

Some Thoughts About Ethics for Agriculture

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Abstract

This paper is a result of a 50-year career in Weed Science, which evolved to study aspects of the moral philosophy and the ethics of Agriculture. It is in many ways a personal story, but it concludes with a plea for careful consideration of the ethics of the agricultural enterprise.

Keywords: Agriculture, ethics, philosophy, production, values, Weed Science

Introduction

After completing a Master of Science degree at Cornell University in 1966 and a Doctorate at Oregon State University in 1968, I arrived in Fort Collins, Colorado, to begin a new life as an Assistant Professor at the Colorado State University. The job required teaching a class — the Biology and Control of Weeds and doing research on soil persistence of herbicides and weed control in various agronomic crops. It was a long-desired opportunity and I knew I was ready.

In the beginning my life and university career resembled a mobile my wife gave me some years ago. It hangs in my home study and consists of a black paper circle and three dolphins made from red construction paper; each with a sharply contrasting black eye. Each dolphin hangs from a string at the end of a slim metal wire and they move alone or in unison, with frail elegance, grace, and beauty. One morning I walked into my study and found the supporting stick had come loose and the mobile had fallen to the floor. The frail elegance was gone. As I reflect on my weed science career, its direction, and on what I thought and knew as fact when I began, I know my career has resembled my mobile. I have come to seriously

question the undergirding agricultural ethos which prizes maximum production at the lowest cost. Ethical consideration of the environmental and human effects of agricultural technology have been ignored.

In 1968, and for some years after, my life was fascinating, and everything moved forward in order and harmony. I knew the Vietnam War TET offensive occurred on January 31, Martin Luther King was assassinated on April 4, the My Lai massacre in Vietnam occurred on March 16, Robert F. Kennedy was assassinated on June 5, Tommie Smith and John Carlos gave the Black Power salute on October 16 at the Mexico Olympics, and Apollo 8 orbited the moon 10 times in late December 1968. Neil Armstrong and Buzz Aldrin walked on the moon on July 21, 1969. While these events were very important, they did not significantly affect my life or career.

Then, the stories and facts about the use of the herbicide 2,4,5-T (2,4,5-trichloro-phenoxy acetic acid) during the Vietnam War intervened. My career's supports began to loosen. I began to doubt if what I knew to be the foundational facts and supporting paradigm of my science were adequate. It was a crisis of faith; a crisis of faith in the conventional wisdom of my science. By 1950, 4.5 million kilograms of 2,4-D (2,4-dichloro phenoxy acetic acid) and 2,4,5-T were

being applied annually in the United States (Wildavsky, 1985). In 1964, a study initiated by the National Cancer Institute suggested concern about the public safety of 2,4,5-T, a herbicide for woody rangeland brush control and forest weed control.

The National Cancer Institute study indicated the possibility that 2,4,5-T or one of its formulation's constituents might be a teratogen. Other allegations appeared over the next several years, many because an ester of 2,4,5-T was half of 'Agent Orange', a defoliant used in Vietnam. By 1970, there was enough evidence to halt military use of 2,4,5-T and for the US/Environmental Protection Agency (EPA) to initiate administrative proceedings to suspend its registration.

Throughout the 1970s increasing attention was given to the dioxin contaminant in 2,4,5-T. Extensive studies confirmed that a dioxin¹ was the teratogen in 2,4,5-T. In 1979, following a still controversial study of human miscarriages after 2,4,5-T had been used in forests in the Alsea basin of Oregon, the EPA issued an emergency suspension of all uses of 2,4,5-T for forestry, rights-of-way, and pastures. Public sentiment against the herbicide grew. The manufacturers and the EPA attempted to negotiate settlements to keep some uses. Discussions broke down in 1983 and all US uses were cancelled in 1985.

In 1971, I presented a paper titled - Human Experiments in Teratogenicity - in the ecology section of the Weed Science Society of America meeting. The philosophical supports of my elegant, ordered, satisfying professional life, began to crumble after that paper. The paper's major objective was to question the role Weed Scientists played and ought to play in an increasingly polluted world. I was troubled and asked my colleagues to help me think about under what conditions one could argue that 2,4,5-T or any other a pesticide is so necessary to achieve the desirable end of food production that any risk of human harm is acceptable.

