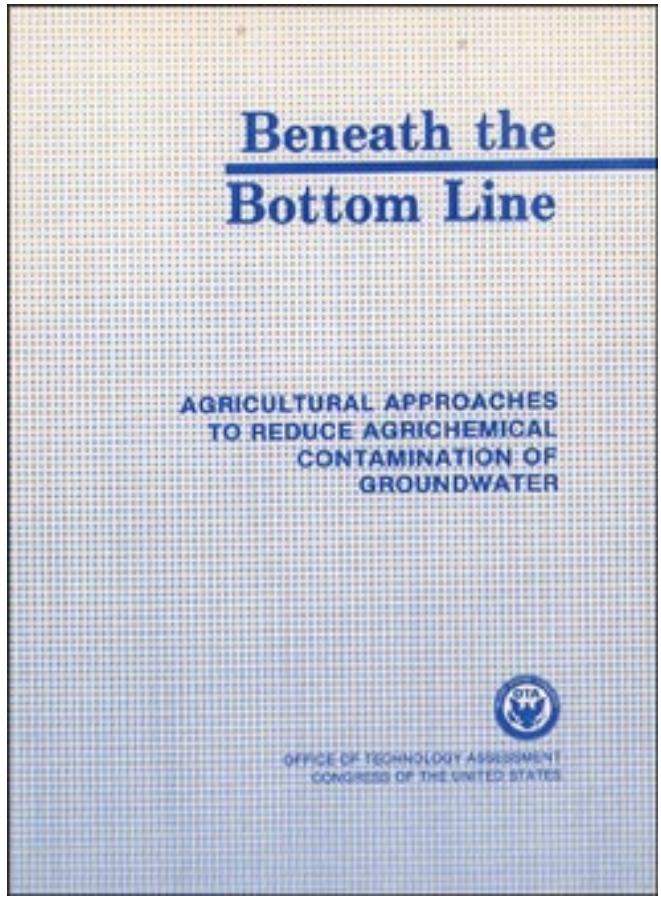
Beneath the Bottom Line: Agricultural Approaches To Reduce Agrichemical Contamination of Groundwater

November 1990

OTA-F-418
NTIS order #PB91-129874



Recommended Citation:

U.S. Congress, Office of Technology Assessment, *Beneath the Bottom Line: Agricultural Approaches To Reduce Agrichemical Contamination of Groundwater, OTA-F-418* (Washington, DC: U.S. Government Printing Office, November 1990).

For sale by the Superintendent of Documents
U.S. Government Printing Office, Washington, DC 20402-9325
(order form can be found in the back of this report)

Foreword

Agriculture has always been a mainstay of the U.S. economy, and an important component of our cultural heritage. However, this century has seen an ‘‘environmental revolution’ occur, emerging into a force of widespread national significance since the late 1960s. The environmental concerns specifically attributed to agriculture have followed a progression: from recognition of ‘on-site’ problems (e.g., loss of soil fertility due to erosion), to ‘‘off-site’ (e.g., degradation of surface-water quality due to nutrient runoff from agricultural fields) and, today, to “out-of-sight” concerns such as groundwater contamination by agricultural chemicals (’ ‘agrichemicals ”).

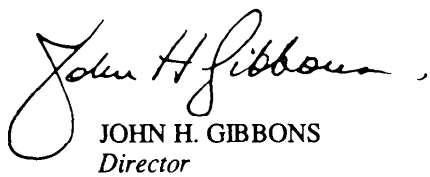
Surveys show that public concern over agrichemical contamination of groundwater (as well as other related issues such as food safety and surface-water quality) is high. Further, this concern extends to farmers and farm communities-the individuals in closest proximity to potentially contaminated groundwater. Because of the nature of groundwater contamination-largely out-of-reach of remedial actions and, thus, essentially irreversible-prevention of groundwater contamination is the only means currently available for responding to the need to protect essential resources, environmental quality, and health.

Protection of the Nation’s groundwater resources has become an issue of pressing concern to the public, to Congress, and to many Federal, State, and local agencies. Agencies and organizations at all levels are undertaking programs designed to affect a farmer’s choice of technology, and thus the potential for introduction of agrichemicals into groundwater. Such programs include extensive efforts in data collection and management, research and development, extension and education, and regulatory actions.

