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World Status of Biotech/GM Crops II

Editor's Note: In my January 2010 SJ column, we looked at the world wide use of GM crop plants and their world-wide acceptance. Due to space limitations, we could only report a summary of world trends. These trends demonstrated that an historical milestone has been reached in the planting of biotech crops with the number of countries planting reaching over 25. In 2008, the global hectarage of biotech crops continued to grow strongly reaching 125 million hectares, up from 114.3 million hectares in 2007. This translates to an "apparent growth" of 10.7 million hectares (the sixth largest increase in 13 years) or 9.4% measured in hectares, whereas the "actual growth", measured more precisely in "trait hectares," was 22 million hectares or 15% year-on-year growth, approximately double the "apparent growth." In this month's column, we will examine in more detail the facts surrounding the rise in use of GM crops.

Measuring in "trait hectares" is similar to measuring air travel (where there is more than one passenger per plane) more accurately in "passenger miles" rather than "miles." Thus in 2008, global growth in "trait hectares" increased from 143.7 million "trait hectares" in 2007 to 166 million "trait hectares." As expected, more of the growth in the early-adopting countries is now coming from the deployment of "stacked traits" (as opposed to single traits in one variety or hybrid), as adoption rates measured in hectares reach optimal levels in the principal biotech crops of maize and cotton. For example, in 2008 an impressive 85% of the 35.3 million hectare national maize crop in the USA was biotech and remarkably, 78% of it was hybrids with either double or triple stacked traits – only 22% was occupied by hybrids with a single trait. SmartStax™ biotech maize, with eight genes for several traits, is expected to be commercialized in the USA in 2010. Similarly, biotech cotton occupies more than 90% of the national area in the USA, Australia and South Africa, with double-stacked traits occupying 75% of all biotech cotton in the USA, 81% in Australia and 19% in South Africa. It is evident that stacked traits have already become a very important feature of biotech crops, and accordingly it is important to measure growth more precisely in "trait hectares" as well as hectares.

Adoption Rates

It took 10 years before the first one billionth acre of biotech crops was planted in 2005 – however it took only three years before the second billionth acre (800 millionth hectare) was planted in 2008. It is projected that 3 billion acres will be exceeded in 2011 with over 4 billion accumulated acres (1.6 billion hectares) by 2015. In 2008, the number of countries planting biotech crops increased to 25, comprising 15 developing countries and 10 industrial countries. The top eight countries each grew more than one million hectares; in decreasing order of hectarage they were; USA (62.5 million hectares), Argentina (21.0), Brazil (15.8), India (7.6), Canada (7.6), China (3.8), Paraguay (2.7), and South Africa (1.8 million hectares). Consistent with the trend for developing countries to play an increasingly important role, it is noteworthy that India with a high 23% growth rate between 2007 and 2008 narrowly displaced Canada for the fourth ranking position globally in 2008. The remaining 17 countries which grew biotech crops in 2008 in decreasing order of hectarage were: Uruguay, Bolivia, Philippines, Australia, Mexico, Spain, Chile, Colombia, Honduras, Burkina Faso, Czech Republic, Romania, Portugal, Germany, Poland, Slovakia and Egypt. The strong growth in 2008 provides a very broad and stable foundation for future global growth of biotech crops. The growth rate between 1996 and 2008 was an unprecedented 74-fold increase making it the fastest adopted crop technology in recent history. This very high adoption rate by farmers reflects the fact that biotech crops have consistently performed well and delivered significant economic, environmental, health and social benefits to both small and large farmers in developing and industrial countries.

This high adoption rate is a strong vote of confidence from millions of farmers who have made approximately 70 million individual decisions in 25 countries over a 13-year period to consistently continue to plant higher hectarages of biotech crops, year-after-year, after gaining first-hand insight and experience with biotech crops on their own or neighbor's fields.

High re-adoption rates of close to 100% reflect farmer satisfaction with the products that offer substantial benefits ranging from more convenient and flexible crop management, to lower cost of production, higher productivity and/or higher net returns per hectare, health and social benefits, and a cleaner environment through decreased use of conventional pesticides, which collectively contributed to a more sustainable agriculture.

Adoption by crop

Biotech soybean continued to be the principal biotech crop in 2008, occupying 65.8 million hectares or 53% of global biotech area, followed by biotech maize (37.3 million hectares at 30%), biotech cotton (15.5 million hectares at 12%) and biotech canola (5.9 million hectares at 5% of the global biotech crop area).

Adoption by trait

From the genesis of commercialization in 1996 to 2008, herbicide tolerance has consistently been the dominant trait. In 2008, herbicide tolerance deployed in soybean, maize, canola, cotton and alfalfa occupied 63% or 79 million hectares of the global biotech area of 125 million hectares. For the second year running in 2008, the stacked double and triple traits occupied a larger area (26.9 million hectares, or 22% of global biotech crop area) than insect resistant varieties (19.1 million hectares) at 15%. The stacked trait products were by far the fastest growing trait group between 2007 and 2008 at 23% growth, compared with 9% for herbicide tolerance and -6% for insect resistance.

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