I proposed that those who work with pesticides must ask and answer questions about whether means and ends are compatible. The paper argued that members of the public must feel they are participants in determining the way things are ordered. They must think they actually have, the power to choose. To make sense of choosing and participation real, people must have the evidence required to judge possible alternatives and outcomes. People must also have,

beyond the evidence, a sense of Agriculture's goals that serve as a context into which particular judgements are fitted. Some senior colleagues spoke to me after the paper to tell me how wrong I was.

The essence of the rather unpleasant encounter was that they wanted to know why I was so eager to bite the hand that fed me and much of the rest of the world. Their comments assured me that something was wrong, but it was something wrong with me and my thinking. In my colleague's view, there was nothing wrong with Agriculture, weed science, or with herbicides. They believed that weed scientists should continue the scientifically responsible quest for the wise use of federally approved herbicides. I knew something was wrong but wasn't able to define it well, and I was beginning to doubt that the unquestioned development of technology for Agriculture was *a priori* good. A 1972 paper (Zimdahl, 1972) elaborated my oral presentation and continued the quest to decide what I thought and to see if anyone cared. The issues didn't go away. I continued to read and think and tried to learn more about the issues when I wasn't doing the teaching and research my job required.

A second paper (Zimdahl 1978) was published later in the same journal. It included two fundamental propositions.

1. Some species are pests and it is necessary to control their populations to produce food; and
2. Pesticides are the primary means to control pests, but there may be an unnecessary dependence on them.

The paper argued that special knowledge and the highly trained mind produce their own limitations, which frequently results in an inability or reluctance to accept views from outside the discipline owing to unquestioning acceptance of the discipline's conclusions; its current paradigm. After doing research and teaching for 20 years and making another attempt to clarify my thoughts (Zimdahl, 1991), it was time to reflect on what I had learned and plan my future. This led to increased focus on the values and ethics of Agriculture and required learning new ways of thinking. Exploring the ethical foundation of a science that had been my professional life was the task. Such decisions don't come without personal and financial costs. The personal costs have included loss of colleagues and friends who don't understand and assume the worst. In the minds of many, I was

¹ There are several dioxins. The dominant teratogenic molecule in 2,4,5-T was 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).

still biting the hand that feeds me. The costs also included the intellectual difficulty of venturing into philosophy—a new, unknown area. The financial cost was because ethical reflection does not provide opportunities for research grants.

Agricultural scientists have always been enthusiastic in their work and ambition for the future. However, they have lacked an understanding of the need for an ethical foundation of Agriculture. They have not been interested in exploring and applying ethical considerations to their work. The central norm, the primary moral stance of agricultural science is that the research that is done should benefit humanity by aiding the production of food and fibre. Agriculture's technology has been the primary moving force behind many social changes. It is one of many production activities that takes pride in reducing its labour force. What becomes of the people displaced is someone else's problem.

I am puzzled by the new directions of Agricultural Science. Predictions about the future by agricultural scientists, say that it is good, essential, and going to get better. When I was a student, I don't recall hearing the word sustainable, and the environment was acknowledged, but not considered endangered. Genetic engineering was unknown. All of these are now powerful ideas with powerful constituencies, and they are affecting Agriculture's direction and its foundational ideas. It is important to acknowledge that Agriculture and its technology can affect and be affected by the development and direction of the greater society.

The aim of my ethical quest is not what many have assumed. Many think what I want is to tell them that they are ethically wrong because they have no ethical foundation for their work. They are wrong. It is not a matter of sorting things out to a final, definitive truth that a few understand, and others do not. The aim is to create a harmonious and mutually acceptable view among its practitioners from which to address existing and future ethical and value conflicts. Discussion of foundational values, of why we practice Agriculture as we do should become a central rather than peripheral or absent part of agricultural practice and education.

One of the important things I've learned is that the persistence of moral conflict, of value questions, is an inevitable and important part of the human condition. Engaging in the debate stimulates the full development of the intellect and of our concern for others and the environment. A fear, and perhaps a fact, is that if agricultural scientists do not begin to

understand and shape the ethical base of their discipline, it will just evolve or be imposed by others. The apparent ethical foundation of Agriculture can be summarized in the following three points.