Several primary conclusions derived from the analysis covered in this assessment have clear policy implications. First, agriculture is a national, strategic resource: options that severely reduce the U.S. capacity to produce food to feed the domestic population are clearly adverse to the interests of society. Second, protection of environmental quality is high on the public lists of societal goals. Certain agricultural technologies—in nutrient and pest management; in crop, sod, and water management practices; in data analysis and planning; and in design of farming systems-show considerable promise for reducing the potential for agrichemicals to enter groundwater.

Four congressional committees and five subcommittees requested the Office of Technology Assessment in 1988 to conduct an assessment of the potentials for agricultural technologies to reduce groundwater contamination by agricultural chemicals: House Committee on Agriculture, its Subcommittee on Department Operations, Research, and Foreign Agriculture; House Committee on Science, Space, and Technology; House Committee on Public Works and Transportation; Subcommittee on Environment, Energy, and Natural Resources of the House Committee on Government Operations; Subcommittee on Water and Power Resources of the House Committee on Interior and Insular Affairs; and Senate Committee on Agriculture, Nutrition, and Forestry. The assessment identifies and discusses in-depth constraints to and opportunities for agricultural approaches to reduce the potential for agrichemical contamination of groundwater.

OTA greatly appreciates the contributions of its advisory panel and authors of commissioned papers. We are especially grateful for the time and effort donated by the numerous contributors who served as reviewers and as liaisons from Federal agencies. The information and assistance provided by those individuals-too numerous to list-proved invaluable to the completion of the assessment. As with all OTA studies, the content of the report is the sole responsibility of OTA.



JOHN H. GIBBONS
Director

Beneath the Bottom Line: Agricultural Approaches To Reduce Agrichemical Contamination of Groundwater Advisory Panel

Sandra S. Batie, *Chair*
Professor
Department of Agricultural Economics
Virginia Polytechnic Institute and State University

John Abernathy
Resident Director of Research
Agricultural Research and Extension Center
Texas A & M University

Donald Duvick
Vice President of Research
Pioneer i-Ii-Bred International

Richard S. Fawcett
Agricultural Consultant
Iowa

Scott Ferguson
Partner, McLeod & Pires
Washington, DC

Roger Gold
Coordinator, Environmental programs
Institute of Agriculture and Natural Resources
University of Nebraska

George Hallberg
Supervisor, Environmental Geology
Geological Survey Bureau
Iowa Department of Natural Resources

Joseph Harkins
Director
Kansas Water Office

Roland Hauck
Senior Scientist
National Fertilizer & Environmental Research Center
Tennessee Valley Authority

Dennis Keeney
Director
Leopold Center for Sustainable Agriculture
Iowa State University

Bobby McKown
Executive Vice President
Florida Citrus Mutual

Robert H. Miller
Dean, College of Natural Resources
University of Rhode Island

Peter Nowak
Professor
Department of Sociology
University of Wisconsin

Donna Pratt
Chairman, Natural Resources
Women Involved in Farm Economics

Carl Pulvermacher
Farmer
Wisconsin

Richard Rominger
Farmer
California

Velma Smith
Project Director
Groundwater Protection
Environmental Policy Institute

Ford West
Vice President
Government Relations
The Fertilizer Institute

L Garth Youngberg
Executive Director
Institute for Alternative Agriculture

NOTE: OTA is grateful for the valuable assistance and thoughtful critiques provided by the Advisory Panel and other reviewers. The reviewers do not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.

(OTA Project Staff on Beneath the Bottom Line: Agricultural Approaches To Reduce Agrichemical Contamination of Groundwater

Roger Herdman, *Assistant Director, OTA*
Health and Life Sciences Division

Walter E. Parham, *Program Manager*
Food and Renewable Resources Program

Alison L. Hess, *Project Director*

Analytical Staff

Mary A. Bruns, *Analyst*

Patricia J. Durana, *Research Analyst*

Laura Dye, *Intern*[1]

Lyn E. Raue, *Intern*[2]

Susan J. Wintsch, *Contracted EditorWriter*

Clerical Staff

N. Ellis Lewis, Office *Administrator*

Nellie Hammond, *Administrative Secretary*

Carolyn Swarm, *PC Specialist*

[1]From May 1989 to September 1989.

[2]From September 1988 to December 1988.