Producing and Consuming Chemicals: The Moral Economy of the American Lawn

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Abstract The burgeoning application of fertilizers and pesticides to residential lawns, which has begun to offset the gains made in reducing the use of chemicals in agriculture, represents a serious environmental hazard in the United States and elsewhere. Increased use and purchase occur specifically among a sector of consumers who explicitly and disproportionately acknowledge the risks associated with chemical deposition, moreover, and who express concern about the quality of water and human health. What drives the production of monocultural lawns in a period when environmental consciousness has encouraged "green" household action (e.g., recycling)? And why does the production of chemical externalities occur among individuals who claim to be concerned about community family and environment? In this article, we explore the interactions that condition and characterize the growth of intensive residential yard management in the United States. We argue that the peculiat growth and expansion of the moral economy of the lawn is the product of a threefold process in which (1) the lawn-chemical industry has implemented new and innovative styles of marketing that (2) help to produce an association of community, family and environmental health with intensive turf-grass aesthetics and (3) reflect an increasing local demand by consumers for anthentic experiences of community, family, and connection to the nonhuman biological world through meaningful work.

Keywords: political ecology · losins · urban growth consumption

In the United States, the economic boom of the late twentieth century led to an unprecedented level of spending power for the majority of middle-class Americans. The resulting changes in everyday urban practies had profound implications for urban environments in the form of the degradation of the quality of air and water, the disposal of an ever-growing mountain of honsehold waste, and the increases in atmospheric carbon loads through the daily commuting patterns of consumers (Newman and Kenworthy 1996).

One of the most profound though understudied impacts of this growth is the transformation of land cover and ecological change in the wake of urban expansion. Specifically, with a conservative estimate of 23 percent of urban cover dedicated to lawns (Robbins and Birkenholtz 2003) and with 675,000 hectares per year converted to urban development in the United States (Natural Resources Conservation Service 2000), the spread of lawn cover has become a major force for ecological change, blanketing the urban landscapes of the United States (see Fig. 1). Typically, threats to the environment are blamed on agricultural and industrial enterprises. Urban construction and runoff from urban and suburban areas, however, contribute significantly to water pollution, although these

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Fig. 1 Aerial photograph of monocultural lawn space, Columbus, Ohio

sources are often overlooked in regulations (Capiella and Brown 2001; Maddock forthcoming). As a result, one of the most profound but overlooked impacts of changes in land cover has been the spread of the suburban lawn and the concomitant rise in high input systems of management that it demands, including the application of chemical fertilizers, herbicides, and insecticides to residential yards (Jenkins 1994; Robbins, Polderman, and Birkenholtz, 2001).

The scale of the lawn-care industry alone suggests the importance of more thorough analyses. In 1999, Americans spent $ 8.9 billion on lawn-care inputs and equipment. In the same year, 49.2 million households purchased lawn and garden fertilizers, and 37.4 million households purchased insect controls and chemicals. The purchase of these inputs, moreover, steadily increased during the past decade (Butterfield 2000).

This expansion of use and purchase has occurred specifically among a section of consumers who explicitly and disproportionately acknowledge the risks associated with chemical deposition and express concern about the quality of water and human health (Robbins, Polderman, and Birkenholtz 2001). What drives the production of monocultural lawns in a period when environmental consciousness has encouraged "green" household action (e.g., recycling)? And why does the production of chemical externalities occur among individuals who claim to be concerned about community, family and the environment?

To answer these questions we take a political ecological approach to the economic geography of the lawn in the United States. Operating from the understanding that decisions about land management are constrained by "parameters of choice" that are set by larger social, political, and ecological actors and processes, political ecology has been successful in explaining the degradation of agricultural land and water in the global South even while it has demonstrated that global economic and political processes are mediated by local-level ecological realities (Blaikie 1999; Blaikie and Brookfield 1987). This approach we suggest can be equally effective when applied to urban and developed settings. Viewing the use of chemicals in lawn management as the structured environmental decisions of individuals that are embedded in larger social, political, and economic processes at multiple scales, our investigation yields a clearer understanding of the continual and increased use of lawn chemicals by affluent Americans despite widespread knowledge of their possible negative environmental impacts. Moreover, it provides a better picture of the emerging environmental implications of the private consumption and public production of suburban landscapes.

In this article, we explore the interactions that condition and characterize the growth of intensive residential yard management in the United States. We argue that the peculiar growth and expansion of the lawn aesthetic is the product of a threefold cross-scale process in which (1) economic imperatives in the lawn-chemical industry have led to new and innovative styles of marketing that (2) help to produce an association of community, family, and environmental health with intensive turf-grass aesthetics, and (3) reflect an increasing local demand by consumers for authentic experiences of community family and connection to the nonhuman biological world through meaningful work.

Following a brief summary of our methodology we begin our analysis with a demonstration of the distinctiveness of the consumption of lawn chemicals with specific attention to sustained sales of lawn chemicals despite increasing environmental consciousness. This situation points to socioeconomic trends in the industry that demand explanation. In the next section, we briefly examine pressures of production in the agrochemical formulation industry, showing the constraining forces that drive chemical formulator firms to be aggressive in seeking new markets. Next we explore the resulting signification strategies of the industry, showing that formulator marketers work to represent the lawn as a site of community, family, and environment. We then examine the microleyed class-based household and neighborhood processes that drive intensive land uses, demonstrating that the American yard is produced by consumers in an urgent drive to realize the very same things (community, family, and environment). Finally, we argue that the convergence of declining formulator margins, aggressive direct marketing, and social desire together produce the parklike monoculture of intensive lawnscapes, demonstrating the deeply structured nature of the question across scales and troubling some otherwise intuitive notions about the American consumer.

We review the implications of this study in the conclusion. We argue that by examining the question at multiple, mutually constraining locations, we can make the increasingly entrenched normative practices of urban land and water degradation more clear and draw the problematic conceptual divisions between production and consumption and between public and private space into empirical and theoretical question.

Methodology

To explore both the global and local forces at work in the production of the high-input lawn, research required both an industry analysis and a survey and interview component. The industry analysis involved fiscal and historical research on the strategy and logies of lawn-care formulator firms, with attention to their economic performance and the various marketing techniques they use. Specific attention was given to the Scotts Company, the leading marketer of lawn chemicals in the world. With net sales of $ 1.74 billion in fiscal year 2001. Scotts controlled 55 percent of the lawn and

garden market in the United States and 25 percent of the market in Europe (Jaffe 1998; Scotts Company 2003).

For the national survey by the Center for Survey Research at Ohio State University during the summer of 2001; researchers conducted 594 phone interviews with respondents across the United States, who were stratified by census region and selected through random digit dialing. The screening sought to identify and interview adults who were "responsible" for the lawn: "a grassy area at the front, the side, or behind your residence."

These surveys were supplemented with intensive follow-up phone interviews with selected respondents in Ohio, as well as face-to-face interviews with a purposive sample of residents in Columbus, Ohio. The city of Columbus and the state of Ohio more generally represent good sample areas for consumer research on lawns, since they are test markets for major consumer marketing firms and because the headquarters of Scotts, a major lawn chemical formulator and service provider, is located in Ohio. Together, these methods were used to explore and explain the distinctive trends in the production and consumption of lawns and the sustained use of lawn chemicals despite increasing environmental awareness.

