential bias. In the field, GMOs have proven to be serious hazards to genetic diversity and pest resistance.
3. **Long-term sustainability:** Organic Agriculture is food production with a priority on the future. Techniques and systems are developed to ensure that our soil, air, water, and genetic resources are safely used today, and will be available in better condition for future generations.
4. **Annual third-party inspections:** Certified organic producers are visited each year by a third-party certification inspector. Working through field inspections,

field records, and farm documentation, inspectors have the authority to grant or deny certified organic status based on producer compliance with organic regulations.

Trends in the Organic Sector

Organic agriculture is the fastest growing sector in Canada's food industry. Why? Because consumers are demanding quality products that are economically, environmentally, and socially responsible, and the organic sector is just that.

Canada

In Canada, the number of certified organic producers increased 34% between 1999 and 2000 – and the trend continues. Organic production revenues calculated by analyzing farm cash receipts reached $500 million in 2000, about 1.5% of Canadian agriculture's total farm cash receipts. Projections over the next three years say the Canadian organic sector is expected to rise 20% annually to $3.1 billion by 2005.

New Brunswick

Since COG's data collection started, New Brunswick has consistently had the highest number of certified organic producers in the Atlantic provinces. Organic production in New Brunswick covers approximately 4,000 acres and extends beyond typical farm products into sea vegetables, mushrooms, cranberries, medicinal herbs, and over 700,000 maple syrup taps.

Other Indicators

There are other indicators telling us that consumers are demanding organic products, and the suppliers are responding: Almost any grocery store now carries foods specially labeled organic, and some even have dedicated organic food sections. President's Choice – a retail brand – came out with its own line of organic products, from fresh vegetables to frozen dinners and cereals. News reports regularly include stories on mad-cow disease and other food-related illnesses, genetically-modified foods, and pesticide contamination.

Canadian agriculture is responding to the demands by the Canadian public for environmentally, economically, and socially responsible food production. These demands are being placed on our forestry industry as well. Consumers and workers in the forest industry are looking for forest stewardship that prioritizes the health of the people, the forest ecosystem, and the economy. Management of our agricultural resources is rapidly changing, and our stewardship of New Brunswick's crown lands can learn from the lessons of organic agriculture. Today, I will focus on one of organics main lessons – elimination of biocides.

Learning Ground: Biocides

One of the most commonly understood aspects of organic agriculture is that no synthetic chemicals, including biocides, are used, at any point along the path from field to table. *Biocide* is an umbrella term covering pesticides, herbicides, fungicides, and rodenticides. Why are biocides not used?

Proven Risks

1. **Human health risks:** Biocides pose a risk to humans through their application and potential ingestion. 23 of the 28 most commonly used pesticides are believed to be carcinogenic or cancer-causing. Studies have shown decreases in male fertility among regular users of biocides, including 2, 4-D (Health Canada, Farm Family Health vol.3, no.1, 1995) – a chemical used in NB crown land forest management. Children are especially vulnerable to the adverse effects of pesticides, as their nervous systems, endocrine systems, and musculoskeletal systems are underdeveloped, so they have less resistance. Plus, children spend more time outside and in direct contact with their natural surroundings (i.e. swimming, playing in the woods).
2. **Environmental health:** Up to 90 % of the biocides applied never reach the intended targets. As a result, many other organisms sharing the same environment as the pests are accidentally poisoned (Thiessen, Gow and Pidwirny, 1996). It has been shown, time and time again, that biocides released into our environment have adversely affected birds, fish, mammals, insects, and plant species. We have witnessed deformities, decreased populations, and massive kills. We have witnessed explosions of pests due to increased tolerance of biocides, and widespread disease infestations. In 1945, only 13 kinds of pests were found to be resistant to the pesticides then available. Forty-five years later, over 500 types of pests had developed resistance. Today there are over 50,000 commercial products manufactured to combat resistant pests. Action is being taken, and policy on biocides is changing. "There has been increasing public awareness about pesticide use in both agriculture and forest industries. Many municipalities are enacting pesticides bans within their jurisdiction. Halifax was the first in the Maritimes. Shediac is NB's first …" (Harvey 2002)

