

## Redesigning the American Lawn: A Search for Environmental Harmony

by F. Herbert Bormann, Diana Balmori and Gordon T. Geballe  
Yale University Press, New Haven, CT

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*Redesigning the American Lawn* is not a new book, having been published in 1993. However, it has become widely read and generally accepted by many concerned with environmental and conservation issues as an honest assessment of the environmental impacts of lawns and their management. Because the authors are respected educators and practitioners, and the book is published by one of our more prestigious universities, it tends to receive more attention than it might otherwise deserve. As professional turf managers, you could be confronted by references to this book, so you might want to read it or at least know that it exists.

I was unaware of *Redesigning the American Lawn* until a TGT reader asked my opinion of it. He had read a favorable review of it in the *New York Times* but found it to disagree with some statements I had made in an article on nitrate leaching from turf. I was embarrassed to admit that I had not seen the book but was eager to read it with this apparent disagreement in mind.

*Redesigning the American Lawn* began in a seminar course on "The American Lawn," organized by the authors at the Yale School of Forestry and Environmental Studies and the School of Art and Architecture. Twelve graduate students in the course wrote the five chapters which became this book. In the Prologue, the basic premise of the book is set forth: "It is the purpose of this book to explore the numerous connections between the lawn and the earth's biosphere, to point out the many ways that we as lawn owners through our lawn management practices diminish in small but collectively significant ways local, regional, and

global environments, and finally to suggest ways by which we can enjoy the many virtues of the lawn while reducing our impact on nature." Right away the reader realizes that this probably will not be a glowing endorsement of lawns or their care.

The book starts innocently enough with a brief history of the origins of lawns in Europe and their greater development and acceptance in the United States. The second chapter traces the growth of environmental concerns and makes a somewhat tenuous connection between general environmental deterioration and contemporary lawn management. Several examples of lawn-free residential landscapes are discussed with a clear message given that these are environmentally superior in many ways to more conventional landscapes featuring a prominent lawn.

In Chapter 3, the concept of a "freedom lawn" as opposed to the conventional "industrial lawn" is developed. A freedom lawn is an open area which is mowed periodically but not fertilized or irrigated in which any plant that can tolerate mowing is permitted to grow. No pesticides are used so the plant population becomes quite varied and includes turfgrasses, wild plants and various invasive weeds. The remainder of the book draws comparisons between this freedom lawn, which the authors conclude is much more environmentally legitimate, and the industrial lawn desired by many homeowners and advocated by landscapers, garden centers, lawn care companies and most of the commercial sector trying to sell goods and services. To this point, I have no particular quarrel with the authors' contentions, being more than willing to grant freedom of choice and seeing no particular virtue in landscape uniformity.

However, beginning with Chapter 4 titled "Environmental Costs," the authors attempt to validate their case by citing the technical literature. The book is extensively referenced and, unlike many semipopular works, some primary scientific literature is cited. This tends to give the reader confidence in the arguments being put forth. Unfortunately, in this case the reader would be deceived. Numerous examples of incomplete or misleading references can be cited but, in the interest of brevity, I will discuss only a couple.

In their discussion of "water pollution" the authors cite a Long Island study which implied that fertilizers used on residential lawns and gardens were a major source of nitrate present in well water. This research was conducted mostly during the 1970s and was among the first to implicate lawn fertilizers as contributing to ground water pollution. The citation that 60% of nitrogen applied to lawns and gardens ends up in ground water is clearly not consistent with current thinking. The Long Island researchers showed only that nitrate in ground water was of human origin. They could not identify its source as being from septic systems, agricultural uses or residential grounds. Because the magnitude of nitrate release from septic systems had not yet been quantified and the substantial nitrate losses from disturbed agricultural sites was underestimated, these investigators assumed that home lawns were a major source of the nitrate present in domestic wells. They assumed that the only real loss of nitrogen from lawns was through clipping removal. If clippings were retained on a lawn, all the nitrogen applied as fertilizer had to go someplace and leaching to ground water appeared likely.