Distinctiveness of the Lawn as a Site of Production and Consumption

Intensive lawn maintenance requires the use of diverse inputs, each with specific associated risks. Pesticides pose risks to both human and nonhuman health if they are found in either surface or ground water (Pepper, Gerba, and Brusscau 1996). Excess fertilizers in water supplies lead to the entrophication of water bodies and the contamination of drinking water (U.S. Geological Survey 2001). Common lawn chemicals include both fertilizers and pesticides, a category encompassing insecticides, herbicides, and fungicides. Table 1 shows the major chemicals that were applied on U.S. lawns in 1995, with basic descriptions of the severity and type of risk that they represent according to the U.S. Environmental Protection Agency (EPA).

Although lawn chemicals do not represent an immediate and proximate risk to consumers if they are used properly, the effects of their sustained use over time are less clear. Even Scotts's CEO admitted that "we cannot assure that our products, particularly pesticide products, will not cause injury to the environment or to people under all circumstances" (quoted in Scotts Company 2002b, 16). As a result, lawn-care chemicals have received increasing attention as a persistent risk. Concern at the EPA has heightened in recent years, and its studies have increasingly pointed to the uncalculated risks of exposure to lawn-care chemicals. Assessments of human exposure have shown that lawn chemicals are more persistent than was previously thought, especially when they are transported into the indoor environment, where their reported laboratory half-lives become relatively meaningless (Nishioka, Brinkman, and Burkholder 1996).

These chemicals track into homes easily and have been shown to accumulate in house dust, especially in carpets, where they are most available for dermal contact and where young children are placed at a significant risk (Lewis, Bond, Fortmann, and Camann, 1991; Lewis, Fortmann, and Camann, 1994; Nishioka, Burkholder, et al. 1996; Nishioka, Burkholder, Brinkman, and Lewis, 1999; Nishioka, Burkholder, Brinkman, and Hines, 1999). Furthermore, the effects of these toxins, especially insecticide neurotoxins, on children is not well understood, but modeled impacts of children's exposure to chemicals have suggested that serious risks result from normal but persistent exposure (Zartarian et al. 2000). The deposition of common lawn chemicals on clothing during application has also been demonstrated to lead to persistent risks of exposure (Leonas and Yn 1992). Therefore, even apart from the water and energy demands of these high-input systems, intensive lawn management carries with it some dilemmas of chemical use that are serious enough to have engaged the EPA's attention (Guerrero 1990).

Table 1 Pesticides used on U.S. lawns[a]

Pesticide	Mlb Active[b]	Type	Use	Toxicity (EPA)[c]	Environmental Toxicity
2.4-D	7–9	Systemic Phenoxy Herbicide	General	Slight to High	Birds Fish Insects
Glyphosate	5–7	Nonselective Systemic Herbicide	General	Moderate	Birds Fish Insects
Dicamba	3–5	Systemic Acid Herbicide	General	Slight	Aquatic
MCPP	3–5	Selective Phenoxy Herbicide	General	Slight	NA
Diazanon	2–4	Nonsystemic Organophosphate	Restricted	Moderate	Birds Fish Insect
Chlorpyrifos	2–4	Insecticide Broad-spectrum Organophosphate Insecticide	24-hour Reentry Restricted	Moderate	Birds Fish
Carbarvl	1–3	Wale-spectrum Carbamate Insecticide	General	Moderate to High	Fish Insects
Dacthal (DCPA)	1–3	Phthalate Compound Herbicide	General	Low	Birds Fish

[a]Following Robbins and Birkenholtz (2003)
[b]Millions of pounds of active ingredients used in the United States (U.S. Environmental Protection Agency (EPA) 1996).
[c]Toxicity risks based on the standards of the U.S. EPA (Extension Toxicology Network 2000)

These risks are increasingly well communicated, to the point that formulators worry about the marketability of lawn-care products. For example, William Foley, head of the consumer products division of Scotts Company, reported as early as 1990 that "we're concerned about the overall growing presence of chemophobia in the minds of both the trade and the consumer" (quoted in Cigard 1990, 53). In their forward-looking statements for fiscal 2002, Scotts officials further stated their concern that the public's perception of chemicals could adversely affect business (Scotts Company 2002b). Even so, trends in consumers' use of chemicals show no sign of flagging.

Trends in the Use of Chemicals on High-Input Lawns

In the national survey of U.S. lawn owners, 11 percent of the respondents reported that they had eaten dandelions (*Taraxacum officinale*) from their lawns. This revelation, however astonishing to students of consumer behavior, is not a surprise to major input producers and suppliers, who urge homeowners to treat dandelions more aggressively: "Don't Eat 'Em Defeat' Em" (see Fig. 2). The degree to which the lawn has not yet been fully colonized by intensified, high-input systems marks the extent to which aggressive chemical sales continue to have room to grow and expand to new markets. As a result, the high-input lawn is distinctive in that it represents a case of the expanding use of chemicals, even in the face of the increasing acknowledgment of negative externalities, where all other forms of chemical use are declining.

Fig. 2 "Don't Eat 'Em Defeat 'Em." (Copyright ©2001 The Scotts Company, Marysville, Ohio, reprinted with permission)

Tracking the sales in the yard chemical-formulator industry suggests the degree of recent expansion. Although they do not manufacture the active ingredients in pesticides and fertilizers, formulator firms purchase them from large chemical companies, mix the active ingredients with other solvents, and package and market the final products for retail sale. In this industry, growth is ongoing. Whereas the overall use of agricultural pesticides in the United States has decreased sharply since the late 1970s, as has the use of pesticides in the commercial and governmental sectors, the sales of residential lawn and garden chemicals are stable and increasing. Between 1994 and 1997, national use of agricultural herbicides decreased by 15 million pounds of active ingredient (3 percent of the total) while the use of household herbicides increased by 3 million pounds (or 6.5 percent of the total). Similarly, for insecticides, agricultural usage decreased by 8 million pounds of active ingredient (9 percent of the total) while household usage remained nearly unchanged (Aspelin 1997; Aspelin and Grube 1999). Over the same period, the total retail sales of private lawn-care products increased from $8.4 million to $8.9 million, making this segment the largest and fastest-growing one of the entire lawn and garden industry, including ornamental gardening, tree and shrub care, and vegetable gardening (Butterfield 2000). In 1999, 55 percent of U.S. households applied insect controls (some 136 million pounds of pesticides), and 74 percent applied fertilizers (Aspelin and Grube 1999). Even though the total quantity of lawn chemicals applied in the United States remains lower than

Table 2 Chemical deposition: Agriculture versus lawn care, 1997[a]

	Agriculture Deposition 1997 (kg/ha)[b]	Lawn Care Deposition 1997 (kg/ha)	Lawn Care Increase 1982–1997 (kg)[c]
Herbicides	1.612	3.288	2,537,500
Insecticides	0.281	1.141	880,357
Fungicide	0.182	0.537	414,286
Other pesticides	0.566	0.134	103,571
Other chemicals[d]	0.597	4.026	3,107,143
Total	3.238	9.127	7,042,856

[a] Following Robbins and Birkenholtz (2003).
[b] Calculated from total usage (U.S. EPA 1996) by land cover (Natural Resources Conservation Service 2000). Figures are given in kilograms of *active ingredient*. Lawn calculated as 23-percent developed cover.
[c] Calculated from cover change and deposition per hectare.
[d] Chemicals registered as pesticides but often marketed for other purposes, i.e., multiuse chemicals, including sulfur, salt, sulfuric acid, and petroleum products (e.g., kerosene, oils, and distillates).

that applied to agricultural fields, the rate of applications per hectare is far greater (see Table 2). So while total deposition of chemicals applied in agriculture can be estimated to have decreased as a result of land-use conversion, these gains are increasingly offset by the greater use of chemicals on home lawns (Robbins and Birkenholtz 2003).

