TOP TWENTY GMO FAQ's – by Robert^2

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1. **What is a GMO?**
    a. It stands for Genetically Modified Organism
    b. It is generally used incorrectly because most of our food has been Genetically Modified by one breeding process or another.
    c. It is used, more specifically to describe a class of breeding called genetic engineering. In plant breeding it covers a broad series of techniques employed by plant breeders to achieve the desired breeding outcome faster, more accurately and safer that previous breeding techniques.
    d. Some of the breeding techniques encompassed by the term GMO includes RNAi technology (gene silencing) used in Arctic Apple or Transgenics which is the moving of specific genes from a donor to non-related host plant (eg Bt Corn) or Cisgenics which take genes from same genus like Innate potatoes with fungal resistance genes from wild potatoes.
    e. GMO or Genetic Engineering is possible because of the massive increase in computing power enabling scientists to isolate specific genes from genomic sequencing. In fact, plant breeding has advanced more in the past 5 years than the previous 5,000.
    f. GMO technologies are employed in many areas.
        i. If you know someone who injects insulin, they are being kept alive with this GMO product.
        ii. Hemophiliacs are kept alive with GMO technology
        iii. The vast majority of our hard cheese in North America is made with GMO produced enzymes.
2. **Are GMO's new?**
    a. Depends how you look at it. This technology is new, but we have been modifying organisms for a very long time. Carrots were not orange. Broccoli, cauliflower and Brussel sprouts all come from the same plant. Corn is not natural at all. Canola is derived from rapeseed. Dogs and cats are heavily modified as are most agricultural animals.
    b. Most people are familiar with BioTech use in medicine. GE or GMO is like edible BioTech.
    c. The technology itself has been used since the 70's with the first major crops licenced in the 90's….canola in 1996.
3. **What GMO crops are grown in Canada?**
    a. There are basically three kinds
        i. Herbicide tolerant crops like Canola, Corn, Soybeans and Sugar beets.
        ii. Bt (*Bacillus thuringensis organic bacteria*) in Corn, Soybeans which provide their own insect resistance. There might some GMO Squash grown in Canada as well.
        iii. Arctic Apple has just been approved, which, through RNAi technology resists bruising and browning after cutting, increasing shelf life.

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4. **What was the first GMO Crop?**
    a. The first commercially viable GMO crop was Papaya. Ringspot virus was destroying the papaya industry. It was a GMO Transgenic solution that has saved that industry and allowed it to be a viable part of Hawaiian agriculture.

5. **Why are GMO's important?**
    a. Canada is one of six regions in the world predicted to be able to grow more food than it consumes. This ability will be critical to helping feed the people of tomorrow.
    b. We cannot feed the people of tomorrow with the technology of yesterday.
    c. GMO's are just one part of the advancements in farming. Together with GPS, precision ag technology, water conservation such as zero tillage, GMO technology is helping farmers in countries like Canada, the US, Argentina, Brazil and others feed people of the world.
6. **Why don't we label GMO?**
    a. Labelling of foods falls under Health Canada and CFIA who looks after food safety.
    b. We label food based on the ingredients.
    c. People need to understand that GMO is NOT an ingredient.
        i. It is a description for a wide variety of breeding technologies.
        ii. Each GMO crop submitted for review goes through its own rigorous testing on a case by case basis.
    d. We don't label breeding techniques.
        i. If we did, we would have to label conventional breeding, hybridization, mutagenesis (breeding new plants by subjecting seeds to nuclear radiation or chemical submersion).
        ii. Most foods would have several breeding methods listed which would confuse the consumer.
        iii. We have not labelled these breeding processes because the science community has deemed them safe, as they have done for GMO technology.
        iv. If these other techniques, that involve the random manipulation of tens of thousands of genes are safe…and are not required to be labelled, then why target the processes associated with Genetic Engineering?
7. **Why doesn't the EU allow GMO's?**
    a. Actually they do. Without feed from GMO soymeal and corn grown in North and South America the EU livestock industry would collapse.
    b. Additionally the EU is going through a change in their GMO policy and individual countries like Netherlands, Denmark, Spain and UK are embracing the need for GMO while other countries (Scotland) are not. Much of this posturing is capitulation to special interest or activist groups such as Greenpeace or Sierra Club or is a non-tariff trade barrier (France, Germany) and is not grounded in science.
    c. European science agrees with North American science on safety of food derived from GE crops
    d. In fact a major independent study in Italy concluded that GMO's are safe. The findings of the study pointed out the flawed logic of EU policy regarding GMO.

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8. **Are GMO's Safe?**
    a. Over 1,700 independent studies have been performed on GMO technology. The consensus of over 88% of scientists is that GMO's are safe. This is a higher consensus than those who agree on climate change at 86%.
    b. We have been consuming food from GM crops for over 20 years. There has NOT been one documented case of human harm from consuming GMO derived food.
9. **Do we know GMO's are safe for the long term?**
    a. The consensus is GMO's are safe.
    b. In science you cannot prove a negative. In science this is called the precautionary principle. Are your cell phones safe? Is driving safe? You can never prove something is safe.
    c. GMO's are the most studied foods in human history. Their record is unblemished.
    d. There is no scientifically defensible hypothesis why food from GE crops represents a unique risk.
10. **Are farmers forced to buy their seeds from Monsanto?**
    a. NO, there are plenty of choices for farmers to purchase both GMO and non-GMO Seeds.
    b. In North America, Monsanto have sued 144 farmers (out of millions of customers) for breach of contract. Of these only about a dozen have gone to court. In court, Monsanto has never lost and when they win, they donate the proceeds to local charities.
    c. The name Monsanto is not interchangeable with GMO and they are one of many players.
11. **Are GMO's causing chemical use to go up?**
    a. NO, in fact, GMO technology has reduced both the toxicity load of herbicides and insecticides applied to the land.
12. **What are some of the benefits of GMO**
    a. In Canada since we have begun growing GMO (HT) Canola in 1996
        i. 53% reduction in herbicide use
        ii. 55% reduction in producer exposure
        iii. 1.3 Million Kg reduction in active ingredient (AI)
        iv. Environmental Impact/Ha '95 – '06 down 37%
        v. Yields up from 21 bu/ac to 41 bu/ac (2012)
        vi. Reduction in soil erosion 66%
        vii. Reduction in Greenhouse Gas 26%
        viii. Contribution to Canadian Economy >$19B
    b. In Ontario, while the land seeded to corn has remained relatively flat there has been
        i. A 63% increase in yield since GMO corn
        ii. A reduction in total herbicides used to grow corn.
    c. GMO technology has allowed farmers to use safer, more reliable, and more specific, less toxic products to control pests.

