Monsanto advertises that biotech crops can feed the world “from a raindrop,” suggesting that GE crops are especially climate change resistant. But this greenwashing doesn’t change the reality of “agribusiness as usual”: using GE crops along with more agrochemicals, more fossil fuels and more-intensive agricultural production.

1. Biotech crops do not reduce agrochemical use

Most GE crops are designed to be tolerant of specially tailored herbicides (mostly glyphosate, known as Roundup). Farmers can spray the herbicide on their fields, killing the weeds without harming GE crops. Monsanto’s herbicide-tolerant corn, soybeans and cotton were planted on 150 million U.S. acres in 2009. Glyphosate use on these Roundup Ready crops has grown steadily: between 2001 and 2007, U.S. application of the herbicide doubled to 185 million pounds annually.

Glyphosate can pose risks to animals and the environment. A 2010 Chemical Research in Toxicology study found that glyphosate-based herbicides caused highly abnormal deformities and neurological problems in vertebrates. Another study found that glyphosate caused DNA damage to human cells even at lower exposure levels than recommended by the herbicide’s manufacturer.

2. Resistant weeds increase herbicide use

Ubiquitous Roundup application has spawned glyphosate-resistant weeds, which drives farmers to apply more toxic herbicides and to reduce conservation tilling designed to combat soil erosion, according to a 2010 National Research Council report. At least 20 weed species worldwide are resistant to glyphosate, including aggressive weeds like ragweed, pigweed and water-hemp. Even biotech company Syngenta predicts that glyphosate-resistant weeds will infest one-fourth of U.S. cropland by 2013.

Agricultural experts warn that these superweeds can lower farm yields, increase pollution and raise costs for farmers. Farmers may resort to other herbicides to combat superweeds, including 2,4-D (an Agent Orange component) and atrazine, which have associated health risks including endocrine disruption and developmental abnormalities. Moreover, as glyphosate-resistant weeds strangle cropland, farmers have returned to deep tilling for weed management, abandoning conservation practices designed to slow soil erosion.

3. No yield advantage

Biotech companies have focused on developing crops that are designed to work with the herbicides they sell, not on developing high-yield seeds. A 2009 Union of Concerned Scientists survey found that herbicide-tolerant corn and soybeans had no yield increase over non-GE crops, and that there was only a slight advantage for insect-resistant corn. A 2001 University of Nebraska study found that conventional soybeans had 5 to 10 percent higher yields than herbicide-tolerant soybeans.

A 2006 Environmental Science and Technology study found that low-input farms in developing countries had significant yield gains. A 2007 University of Michigan study found that organic farming in the developing
world had higher yield gains than conventional production and could feed the global population without increasing the amount of cultivated land.15

4. No drought protection

Biotech firms have long promised high-yield and drought-resistant GE seeds, but by mid-2012 only one variety of drought-tolerant corn was approved for U.S. planting.16 Crop research has yet to achieve the complex interactions between genes that are necessary for plants to endure environmental stressors such as drought.17 Monsanto’s approved drought-tolerant corn has overestimated yield benefits, and there is insufficient evidence that it will outperform already available conventionally bred alternatives.18

Traditional methods of breeding for stress tolerance produce crops that are more resilient to disruption and climate change than GE crops because these crops complement and thrive in nutrient-rich and biodiverse soil.19 Even if research succeeded in developing drought-tolerant crops, biotechnology companies would control any viable seeds, potentially putting new seeds out of reach for poor farmers.

5. GE crops benefit biotech companies, not farmers

Only a few chemical and pharmaceutical giants dominate the seed industry, which once relied on universities for most research.20 By 2009, nearly all (93 percent) of U.S. soybeans and four-fifths (80 percent) of U.S. corn cultivated were grown from seeds covered by Monsanto patents.21

Biotech corn seed prices increased 9 percent annually between 2002 and 2008, and soybean seed prices rose 7 percent annually.22 By 2009, Roundup Ready soybean seeds cost twice as much as conventional seeds.23 Biotech companies also zealously pursue farmers that allegedly violate their patents.24 By 2007, Monsanto had filed 112 lawsuits against U.S. farmers for patent infringement, recovering between $85.7 million and $160.6 million.25 In the developing world, patented GE seeds threaten the traditional practice of saving and sharing seeds from harvested crops to plant the next season.26

6. GE crops will not feed a hungry planet

High-priced seeds and herbicides are ill suited to farmers in the developing world. The prestigious 2009 International Assessment of Agriculture Knowledge, Science and Technology for Development (IAASTD) concluded that the high costs for seeds and chemicals, uncertain yields and the potential to undermine local food security make biotechnology a poor choice for the developing world.27

For example, Indian farmers, wooed by Monsanto’s marketing, have widely adopted GE cotton.28 Farmers take out high-interest loans to afford the GE seeds that can be twice as expensive as conventional seeds.29 Half of the pesticides in India are applied to cotton, and some farmers significantly over-apply, making themselves highly vulnerable to health problems.30 More than half of India’s farmers lack access to irrigation and are dependent on a punctual rainy season for a good crop.31 And when GE cotton crops fail, farmers are unable to repay the substantial debt. The steeper treadmill of debt with GE crops contributes to a rising number of farmer suicides — exceeding 17,000 in 2009.32

Despite biotech companies’ huge public relations campaigns, biotechnology is not solving our sustainability problems — it’s helping to create them.
To date, the United States has only approved herbicide-tolerant and insect-tolerant canola, corn, cotton and soybeans as well as virus-resistant squash and papayas. Fernandez-Cornejo, Jorge. “Rapid growth in adoption of genetically engineered crops continues in U.S.” Amber Waves, vol. 6, iss. 4. September 2008 at 6; International Service for the Acquisition of Agri-Biotech Applications, “Biotect crops poised for second wave of growth.” [Press release]. February 11, 2009; USDA. “Petitions for Nonregulated Status Granted or Pending by APHIS as of February 1, 2012.”


18 Brasher, Philip. “Monsanto to test seed that might beat drought.” Des Moines Register, May 21, 2011.

19 IAASTD, 2009 at 10.


27 IAASTD, 2009 at 10.


