esizing about how new weed management systems can be developed is easy, delivering the product is another matter." Expanding options for weed management beyond the herbicide model, to a considerable extent, means resorting to tried and proven methods relied upon by those who farmed prior to the time of herbicides, such as timely tillage and cultivation, preventing new weeds from being introduced to the farm, using rotations and cover crops to suppress weeds, and not allowing weeds to go to seed. The fact that these methods are not novel does not detract from the present need to better understand the underlying relationships of cause and effect. For instance, we cannot hope to prevent invasion of our agroecosystems by new invasive plants until we understand the relationships between weed dispersal and the relative roles of anthropocentric and nonhuman vectors. The soil weed seed bank was identified by several as a relatively unexploited target for weed management. Current understanding of the dynamics of the weed seed bank is insufficient for us to realize this opportunity, and component research alone has proven inadequate to render understanding of this complex system. Apparently the future for weed management breakthroughs resides with those capable of contemplating and studying weed communities within cropping systems.

"Expanding the Context of Weed Management" will be of interest to seasoned scientists and advanced students alike, who require a probing analysis of contemporary research on alternative approaches to weed management. It will also serve as an excellent focus for senior- and graduate-level class discussions and in-depth research and reading. The reader will be pleased with generally smooth transitions, continuity, and complimentary writing styles for a work written by 13 different authors or author groups. The volume succeeds in presenting the scope and complexity of contemporary weed science issues, along with the thinking and experimentation of some of the discipline's best minds. With just a few exceptions, a uniform depth of analysis and synthesis is achieved. However, omitting perspectives from outside of the United States and Canada is a failing of the book that will minimize its audience and likely impact. —DOUGLAS J. DOOHAN, Dept. of Horticulture and Crop Science, OSU/OARDC, 1680 Madison Ave., Wooster, OH 44691 (doohan.l@osu.edu).


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Carbon dioxide accumulation in the atmosphere as a result of fossil fuel emission and land use change threatens global warming as well as climatic change. Both are much-debated scientific topics. One possibility to reduce the increase in atmospheric carbon dioxide is through its capture by photosynthesis and storage (sequestration) in soil. In response to this, the book deals with four issues that must be addressed before soil carbon sequestration programs could be implemented on a large scale. It examines:

- new lines of research that promise a better understanding of soil carbon dynamics and may lead to improved sequestration methods.
- near term deployment of existing procedures and the development of new methods based on remote sensing, geographic information systems (GIS), flux monitoring, and other technologies.
- programs to couple the objective of climate change and desertification conventions.
- institutional, economic, and social impediments to implementation of domestic and international carbon sequestration (CS) research and action programs with particular emphasis on the preceding issues.

All chapters reflect questions and remarks that arose during the workshop and add these separately. In my opinion there is only one minor deficiency: The effects on soil properties, resulting from an increase of soil organic matter, could have been mentioned a little bit clearer as these properties may be relevant for other environmental concerns. However, the book presents much information on carbon sequestration methods, monitoring, and verification possibilities and discusses these from different ecological as well as economic and political points of view. Additionally, it examines the way to transfer field scale methods to larger scales. Therefore, it is valuable for people coming from different scientific fields at universities, research institutions, government agencies, information centers, and farmers as well as for policy makers.—R.H. ELLER-BROCK, ZALF e.V., Dep. of Soil Landscape Science, Eberswalderstr. 84; D-15374 Müncheberg, Germany (ellerbrock@zalf.de).

**Greening Industry: New Roles for Communities, Markets and Governments**


Environmental pollution is an important problem globally. Conventional wisdom holds that developing countries cannot clean up air and water pollution until they reach a level of affluence seen today only in wealthy, developed countries. This research report takes issue with this conventional wisdom in the case of large industrial point-source urban pollution in developing countries. Based on six years of research, policy experimentation, and firsthand observation, the authors believe that environmentally sustainable development is within reach, even in the poorest countries, if proper economic incentives and policies are in place.

The authors justify their focus on large point-source urban industrial polluters because (i) this is an important source of total pollution in developing countries, (ii) environmental agencies in these countries have limited resources for regulation, and (iii) industrial pollution is more highly varied and lends itself to comparative analysis. It is probably reasonable to focus the analysis on something less than the total domain of air and water pollution. However, a World Bank expert panel in 1987 ranked environmental risks from highest to lowest as deforestation, loss of biodiversity, watershed degradation, desertification, salinity, pesticide misuse, industrial disasters, urban air pollution, and global climate change. Additional analysis is needed to deal with these other pressing environmental risks.

This policy research report describes a series of steps for economically efficient, politically viable point-source industrial pollution control similar to earlier suggestions from economists Baumel and Oates. They include (i) determining environmental quality goals, (ii) estimating the pollution reduction required by these goals, (iii) estimating the marginal cost of abatement at the desired level of pollution, and (iv) setting...