Article 5

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Urban Pesticides: From the Lawn to the Stream

The fate of pesticides applied to our lawns remains somewhat of a mystery. Indeed, it seems to depend on whom one talks too. The fact that an enormous quantity of pesticides is being applied to our nation's lawns is beyond dispute. A key question is whether pesticides reach urban streams either by leaching into groundwater or in stormwater runoff. On one hand, turf researchers generally report very little runoff or leaching of pesticides from carefully controlled lawn test plots (see article 129). On the other hand, stream researchers frequently detect a relatively wide range of herbicides and insecticides in dry weather and storm runoff from residential watersheds, at the part per billion level. While this finding seems to demonstrate a clear link between the input of lawn pesticides and their delivery to streams, it fails to tells how they were delivered, or what environmental risk they may pose. In this article, the available research on the use, fate and environmental significance of urban pesticides are reviewed.

Urban Pesticide Use

The U.S. EPA estimates that nearly 70 million pounds of active pesticide ingredients are applied to urban lawns each year. Collectively, urban lawns cover an estimated 20 to 30 million acres of our country's landscape. Homeowner surveys suggests that pesticides are regularly applied on roughly half of these acres. Thus, an average acre of maintained lawn receives an annual input of five to seven pounds of pesticides.

Who applies these pesticides to the lawn? Surveys indicate that about two-thirds of all homeowners perform their own lawn care, while professional lawn care companies service the remainder (Table 1). In some residential watersheds, the fraction of lawns treated by professionals can approach 50%, particularly when lot size and income are high.

The fraction of homes that actually apply pesticides outdoors ranges from 40 to 60% in most surveys (which includes both homeowner and professional lawn care applications). About three in 10 residents report that herbicides were applied outdoors. A similar but more variable proportion of residents—20 to 40%—report using insecticides.

The diversity of pesticides applied in urban areas is staggering. Kroll and Murphy (1994a) performed an extensive survey of pesticide use in nearly 500 homes in Baltimore and found nearly 50 herbicides, insecticides and fungicides commonly applied by residents or commercial applicators (Table 2). Immerman and Drummond (1985) report that some 338 different active ingredients are applied to lawns and gardens nationally. Each pesticide differs greatly in mobility, persistence and potential aquatic impact, and is difficult to ascertain what if any environmental risk they may pose. Marketing surveys, however, indicate that a relative handful of brand name pesticides make up the bulk of most residential pesticide applications, such as 2,4-D, MCPP, diazinon and chloropyrifos.

Table 1: Summary of Lawn Care Surveys

Lawn Care Study	Wisconsin	Virginia	Maryland	Maryland	Minnesota
References	Kroupa	Aveni	Kroll	Smith	Dindorf
Homes surveyed	204	100	484	403	136
Take care of own lawn	69%	85%	61%	68%	63%
Professional lawn care	21%	10%	39%	32%	37%
Use pesticides	—	66%*	40%	—	—
Use insecticides	17%	—	—	42%	—
Use herbicides	29%	—	—	30%	76%*

* Mail in survey technique may have led to over-reporting