

Christmas Tree Cultivation: Open Season On Pesticides

By the Green Web

Introduction

In Nova Scotia, there are about 30,000 acres under Christmas tree cultivation. Estimates of the number of growers range from 2,500-3,000. Acreage ranges from a few acres to many hundreds of acres in size. The industry is overwhelmingly based on balsam fir – the other species being spruce, pine and Douglas fir – with about 45% of the trees being grown in Lunenburg County. Guysborough and Antigonish Counties are also important for Christmas tree cultivation, although Christmas trees are grown throughout the province. The Royal Commission on Forestry, held in N.S. in 1982-3, stated in its report that 50% of Canadian Christmas tree exports are from our province. The exports are mainly to the United States. A Christmas tree specialist for the provincial department of lands and forests noted “Nova Scotia exports 96 per cent of its total production of approximately 1.9 million trees to the U.S.” (Chronicle Herald, November 28, 1988) More than 90% of Christmas trees are grown in N.S. from what are called naturally cultivated stands – which follow clearcutting – with the rest being grown on field plantations. Prices to growers in November of 1988 were \$10 to \$11 for sheared trees and \$3 to \$4 for unsheared trees. Wreath-making, utilizing branches from thinning operations and broken balsam fir trees, is a cottage industry in some areas of the province. In December 1988, workers in the New Ross area received \$2.10 per wreath, which would be sold in the U.S. or Halifax for \$20. (Chronicle Herald, December 12, 1988) About 6,000 people are employed in the Christmas tree industry, with 5,000 working part-time (about six weeks) and 1,000 more working full time (six to ten months). A publication, Atlantic Canada: Land of Christmas Trees, states that the production area for these trees was under 100,000 acres in the Atlantic Provinces.

Trends

It has been said that the objective of Christmas tree growing is to produce a tree about 6-8 feet in height as soon as it is possible, having foliage that is dense and dark green in colour, with the base of the tree about two-thirds of its height and a tree resistant to disease. Foliage density is considered the key characteristic for Christmas trees. Balsam fir is a native tree to this region which, if given half a chance, grows well and profusely. While Christmas trees can be grown in a non-environmentally destructive manner, the dominant trend is for chemical cultivation – pesticides and fertilizers. As revealed in literature put out for Christmas tree growers, there are approximately 40 known pesticides – herbicides, insecticides, fungicides, growth regulators, etc., recommended for use by Christmas tree growers. (See in particular the Christmas Tree Growers Manual: Atlantic Canada 1987 – compiled by the N.S. Christmas Tree Council, the Canadian Forestry Service and the N.S. Department of Lands and Forests – government-funded but costing, if you can obtain a copy, \$35 to the public.) Yet the use of these pesticides (the list is given on page 6 of this Bulletin) is basically unregulated and unsupervised, because the application is considered a farming activity.

Spokespersons for the Christmas tree industry continually publicly agonize about the move to artificial trees in the U.S. and tout the merits of the sheared (shearing increases the density) “natural” high-quality tree for the export market. Yet a real issue for the industry will be when the buying public becomes conscious about the pesticide-residue trees and Christmas wreaths

which are now for sale, and the consequences which will follow from this. Unfortunately, organic growers of Christmas trees who do not use pesticides will also end up suffering for a situation for which they bear no responsibility.

Chemical Cultivation: The provincial and federal government literature on Christmas trees distributed in N.S. – advice from Lands and Forests Christmas tree specialists, articles in the Lands and Forests publication Forest Times, etc. – all promote the use of pesticides and nitrogen fertilizers. Recently, the Lunenburg County Christmas Tree Association was one of three groups lobbying Lunenburg Municipal Council to appoint a weed inspector in the county. The weed inspector is the county person who promotes and “supervises” a weed control program where so-called noxious weeds are seen as a threat along the highways. (Chronicle Herald, March 3, 1989)

Chemicals are seen as reducing labour costs. The largest growers and their spokespersons see that larger plantations of Christmas trees can be “managed”, using chemical pesticides, with fewer workers. Costs to the environment, wildlife and human health, are not prominent factors in this bottom-line view of the world.

Chemical cultivation means there is a movement away from varying-aged stands to even-aged stands, because they are more “economic” to manage. But disease and insect problems magnify in even-aged stands. In Christmas tree woodlots, the distance between roads – about 200 feet – is recommended as best suitable for ground spray coverage. A pond is not only a fire pond, but is a source of water for pesticide sprays. “Weed control”, through the use of herbicides, can result in soil erosion, the depletion of organic matter and frost heaving. But these “costs” are accepted. Chemical insecticides are promoted, yet they end up interfering with the natural cycles of insects, kill insect predators and often compound the original problem, resulting in additional applications of insecticides.

