Cosmetic Pesticide Use

Witness Remarks to the Special Committee on Cosmetic Pesticides
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Background

My comments are based on my experience at UBC Botanical Garden, as a horticulture instructor at UBC and Kwantlen Polytechnic University, a horticultural consultant, grower and propagator of nursery stock, garden centre employee and—early in my career, a gardener and indoor plant store clerk. In all, I have been involved in horticulture for about four decades. Throughout my career, I have been closely involved with the use of cosmetic pesticides, either as an applicator, a manager, a teacher or a policy maker. When I started in horticulture, there was a "wild west" kind of approach to pesticides. Today, attitudes about the value and true cost of pesticides have changed considerably. I welcome this opportunity to be able to share my views on this important subject. My comments draw specifically upon the history of pesticide use and common pest management practices at UBC Botanical Garden. The analyses and conclusions are my own and may not represent the views or policies of the University of British Columbia.

Prior to about fifteen years ago, pesticides were routinely used at UBC Botanical Garden for all manner of pest, weed and disease problems. Pesticide use was never significant, except in the nursery and in the Food Garden and, even in these areas, applications were much less than would have been recommended for commercial growers. Outside of the Food Garden and Nursery, staff observed that problems other than weeds would generally diminish in intensity when nothing was done (i.e., in the absence of sprays).

In more intensively gardened areas, such as the Food Garden, there was a gradual shift to applications of only "organically-acceptable" materials (e.g., lime-sulfur, dormant oil, fixed copper, soaps, etc.) to deal with pests and disease. Currently the list of acceptable products includes only materials accepted by the Certified Organic Associations of BC. A combination of resistant cultivar selection, timely spraying (particularly for fruit trees) and appropriate cultural practices, such as crop rotation, companion planting and the use of cover crops, keeps the Food Garden area productive and free of significant pest and disease problems. We don't consider pesticide use on food crops "cosmetic." Pests, disease and weeds all adversely affect productivity (and it's certainly true that the Food Garden provides the most challenging pest control challenges), but our goal is to apply the same practices across the Botanical Garden as a whole. All of the produce derived from the Food Garden is harvested for a soup kitchen on Vancouver's Downtown Eastside.

In the Botanical Garden Nursery there has been a gradual transition from the regular use of synthetic pesticides to the adoption of least toxic, more specifically targeted compounds, and most recently, to more widespread use of biologicals for both control of damaging insects and mites and fungal pathogens. Biologicals include biocontrol agents, such as insect predators and parasitoids, as well as fungal protectants and mycorrhizae and even insectivorous plants. The use of biologicals requires considerable managerial expertise, particularly because of the open, often crowded environments in the nursery and the potentially diverse pest species attracted to the ever-changing variety of plants grown. The Botanical Garden's collections are used for research and education, as well as public amenity, so nursery pest management is not merely for cosmetic purposes—but the point is that for the most part, we can do without pesticides.

Weed control along pathways, which was traditionally carried out with regular herbicide applications throughout the Botanical Garden (and can correctly be categorized as cosmetic) is now tackled by more generally labour-intensive methods. Hoeing and hand pulling, regular mowing and deep mulching with organic

materials are our most common techniques for ongoing weed control. We also employ, to a lesser degree, infra-red burners and steam machines, as well as "natural" herbicides, such as acetic acid and citric acid combinations, for temporary control.

Outside of the Botanical Garden Nursery and Food Garden, significant plant disease problems are rare, and can, in our experience, almost always be corrected by improving cultural conditions. In extreme situations, susceptible species are removed; rhododendrons and junipers are good examples. With the former, keeping roots well oxygenated and moist by mulching and applying summer irrigation, lifting plants higher in the soil profile to avoid saturated conditions in the winter, and providing overhead shade to reduce heat stress, keeps rhododendrons healthy, and diseases at sub-lethal levels. The majority of junipers, on the other hand, are inherently predisposed to fungus infections that are not easily controlled in a cool, humid winter climate. Extraordinary above- and below-ground measures—improving deep drainage characteristics, providing superlative air circulation and maximum sun exposure, as well as regular fungicide applications on stems and foliage—are required to keep junipers alive. Thus, they are seldom grown and never recommended.

Insect and mite pest infestations are, like disease problems, often environment and species related. Viburnum beetle is a case in point. The larva of the beetle is known to attack susceptible species of *Viburnum* in local landscapes. This typically happens repeatedly (i.e., every year) to the degree that some species may be weakened to the point of death. Under some conditions, however, the presence of larval damage on the same susceptible species diminishes after an initial infestation and does not appear to significantly weaken plants in the long term. The reasons may be complex (weather, predation, disease, etc.), but in gardens where there is considerable biodiversity, viburnum beetle is not proving to be as significant a pest as it is otherwise.

In all cases—weeds, viburnum beetle, juniper twig blight—there are cosmetic pesticides available that can help control these pests and/or reduce their damage. At the Botanical Garden, however, we are more interested in finding alternatives. For one thing, Botanical Garden staff don't want to spray pesticides. And while that in itself is telling—professional gardeners generally know more about pesticides than others in the general public—there are other compelling reasons to reject pesticide use. Leaving aside issues of public acceptance and human health, it is well documented and observable both that **biodiversity builds resilience in ecosystems**, and **pesticide use generally reduces biodiversity and degrades environmental health**. A well known corollary is known as "the pesticide treadmill"; that is, the more pesticides are used, the more difficult it becomes to control pests without them because, in large part, the natural checks and balances (the organisms representing biodiversity) are also adversely affected by pesticides.

Still, some people and some segments of the horticulture industry are reluctant to abandon the convenience, ostensibly low cost and effectiveness of certain pesticides. Admittedly, it requires some knowledge of pest biology and pest ecology to effectively manage biocontrol agents, a different esthetic to accept the high-cut, multi-species lawn, a greater level of patience to wait for landscape pest numbers to naturally drop to less damaging levels, and more physical labour to manually control weeds. Nevertheless, it would be safe to surmise that most ecologists, environmental toxicologists, professional biologists and horticulturists are convinced that it is worth the effort (for ecosystem health alone) to avoid pesticides wherever possible. And there are alternatives. The insidious nature of synthetic chemicals is not limited to the well-documented dangers of their manufacture, transport, storage, application and local and downstream effects. Their presence and promotion in the marketplace also effectively suppresses demand for alternatives and the research and development that would help to make them obsolete.

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Pesticide Use Policy, UBC Botanical Garden (May 2010)

- Pesticide materials currently acceptable for application in public areas of the Botanical Garden and Nitobe Memorial Garden are only those accepted by the Certified Organic Associations of BC (COABC).

- The use of non-COABC accepted pesticides, in public areas of the Botanical Garden and Nitobe Memorial Garden is not allowed, notwithstanding the appearance of a federally quarantinable pest or disease.

- Limited use of non-COABC accepted pesticides, including herbicides, is currently allowed in the Botanical Garden Nursery, on the Totem Research Fields and in other Botanical Garden areas that are strictly off-limits to the public. All treatment areas under the Botanical Garden's jurisdiction must be well marked and posted with appropriate information relating to the application at least 24 hours prior to the treatment. Materials used for treatment will be reviewed annually and COABC accepted substances and other alternatives sought, with the objective of harmonizing policy and practice throughout the Botanical Garden.