

THE PROMISE OF BIOTECHNOLOGY



There are now over 17 million farmers utilizing biotechnology globally, at least 15 million of whom are small, resource-poor farmers in developing countries. Clive James, founder and chair of the International Service for the Acquisition of Agri-Biotech Applications (ISAAA) reports this significant statistic in his brief, *Global Status of Commercialized Biotech/GM Crops: 2012*.

James also shares that last year was the 17th year that biotech crops were grown commercially, with a record 420 million acres produced; yet consumer opposition is at an all time high.

In the produce industry, it's important to understand the reasons farmers are planting millions of acres and address how the industry is going to overcome consumer resistance.

THE BENEFITS

A particularly notable paper on the benefits of biotech crops, titled *GM Crops: Global Socioeconomic and Environmental Impacts 1996 to 2011*, draws from 16 years of studies conducted by UK consultants, PG Economics. Perhaps the most telling statistic of all is the \$98.2 billion in global income gains from crop biotechnology during this period. Around half of these benefits are a result of yield increases from lower pest and weed pressure and improved genetics, but the benefits extend far beyond agronomic enhancements.

Agricultural biotechnology has significantly reduced greenhouse gas emissions. According to PG Economics, in 2011 alone the use of biotech crops reduced carbon dioxide emissions by 23 billion kg; the same as removing over 10 million cars from the road for a year. Biotech crops have also reduced pesticide use by a whopping 474 million kg from 1996 to 2011.

These benefits represent just the tip of the iceberg, and many believe the greatest benefits are yet to come.

THE FUTURE

With ever-increasing technological expertise at our disposal, advancements that are incredibly precise and effective will tap into even more potential.

My work as a trained botanist, mycologist and plant pathologist has led me to an exciting project with a small agricultural biotechnology company — Okanagan Specialty Fruits (OSF). At OSF, we have developed a truly nonbrowning apple — the Arctic apple.

Using relatively simple gene-silencing techniques, the enzyme that initiates the browning reaction in apples (and many other produce items) when its flesh is exposed to air has been essentially “turned off.” As a result, the apples’ flesh stays crisp and white. This is a fairly minor change, yet it provides a benefit to every member of the supply chain,

especially consumers.

Just as the added convenience and “snackability” of baby carrots sent sales skyrocketing, these nonbrowning apples can do the same in the apple category. Fresh-cut apples are a growing category, but a product that can remove much of the associated processing costs has the potential to propel apple consumption to a new high. Apples are also one of the most often wasted foods, but non-browning apples will reduce needless waste and shrink from the orchard right through to the consumer.

There are plenty of other biotech crops that have already made their way to the produce aisle — or soon will. The USDA is reviewing Simplot’s new Innate potato that is resistant to black-spot bruising and has reduced degradation of starch and produces less acrylamide (a carcinogen) when cooked. Del Monte is also testing a new “Rosé” pineapple that has elevated lycopene content and is pink in color. Insect resistant sweet corn has been available for over a decade. And, of course,

Hawaiian papaya wouldn’t be present in the produce aisle today if it wasn’t for biotechnology.

Beyond developments like these, a number of upcoming biotech staple crops have significant life-saving potential. Researchers have been able to fortify cassava — the most important food source for half a billion people — with improved

nutritional value and tolerance to pests and disease. Scientists also have created a blight-resistant potato that can save farmers’ shares of the \$5 billion a year currently being spent fighting this disease.

Agricultural biotechnology is controversial to some, yet the fact that it’s the fastest adopted crop technology in history validates that the tangible benefits are trumping the perceived risks.

THE NEED FOR EDUCATION

Biotech crops can offer so many important benefits, and a vast wealth of evidence supports its safety. One major hurdle to address is the need for greater education on the subject. A survey from the International Food Information Council highlights that a number of studies have shown that consumers know very little about biotech crops and it is important to note that very little has been done to actively educate and engage consumers.

Agricultural biotechnology is on track to play a large part in the future. It’s a technology that can help feed our planet, which, according to the Food and Agriculture Organization of the United Nations, is expected to have over nine billion people by 2050. Biotechnology can help us fight disease, grow food in the face of drought, and help people eat healthier.

The first step to understanding agricultural biotechnology is to learn more and to obtain information from reputable sources. Once the industry has its collective arms around how biotechnology will benefit produce, we can then educate consumers. The goal for this technology is to offer consumers produce that tastes better and is better for them. There will likely come a day when produce enhanced through biotechnology will be recognized as the most environmentally sound approach to delivering fruits and veggies to consumers.

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By Jennifer Armen

With nearly 30 years of experience in the specialty crops arena, including many in the post-harvest crop protection and vegetable seed industries, Armen is well acquainted with the challenges facing the produce industry. Today she works as a strategic business and marketing consultant to the vegetable seed and grower/shipper industries.