Organic Alternatives: The Presentation of the Cape Breton Christmas Tree Association, to the Royal Commission on Forestry, argued that “It is also essential that we develop alternatives to the reliance on chemical insecticides and herbicides” in Christmas tree cultivation. The presentation went on to state the larger question facing forestry in N.S.: “In developing our productive capacity, not only in Christmas trees, but in our entire forest industry, we mustn’t risk poisoning ourselves, our land and our environment by the heavy dependence on chemicals of questionable safety. Research into alternatives must be conducted”. Yet in the literature from Lands and Forests on Christmas trees, there is little attention paid to alternatives. In Cape Breton, as in B.C., sheep have been used as an alternative to herbicides against weeds and hardwoods. Sheep also provide fertilization. Most Christmas tree growers in Cape Breton do not use pesticides and are prepared to accept a tree of lower visual quality, if it means not harming the environment. Although there is no consensus, a full-time grower, not using pesticides, can handle about 40-50 acres of trees, with some additional help at harvest.

American Ownership and Control: American-owned firms are the largest exporters and major producers of Christmas trees in N.S., but precise data is hard to obtain. The Submission of the Christmas Tree Council of Nova Scotia to the Forestry Royal Commission stated that “almost all of the money from the Christmas industry is outside capital, mainly American”. This was the extent of the data given in their submission on this matter! In the discussion period dealing with the material from the Council, it was suggested that about 20% of Christmas tree production is from American-owned land and that American companies bought “a much larger percentage also”. Both spokespersons for the Christmas Tree Council were unqualified in their praise of American involvement. The foreign companies have representatives on the Council.

Newspaper articles have identified the four big American names in Christmas trees in N.S. as G. R. Kirk Company, J. Hofert Maritimes Limited, Gold Star Limited and M. Walters Company.

Another American-owned corporation of significance in the Christmas tree world is the pulp and paper company Scott Maritimes Limited. Its Submission to the Forestry Royal Commission, said that by 1976 it had 450 acres in Christmas tree production and that “The maintenance program includes shearing, fertilization, weed control and spacing from April through October”.

Land Ethic, Ecological Interrelationships and Forest Guardians: Overall, the Christmas tree industry in its chemical manifestation is an environmental disaster. At present, private or crown property rights allow the “owners” to do essentially whatever they want on their land. Yet ecological rights override property rights. Private or crown interests cannot be allowed to override the ecological interrelationships of the living forest ecosystem. A pesticide let loose into the environment has no respect for property boundary lines. Christmas tree growers, like anyone else who earns a living from the woods, must be forest guardians. They must uphold a Land Ethic which cares for the health of the soil and water, the well being of all the non-human animals – other mammals, birds, fish, insects, etc. – and the health of diverse tree varieties and plant life.

Pesticides

The term pesticide covers a wide variety of toxic chemicals and, as used for Christmas tree cultivation, covers herbicides – used to kill what are considered weeds along with hardwoods; insecticides – used to kill insects considered pests like the twig aphid, gall midge, tussock moth and spruce budworm; fungicides – used to control fungi associated with various tree diseases, like needlecast, canker, and shoot blight; and growth regulators – used to change plant growth characteristics so as to produce additional buds and branches. (See the list of Christmas tree pesticides advocated in the promotional literature, on page 6 of this Bulletin.)

Active and Inert Ingredients: All pesticides contain two categories of ingredients – active and inert or unknown ingredients. For example, for the herbicide Vision (also called Round-Up), which is used on Christmas trees, the active ingredient glyphosate makes up 41% and other ingredients make up the other 59%. Data available on pesticides usually only concerns the active ingredient. Inerts are normally unknown and considered trade secrets by the manufacturer. While inerts may be harmless fillers, they can be poisonous in their own right or enhance the toxicity of the active ingredient. Inerts can be stickers, emulsifiers, preservatives or contaminants. (For example, it has been shown that dicofol, which is used as an insecticide on Christmas trees, contains 7-12% DDT as a contaminant. (Chronicle Herald, January 31, 1984) Manufacturers of pesticides do not normally allow access to the raw data on which they base “safety” claims. Such data are considered “trade secrets” and not open to independent critical scrutiny. So, full disclosure about a pesticide is not normally available to the public.