The environmental and popular presses have increasingly serutinized the conventional yard as a potential environmental problem (Bormann, Balmori, and Geballe 1993; Jenkins 1994; Feagan and Ripmeester 1999). Nevertheless, U.S. homeowners apply chemicals to their lawns even though they understand the negative environmental impacts of doing so. Higher rates of chemical use have previously been shown to correlate with higher incomes, greater levels of education, and high degrees of environmental knowledge and concern (Feagan and Ripmeester 1999; Robbins, Polderman, and Birkenholtz 2001).

In the national survey, the use of a chemical lawn-care company was associated not only with individuals with higher incomes and higher-valued houses, but disproportionately with individuals who believe that homeowners lawn practices and lawn-care services have a deleterious impact on the quality of local water supplies. Moreover, those who use chemicals or chemical application companies are significantly *more likely* to perceive that their own or their neighbors' chemical-use practices have "a negative effect on water quality" than are those who do not use inputs (the survey questions are in Table 3, and the supporting data are in Table 4). Thus, despite greater environmental knowledge and concern, high-energy lawn-care inputs are increasing among the most environmentally sensitive and aware. Therefore, the U.S. lawnscape presents a significant problem, and the increasing production and consumption of these products demands an explanation, as do the complex moral economies that surround them.

Limits to Current Models of Explanation

To date, such questions have been approached largely from an economic perspective, with lawn management described and theorized as individuated, economically rational behavior that is meant to maximize the economic utility of the yard (Templeton, Zilbermand, and Yoo 1998). From this perspective, the use of chemicals has remained steady in the face of wide-spread knowledge of its negative impacts because of (1) broad economic and demographic trends and an increase in the total area of lawns, (2) an increase in the number of people who are likely to use chemicals, and (3) the labor burden that is offset by their use.

In addition to fueling a housing boom, the protracted economic expansion of the late 1990s meant that many Americans had more discretionary income (Cook 1990; Reich 2000), and the low interest

Table 3 Survey questions and response categories

Environment
Impact of home care practices on local water quality
How much do lawn-care practices of home owners, such as the use of fertilizers, weed killers, or bug killers applied to their yards affect water quality near your community? Would you say a lot, some very little, or not at all?
Response Categories: a lot, some, very little, not at all
Impact of lawn-care services on local water quality
How much do companies that provide lawn-care services affect water quality near your community? Would you saw a lot, some, very little, or not at all?
Response Categories: a lot, some, very little, not at all
Community
Impact of neighbors' lawn-care practices on water quality
What kind of effect do you think your neighbors' lawn-care practices have on water quality—a positive effect, a negative effect, or no effect?
Response Categories positive effect, negative effect, no effect
Neighbors' use of lawn chemicals
Do your neighbors use any kind of chemicals on their lawns?
Response Categories yes, no, no neighbors
Knows neighbors by name
How many of your neighbors do you know by name? Would you say . . .
Response Categories all of them, most of them, about half of them, some of them, none of them, no neighbors' don't live in a neighborhood
Family
Learned about yard chemicals from a family member Where did you originally learn about how much to use and how to apply fertilizers weed killers or pesticides?
Response Categories family members, retail salespeople (hardware store for examples, books/magazines from packaging materials instructions included with product, other
Environmental Health
Worry about water supply an index variable
An index variable composed front three survey questions:
Next, I'm going to read von some different statements, and for each one I'd like you to tell me how much you agree or disagree with it
I am concerned that water pollution is a threat to my family's health
I am concerned about pesticides and nutrients in my drinking water
My drinking water is clean
Response Categories; strongly agree, somewhat agree, somewhat disagree, strongly disagree
Willingness to pay for clean water supply
If more tax money were needed to prevent water pollution in your community, about how much more if any, would you be willing to pay per year?
Response Categories: open ended
Socioeconomic Status
Income
And, approximately what was your total household income from all sources, before taxes for 2000?
Response Categories open ended
Education
What is the highest grade or year of school von have completed?
Response Categories: open ended
House value
What is the approximate value of your home?
Response Categories: open ended

Table 4 Status, environment, community, family, environmental health, and lawn chemical use, $N = 594$ (contingency analysis)

	Use lawn-care company		Use do-it-yourself chemicals		Use fertilizers (among chemical users) $N = 271$	
	χ^2	df	χ^2	df	χ^2	df
Status Variables	28.607***	6	15.103**	4	7.466	6
Income						
Education	22.680**	7	12.260	7	14.626*	7
House value	40.078***	5	7.676	5	14.052*	5
Environmental Variables						
Belief that home lawn-care practices have a significant impact on the quality of the local water	15.801**	3	1.350	3	1.427	3
Belief that lawn-care services have a significant impact on the quality of the local water	7.854*	3	6.616	3	1.221	3
Community Variables						
Belief that neighbors' lawn-care practices have a negative impact on the quality of water	6.832*	2	3.319	2	3.410	2
Neighbors use of lawn chemicals	13.452**	2	31.357***	2	3.044	2
Knows neighbors by name	1.423	5	16.621**	5	3.199	4
Family Variable						
Learned about yard chemicals from a family member	–	–	–	–	4.929*	1
Environmental Health Variables						
Worry about home water supply	408	4	4.743	4	13.299**	4
Willingness to pay taxes for clean home water supply	11.495*	4	.842	4	.870	4

* Significant at the .05 level.
** Significant at the .01 level.
*** Significant at the .001 level.

rates of the late 1990s fed the boom in the construction of new single-family homes (see Fig. 3). Simultaneously, there was an increase in the proportion of the lot committed to lawn as ranch-style construction gave way to multistory dwellings (Robbins and Birkenholtz 2003). This increase in gross yard space provided more opportunity for the use of chemicals ("Pesticide Herbicide Innovations" 2000; Reich 2000).

Second, demographic shifts are increasing the number of people who are likely to take yard work seriously enough to use chemicals. Market research has suggested that Americans in their 50s are more likely to work extensively in their yards than are those of any other age (Howell 2000). Disposable income rises dramatically for Americans in their 50s, in particular, and this extra income is often invested in home improvements, including the yard (Assael 1990). People in this cohort are more likely than are others to own homes with yards (Robbins, Polderman, and Birkenholtz 2001). The first baby boomers turned 50 in 1996, bringing the largest group of Americans into their prime yard-management years (U.S. Burean of the Census 1990). As this generation continues to age over the next two decades, the number of people who engage in yard-care activities can be expected to increase dramatically.

