Chapter 2

Against Herbicide Resistance (1990)

There’s corn in the bean field,
Persnickety wants it clean.
I got these blisters on my fingers,
I got these cockleburs in my dreams.
I been walkin’ the beans, in the burnin’ sun,
And it looks like I ain’t ever ever gonna get done.

- Greg Brown

I pulled weeds out of half-mile rows of soybeans on grandma and grandpa’s farm long before I heard of the controversy surrounding herbicide resistance and genetic engineering. Twenty years ago, Gordie, Richard, Greg, and I “walked beans,” not knowing that our fists and scythes were not the only means available to Grandpa for killing weeds. We knew little then about uprooting thistles with tractors and discs or about spraying chemicals onto mustard. We knew only that a cool thermos of lemonade and some stern looks from Mom would motivate our troop into action because every good Iowan hated volunteer corn and sunflower shoots. The hatred stemmed as much from the fact that the weeds made a field “look messy from the highway” as from the fact that they cut down yields; Grandma had aesthetic sensibilities as highly developed as any character in Greg Brown’s song.

The chore of weeding has fallen squarely into uncle Harold’s hands for the last two decades. He understands that shelling out money in February to buy soybean seeds with a strong tolerance for (“resistance to”) the presence of herbicides will cut his weeding costs in July. By applying chemical weed killers from his tractor, he saves the cost of hiring high schoolers to walk the beans.

In 1990, Iowa farmers have safer toxins and more discriminating spray equipment available than they did in 1970. But they still attack weeds the way farmers have done for thousands of years: They plant their crop, see what weeds come up, and then try to kill the weeds with chemicals, rotary hoes, and high school kids. For millennia, farmers have started with seeds, selected those they believe will be most productive, hardy, or drought-resistant, planted them, and then tried to devise means to eliminate their
competitors. "Pre-emergent" herbicides, applied to the soil at planting, allow farmers to prevent weeds from coming up, but this is just a variation on the theme. The tune stays the same: You start with seeds that have traits you desire and then you find chemicals or cultural practices to get rid of everything else.

The time-honored technique is about to be reversed. Scientific developments have made it possible to start with chemicals rather than seeds. Having identified the genes that allow certain herbicide resistant weeds to survive in the presence of specific toxins, scientists have successfully transferred the genes from the weedy species in which they naturally occur to tomatoes, tobacco, and petunias. Soon, genetically engineered soybean and corn plants may be commercially available, crops designed to flourish in the presence of synthetic compounds. Glyphosate is a weed killer known by the trade name Roundup, assigned it by its parent company Monsanto. Glyphosate kills virtually every plant it touches. Starting with Roundup, scientists designed seeds to grow in the presence of the chemical.

Genetically engineered herbicide resistant (GEHR) crops reverse the order of weeding. Where our great great grandparents started with seeds and then hunted for chemicals, scientists now hunt for a chemical and then look for seeds. The reason is that a new generation of poisons has been discovered which seem to be far safer for humans and the environment than older poisons. If the new generation of broad-spectrum chemicals truly is safe, if you can drink glyphosate from a glass as proponents have done at press conferences, then seeds genetically engineered to grow in the presence of such benign chemicals would be welcome developments indeed.

That is the promise of GEHR research. Farmers, seeing ever tougher species of mutant weeds appearing in their beans, will have more efficacious and safer chemicals. Consumers, worried about pesticide residues on and in their vegetables, fruit, and meat, will have produce grown with less dangerous herbicides. Despite the excitement, however, there are problems associated with the technology. Leaving aside for the moment agronomic questions like whether GEHR crops will actually work in the field or how long it will be before weeds resistant to the new chemicals appear, consider the ethical questions.

Some critics have expressed reservations about the moral propriety of crossing unrelated plant species. Jeremy Rifkin, for example, has argued that it offends God to cross plants with weeds when the two species cannot be crossed by natural means of reproduction. Is it right to violate species boundaries set up by "natural law"? This question may appear extreme to some plant geneticists and breeders, but it deserves the attention of moral philosophers interested in agriculture.