A 1.4 BILLION POUNDS LESS ACACTIVE INGREDIENT OF INSECTICIDE HAS BEEN USED IN THE UNITED STATES BECAUSE OF GM CROPS BETWEEN 1996 AND 2016...

Approximately 1.4 billion pounds less active ingredient of insecticide has been used in the United States because of GM crops between 1996 and 2016. As the examples above indicate, Genetically Modified Organisms (GMOs) are being used in agriculture to improve the lives of millions of people, and the future promises even more improvements in food security and nutritional safety.

BACKGROUND ON GMO ANSWERS
GMO Answers (www.GMOAnswers.com) was created to do a better job answering questions—no matter what they are—about GMOs. The biotech industry stands 100 percent behind the health and safety of the GM crops on the market today, but we acknowledge that we haven’t done the best job communicating about them—what they are, how they are made, what the safety data says. The Council for Biotechnology Information (CBI) and developers of biotech seeds, along with our farmer and agriculture partners who are aligned with GMO Answers are dedicated to helping support growers and organizations along the food value chain as they discuss GMOs with their members and stakeholders.

GMO Answers is funded by the members of The Council for Biotechnology Information, which includes Bayer, Corteva and Syngenta. Our members are dedicated to the responsible development and application of plant biotechnology.

Sources:
1. Farm Flavor: Know Your Agriculture. Retrieved from
2. International Service for the Acquisition of Agri-Biotech Applications. Retrieved from

FIVE CORE PRINCIPLES:
1. Respecting people around the world and their right to choose healthy food products that are best for themselves and their families
2. Providing and answering questions on all GMO topics
3. Making GMO information, research and data easily to access and supporting validity of GMO research including showing independent safety testing of our products through validated, peer-reviewed methods.
4. Supporting farmers as they work to grow crops using various resource more efficiently, with less impact on the environment and producing healthier foods.
5. Respecting farmers’ rights to choose the seeds that are best for their farms, businesses and communities and providing seed choices that include non-GM seeds based on market demand.

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WHAT ARE GMOS?
Biotechnology in plant agriculture has come to mean the process of intentionally making a copy of a gene for a desired trait from one plant or organism and using it in another plant. The result is a GMO (genetically modified organism).

WHY DO FARMERS USE GMOS?
Farmers choose seeds based on what is best for their farms, market demand and local growing environments. Farmers select GMOs to reduce yield loss or crop damage – by applying pesticides in more targeted ways, for example. Farmers have also used genetic modification to save crops – such as papayas from Hawaiian – that were being threatened by a disease.

THERE ARE CURRENTLY 10 CROPS COMMERCIALY AVAILABLE FROM GMO SEEDS IN THE US:

<table>
<thead>
<tr>
<th>CROP</th>
<th>GENETIC TRAITS</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIELD CORN</td>
<td>Genetic Traits: Drought Tolerance, Insect Resistance, Herbicide Tolerance</td>
<td>- Livestock and poultry feed - Starch - Corn oil - Cereal and other food ingredients - Alcohol - Industrial uses</td>
</tr>
<tr>
<td>SOYBEAN</td>
<td>Genetic Traits: Herbicide Tolerance, Increased yields, Protein, credits to the soil</td>
<td>- Livestock feed - Processing - Nutritional value, printing ink, adhesives, building materials</td>
</tr>
<tr>
<td>SUGAR BEET</td>
<td>Genetic Traits: Herbicide Tolerance</td>
<td>- Sugar - Animal feed</td>
</tr>
<tr>
<td>ALFALFA</td>
<td>Genetic Traits: Herbicide Tolerance</td>
<td>- Animal feed</td>
</tr>
<tr>
<td>PAPAYA</td>
<td>Genetic Traits: Disease Resistance</td>
<td>- Printing ink, adhesives and building materials</td>
</tr>
<tr>
<td>RAINBOW SQUASH</td>
<td>Genetic Traits: Disease Resistance</td>
<td>- Printing ink, adhesives and building materials</td>
</tr>
<tr>
<td>WILD CABBAGE</td>
<td>Genetic Traits: Disease Resistance</td>
<td>- Printing ink, adhesives and building materials</td>
</tr>
<tr>
<td>BROCCOLI</td>
<td>Genetic Traits: Disease Resistance, Reduced black spot, Reduced bruising</td>
<td>- Vegetable, animal feed</td>
</tr>
<tr>
<td>KALE</td>
<td>Genetic Traits: Disease Resistance</td>
<td>- Vegetable, animal feed</td>
</tr>
<tr>
<td>SWEET CORN</td>
<td>Genetic Traits: High-fructose corn syrup</td>
<td>- Sugar, Animal feed</td>
</tr>
</tbody>
</table>

HUMANS CREATED TODAY'S CORN CROP
Over the past century, corn has evolved with the availability of hybrid corn in the 1930s and the planting of GM crops in the mid-900s. Due to the benefits provided by resistant varieties and herbicide tolerance traits in GM corn, more and more of it has been planted. Contrary to popular belief, the development and increased usage of GM corn has not changed the physical appearance of corn.

WHAT HAS CHANGED, DUE TO MODERN PLANT BREEDING, IS THE COMPOSITION OF THE CROP.

THE HISTORIC PROCESS OF INTRODUCING GENETIC MODIFICATION IN CROPS
10,000 BC: Humans began domestication and innovation in crop breeding.
1700s: Corn plants were introduced to Europe.
1840s and 1950s: Breeders and researchers seek and develop crops to introduce genetic variation into the gene pool.
1980s: Researchers developed commercial yeast and bacteria capable of producing genetically modified plants.
1990s: The first GMOs are introduced to the marketplace.

THE EVOLUTION OF CROP IMPROVEMENT BUILDING ON GENETIC DIVERSITY
In the late 20th century, advances in technology provided us with the expanded genetic diversity of crops. For years, university, government and company scientists intensively researched and refined this process. A major result has been GM seeds that maintain or increase the yield of crops while requiring less land and fewer inputs, both of which lessen the impact on agriculture on the environment and reduce costs for farmers.

EXTENSIVELY RESEARCHED AND STUDIED
Before they reach the market, crops from GM seeds are studied extensively to ensure they are safe for people, animals and the environment. Today’s GM products are the most researched and tested agricultural products in history. Bringing a new GMO to market involves comprehensive safety and environmental reviews by regulatory authorities around the world. In addition to the review process conducted in the U.S. by the U.S. Department of Agriculture (USDA), U.S. Environmental Protection Agency (EPA) and U.S. Food and Drug Administration (FDA), other nations conduct their own rigorous certification processes and regulatory approvals.

PRECEDE OF PLANTS
When creating a GMO, researchers copy specific genetic information from one plant or organism and introduce it into another to improve or enhance a specific characteristic or trait, such as resistance to insects.

The researchers characterize very precisely what changes they are making to the plant’s genome, and how it will impact the metabolites of the plant cells. The plants are then extensively tested in the greenhouse and field, and researchers look for any differences between the GM plant and conventional plants. Plants grown in the field across a range of environments are also harvested and analyzed to determine their compositional makeup.

THE SAME AS OTHER CROPS
Biotech crops currently available on the market are the same from a compositional and nutritional standpoint as their non-GM counterparts. For example, GM corn is the same as non-GM corn. Testing has shown and FDA review has confirmed that GMOs are nutritionally the same as non-GM crops, including the same levels of key nutrients like amino acids, proteins, fibers, minerals and vitamins.

No commercially available crops in the US were created by nature alone. Every fruit, vegetable and grain that is commercially available today has been altered by human hands, including organic and heirloom seeds, for taste, yield or disease resistance.

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