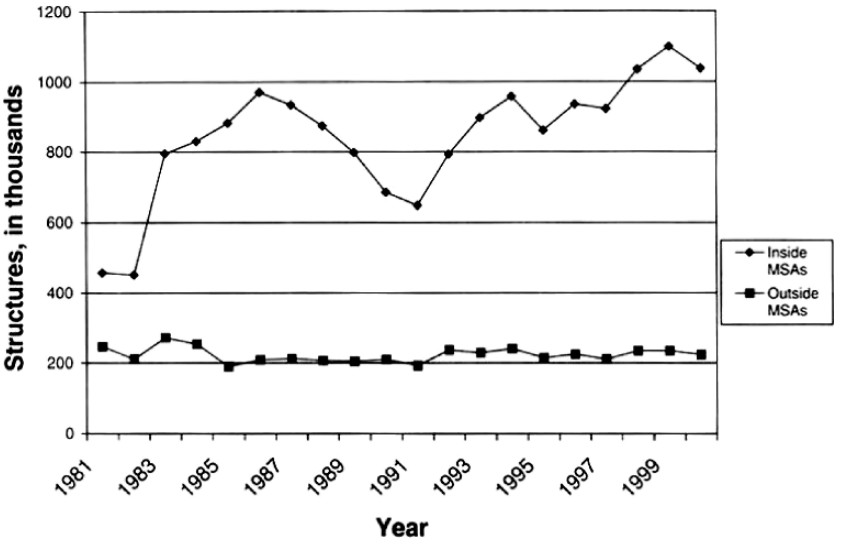

Fig. 3 Single-family housing starts by metropolitan character. *Source*: U.S. Burean of the Census (2001)

Finally, economists and market researchers have asserted that homeowners who engage in yard care tend to use a highly intensive style of management. The geography of new home construction contributes to this intensity, since the majority of new homes that were constructed in the last 20 years were built in metropolitan areas, where residents are more likely to use yard chemicals than people in small towns or rural areas (Cook 1990; Butterfield 2000). In addition, the majority of new homes were built in the southeastern and southern central portion of the United States, where a longer growing season and more virulent insects mean that homeowners have a greater opportunity and incentive to use yard chemicals. These factors, combined with the decreased labor requirements of chemical inputs relative to their manual alternatives, can be used to explain the persistence of the use of lawn chemicals (Templeton, Zilbermand, and Yoo 1998). Thus, many scholars view the continued use of yard chemicals in the United States as being coincident with economic expansion and demographic change and use rational actor models to explain why Americans mow, clip, and spray every Saturday.

These economic explanations, we argue, are insufficient to elucidate fully the sustained and increasing sales of chemicals or to explain the specific cultural economy of the lawn. Describing market behaviors in the absence of a wider economic context, these approaches do not place lawn managers decisions within the social and cultural processes that operate on both the local and global scales. Nor do such explanations posit why specific practices, especially the greater use of chemicals, prevail even in the face of changing public values. They cannot answer why Americans, known for their environmental awareness, continue to manage land in contradiction to their increasing environmental knowledge (Robbins, Polderman, and Birkenholtz 2001).

We suggest, therefore, that a robust explanation of this problem lies in understanding the social construction of the lawn aesthetic within the wider context of the restructuring of the chemical industry at the global scale, as conditioned by residential class and community identity at the local scale. By examining both locations, we find that there is an increasing imperative to produce monocultural lawns and that the demand is created both by formulators who must sell and by local consumers who must buy the monocultural aesthetic of the American lawn. Formulators are forced by declining margins to expand sales aggressively through representational techniques that sign the lawn as part of consumers' identity. Local lawn owners, in contrast, are driven to maintain the monocultural lawn

with an urgency rooted in their perceived alienation from community, family, and environment. We consider each process in turn.

The Drive for Markets: Economic Imperatives to Expansion

Over the past 20 years, formulator firms—companies that purchase raw chemical inputs for lawn care, combine them, brand them, and supply them to retail outlets—have faced several new challenges that have forced them to expand and adapt. These challenges have included declines in retail outlets, difficulties in financing, the rising costs of raw materials, and regulatory and ecological limits to production.

First, as in most traditional Fordist industries, the cost of standing warehouse stock, essential in this highly seasonal industry, has become prohibitive for traditional retailers, who rarely want to stock spring merchandise the previous fall. As Scotts executive Charles Berger (quoted in B. Williams 1997, 211) explained. "Nobody wants March merchandise in November." At the same time, there has been an increasing shift in retail sales toward the cheap prices of mass discount and home improvement stores, which have become the new centers of lawn and garden retailing (Bambarger 1987; Cook 1990).

As a result, hardware stores and nurseries, the traditional outlets for lawn-care products, have lost market share in chemical sales, and formulators have come to rely more heavily on a relatively smaller number of larger-scale customers: home improvement and mass market retailers. Ten North American retailers account for 70 percent of the sales of the Scotts Company, for example. Home Depot, Wal-Mart, Lowe's, and the increasingly troubled Kmart provide 60 percent of the sales, with Home Depot alone accounting for 28 percent (Scotts Company 2002a). In addition, competition among these retailers is intense. If any of these customers falters, formulators may lose important outlets (Scotts Company 2002b).

At the same time, many formulators are facing increasingly difficult financial situations. Scotts's leveraged buyout in 1986, as a prominent example, cost $211 million, of which $190 million was financed by an investment banking firm. This debt was blamed for the 11-percent fall in Scotts's stock share price from June 1999 to June 2000 ("At Scotts They Call It Pull" 2000).

In an attempt to increase sales through acquisition, formulator firms have assumed even more debt with the purchase of new product lines (Baker and Wruck 1991; "Monsanto completes pesticide sales" 1998), resulting in declines in credit ratings. Other expenses in the industry, including company software, the closing of facilities that operate at a loss, severance pay for redundant employees, and costs associated with product recalls, have also driven significant debt (Scotts 2002b). In fiscal year 2000. Scotts spent $94 million on interest payments alone a figure inflated by the high interest rates of that year, requiring Scotts to increase sales to generate a sufficient cash flow (Scotts 2002a).

Formulators must also deal with the increasing costs of raw materials. Scotts sold its professional golf-turf business partly because of the increased cost of raw materials, such as urea and fuel (Scotts Company 2002a). In addition, the costs of most pesticides' active ingredients have been steadily rising since the early 1980s (Eveleth 1990).

Expiration of patents and environmental regulation further threaten formulators. The patent for glyphosate, for example, the active ingredient in one of Scotts's best-selling herbicides, expired in September 2000, opening production opportunities and tight competition for market share (Scotts Company 2002b). Neither are formulators immune from the complexities of state regulation. Active ingredients in pesticides can be removed from the market under the Food Quality Protection Act, and companies must be prepared to find new sources of raw materials for all of their pesticides, as well as be prepared for the potential costs of remediation or liability if any pesticide causes harm (Scotts Company 2002b).

In addition, the harvesting of peat for potting soil is subject to environmental regulation in both the United States and Britain. The U.S. Army Corps of Engineers has used Scotts over surface water contamination from its peat-harvesting activities at a New Jersey plant and the company only recently reached an agreement with British environmental officials to close down its peat-harvesting plants at several sensitive sites in the United Kingdom (Scotts Company 2002c). Federal, state and local environmental regulators strictly regulate the disposal of wastes from fertilizer- and pestieide-formulating plants. Scotts has been paying fines and cleanup costs for unlicensed waste disposal and asbestos contamination at several sites in the United Kingdom and Ohio (Scotts Company 2002b).

Moreover, the ecological cycles of the industry pose problems for formulators. The cyclical nature of grass and garden growth means that cash flow is cyclical, since early spring and summer bring the highest sales of lawn and garden products. To meet this demand, fall and winter are the highest production times at formulation plants. Yet fall is the time of the lowest cash flow because receipts from spring and summer sales have not yet been received. As a result, formulators must maintain their highest production at a time when their cash flow is the lowest. This cash-flow "crunch" has implications for financial integrity. The Scotts Company's executives are unsure of their ability to make even minimal debt-service payments in fall and winter when their cash flow is the lowest (Scotts Company 2002b). Because debt service is so crucial, the company must boost sales enough to provide adequate capital even in the fall and winter "crunch."

Changing weather affects formulators, as well. A wet spring slows fertilizer sales but increases pesticide sales. Conversely, a dry spring increases fertilizer sales but decreases pesticide sales, while a cold spring can slow all lawn and garden sales. This is one reason why formulators seek a global market, hedging against a cold spring in the United States with sunny weather in Europe, and vice versa (Scotts Company 2002b).

