INTRODUCTION

The challenge of clean water

Don O. Richardson

This publication emphasizes the concern that the general agricultural and scientific communities have about environmental issues. Unfortunately, our lack of an adequate knowledge base for environmental issues leads to speculative assertions and confusion. While the scientific community is accustomed to debate about whether perceived phenomena are real or not, the lay public often is both confused and mislead by the assertions of various scientific points of view. For example: Are we experiencing global warming? Is groundwater polluted if it contains in excess of one part per billion of some chemical?

We are living in a unique age--one in which the time available for determining research priorities, approaches, evaluation of alternative solutions, and the development of public policy is compressed. Sometimes the compression is so acute that all aspects, from determining if a problem exists, to development of policy, to redress of the problem, occur simultaneously. Rational approaches and solutions are difficult to develop in a "fish bowl" setting where development of true facts is secondary to "images."

The setting for the conference on which this book is based and the theme of that meeting, "Cover Crops for Clean Water," have a substantial history of research activity on which to build. I think that it is also appropriate that this conference was held in West Tennessee--an area of our state and nation that has an inherent, intense soil erosion problem. This rampant erosion is occurring not because farmers are different or less capable than those in other regions but because the nature of the soil resources (wind-blown silt) bundant rainfall (50 inches per year), and the existence of economic encouragement to adopt row-crop-oriented production systems make this area erosion-prone. The movement of the soil particles into streams, rivers, and lakes carries with it various agricultural chemicals. This process produces multiple problems for society.

1. Silting-in of streams and lakes.
2. Potential contamination of waterways with agriculture chemicals.
3. Interference with recreational uses of waterways.
4. Loss of agricultural productivity on eroded lands.

The development of no-till and minimum-tillage systems with the concomitant high surface organic residues is a promising solution to the problem. It is a fact that we can reduce soil loss with these practices and thus reduce surface water contamination. These systems can be improved further by developing more appropriate technology in cover crops that enhance the organic residue, recycle nitrates to the first few inches of the topsoil, and that provide organic matter/herbicide interaction sites that encourage the decomposition of residues.

However, we presently do not know for sure that the adoption of minimum tillage practices will not increase movement of agriculture chemicals into groundwater by normal leaching and by percolation through channels that develop in untilled or minimally tilled soils. This aspect of our overall concept requires additional research.

I challenge all readers of this publication to move the knowledge forward so that functional solutions for agriculture's environmental problems can be developed, adopted, and used.

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