Should Food Supply be Controlled by Monsanto?

review by Katherine Duff

Against the Grain: Biotechnology and the Corporate Takeover of Your Food
by Marc Lappé, Ph.D. and Britt Bailey
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To fully appreciate the many implications of genetic engineering in crops, one must have an understanding of corporations and their methods of assuring profit and controlling markets. *Against the Grain: Biotechnology and the Corporate Takeover of Your Food*, by Marc Lappé, Ph.D. and Britt Bailey, is an examination of the corporate role in this emerging technology. With their backgrounds in writing about and investigating toxic chemicals, Lappé and Bailey are familiar enough with the workings of corporations and government on these matters, that they take us right to the point – biotechnology crops are commercial products meant to generate profits.

The authors profile three transgenic crops to demonstrate some of the consequences we don't generally hear about and the reasons for the pursuit of this technology that corporations would rather we did not know about. They examine the herbicide resistant cotton plant, BXN® Cotton, the much touted Roundup Ready™ plants and Bt resistant plants.

In the race for profits and market dominance, safety issues have been pushed aside. In the example of the BXN® Cotton, we learn it has been engineered to be resistant to bromoxynil, an herbicide of questionable safety that in normal plants prevents photosynthesis. The genetically altered plant breaks down the bromoxynil into a metabolite called DBHA. Manufacturer's toxicity testing has found DBHA to be as toxic as its parent compound and there have been no reported studies of its effect on the human body. Nonetheless, the EPA registration team approved expanded use of the herbicide on the genetically altered plants with application now determined by the size of the weeds instead of the size of the cotton. We end up with *more* bromoxynil and more of its breakdown product DBHA in the environment.

Risk calculations for bromoxynil have always excluded cotton as a significant contributing factor in human exposure. The authors point out that cotton slash and gin mill leavings are used for animal feed, constituting 50% of the traditional silage, and cotton seed oil is used in many consumer products. Occupational exposure to cotton dust contaminated with DBHA raises even more health and safety questions. But these issues were not considered by the EPA reviewers.

Safety concerns are also discussed with regard to the Roundup Ready™ crops. A Roundup Ready™ plant is one that has been genetically engineered to produce more of an enzyme that provides protection from most of the toxic effects of the herbicide Roundup®. This means that it is probable that more of the herbicide will be used and food crops will be sprayed directly with Roundup®. As evidence of this, one of the authors notes witnessing aerial spraying of fields with this herbicide, a method normally reserved for pesticide applications.

The authors teach us about the important role of patents in the agbiotech industry. In the example of the popular herbicide Roundup®, we learn that the patent on that product expires this year. The genetically engineered Roundup Ready™ crops will continue to provide protection for the herbicide profits though, since one of the conditions placed on the purchasers of Roundup Ready™ seeds is that they use *only* the Roundup® branded herbicide.

The case of *Bt* resistant crops may be the most chilling of all. In a chapter titled *Destroying a Miracle*, we learn that the bacteria known as *Bacillus thuringiensis (Bt)* has long been used in integrated pest management and organic farming for the control of certain insects. The "bacteria organisms contain a crystalloid toxin that carries insecticidal properties that is activated only in the uniquely alkaline environment of the intestinal tract of the coleoptera or lepidoptera larvae." Scientists have isolated the gene for the toxin and believe it will serve as a natural biocide when transplanted into such crops as corn, cotton and potatoes. This should raise safety questions as we will be consuming food that is likely to contain this biocide, but those questions have been largely ignored.

Another problem with the manipulation of *Bt* is that this once minor bacterium among soil organisms will launch evolutionary changes that will result in *Bt* resistant insects, a development that has already been reported. If taken too far, this short lived enterprise will have destroyed a natural toxin for use by nature and farmers alike. Which leads us to wonder if corporations could really be this ignorant. The authors speculate that the patents on the *Bt* crops would be profitable in their early years, and by the time the patent expires, insect resistance will deter other manufacturers from marketing similar products. Predicted sales of these crops are in the billions.

There are many concerns raised in this book that should cause us to question the wisdom of our food supply being controlled and driven by the ethics of a few large corporations, such as Monsanto, DuPont and Dow. These companies are part of an industry that has a track record which can be judged as to their responsibility when their products fail or cause harm. Anyone familiar with that record will recognize the response given by Monsanto in one of the examples of transgenic crop failures in this book.

The example concerns the failure of certain Roundup Ready™ Paymaster (a subsidiary of Monsanto) cotton crops in 1997. After the second application of Roundup®, the cotton bolls became deformed and fell off the plant, resulting in great losses to farmers. This event is a perfect demonstration of the kind of dependence we will have in a world of corporate crops and food supply. Only Monsanto has the information necessary to determine what went wrong but they have remained quiet. While questions remain about the effect of the newly inserted gene on the stability of the crop, it is unlikely that Monsanto will reveal much information, as reflected in a statement by their public affairs representative, "there are a number of environmental factors that can put stress on cotton plants."

Biotechnology is being sold to us as a moral imperative – it is good to feed the hungry, it is good to make food crops more nutritious. But before we buy into it, Bailey and Lappé caution us to pay attention to what corporations find good – increased reliance on their products and control of markets, even at the expense of our natural genetic diversity. In light of this, they propose protections such as full disclosure on the part of corporations and labeling to preserve the autonomy of consumers.

At 150 pages, plus a very helpful glossary, this concise book raises the critical questions about this new technology that citizens must insist be addressed. Genetically engineered crops, whatever the consequences, are intended to become our food supply.