Unproven Risks

It is estimated that 4.1 billion pounds of pesticides are used throughout the world each year, which is very unnerving considering how little we know about them. Our lack of knowledge on pesticides is because of inadequate testing and regulation. Canada is the only industrial country that does not collect data on the amounts of pesticides used. Nor does it do much of its own testing, and often relies on US data. Canada's Environmental Commissioner recently stated that many older pesticides (some 50 years old) have never been reevaluated using modern methods. Of those that have, all contained unacceptable associated risks and have either been restricted or banned altogether. The methods of testing currently used base risk estimates on the risk of a healthy man weighing 150 pounds, and bear little relation to the elevated risks borne by pregnant women or children (Environmental Illness Society of Canada, http://www.eisc.ca/pesticide_mor_part9.html). We are allowing industry and government to push these chemicals on us and our environment without fully knowing what they do.

Proven Alternatives

Organic agriculture is not without its pest and disease problems. Organic producers and consumers have rejected biocides for the above reasons, and also because there are alternatives.

1. **Diversified production:** Maintaining and fostering a diverse production system, which includes a wide variety of species and organisms that fill different functions, is a priority. In the case of a disease or pest, there are many different pillars that can respond within a diverse system, and resilience is greater.
2. **Manual pest control:** Manually controlling unwanted organisms is labour intensive, but thorough and highly effective. Hand weeding and thinning is work that still removes the pest, but at a much lower level of impact on the ecosystem.
3. **Beneficial organisms and plantings:** It is known that some plants and organisms have relationships that are mutually beneficial. Ladybugs are great garden pest predators, and garlic is a multi-use organic pest control. These types of beneficial relationships have been recognized in forest ecosystems also.
4. **Decoy crops:** Planting a decoy crop will attract pests to a part of the system, while leaving the part desired for harvest.
5. **Alternative products:** There are natural, plant-based products that can be used as alternatives to synthetic chemicals, and do not have the same adverse health impacts.

Glyphosate

In NB Crown Lands forestry today, the NB government contracts out the annual application of a variety of biocides on public lands, the most popular being glyphosate-based products, commonly recognized as "Roundup", "Vision", and "Accord". These herbicides (biocides that control for plant pests or weeds) are sprayed on 12 000 hectares (almost 30 000 acres) of crown land clearcut that has been replanted in softwood plantation. Glyphosate is used to control the emergence of broadleaf pioneer species that compete with softwoods, such as alders, raspberries, and maple.

The Journal of Pesticide Reform, a peer-reviewed scientific journal, introduced their "Glyphosate factsheet" with the following:

> Glyphosate-containing products are acutely toxic to animals, including humans. Symptoms include eye and skin irritation, headache, nausea, numbness, elevated blood pressure, and heart palpitations…Given the marketing of glyphosate herbicides as benign, it is striking that laboratory studies have found adverse effects in all standard categories of toxicological testing. These include medium-range toxicity (salivary gland lesions), long-term toxicity (inflamed stomach linings), genetic damage (in human blood cells), effects on reproduction (reduced sperm counts in rats; increased frequency of abnormal sperm in rabbits), and carcinogenicity (increased frequency of liver tumors in male rats and thyroid cancer in female rats). (Cox, Journal of Pesticide Reform, 1998)

Soils have been tested for Glyphosate contamination. Results have shown half-lives (the time required for half of the amount of glyphosate applied to break down or move away) between 259 and 296 days on eight Finnish forestry sites; 335 days on an Ontario forestry site; 360 days on 3 British Columbia forestry sites; and, from 1 to 3

years on eleven Swedish forestry sites, proving a long environmental persistence (Cox, Glyphosate Part 2: Human Exposure and Ecological Effects, 1996).