To pay off their considerable debt; to over-come the rising costs of raw materials, to deal with the possibility of losing an important retail customer, to ensure sufficient funds to acquire new active ingredients, to manage environmental liabilities, to meet winter debt-service obligations, and to compensate for fluctuations in the weather, formulators of the early twenty-first century must increase sales of lawn chemicals and do so at an increasing rate (Robbins and Sharp forthcoming). Fortunately for firms, changes in the retailing environment have led the industry into a new era of consumer advertising, resulting in increased sales, which the industry needs. These direct ("pull") marketing systems depend, to a great degree, on carefully representing the lawn aesthetic to potential consumers.

Signification: Creatively Representing the Lawn Aesthetic

Like most formulators the dominant firm, Scotts, sold yard chemicals prior to 1990 through a "push" strategy, in which incentives were provided to a close network of retailers—usually independent hardware stores, nurseries, and specialty garden stores—who ordered large shipments of merehandise. Products were shipped to stores in the fall and then held by retailers until spring sales, when the retailers were responsible for selling the products, relying on advertising and knowledgeable, motivated sales staffs (B. Williams 1997; Baker and Wruck 1991).

But in 1986, following a leveraged buyout from its parent company ITT, Scotts proceeded with an innovative marketing tactic: "pull marketing" ("Why I Bought the Company" 1989; Baker and Wruck 1991). On the basis of direct advertising to consumers by the formulators themselves, via television, radio, and print advertising, a "pull" approach concentrates on creating demand at the customer level ("At Scotts They Call It Pull" 2000). Rather than rely on a retailer to sell a specific brand, the formulator presents its products by promulgating novel imagery and signifying the lawn (B. Williams 1997).

The move to a pull marketing strategy now extends to new products that attempt to "turn more dirt—branded dirt—into dollars" and to branded plants, sprouted with company products (Scotts Company 2001, 9). Moreover, the current marketing strategy seeks to increase applications per user. "Consider the $900 million lawns category: almost 30% of homeowners are do-nothings! The average do-it-yourselfer still makes fewer than half the recommended product applications each season. If every home-owner made just four applications a year lawns could be a $2.8 billion market!" (Scotts Company 2001. 12). In addition, advice is readily available through toll-free help lines, in-store counselors, extensive web pages, and e-mail reminder services, all backed by a guaranter of satisfaction for markets in both the United States and Europe (Hagedorn 2001; Scotts Company 2001a).

This emphasis on marketing is capital intensive. After purchasing a new pesticide line. Scotts spent twice as much as its former owner to advertise it (Reich 2000). In 1998, with only about half the market share in yard-care supplies. Scotts spent 75 percent of all the advertising dollars in the sector, and in 2002, it purchased $8 million of television airtime (Jaffe 1998; Scotts Company 2002a). In the process, the lawn-care industry has reinvented itself as a directly marketed aesthetic tied to community values: family, nature, and collective good.

Traditional images generally showed manicured yards, menacing magnified pests that inhabited lawns that received poor care, and specific branded compounds that provided solutions. Recent images have followed this approach, but with many new symbols apparent. Specifically, the lawn is increasingly represented as something that transcends personal value to managers of home lawns with collective activities and pride among neighbors much more prominent, as in Fig. 4, where the lawn becomes a community-activity space for parents and children.

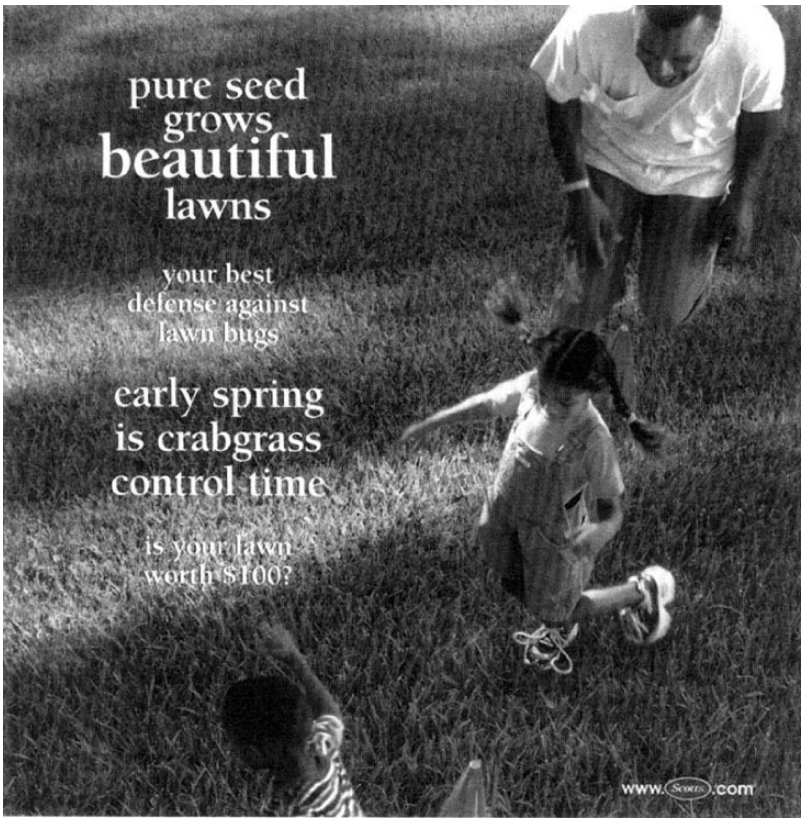

Fig. 4 Advertising the lawn as activity space. (Copyright © 2001. The Scotts Company, Marysville, Ohio, reprinted with permission)

These advertisements reinforce the lawn as a symbol both of collective consumption and of competitive social status. One typical advertisement simply shows a square of turf grass in a saturated green shade, accompanied by the caption, “Not only will your grass be this color, your neighbors will be too.” As typically depicted, the monocultured lawn is pictured as an enviously (“green”) coveted symbol of community status where the goal is to produce collective social value and to accrue individual merit.

Second, the lawn continues to be depicted as a way to participate in and strengthen the traditional nuclear family. The lawn-advertising images shown in Fig. 4 depict typically young, heterosexual couples working and relaxing amid a healthy sward of monoculture lawn and portray the lawn as a place where children learn to play and share and where turf grass bonds and secures the relationships between fathers and their offspring. Advertisements for lawn chemicals never depict two men or two women, a child with an elderly person, or a group of schoolchildren at play. It is always the nuclear family that enjoys the lawn.

Finally, lawn chemical companies build on and reinforce the sense of lawn management as a bridge to the biotic, nonhuman natural world. Fig. 5 shows the yard as a place in which the suburban homeowner engages in the timeless human activity of planting growing things in the soil. By sowing and nurturing living green plants, these advertisements suggest, modern suburbanites can reconnect with the soil, sun, and water.

Thus, the formulator industry, under pressure to find new markets in an increasingly constricted sales environment has come to produce and reproduce an aesthetic of the lawn that associates the

Fig. 5 Advertising the lawn as family space. (Copyright ©2001 The Scotts Company. Marysville, Ohio, reprinted with permission)

preservation of community, family, and environment with the production of monoculture. The rising lawn-chemical purehases by consumers, in a period when other chemical uses are decreasing coincides with a period of more aggressive and creative marketing.