1. Those engaged in Agriculture are certain about the moral correctness, the goodness, of their activity.
2. The basis of that moral certainty (the supporting reasons) is not obvious to those who have it.
3. In fact, Agriculture's moral certainty is potentially harmful because it is unexamined by most of its practitioners.

My 2006 book, *Agriculture's Ethical Horizon*, deals with these important questions. It has, to my surprise and disappointment, drawn almost no comments. I hoped to make people think and thought some would comment, even if the comments were angry. In Agriculture, we have assumed that as long as our research and the resultant technology increased food production and availability, Agriculture and its practitioners were somehow exempt from negotiating and re-negotiating the moral bargain that is the foundation of the modern democratic state (Thompson 1989).

It is a moral good to feed people and Agriculture does that. Therefore, we assume that anyone who questions the morality of our acts or our technology simply doesn't understand the importance of Agriculture or the value of what has been accomplished. The results of our technology make us morally correct. Wendell Berry (2002), an American author and agricultural philosopher, points out the error of this common agricultural assumption.

Higher education has grown more scientific in its quest for knowledge. At the same time people in many countries have become more concerned about moral truths—absolute truths. A result is that societies are more polarized in their struggle to find political and existential truth (Yankelovich, 2005). It is also true that some areas of truth do not yield to scientific inquiry. Moral dilemmas are common in Agriculture and we need an ethical foundation to help decide between two choices where each has strong supporting arguments. For example:

1. Should we increase agricultural production, to feed more people, regardless of the environmental or human harm the technology that creates the production causes?

2. Should we raise animals in confinement if it is harmful to the animals but makes meat cheaper for consumers?
3. Should we mine water from deep aquifers to maintain irrigated farms in dry areas?
4. Should we change production systems to decrease soil erosion?
5. Should we decrease nitrogen fertilizer use in the Mississippi basin to reduce the effects on fishing and ecological stability in the Gulf of Mexico hypoxic zone; one of the largest in the world? ²
6. Should family farms be protected and preserved or allowed to die because they are economically inefficient, that is, they can't make sufficient profit?
7. Should we give more or less food aid to developing countries?
8. Should we accept or reject agricultural biotechnology?
9. Should we reduce herbicide and other pesticide use in American Agriculture?

Each of these is a difficult moral dilemma for Agriculture. They are not just scientific questions. It is time, indeed past time, for all involved in Agriculture to think about and address the ethical dimensions of these and similar questions.

The next generation of Agriculture practitioners, scientists and teachers should be equipped with the intellectual tools required to guide decisions about Agriculture's existing and future ethical dilemmas (Chrispeels, 2004). Offering courses in agricultural ethics will not alone quickly increase the overall emphasis on ethical considerations within the agricultural community. But it will be an important recognition of the need for Agriculture to address its ethical dimensions and for the entire agricultural community to become engaged in the discussion (Zimdahl and Holtzer, 2018).

When one questions the value or wisdom of continued use of agricultural technology, many think the goal is to go back to 40 acres and a mule. Those who question the continued value of modern technology are not regarded as risk takers and without risk takers, progress will be inhibited. But it is not difficult to recognize that an increasing number of

citizens question the safety of their food and the ethics of the system that produces it. Creating an ethical standard requires considering and perhaps changing fundamental values. It probably requires us to be counter-cultural and maybe even revolutionary. It requires taking some risks.

Conclusions

I conclude that we need to take public opinion seriously, which can be very difficult. A guiding principle to taking the public seriously is found in public engagement with honesty (Sterckx and MacMillan, 2006). The public's view of Agriculture and its technology is often one of tampering with nature that leads to bad results. This view does not stem solely from scientific ignorance and technological illiteracy. It is based more on distrust of science and scientists not on a misconception of scientific facts or irrationality (Shader-Frechette, 1991, p. 5).

Public disagreement with scientists on matters of risk is not irrational although the general public tends to be willing to assume less risk than scientists, who frequently operate with subjective values (Myskja, 2006). For example, a US National Academy of Sciences study (Edwards, 1987) reported that 60% of all herbicides then used in the U.S. can cause cancer in animals.

