A Few Myths (and Truths) about Genetic Engineering and GMOs

(by no means all)

Dick Atlee, March 21, 2014

1. Genetic engineering used for GMOs is no different from traditional breeding.
2. GMO opponents are anti-science.
3. GMOs are tested for safety by the FDA... or, somebody.
4. GMOs are needed to produce vital traits important for the future.
5. GMOs will feed the world; opponents are promoting mass starvation.
6. GMOs reduce the need for herbicides and pesticides.
7. GMOs can live side-by-side with conventional or organic agriculture.
8. GMOs are good for farmers
9. There is no need to label GMOs -- or, "Trillions of meals, and no one has gotten sick"

1. Genetic engineering used for GMOs is no different from traditional breeding.

Genomics (gene study and mapping) can be helpful in speeding up the promulgation of desirable traits via traditional breeding (even Monsanto does it!). But the technique of *genetic engineering* -- infecting or firing alien DNA at random into a plant or animal's genome -- causes local DNA damage and insertion of alien promoter genes, giving rise to changes in protein expression. These novel, altered or previously unexpressed proteins are potential -- as well as demonstrated actual -- allergens, toxins, carcinogens and reproduction damagers. Traditional breeding occurs in the context of a system evolved over long periods of time that does not create this kind of radical genetic damage that the organism is not equipped to fix.

2. GMO opponents are anti-science.

In the 1970s/80s, the birth of genetic engineering, genes were understood to work in a "one gene: one protein" fashion, so that incorporating a single gene would simply produce that gene's protein, with no side effects. With the completion of the Human Genome Project in 2002, however, that was completely replaced with an understanding that genes function in families, as part of a network, an ecosystem -- not as isolated genes. When you disrupt such an ecosystem, you inevitably create damage of an unpredictable nature -- maybe harmful, maybe not. So it is the supporters of GMO's old technology that are at odds with science.

3. GMOs are tested for safety by the FDA... or, somebody.

Fact: The FDA has <u>never</u> tested GMOs for safety. Prior to being squelched by political appointees in 1992, FDA scientists raised serious questions about the technology's potential for generating allergens, toxins, antibiotic resistance and worse. But the former Monsanto lawyer in charge of FDA policy made sure that that policy asserted "substantial equivalence" between GM and non-GM organisms, hence "assumed safe" and not needing safety testing. FDA protocol (and its copy-cat version in many other countries) calls for industry to do whatever testing they wish (if any), and optionally report to the FDA, which writes a letter stating that the company claims safety. Period. *Industry doesn't even have to notify the FDA before marketing.* Industry safety tests that have been done have frequently been shown to be faulty, in some cases "designed to fail." Studies done by industry/technology-related scientists generally show safety (and those that don't are frequently suppressed or mis-reported), while studies done by independent scientists *all* show indications of problems.

4. GMOs are needed to produce vital traits important for the future.

GMO proponents talk of increased yields, and of tolerance of droughts, floods, heat, salinity. In fact, these are complex traits relying on the uncharacterized interaction of a host of genes (see #2, above). They are not susceptible to manipulation by a one-or-two-gene gene gun or bacterial infection. They *are* attainable -- *are* being obtained, and have *always* been obtained -- via traditional breeding, which can be augmented by genomics (see #1, above). Plants all

over the world have been bred to their unique local conditions. GMOs, coming from a single plant line, tend to show reduced yields when introduced into different conditions.

5. **GMOs will feed the world; opponents are promoting mass starvation.**
   This claim is a corollary of #4, above -- that GMOs will grow better and offer more nutrition than traditionally bred plants. Even on the limited basis of this statement, the claim is false. In addition to the yield losses mentioned above, GMOs bred to include additional nutrients have failed -- either because breeders have accomplished the same thing, or because the augmented nutrition is better accomplished by less technical means. But beyond this, GMOs have resulted in mass loss of local farming (financial pressure from seed/chemical companies requiring continual purchase of seeds and chemicals, and resulting farm abandonment and suicides), leading to agricultural consolidation and fragile monocultures. When some disease or condition arises inimical to a monoculture GMO crop, the whole crop dies, and there is nothing to replace it, since local seeds have been driven out (even become extinct). And far more threatening is Monsanto's *Terminator* technology, which causes the seeds of the plant to be sterile. If this DNA begins to combine with existing crops, the world food supply could be damaged irreparably.

6. **GMOs reduce the need for herbicides and pesticides.**
   Another anti-science claim. It was inevitable that "weeds" and "bugs" would develop resistance to Monsanto's Roundup herbicide heavily sprayed on "Roundup Ready" crops, and the Bt insecticide GE'd into every cell of Bt-GM crops. Roundup use has skyrocketed since the introduction of GMOs and the arrival of "superweeds," so Dow and others are moving in with GMOs resistant to far more dangerous chemicals (e.g., 2,4-D of Agent Orange fame). Bt (an essential for organic agriculture) is losing effectiveness against insects.

7. **GMOs can live side-by-side with conventional or organic agriculture.**
   GMO is genetic "pollution with legs." GM pollen blows everywhere. GM seeds blow from trucks into conventional fields. The resulting GM plants destroy a farmer's organic certification, or, for conventional farmers, result in threats and lawsuits from Monsanto. GM DNA has polluted corn in central Mexico, the birthplace of corn, which had been thought safe, thousands of miles from the nearest GM plantings.

8. **GMOs are good for farmers.**
   As Europe and other markets around the world have rejected GMOs, the Canadian canola crop and the U.S. corn and soy crops have suffered massive market loss and price drops. Farmers cannot save seeds (under Monsanto lawsuit threats). 250,000 farmers in India (mostly Bt cotton) have committed suicide because of GM crop failures and input costs. And Roundup's glyphosate wipes out soil bacteria, compacting soil, causing water runoff and increasing fertilizer need. This agriculture is simply not sustainable.

9. **There is no need to label GMOs -- or, "Trillions of meals, and no one has gotten sick"**
   Labeling is required in most places except North America and the UK. Without labeling, there is no way to tell what health effects GMOs have, although a great increase in food-related illnesses has tracked the increase in GMOs. Where labels are introduced, people don't buy GMOs, retailers and then wholesalers stop carrying them, and markets dry up. This is why the GMO industry has spent megabucks defeating or neutering state labeling initiatives. They are now aiming for a federal law to preempt any state labeling or regulation attempts.
   It is vital that your Congressional representatives be warned to resist this.

10. **The list goes on and on . . .**
    For an in depth look at this, with references to supporting studies, you can download the free *GMO Myths and Truths* book from

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