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Weed Science: A Plea for Thought—*Revisited*



 Springer

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Abstract

The original essay was written in 1991 and published by the US Department of Agriculture in 1993. After twenty years it is appropriate to ask if weed science has overcome the paralysis of the pesticide paradigm and if the discipline's research emphases have changed. Weed scientists are confident of increasing production through intelligent use of agricultural technology, including herbicides. But, we must ask if the moral obligation to feed people is sufficient justification for the benefits and harms achieved. A continuing, rigorous examination of the science's goals that leads to appropriate changes is advocated. People agree that all goals and the means to achieve them should be good. Inevitable value questions arise because people do not agree on what is good, true or on what ought to be done. There is little public consensus about the necessity and value of widespread pesticide use to increase food production and improve public health. Weed scientists have a research consensus, and thus a paradigm, which should be explored. The paradigm has two propositions: 1. there are weeds that must be controlled and 2. herbicides are the primary, most efficient control technology. Since 1800 the indisputable evidence shows that agriculture has contributed significantly to the fact that the majority of the earth's population is better fed, better sheltered, protected from disease, richer and lives longer. This perception of success affects how agriculture is practiced in developed and developing nations. The conventional wisdom is that herbicides are necessary tools of modern technology avocated by nearly all parts of the agricultural enterprise. Agriculture's practitioners should engage in regular discussion of the necessity and risks of all pesticides for continued agricultural progress. These will not and should not focus only on the scientific evidence. They will include and must address value-laden arguments. Separating issue of fact from issues of value is fundamental to debate about weed science's future.

Keywords Collaboration • Controlling knowledge • Definitions • Ecologists • Entomology • Facts • Future • Goals • Herbicides • History • Historical reflection • Morality • Plant pathology • Paradigm • Pests • Pesticides • Plant protection disciplines • Plea • Prometheus myth • Receiving knowledge • Research • Risk • Shifts • Values • Weed control • Weed science • Weeds

Preface

Hope resides in the future, while perspective and wisdom are almost always found by looking to the past.

Mortenson G. 2009, p. 21

The past is a foreign country. They do things differently there.

Hartley L. P. 1967, p. 3

Weed science—A plea for thought was written in 1990 and published by the Cooperative State Research Service¹ (CSRS) of the US Department of Agriculture in 1991 as a symposium preprint. The symposium was held in Washington D.C. on 15 April 1993. It was convened by J. P. Jordan, Administrator of CSRS/USDA. I was the first speaker. Other speakers and their affiliation in 1993 were: John Abernathy, Texas A&M University; David Bridges, University of Georgia; Harold Coble, North Carolina State University; Jodie Holt, University of California—Riverside; and Donald Wyse, University of Minnesota.² F. Dan Hess, Sandoz Agro, Inc., submitted a manuscript.

Dr. John A. Naegele, in the preface for the essay published in 1991, noted that the essay asked if the weed science research planning community could “overcome the paralysis of the pesticide paradigm and conceive a weed science research program that addresses both society’s perception of safety and the scientific community’s perception of risk?” The essay was to serve as a “cognitive launching pad” for a CSRS sponsored weed science research planning symposium to be held in 1993.

After 20 years it is appropriate to revisit my thoughts from 1990–1991. It is reasonable to ask if the weed science community has “overcome the paralysis of the pesticide paradigm” and if weed scientists and the discipline’s research emphases have changed their focus and goals. Have weed scientists thought about

¹ CSRS is now The National Institute of Food and Agriculture (NIFA).

² The papers were published in *Weed Technology* 8:388–412. 1994

the direction and goals of their science and whether they are acceptable or need to be modified? Have they developed reasons to explain why modification is or is not necessary? 20 years ago in the enormously successful agricultural system in the developed world the dominant weed control techniques clearly had great (sometimes complete) reliance on herbicides. Weed and other agricultural scientists were confident of the truth of their basic faith in the possibility of perpetually increasing production through intelligent use of ever more efficient agricultural technology, including herbicides. The justification was the moral obligation to feed people. Is this belief still prevalent? Is it justified by the evidence and rational argument? The original essay was not intended to demean, diminish or be only critical of the great accomplishments of weed science. It was a plea for thought, as is this re-visitation. Knowing about the mistakes and successes of the past is vital, not to return to the past, but to learn from it (Cox 2009, p. 57).

To retain the intent and integrity of the original essay nearly all of it has been retained including the chapter titles and literature cited. [Chapters 2 and 3](#), with minimal changes appear as they did in the 1991 essay. The essential message of [Chaps. 1 and 4](#) has been retained, but both have several additions. [Chapter 5](#)—The Future is a new, brief, conclusion. Editing has been primarily to correct mistakes, to acknowledge the passage of 20 years, and include knowledge gained in those years.

Sen. Daniel Patrick Moynihan is purported to have said: “We each may be entitled to our own set of opinions, but we are not entitled to our own set of facts.” In the original and this revision I have tried to get the facts right. If I have not succeeded, please inform me of my errors. The opinions are, of course, my own. The purpose of this essay is identical to the purpose of the original. It is to plead for thought about who we are, where we have come from, where we are going and where we ought to go. If the essay accomplishes or fails to accomplish these goals, I look forward to hearing and will appreciate knowing your view.

Literature Cited

- Cox H (2009) *The future of faith*. Harper Collins, New York, pp 245
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Mortenson G (2009) *Stones into schools—promoting peace with books not bombs in Afghanistan and Pakistan*. Penguin books, Inc. New York, pp 420
Naegele J (1993) See Preface, Zimdahl RL (1993) *Weed science—A plea for thought*.

Acknowledgments

The 1991 version of this essay was written without the aid of reviewers. This revision has not been hampered by the same error.

Many of the thoughts and arguments in the essay were created and nurtured over many years in classes I have taught and others I have attended during seminars, professional meetings, and in numerous conversations with colleagues. All of these took place over several years and with far too many people to list them all. I am indebted to all who have given me the privilege of sharing their thoughts, even when we knew we did not agree.

Dr. Thomas O. Holtzer, Professor and Head, Department of Bioagricultural Sciences and Pest Management, Colorado State University has supported and advocated my work by providing office space and departmental administrative support. His careful reviews of portions of the manuscript have improved clarity and presentation of ideas. Dr. K. George Beck, Professor, Department of Bioagricultural Sciences and Pest Management, Colorado State University critically reviewed portions of the manuscript. Members of the Publication Coordination Committee of the Weed Science Society of America provided a brief, useful comment.

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The inside cover picture is used with permission of the artist, Jim Foster, Waverly, CO, fostart.jimart@gmail.com

My wife, Pamela J. Zimdahl, encouraged my writing and offered comments and criticism when she thought it was appropriate (it usually was).

March 2011

R. L. Zimdahl

Contents

1	The Need for Historical Perspective	1
	Historical Reflection	5
	What is a Weed?	7
	The Role of Definitions	8
	The History of Weed Science	11
	The History of Other Plant Protection Disciplines	15
	An Historical Conclusion	17
	References	21
2	Pesticides and Value Questions	25
	The Value Issue	26
	The Response	27
	Opposition to Pesticides	28
	References	30
3	The Pesticide Paradigm	31
	Paradigm	31
	Pest	32
	The Pesticide Paradigm	33
	Knowing the Issue	33
	The Paradigm Shift	35
	How Will the Paradigm Evolve?	39
	References	41
4	A Question of Faith	43
	The Quality of Evidence	46
	History and the Future	49
	Perception of Risk	55