

My view

Steven Radosevich

Department of Forest Sciences, Oregon State
University, Corvallis, OR 97331

Weeds are such a pernicious aspect of food production that weeding is often the most important task, besides planting, that farmers do to assure crop growth. It is a chore that overshadows most other, more satisfying, aspects of farming. The tools used for weed control now range from machetes to microbes and hoes to herbicides, but no matter what tool is chosen, it is always with the expectation that reducing weeds increases crop productivity—an assumption proven correct by scores of experiments conducted in almost every cropping system of the world. Despite this monumental effort to control weeds, however, the incidence of weeds in cropland has not declined, nor has any weed species ever become extinct. In fact, new and existing weed species increased in North America during the last half century. Thus, weed control works only from the limited perspective of improved crop production. From another perspective, weed control actually increases weed prevalence while billions of people spend their lives hoeing and millions of dollars are spent every year for chemicals to kill unwanted plants.

Alden Crafts, a pioneer of modern weed control, states in his first book that "In the beginning there were no weeds." This statement acknowledges that plants only become weeds as agriculture evolves. The notion of a weed is a human construction, its origins man-made, just as the hoes and herbicides used to kill them are human inventions. Weeds are adaptable, perhaps even more adaptable than we are, and it is this characteristic that is disconcerting. These organisms adapt to us, to the very tools and practices that we use against them. They are vegetation's equivalent of the housefly and wharf rat, organisms that cannot exist without people. Perhaps we could learn more about weeds if we learned more about our motivations.

Weed scientists, working in their separate disciplines, collect vast amounts of information about the problems weeds cause. They also are successful in developing new tools and tactics to control them. However, almost every innovation in modern agriculture, including the technology to control weeds, drives some rural people from the land. Substitution of pesticides, fertilizers, energy, and money for human work, can be desirable when it creates urban jobs. However, in many instances, such "efficiency" displaces rural people to urban slums and to even greater poverty. The paradox, as far as weeds are concerned, is that hoeing, while a predominant source of human drudgery, is also a major user of hand labor and source of employment in developing nations. In developed countries, the continual quest for ever higher yields has become a technological treadmill. Farmer debt, loss of land, and ultimately labor's displacement to cities result because of the high costs of chemicals and energy used to produce food coupled with low prices from overproduction. Today less than 2% of Americans are farmers. Serious questions now must be answered about the stability and environmental quality of a

food production system that relies so much on off-farm inputs of chemicals and energy and so little on farmer intuition and an understanding of natural, biological processes.

Now, weed scientists search for a better technology to manage vegetation and control weeds. Some search for more efficient technology, while others look for more economical or environmentally sound answers—those based on a broader understanding of environment and biology. But it remains likely, nonetheless, that farmers will still face weedy fields, the paradox of hoeing will still exist, and the dilemma of rural displacement will continue with each new turn of the technological wheel. Weeds are a real aspect of modern farming. They are also a symptom of how we view ourselves and farmers, which originates from how we grow food. From this viewpoint, farmers are managers, manipulators of nature, and science is inextricably bound to technology. Thus, plant science, even ecology, becomes a tool to manipulate nature in different ways, sometimes finding new tactics and new tools, but often only counteracts the problems caused by older technologies. For example, farmers alarmed by declining crop yields looked for solutions in weed control, but these solutions begat more problems: soil erosion, chemical contamination of food and water, and displacement of rural people. Unfortunately, we don't know what new questions will arise from any new technology to control weeds. But such questions will probably stem from our definition of weeds as a problem—or rather, as a unique, discrete problem, disconnected from the rest of society's concerns.

I imagine a better scenario, a different possibility in which people base their decisions on an understanding that they are part of a web in which every action causes a whole variety of reactions. In this scenario, human beings would be more humble and accountable to nature, adapting to what exists rather than the other way around. It is unlikely that weeds would even exist under such a scenario. These plants probably would simply be incorporated into the "normal" cycles of production and grazing. However, barring a sudden shift in human consciousness, society seems well entrenched in the former scenario. So what can be done to resolve the dilemma of weeding and avoid the treadmill?

Do not oppose progress, but think broadly and critically about the consequences of your actions, whether in science or production. Wonder who will benefit from these actions. If your actions enhance only yourself or rich and powerful people or organizations, or if they push small farmers off their land, or if they displace indigenous or other self-sufficient people, or if they degrade the environment, injure animals, or cause unpredictable economic effects, then consider alternatives that do not. Technology for its own sake is not progress, and weeds are plants whose virtues have not yet been discovered.