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13. I heard that farmers douse their crops with chemicals because of GMO?

a. This is simply a distortion. Why would farmers spend any more money on crop protection products than necessary?
b. Farmers and custom sprayers are certified and trained to apply these products safely and in accordance with specific label instructions.
c. For example glyphosate (the active ingredient in Round Up) is applied typically at or below the rate of 545 gms per acre. That is like taking 545 grams and spreading it over an area the approximate size of a football field.

14. I heard glyphosate is toxic?

a. It has a toxicity rating (LD50) that is safer than caffeine, salt, aspirin or nicotine. If coffee were a pesticide it would not receive registration in Canada today because it is too toxic.
b. Glyphosate has been recently classified by IARC of WHO as a "possible" carcinogen. So have cell phones. This ruling on glyphosate will likely be challenged as it one of the most studied agrochemicals in the world with the vast majority of science organizations classifying it as safe.

15. What about weed resistance or super weeds?

a. This is not a GMO issue.
b. There are no "super weeds" although weeds can become resistant to herbicides. This is more common in non-GMO herbicides. There are far more weeds resistant to non-GMO herbicides.
c. Herbicide resistance is an important issue. Farmer need to rotate chemistries they use in the field otherwise they will lose the use of certain products.
d. We have some weeds that are becoming resistant to products used in GMO production. Scientists are working on new solutions with farmers and industry.
e. This is happening in UK where they do not yet have GMO crops yet herbicide resistance Black Grass is so wide spread, the wheat yields in UK are being compromised.

16. What about Bees?

a. Bees are not a GMO issue.
b. In fact the use of Bt GMO tech in corn and soybeans is significantly reducing farmer's use of harsh broad spectrum insecticides that would harm bees.
c. There have been some questions surrounding the use of seed treatments and bee population however there are no confirmed conclusions.
d. In fact the bee populations in North America including Canada are near a 20 year high.

17. What about Monarch Butterflies?

a. Farmers get paid to grow crops, not Milk Weed. As they have cleaned up their land, there is less milk weed. This would have happened with or without GMO's.
b. We need to look at increasing Monarch host plants in their migration paths. This can be done in non-crop land areas.

18. What if we just promote organic production that doesn't use pesticides?

a. Organic farmers DO spray on pesticides
b. Bt – the compound inside GMO Bt Corn and Soybeans IS an organic insecticide sprayed several times on organic crops.
c. There are all kinds of organic pesticides such as Bt, pyrethrin and rotenone that are used in organic farming.

d. There is no proof that organic food is safer, healthier or more sustainable. It is a brand and a marketing tool indicative of a philosophy of farming that some are prepared to pay 30-300% more to support.

19. What is the future of GMO's

a. The citrus industry in North America is dying one tree at a time as the citrus greening bateria kills the groves in Florida and now California. There is no cure. They are working on a GMO cure.
b. Chemicals used in the strawberry industry are being discontinued this fall. Without a GMO solution, production of strawberries will decline.
c. As we experience climate change, growing conditions will change. GMO solutions are being worked on for saline resistance and drought tolerance.
d. There will be many more breakthroughs in nutrient enhancement such as Golden Rice which is fortified with Beta Carotene.

20. Why all the pressure against GMO's.

a. Special interest and activist groups.
b. You cannot sell memberships and raise money without fear….think bees, butterflies and GMO's.
c. It is much easier to sell fear than science…science is hard…you have to think.
d. It is much easier to sell higher priced specialty foods (think non-gluten) or organic foods if you make the population scared of how food is produced. It is easy to sell fear.
e. The Academic Review on the Organic Industry estimates there is $2.5 Billion annually distributed through over 300 disparate groups whose mission is to discredit agriculture and GMO science specifically creating fear to drive a higher priced food agenda.
f. Monsanto talks positively about GMO to its customers…farmers (1% of the pop) and has 66,000 followers on Twitter.
g. Whole Foods talks negatively about GMO to its customers (the other 99%) and has over 4,400,000 million followers on Twitter – and sells organic water for $6.00 per bottle.
h. In Canada, a 16 year old Anti-GMO activist, is trying to make a name for herself by demanding labelling for GMO in Canada and appears to be providing guidance to the Federal New Democrat Party. Her Mother and Grandparents own an organic food company, her father is CEO of the same company. I have asked her to visit farms with me…so far … crickets.

Farmers represent less than 1.5% of the population in North America. Many of these farmers rely on GE technology to make their farmers efficient, profitable and sustainable. Most of these farmers are busy growing crops and raising livestock to feed people; they don't have time to spend on social media fighting Non-Science. This is why we produced this fact sheet…we hope is has been of use to you.

Sincerely,

Robert Saik, PAg, CAC

Robert Wager