But to imagine that the formulator industry, by itself is responsible for the increasing consumption of chemicals and the specific aesthetic and social association of lawnscape production is to overlook a highly localized moral economy. Increased advertising budgets cannot explain the specific character of the emerging aesthetic and its appeal, particularly to collective values. To do so requires a reorientation to local-scale analysis and an understanding of the classed character of consumer communities.

Lawn Aesthetics: Classed Expressions of Community Desire

For the most part, yards are not managed for physical resources, such as food, fuel, or shelter, or for environmental purposes like the control of erosion. Instead, yards are managed for other qualities. Specifically, lawn managers overwhelmingly associate their lawns with the preservation of community, family, and environment.

Lawnscape as Participation in Community

The results of the survey indicate that lawn managers who use chemicals are more likely to know their neighbors by name than are those who do not use chemicals (see Tables 3 and 4). Moreover, the majority of the respondents reported that their neighbors used chemicals. The resulting perceived impacts of neighbors' practices are shown in Table 5. While most of the respondents reported that their neighbors' practices had no impact or negative impact on the quality of water most agreed that these practices had a positive impact on both property values, and more significantly, "neighborhood pride."

As a result, intensive lawn management tends to cluster. If one's neighbors use lawn chemicals, then one is more likely to engage in a number of intensive lawn-care practices, including hiring a lawn-care company, using do-it-yourself fertilizers and pesticides, and applying chemicals more frequently if one uses chemicals (see Table 4).

In addition, lawn management, in general, is associated with positive neighborhood relations. People who spend more hours each week working in their yards and report greater enjoyment of lawn work, feel more attached to their local community (see Table 6). Data from the interviews supported the idea that people associate yard work with a sense of neighborly attachment. One 29-year-old male informant explained: "It's nice just to have people on either side of us who are out doing things in their yard, whether they're planting flowers or whatever they're doing. . .. It's more about the neighborhood. That's kind of the reason why we like where we are."

This sense of community action was supported in follow-up interviews, in which the respondents commonly reported an "obligation" to manage their private lawns intensively, not only in defense

Table 5 Kind of impact resulting from neighbor's lawn-care practices, $N = 594$ (percentage)

	Kind of Impact		
Impact of neighbors lawn-care practices on	Negative	None	Positive
Quality of water	34.0	48.5	11.9
Property values	6.2	41.2	49.8
Neighborhood pride	4.9	18.4	73.1

Note: Rows do not total 100 percent because of missing data.

Table 6 Community attachment and lawn-care practices, $N = 594$ (pearson's correlation coefficients)

	Number of Hours per Week Spent on Lawn Management	Enjoyment of Lawn Work
Sense of attachment to the local community	134**	278***

** Significant at the .01 level.
*** Significant at the .001 level.

of their neighbors' property values, but also in support of "positive neighborhood cohesion." "participation," and "holding the neighborhood together." Thus, yard management is not an individual activity; rather, it is done for social purposes: the production of community.

Lawnscape as Family Space

Second, lawn managers see their yard work as a way to strengthen the traditional nuclear family; family members play an important role in passing on the correct way to maintain a lawn. Among the respondents who used do-it-yourself chemicals of some sort, those who learned about lawn management from a family member were more likely to use chemical fertilizers regularly than were those who learned about lawn management from a family member were more likely to use chemical fertilizers regularly than were those who learned about lawn management from another source (see Table 4). Data from the interviews also revealed the importance of nuclear family relationships, and many respondents explained the importance of the lawn for family life. When asked why he maintained a lawn, the 29-year-old male respondent did not espouse the virtues of higher property values: instead, he suggested that he managed his lawn for his wife: "Jenny [his wife] loves the house and the neighborhood. She just really enjoys going out and being in the sun and pulling weeds. I guess that's why we have the lawn."

Lawnscape as Environment

The third distinctive feature of the production and consumption of lawn is its strong and increasing association as a form of care for the environment. In this regard, chemical users were more likely to worry about the quality of the water and reported a greater willingness to pay for clean water than did nonusers (see Table 4). Lawn managers who seemed the most concerned about the quality of the water were also the most likely to contribute potential pollutants to the water supply in the form of lawn chemicals.

In addition, the respondents often considered working in their yards to be a link between people and the nonhuman world. The belief in yard work as a connection to nonhuman nature was expressed by the respondents, regardless of their lawn-management style. One 47-year-old woman told us: "I really do enjoy being outside. That's really why I do it. . .. It's fun to watch things grow. . .. I'm sure when I retire. I'll find some reason to get out there in the lawn and dig around. It just makes you feel better to be out—in the earth." Another woman in her late 50s described her yard work in glowing terms: "I see my yard as. . . my communion with our environment. It's the way I mark the seasons, the way I reaffirm who I am as a member of the community of earth. I go out and . . . benefit from the wonderful fragrance of the fresh air. . .. The birds just find our yard to be a fabulous feast. . .. I just love the capacities to ever tune in to the way the world works."

In this way, the practices and aesthetics of lawn managers who use inputs are associated with a concern for community, family, and environment. Herbicides that flow off lawns and represent a

risk to the good of the community are seen as fundamental to proper community behavior. Lawn chemicals that are potentially harmful to children and collect in carpet dust are viewed as important for the family. Lawn chemicals with potentially detrimental impacts on the ambient environment are understood as taking care of the environment. Chemical users are more likely to be concerned about their neighbors' values and feelings. They are more likely to get their lawn-management information from family members. They are more likely to be concerned about the quality of water. These local actors thus closely resemble the figures who occupy the frozen advertising images of the formulator industry, whose drive for new markets has led to the direct marketing of just such practices and aesthetics. What does this coincidence tell us?

The Moral Economy of the Lawn: Production and Consumption, Public and Private

The relationship of chemical firms and suburban consumers to one another and to the environment and the apparently contradictory practices of lawn production and consumption that result suggest several conclusions both for explaining environmental behaviors and for interpreting landscapes like the lawn. First, the case exposes the difficulty in identifying and isolating sites of production and consumption, showing the mutual coercion and constitution of chemical formulators and lawn managers. Second, it suggests the porousness of public and private spaces and the degree to which their intermingling is fundamental to contemporary cultural and economic practices, characterized by a moral economy of the lawn.

Producing/Consuming Authentic Community, Family, and the Environment

Materialist theory suggests that consumer desires are forged in the production sector of the economy to maintain levels of surplus (Schnaiburg 1980; Galbraith 1958; Debord 1983). Support for such a view may be drawn from the case of the lawn. Chemical marketers are implicated in the production of desire for the monocultural lawn through unique and powerful marketing programs, essential to the survival of their economic enterprises. Their receipts depend on successfully conveying to nonusers the personal, social, and environmental importance of proper lawn care: formulators produce images that lawn managers consume.

At the same time, however, the drive for the manicured lawn is clearly a result of localized desires for conspicuous performance of class identity: the use of lawn chemicals is positively correlated with household income, level of education, and market value of the home (see Table 4). The creative lawn industry may therefore be seen as simply responding to patterns of locally classed conspicuous consumption whereby the ability to refrain from productive work is demonstrated through rituals that suggest freedom from labor (Gidwani 2000; Veblen 1899). Agrochemicals, it may be argued, are an essential tool in such rituals, allowing homeowners to project a social landscape of laborions hours spent pulling dandelions, removing insects, and reseeding yards. Lawn managers produce the monocultural lawn in the formation of identity.