One must ask if the public's scientific values ought to dominate further discussion on the topic and if such discussion occurred. The question for all agricultural scientists is not whether we are better than we used to be. The question is, are we as good as we ought to be? Agricultural scientists are proud because of their contributions to agriculture's productive success. They know they are technically capable, and most assume that the technology's results (increased production) show that the agricultural enterprise is morally correct. But it is not wrong to suggest that only with respect for nature instead of opposition to it that our species will be able to remain in the world. A morally wrong act is disrespect for the limits of human capability, not just incorrect prediction of the harmful consequences of acts (Myskja, 2006).

² Nitrogen and phosphorus come from fertilizer in the farming states of the Mississippi River Valley. More than half of the fertilizer applied each year ends up in the atmosphere or local waterways releasing 2.1 billion tons of carbon dioxide

equivalent in the form of nitrous oxide. (Worldwatch, May/June 2008, p. 4). One third of US greenhouse gas emissions come from Agriculture (Gilbert, 2012).

A value judgment of merit, or worth (Scriven 1994) is often thought of as subjective, biased, and unreliable. Positivists and scientific analysts alike believe that the words *is* and *ought* to belong to different worlds. The belief is that sentences constructed with *is* usually have verifiable meanings whereas sentences constructed with *ought* never have (Bronowski 1965, p. 56). For example: Plant leaves are green because chlorophyll, the dominant pigment, *is* green. Sentences with *ought* are possible because we have the ability to reason. We ought to do what there are the best reasons for doing. For example: We ought to always be kind to children.

In science we accumulate observations and evidence that bear upon judgments and thus increase the probability of statements to the point where they become accepted beyond a reasonable doubt. The scientist is never absolutely certain because there always is or should be a healthy scientific skepticism that says: Criticism is always legitimate, no one has the final say, and no one has personal authority (Rauch 1993, p. 46). Science would not be science if it could not make and adequately support value judgements. Agricultural scientists make value judgements regularly [It is good to use herbicide X in the weed management system for crop Y because good results (higher yield, improved quality, lower costs) will be achieved]. Agricultural scientists also make moral judgements. For example, it is not uncommon to find the conclusion that we ought to pursue transgenic technologies because they offer the best promise of feeding a growing world population—a good thing to do. Those who oppose this view are often labelled as uninformed or simply ignorant. The dogma is not questioned, it is accepted.

Science is an activity that evaluates means to ends and the ends. But many claim that science does not make moral judgments or claims about ultimate value (Scriven 1994). That, I suggest, is false. We need the best scientists and the best philosophers to justify the basic value positions of science and to create an appropriate ethical standard for our science.

Ethical matters (the rightness or wrongness of actions) have always been implicit in Agriculture but they have not been emphasized or given a dominant role in decision making in agricultural education, industry, or research (Burkhardt et al. 2005). Agricultural practice has regularly raised “questions about values, priorities, practices, and policies” (Burkhardt et al., 2005). Few decisions in Agriculture are purely scientific or purely ethical. They are

complex with scientific, economic, social, political, legal, and moral dimensions.

All dimensions must receive proper attention. Ignoring the ethics of what we do reflects the view that Agricultural Science is value-free, and ethics are simply personal. Omitting ethics from our science reflects the dominant, but now largely discredited view that values and value-judgments are contrary, to the practice of science (Burkhardt et al., 2005). It ignores the fact that the public is tracking us, they are good at what they do, and they care about what they value and what they assume we value.

All societies and all cultures, including the scientific culture, have created a system of values. It arises from collective beliefs of what it means to be human, part of a society, and an understanding of and assumptions about the natural world, their fellow human beings, and the transcendent (Anonymous, 1991). Dominant cultures, including the scientific culture, have always claimed the universality of their beliefs—their values. The scientific culture has ignored making its values and the ethical foundation of its work explicit. It has thereby ignored the effects of its work and its implied values.

The idea that ethical reflection is important to Agriculture is relatively new. In the words of the American philosopher William James (1995, p. 76), “...*First, you know, a new theory is attacked as absurd; then it is admitted to be true, but obvious and insignificant; finally it is seen to be so important that its adversaries claimed that they themselves discovered it...*” The risk of being of taking the lead to develop an appropriate, defensible ethical position for Agriculture is small. My advice to all is: Try it, you might like it.

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