Roundup treatment of a Maine clear-cut caused an 89 percent decline in the number of herbivorous (plant-eating) insects. While these are not usually considered beneficial insects, they serve as an important food resource for birds and insect-eating small mammals (Cox, Glyphosate Part 2: Human Exposure and Ecological Effects, 1996). Because glyphosate-based products target herbaceous plants, their application in forests negatively affects moose, elk, and mule deer. 46% of important browse for moose, 34-40% for elk and 36% for mule deer have been damaged by glyphosate application.

But it is not just glyphosate that has been proven to be toxic. Inert ingredients are those within a biocide product, but are not designed to do the killing action. Because they are not the "active" ingredient, they are most often not identified on the labels of biocide products. In Vision (trade name for glyphosate) 59% by volume is composed of inert ingredients, many of which have been proven to have serious adverse effects on human and environmental health. Toxicology tests on glyphosate-based product Roundup's inert ingredients "is more acutely toxic than glyphosate itself; the combination of the two is yet more toxic still." (Cox, Journal of Pesticide Reform, 1998)

Aerial Spraying

The most common application method of biocides on NB crown land plantations is aerial spraying. Both helicopters and small airplanes are used, and both leave something to be desired.

Helicopter applications: Between 41 and 82 percent of glyphosate applied from helicopters moves off the target site. Two studies done in Canada measured glyphosate residues 200 meters (656 feet) from target areas following helicopter applications to forest sites. In both studies, 200 meters was the farthest distance at which samples were taken, so the longest distance glyphosate traveled is not known (Cox, Glyphosate Part 2: Human Exposure and Ecological Effects, 1996).

Fixed-wing aircraft: Long drift distances occur following applications of glyphosate made from fixed-wing airplanes. Three studies on forested sites conducted by Agriculture Canada (the Canadian agricultural ministry) showed that glyphosate was consistently found at the farthest distance from the target areas that measurements were made (200, 300, and 400 meters, or 656, 984, and 1312 feet) (Cox, Glyphosate Part 2: Human Exposure and Ecological Effects, 1996).

Consequences

When herbicides such as Vision and Roundup are used on our crown land forests, it leads to many devastating consequences. There is risk of human and environmental health effects, as mentioned previously, as the chemicals move through our air, water and soil. Many of the naturally occurring herbaceous and hardwood forest species are eliminated, decreasing the species diversity of the forest. This means that there are less habitat and food sources for animals, birds and insects. It also leads to a forest ecosystem that is weaker in the face of pests, disease, and extreme weather conditions. Using herbicides and applying them aerially greatly increases the risk of lost certification to neighbouring organic operations.

Currently, some crown land is licensed to certified organic maple sugaries, some of which are located very close to crown land clearcut and plantations. If spray drift is found within these organic maple sugaries, their certification is revoked, and their economic advantage and environmental responsibility is jeopardized. Organic sugaries have been proven to be a viable long-term sustainable use of a diverse forest ecosystem, and source of long-term employment. One certified organic sugary of 500 hectares (with 100 000 taps) can employ 10 people, full-time for 52 weeks. If this ratio of hectares to jobs is related to a 104 000 hectare crown land timber lease (such as the one leased to Nexfor-Fraser that supplies the Juniper mill), that would work out to 20 800 full time jobs. Currently there are just over 300 people working for the Juniper mill. The sugary operation example used here would not be viable unless it was certified organic.

J.P. Report Recommendations

The Jakko Prory report recommends the doubling the annual allowable cut from current levels by increasing the amount of crown land in softwood plantations to 40% of crown land. The predominant way plantations are managed to eliminate competing plant species is through the aerial spraying of glyphosate-based products. Increasing the amount of land in plantation will ultimately lead to the increased use of these herbicides, further jeopardizing human and environmental health, decreasing the diversity of our forest ecosystems, thereby decreasing our chances of alternative economic opportunities, such as organic maple sugar production, which has been shown to have a higher rate of long term employment and environmental sustainability.

COG Recommendations

There are alternative crown land forest management systems. Canadian Organic Growers recommends the elimination of biocides, specifically glyphosate-based products such as Vision and Roundup. This will ultimately mean moving away from the plantation model of forests, to recognizing and reaping the diverse opportunities that are available in a naturally diverse Acadian forest ecosystem.