No Regulations: Once a pesticide has been authorized for use on Christmas trees by Agriculture Canada (the federal department which authorizes and promotes the use of pesticides in Canada), the application of Christmas tree pesticides to tree growing areas or to seedling or transplant beds is essentially unregulated. The only requirement is that anyone doing aerial spraying must have a permit granted under the 1986 Pest Control Products (Nova Scotia) Act. Christmas tree spraying is treated as an agricultural activity, and, under this Act, is thus exempt from regulations. Hence the 1987 Christmas Tree Growers Manual: Atlantic Canada, the basic reference for the industry, which lists the recommended pesticides for suggested use, has nothing to say about posting notices of intention to spray, width of buffer zones alongside streams or lakes, maximum wind speeds for spraying operations, rain restrictions, impact of pesticides upon differing soil types, etc. Thus the spraying guidelines/“regulations”? which are supposed to apply to “regular” forest spraying, do not apply to Christmas tree spraying. (There has never, as yet, been a prosecution for violation of forest spraying guidelines, although there are many examples of violations.) *See

Spray Drift: People living in the vicinity of sprayed Christmas tree operations, should be particularly concerned about drift of pesticides off-target. Pesticide drift occurs through spray drift and vapour drift. Vapour drift results when the pesticide evaporates. The factors causing pesticide drift are considered complex and include wind velocity and air currents, temperature, air pressure, size of spray nozzle holes and droplet size, height of spray nozzles above the ground, etc. Given these factors, a “buffer zone”, if allowed around a sprayed area, becomes essentially a public relations gesture. Pesticide residues have been found in the atmosphere around the globe, even turning up in the Arctic. An article “Pesticides: Where Do They Go?” (*Journal of Pesticide Reform*, Winter 1988), gave a number of examples showing “that extremely little pesticide actually reaches target pests”. This article also noted that “Spray drift from aerial application is about five times greater than from ground-rig applications for row crops”. Various types of spray systems – aerial, tractor-drawn and backpack – may be used for Christmas trees. If a Christmas tree plantation is being chemically treated, it may occur from early May until October or early November.

Known Impacts of Christmas Tree Pesticides on Non-Target Wildlife: According to the Pesticides Safety Handbook (1986 edition), published by the Ontario Ministry of the Environment, (pages 22-24), the following pesticides, which are promoted for use in Atlantic Canada Christmas tree cultivation, are listed as known to be toxic to fish, birds and honey bees:

- Known to be toxic to fish: captafol, chlordane, dicofol, fenitrothion, malathion, maneb, permethrin.
- Known to be toxic to birds: chlordane, dimethoate, diazinon, fenitrothion, methoxychlor, trichlorfon.
- Known to be highly toxic to bees: acephate, carbaryl, chlorpyrifos, dicofol, dimethoate, fenitrothion, malathion.
- Known to be moderately toxic to bees, i.e., “should not be applied when bees are foraging in the field, or at the colonies”: chlordane, methoxychlor, trichlorfon.

See also under “Wildlife Pesticides” on page 6 of this Bulletin, use of thiram-based taste repellents and zinc phosphide poison bait, for direct pesticide use against wildlife in Christmas tree plantations. Deer, porcupines, snowshoe hares, squirrels, mice, spruce grouse and pine grosbeaks are considered threats and subject to “control”. The Christmas Tree Growers Manual informs us that “With many of the larger animals that feed on the larger trees, population control may often be the best answer. This may be accomplished by shooting, trapping and removal to another location, or by poison baiting”.

Christmas Tree Pesticides and Human Health

Given the acreage of Christmas trees in N.S. and the number of growers; given the promotion by Lands and Forests and the Canadian Forestry Service of pesticide use for Christmas tree cultivation; given the dangerous nature of many of the pesticides being used and the basically unregulated nature of their application; given our lack of understanding of how such pesticides interact with each other in the human body and within the non-human environment, Nova Scotians and the people living in the vicinity of chemically-treated Christmas tree operations should be extremely concerned.

Pesticide Information is Promotional: Information on pesticides available from the provincial or federal governments – whatever the department – is, in general, promotional of the use of

pesticides in forestry and agriculture. Such information usually, and falsely, presents the viewpoint that there are no “realistic” alternatives to pesticide use. Anyone with an open mind who reads the promotional literature from chemical companies or the appropriate government department comes to see that economic, not health or environmental considerations, have the top priority. This because the government, at the provincial or federal level, serves first capitalist business interests. How often have we seen an independently funded study publish its results linking a pesticide, e.g. 2,4-D, to cancer and other health problems, and then the whole machinery of cover-up and diversion swings into action?