The identity derived from production of the lawn is of a specific sort, however, one that accrues status as much to community and collectivity as to individuality. Unlike many conspicuously consumed goods, such as automobiles, the lawn carries the moral weight of participating in a greater community or polity, touching on the relationship of the consumers not only to their families and neighborhoods, but to the broader natural world, over which high-input lawn managers express an explicit sense of stewardship.

These specific goals—community, family, and a "green" environment—may be viewed as a triumvirate of alienated desires. As local communities expire, families fragment, and natural

environments are lost, the desire for them grows in an increasingly alienated and individuated society that "goes bowling alone" (Putnam 2000). What is more critical, these desires may be seen as reconsumed fetishes, marketed back to increasingly alienated consumers in the form of "natural" products (Smith 1996). In this view, the human need for creativity and productive work, frustrated by the contemporary system of production, makes consumption the last-resort source of personal identity: the lawn is an arena in which alienated homeowners use energy and skill in yard management to recover personal and community identity based on the creation of a specific commodified landscape: the manicured lawn (Miller 1987).

Yet this interpretation requires that one posit an "authentic" moment from which family, community, and nature have been lost. Careful historical and ecological scrutiny do not support the existence of any such condition (Hull, Robertson, and Kendra 2001; Coontz 1992; Botkin 1990). yet the recapture of that moment commands the attention and capital of homeowners who establish monocultural landscapes for personal and collective gain. That urge to restore lost social-environmental relationships is also a goal of the formulators, whose narrowing margins depend on the increased demand for these moral landscapes of collective desire.

Therefore, the production of authentic community, family, and environmental practice must be seen as the fundamental and common cultural and economic currency of *both* lawn managers and chemical formulators. Both are deeply invested in the establishment of this authentic landscape in the discursive-material realm of suburban space, realized as turf grass. Hence, both formulators and consumers collectively produce the larger system in which each is constrained and directed. Local lawn managers produce the moral imperative to invest in and recover collective landscapes, while formulators produce the specific normative and common images of healthy relationships among neighborhoods, children, and the nonhuman world, made to order, providing an imaginary back-drop to which intensive and earnest local practices can be directed.

Production and consumption are in this way entangled through the simultaneous cultural and economic impulses of the suburban landscape. Their distinction is difficult on many levels. Is the lawn consumed or produced by lawn managers? Are its collective community and environmental values consumed or produced in the process of nurturing turf grass? A convincing explanation of the lawn requires that all these things are simultaneously acknowledged.

Privately Producing Public Space

In much the same way that production and consumption are enmeshed in the lawn and made difficult to distinguish, the public and private spheres of producer-consumer activity are also hard to distill. By examining the porousness of this boundary, some otherwise-intuitive notions about the American consumer can be called into question.

Specifically, in surveys or interviews, lawn managers rarely emphasize issues of rights to private property, concepts usually stressed in analyses of alienated, industrial, suburban consumers. Rather, it is the public nature of the front yard that is most often championed. Lawn managers consistently speak of "obligations," "community," and "neighborhood pride," rather than "rights," in their explanation of activities and choices. Private spaces are managed as public goods.

Drawing on research in cultural and political ecology, this kind of action, with its simultaneously redistributive and disciplinary implications, recalls the actions of peasants in the "moral economy." According to Scott (1976), the moral economy is the collective culture of redistributive obligation in which the risks of failed harvests and poverty are spread through extended villages and families by shared harvests and shared poverty. This economy transcends the neoclassical model of rational household action, demonstrating the emergence of a shared culture of collective good. Ecologies are managed with sensitivity to collective, as well as individual, needs.

Although this analysis depends on an explicitly economic rationale of collective good through shared risk, it makes a convincing bridge between private land management and shared-collective good with implications for the lawn. In their consistent, indeed emphatic, insistence on collective good, suburban peasants redistribute public value through private investment in collective monoculture. As seen from the air (see Fig. 1), the unbroken spaces of the lawn do, indeed, suggest community parkland, rather than private holdings.

In the process, the lawn inverts the traditional "tragedy of the commons" scenario (Hardin 1968). Rather than create collective externalities in pursuit of personal gain lawn managers create personal externalities in pursuit of collective gain. The apparent contradiction (why do lawn owners who are environmentally concerned use chemicals?) is resolved if the actions are seen as resolute markers of collective responsibility.

The implications of this moral economy are several. First, they suggest the harsh and disciplinary regimes that prevent the changing of land-management practices at the local level. The reluctance to disintensify inputs or to allow more heterogeneous ecological landscapes (e.g., dandelions) to flourish is not simply a product of individual choices, time, the optimization of resources, or even individual planning and desire. Rather, it is bound up in the social obligations for the production of public space in the form of the lawn, a landscape that is under constant collective scrutiny and carries great moral weight. In this way, it is difficult to reform.

On the other hand, it opens up opportunities for reform of action, consciousness, and change, especially when we consider cases of other ecological practices in the urban system. Recycling, for example, has been criticized for moving from a rational exercise to one with moralistic overtones, an irrational crusade that brainwashes unsuspecting citizens, especially children (Tierney 1996). Yet it is the moral reversal, from an ethic of disposal by which materials disappear into the waste stream, to an ethic of recycling, by which geographic and ecological consciousness follows materials through complex life cycles, that makes radical changes in behavior possible (Ackerman 1997). Therefore, the profoundly moral character of the lawn economy may yet be leveraged to produce changing consciousness and practice in the suburbs. Organic lawn-care options increasingly appear both in do-it-yourself form (organic fertilizers, how-to books, and nonpower mowers), as well as in the commercial lawn-care sector, where dozens of organic lawn-care companies have sprung to life in recent years. Thus, the blurred line between the public and the private breaks both ways, allowing both the colonization of "private" life worlds by economic imperatives traveling in the guise of community and new community visions to disturb the status quo of accumulation. An understanding of the political ecology of the lawn thus enables the critical possibility of uniting *meaningful work* with sustainable suburban landscapes.

Conclusion: Toward a First-World Political Ecology of Meaningful Work

To date, rigorous and extensive research on urban ecology has traveled in several disparate directions. Ecological explorations of the city have been effectively centered on the simultaneous creation of urban and nonurban spaces as sites of *production* (Cronon 1992 and R. Williams 1973 are notable examples). This research has been supplemented with a greater focus on the city as a site of *consumption* of alienated "second" nature (Smith 1996). At the same time, there has been an increasing emphasis on the actions of individuals on *private* land and the aggregation of decision making in the expansion of urban environments (Brabec and Schulte 2002; Capiella and Brown 2001), combined with a wealth of research on ecological management and struggles for justice over the environment of *public* space (Pulido 2000).

This exploration of the lawn, however, suggests the convergence of these themes—production and consumption, public and private—posing a landscape privately produced for collective consumption,

balanced between economic imperatives of accumulation and moral imperatives to recover community, family, and environment. Moreover, the lawn may not be unusual in this regard. Sustained attention to urban ecologies may yet reveal the plural character of many urban spaces, from parks and gardens to sidewalks and houses. The results of this study have implications for any such future investigation.

For economic geography, the results suggest that lessons can be learned from political ecology, where local people perform as land managers and local agents are as much producers as they are consumers of landscapes. Furthermore, these local land managers work not only to produce private property for personal gain and satisfaction, but also to create collective moral spaces for public consumption. But homeowners are not the only agents in the production of lawn landscapes and externalities, even if they are the most proximate ones. Rather, they are the local participants in a convergent process of production and consumption (see Fig. 6). As such, they are driven by a range of contextual forces, from the increasing costs of chemical inputs to embodied practices of class status, constrained by a range of truncated opportunities.