Since then, numerous research reports have been published and they all conclude that lawns leach very little nitrate to ground water. Elevated nitrate levels present in well water invariably are derived from other sources. Lawns probably contribute no more than 5% to ground water nitrate which is much less than the 60% cited in this chapter. The authors compared nitrate losses from home lawns to those of native forests but failed to mention that one of the references they cite concluded that home lawns were second only to forests in con-

tributing minimum nitrate to ground water. Several agricultural land uses and domestic septic systems all leached more nitrate than a normally maintained home lawn.

The authors later concede many of these points but then go on to say, "... lawn fertilization may account for a relatively minor part of a ground water pollution problem. On the other hand, by reducing or eliminating the use of lawn fertilizer, the homeowner can minimize the lawn's contribution to nitrate pollution as well as save money." In other words, rather than confront the real causes of ground water pollution, stop fertilizing your lawn and make believe you are being environmentally responsible.

In that same section, the authors go on to describe the interconnectedness of water bodies and the high nitrate loads being carried by many of our largest rivers but they never show a connection between this and lawn fertilization. What these authors do not mention is the extensive use of grassed buffer zones and filter strips designed to capture nutrients present in runoff water before they enter streams or ponds. Grasses are generally acknowledged to be most effective in scavenging nutrients from soil or water. This is not consistent with grass lawns contributing to ground water pollution.

Further on, a case is made for lawns contributing to pesticide pollution of ground and surface waters. The common turf herbicide, 2,4-D, is cited as being considered by EPA to be a "priority leacher" that travels quickly to ground water. This is strange because 2,4-D is ranked by the Natural Resources Conservation Service as having a "medium" leaching potential and is rarely found in well water samples. Recent research also shows that the thatch layer present in turf strongly binds many pesticides and reduces their capacity to leach.

The authors go on to state that, "A component of 'agent orange', a defoliant used in the Vietnam war, 2,4-D has been linked to cancer and birth defects." This unreferenced statement is just plain wrong. Few pesticides have been studied as exten-

sively as 2,4-D and after many years of review by federal and private agencies no evidence of it causing cancer or birth defects has been substantiated. The great preponderance of evidence indicates that 2,4-D poses less risk to human health than almost any commercial pesticide marketed in the US. True, 2,4-D was one of three or four components of infamous 'agent orange' but it was never shown to be the cause of problems associated with its use. A dioxin contaminant of another herbicide component, 2,4,5-T, ostensibly was the cause of most health problems experienced by the native Vietnam populations and US soldiers. Linking 2,4-D with cancer and birth defects is clearly not supported by any reputable literature and one wonders why the authors make the statement at all.

This latter point is what bothers me most about *Redesigning the American Lawn*. The book appears to be well researched and is written by respected academicians and yet it contains many statements which are not supported by the preponderance of published literature or even by the primary literature they cite. It almost appears that the authors knew the arguments they wanted to make and gleaned from the literature statements which appeared to support their position. Little matter

that statements were taken from old, largely discredited studies or that most recent research was largely ignored. Any graduate student who destroyed most of his data and saved only that which supported his hypothesis would be thrown out on his ear by any reputable university. One might ask why such selective reporting of the scientific literature is acceptable when writing for the general public. I also question how well students are being introduced to the scientific method when such selective interpretation of scientific data is practiced.

Unfortunately this apparently biased reporting of the scientific literature is characteristic of much popular environmental writing. Bringing valid environmental issues to the public's attention is not well served by this practice. It may even contribute to a growing cynical view that most environmental problems are grossly overstated and serve only special interests. This is clearly not what the authors of such pieces intend but it is the inevitable consequence of departing from scientific objectivity. I am sorry to say that, its several virtues notwithstanding, *Redesigning the American Lawn* is a less than objective analysis of the environmental impacts of lawns and their management.

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