Ottawa Pesticide Hot Line: There is a toll-free number (1-800-267-6315) operated by Agriculture Canada, which is widely advertised as a source of information by the pesticide pushers in forestry and agriculture. Agriculture Canada is the federal government department which registers pesticides for use in Canada and also promotes their use. This source of information does not generally give out critical information, but it is very strong on “reassurances” that the particular pesticide of concern, if registered by the federal government, is “safe” to use, providing the label instructions are followed. Yet we know, according to the United Nations 1987 report, Our Common Future: The World Commission On Environment And Development (see p. 224), that “By 1986, more than 500 chemicals and chemical products had been banned altogether or had their uses severely restricted in the country of origin.” While the Ottawa pesticide hot line functions essentially as a PR source for the pesticide industry, it may still be worthwhile to telephone and ask to be sent whatever material they have on the pesticides of concern.

Cancer And Birth Defects: The Green Web considers all the pesticides used by Christmas tree growers to have consequences for health and the environment, even if we are not yet aware of what some of these will be. We are also concerned about the impact of nitrogen fertilizers on groundwater contamination. Ammonium nitrate or urea are used as a source of nitrogen for Christmas tree plantations. The amount to be applied is given in the Christmas Tree Growers Manual as 165-275 pounds of ammonium nitrate per acre and 122-203 pounds of urea per acre. Small amounts of phosphorus and potassium can also be applied. Mid-May to June is the recommended period for applying nitrogen fertilizers. It is said that nitrogen fertilizers can increase Christmas tree density by 10-20% and bring about a darker green colour. (Pine trees, when sold as Christmas trees, can be sprayed with a green dye, to enhance their green colour.) Nitrogen fertilizers, which are water soluble, can also bring about nitrate contamination of groundwater and wells.

Nitrate contamination of groundwater and wells has already occurred in some areas of Kings County, where nitrogen fertilizers are heavily used in farming operations. Water from some wells has become undrinkable. One newspaper report noted “Nitrates reduce the ability of red blood cells to carry oxygen, causing shortness of breath and eventual suffocation. Infants and young children are particularly vulnerable and may develop an acute condition called methemoglobinemia or ‘blue baby’”. (Chronicle Herald, January 28, 1989) Nitrates are also implicated in cancer formation.

Chemical residues on sprayed Christmas trees, as well as the brush from plantations used to make wreaths which could also contain pesticide residues, have to be considered. A sprayed tree in a well insulated house, which prevents the exchange of air, will magnify problems with toxic pesticide residues. Christmas tree employees who work with sprayed trees are also at risk.

Based on a partial examination of the critical literature on pesticides used by some Christmas tree growers, the following pesticides which are promoted for use, are linked to cancer and/or birth defects: amitrole, benomyl, captan, carbaryl, captofol, chlordane, chlorothalonil, lindane, methoxychlor, thiram, 2,4-D.

The following pesticides, because they are more water soluble, are particularly likely to cause groundwater contamination: atrazine, acephate, hexazinone, pronamide, simazine, chlorothalonil, benomyl, carbaryl, 2,4-D, glyphosate, malathion. (See the useful 1986 publication by Environment Canada, Pesticides and Groundwater in the Atlantic Region, for some insight into this problem.)

What Can Be Done?

The position of the Green Web is that Christmas tree growing is a welcome alternative to the pulpwood orientation of forestry in N.S. and provides a relatively high economic return to growers. However, we completely oppose the dominant chemical orientation within the Christmas tree industry, and suggest the following as a course of action:

1. As a first step, if Christmas tree spraying is a problem where you live, make the information in this Bulletin known to your community. Pesticide sprayers do not like publicity.
2. Organize community-based environmental protection committees to stop the pesticide spraying of Christmas trees, blueberry fields, large clearcut forest areas, roadsides, power lines, or other attacks on your local environment. Rely on your own resources.
3. Fight for the elimination of all pesticide use but, as an interim measure, insist on your right to give an informed consent or informed rejection to Christmas tree spraying. This would mean that all people living in the vicinity (e.g., one kilometre) of a Christmas tree plantation, would have to give their written permission if spraying were to take place. It should be a basic democratic right, not to personally suffer the consequences of toxic pollution caused by others.
4. People who are not directly exposed to Christmas tree sprays should make the effort to popularize the information in this Bulletin. Christmas trees are also grown in provinces outside the Atlantic region, like Quebec, Ontario and B.C.
5. Boycott all pesticide-raised Christmas trees. Support organic growers who do not use chemicals to grow their trees. Encourage such growers to publicly oppose the dominant chemical trend in Christmas tree cultivation and to develop an "organic certification" program, guaranteeing that their Christmas trees do not have pesticide residues on them.