For political ecologists, the extension of land-management approaches to the urban First World demonstrate that lawn owners are not necessarily unique specimens of ecology, geography, or history, but can be seen instead as land managers of the most traditional sort, living within a broader *moral economy* (Scott 1976; Chayanov 1986): tending to status as well as production (Gidwani 2000): and seeking collective good, however disciplinary or constraining (Fig. 7). As for their primary-producer counter-parts, lawn owners are ecological managers, under the collective obligations of a community, operating in a class process, although one not solely capitalist in nature (Gibson-Graham 1996).

In addition, as Blaikie and Brookfield (1987) insisted in their discussion of traditional peasant practices, state and academic castigation of such land managers as "ignorant," "stupid," and "conservative" misses the point. Insofar as producers operate within boundaries and constraints, "where there is a known set of practices and behavioral responses, it is . . . much easier for the [manager] to

Fig. 6 Advertising the lawn as human/nature space. (Copyright © 2001 The Scotts Company, Marysville, Ohio, reprinted with permission)

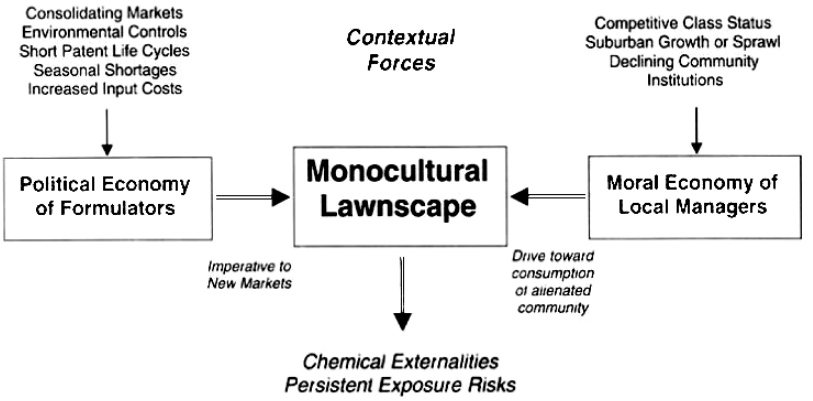

Fig. 7 The political ecology of lawn chemical production and consumption

adhere to an established pattern than to make changes" (p. 35). This is as true for the lawn manager in Ohio as it is for the grower of millet in India. Political ecology unites our understanding of lawns and fields, villages and suburbs.

We have not argued that the position of a subsistence producer, living at the edge of hunger, is the same as that of an affluent suburban dweller. Nor have we argued that both these agents are equally able to deploy alternative strategies for land management. As private producers for public consumption, lawn managers differ significantly from subsistence producers, who arguably publicly produce for private consumption. The visual nature of the lawn landscape, moreover, conveys status through pride of place that would be unknown to many "peasant" producers, who prefer conspicuous poverty and hide their wealth "behind mud walls" (Wiser and Wiser 1989).

We have argued, however, that in either case, whether among subsistence land managers or those of the suburbs, "there is no 'correct' scale for an investigation of land managers and their decisions" (Blaikie and Brookfield 1987, 68). As viewed in a political ecological framework, the discursive-economic rationalities of land managers everywhere are conditioned by the structures of experience that dictate the logics of production. Bemoaning the mindset of individuals is therefore an antisystemic and politically fruitless effort.

Nor have we argued that the goals stated by lawn managers—increased engagement with community family, and the natural world—are in and of themselves problematic or undesirable. There is no doubt that lawns, like other landscape features from parks to porches (Brown, Burton, and Sweaney 1998), actually do produce the effect of putting community members in touch with one another and literally in touch with the soil. These are individuals and communities on a real and profoundly urgent search for *meaningful work*, which will connect them to things, people, and places outside themselves. Even so, we demonstrated that it is the *coupling* of this search with a high-input system of turf management that sets the terms for specific, and potentially pernicious, ecological practices. Through the onmipresent signification practices of input marketing—in which the urgency of public desire is unnecessarily tied to the urgency of constricted chemical markets-community, family, and the biological environment become 2.4-1), glyphosate, and dicamba.

Similarly, we have *not* argued that yard managers' decisions are simply manipulated by chemical company executives. Rather, we have shown that contextual conditions and reduced alternatives constrain the logics of all players, resulting in emergent properties of the system: magnification and acceleration of the persistent chemical hazards. Following Foucault's (1990) "rule of immanence," we suggest that local class processes condition the situation of chemical markets as much as the reverse and that hierarchy of scale is not necessarily hierarchy of causal force. It is the specific

power-knowledge relationship between formulators and consumers that produces landscapes, not simply the force of one over the other.

The possibilities for practical progressive policy should operate with these lessons in mind. Assuming that the overuse of lawn chemicals is a problematic practice for both human and non-human health and operating under the normative goal of sustainable urban environments, practical efforts must simultaneously address the structures of chemical supply and the demands of chemical consumption, taking seriously the confounding entanglement of production and consumption, public and private space.

In the case of supply, it is evident that the pressures of chemical production will increase the aggressive promulgation of lawn formulations: even when biotechnologically advanced turf grasses can be produced, they cannot be imagined in the absence of chemical inputs, at least insofar as the producers of seed and the producers of chemicals are the same firms or are contractually linked. Local- and regional-level action to limit the availability of such inputs is viable, however, especially since the private domain of the lawn is viewed generally in such public terms. Therefore, the model of Canadian municipalities offers a possible direction forward. Since 1991, when the Montreal suburb of Hudson outlawed the use of pesticides on lawns, dozens of municipalities have followed suit, enacting bans across the country (Bailey 2002). Although opposed by the landscaping and chemical industries (Carmichael 2002), these bans are broadly supported—precisely because of increased concerns by consumers about environmental conditions, the sustainability of communities, and the health of their families. The driving local forces for consumption may yet be turned to local-level resistance, inverting the social pressures that account for the use of chemicals. Moreover, such a municipal approach stresses the public urgencies associated with private property, departing significantly from "green city" planning, which concentrates on public works and public space.

In the case of demand, the wealth of alternative landscapes that does not require high-input, monocultural management continues to grow. In many communities, violation of local "weed laws," which ban perennial grasses and other alternatives, is increasingly common. Municipalities rarely pursue such cases, since such landscaping decisions rarely represent a credible health risk (Crumbley 2000; Crumbley and Albrecht 2000; Long 1996). Such forms of resistance are increasingly well organized, with groups forming to either coordinate action or simply provide viable landscaping alternatives (Robbins and Sharp forthcoming). They succeed, however, again precisely because they allow homeowners to produce landscapes without necessarily consuming chemicals, inverting the pressures that direct the construction of monoculture, and drawing on people's drive from meaningful work to create new and alternative landscapes.

Therefore, the problem of lawn-chemical externalities, although structured into vast cultures and economies, is not intractable insofar as there are multiple locations of intervention and action. This problem, which continues to pose a technological risk especially for vulnerable populations, can be approached locally, as well as federally. Municipal codes, for example, can be changed, and moral quandaries about the use of chemicals can be more publicly explored, just as lawn products like Diazanon have already received federal regulatory serutiny. The vastness of the "nexus of production relations" (following Yapa 1996) that govern such a problem is therefore a cause for optimism, rather than for political paralysis; environmental challenges become opportunities when they are rendered clear through political ecological analysis. Moreover, such an exploration of the context of daily action opens the door for a hard and personal look at our own situated ecologies, even and especially for those of us in the middle class. These everyday geographies are no more or less than suburban moral economies.

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