Bulletin 3 was produced by the Green Web, an independent research group serving the needs of the green movement. Your comments/criticisms/financial support and help to disseminate this information will be appreciated and are crucial. Requests for other environmental information, topics for the Green Web to investigate, offers to help in research, etc., should be sent to David Orton or Helga Hoffmann, R.R.#3, Salt Springs, Pictou County, Nova Scotia, Canada BOK 1PO. Please make contributions payable to the Green Web. Permission to reproduce the information in Bulletin 3 is gladly given, acknowledgement to the research group would be nice.

Postscript on finances: It costs money to print and send out material from the Green Web. This is our third publication, since forming this group. Bulletin 1 was called "Blueberry Spraying: A

Chemical Horror Story”, and Bulletin 2, “Pulp And Paper Mill Pollution: Some Information Sources For Nova Scotians”. We believe this kind of research work is needed and we plan to do it on a continuing basis. To be economically sustainable in the long term, we do need financial contributions from those who support the kind of work we are doing. Our mailing list has, to some extent, to reflect this economic reality.

March, 1989

*(See page 3) We have since found out, that there are spraying guidelines for aerial spraying of Christmas trees. Ground spraying, however, remains completely unregulated.

PESTICIDES FOR CHRISTMAS TREES

The following pesticides are recommended for use by Christmas tree growers. All pesticides, unless otherwise noted, are taken from the 1987 Christmas Tree Growers Manual Atlantic Canada, sent to registered members of the Nova Scotia Christmas Tree Association. Some pesticides are recommended for use in combination. Each pesticide has a chemical and a trade, or product, name or names. We list here (in brackets) only one of the trade names.

HERBICIDES (a total of 13): asulam (Asulox), glyphosate (Vision), hexazinone (Velpar), amitrole/simazine (Amizine), simazine (various), 2,4-D (various). Another publication, Growing balsam fir Christmas trees in field and forest, 1988, by G. F. Estabrooks (Canadian Forestry Service), introduces two additional herbicides: pronamide (Kerb), and atrazine (Aatrex). The Tree Growers Manual also recommends additional herbicides for use in balsam fir seedbeds and transplant beds. Seedbeds: dazomet (Mylone chlorthal-dimethyl (Dacthal 75W), diphenamid (Dymid 80W), varsol (Shell AWK). Transplant beds: trifluralin (Treflan 4E).

INSECTICIDES (a total of 19): diazinon (Basudirt), dimethoate (Cygon), insecticidal soap, malathion (Cythion), miscible oil, carbaryl (Sevin), oxydemeton-methyl (Meta-Systox-R), chlorpyrifos (Dursban), trichlorfon (Dylox), fenitrothion (Sumathion), *Bacillus thuringiensis* - B.t., acephate (Orthene), permethrin (Ambush), dicofol (Kelthane), pyrethrins, lindane, methoxychlor (Methoxol), petroleum oil (Pine Sol). The Manual recommends one additional insecticide for use in balsam fir nursery beds: chlordane (various).

FUNGICIDES (a total of 6): chlorothalonil (Bravo), maneb (Dithane), benomyl (Benlate). The Manual recommends additional fungicides for use in balsam fir nursery beds: thiram (Thiram 80WP), captan (Captan SOW), captofol (Difolatan 4F).

GROWTH REGULATORS: No growth regulators are mentioned in the Manual. However, the Annual Report of the N.S. Department of Lands and Forests for the year 1986 speaks of research on Christmas tree growth regulators. Also, the Chronicle Herald (September 27, 1982) reported that “Eight Lunenburg County Christmas tree growers found an experimental plant growth regulator improved tree quality”. This particular regulator was identified only as ABG-3034, made by Abbott Laboratories. (One of the growth regulators used on apple trees [Alar], has been linked to cancer.)

WILDLIFE PESTICIDES (a total of 2): Two pesticides are recommended for use against animals damaging Christmas trees. Thiram-based “taste repellents” are advocated for use against deer and rabbits. Zinc phosphide, which the Manual notes is “extremely poisonous to humans”, is mixed with cracked corn, vegetable oil and “methyl green dye” to repel birds, and placed in “bait stations” to poison mice.

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