BIOTECH TRAITS
ANNUAL UPDATES

Biotech Traits

HERBICIDE TOLERANCE

During the 22-year period 1996-2017, herbicide tolerance (HT) has consistently been the dominant trait deployed in soybeans, maize, canola, cotton, sugar beets, and alfalfa. It is slowly declining through the years with increasing prominence of stacked traits.

HT crops were planted in 88.7 million hectares or 47% of the 189.8 million hectares of biotech crops planted globally in 2017.

In 2017, HT crops were planted in the USA (41.5 million hectares), Argentina (15.5 million hectares), Brazil (14.5 million hectares), Canada (11.6 million hectares), Bolivia (1.8 million hectares), Paraguay (1.7 million hectares), South Africa (1.1 million hectares), and less than 1 million hectares in Uruguay, Australia, Philippines, Colombia, Chile, and Honduras.

STACKED TRAITS

In 2017, stacked insect IR/HT traits deployed in soybean, maize, and cotton had the highest increase in year-on-year increment of 3% and occupied 41% of the global area.

Stacked traits increased from 75.4 million hectares in 2016 to 77.7 million hectares in 2017. The trend for increased use of stacks is expected to continue as country markets mature and more stacks are offered for farmer's use in the market such as the BolgardIII/RRFlex® cotton from Australia. Stacking is an important feature of the technology with SmartStax™ comprising eight genes coding for three traits, launched in the USA and Canada in 2010, as well as the Innate™ potato generation 2 which was approved for cultivation in 2015 in the USA and in Canada in 2016.

The deployment of stacked traits of different Bt and HT genes is becoming increasingly important and is most prevalent in the USA and Brazil. Of the 77.7 million hectares of biotech crops with stacked traits in 2017, USA and Brazil contributed 41% each.

In 2017, a total of 14 countries deployed biotech crops with stacked traits: USA (32.1 million

hectares), Brazil (32.4 million hectares), Argentina (7.6 million hectares), Canada (1.5 million hectares), South Africa (1.3 million hectares), Paraguay (1.2 million hectares), and smaller areas in the Philippines, Australia, Uruguay, Mexico, Colombia, Vietnam, Honduras, Chile, and Costa Rica.

The stacked traits for herbicide tolerance and insect resistance are deployed in cotton and soybean (IR/HT), and maize (Bt/Bt/IR, Bt/HT, and Bt/Bt/HT) but not in sugar beets, canola, and alfalfa. The Bt/Bt/IR stack refers to different Bt or other IR genes that code for different insect resistance traits, for example for maize, above ground pests and below ground pests and herbicide tolerance are all stacked in the same maize product.

INSECT RESISTANCE

The area planted to biotech crops with insect resistance (IR) in 2017 reached 23.3 million hectares in 2017, compared with 23.1 million hectares in 2016. IR is deployed in maize, cotton, and eggplant. IR crops were planted in India (11.4 million hectares), Brazil (3.4 million hectares), Pakistan (3.0 million hectares), China (2.8 million hectares), USA (1.3 million hectares), and less than 1 million hectares grown in Argentina, South Africa, Myanmar, Sudan, Spain, Paraguay, Canada, Portugal, and Bangladesh.

BENEFITS FROM BIOTECH TRAITS

The distribution of economic benefits at the farm level by trait for 21 years of commercialization of biotech crops 1996 to 2016, were as follows: all HT crops at US$89.02 billion and all IR crops at US$97.4 billion, with the balance of US$0.4 billion for other minor biotech crops for a total of US$186.1 billion.

For 2016 alone, the economic benefits were: all HT crops US$8.44 billion, and all IR crops US$9.73 billion plus a balance of US$0.03 billion for the minor biotech crops for a total of ~US$18.2 billion (Brookes and Barfoot, 2018).

SOURCE

ISAAA. 2017. Global Status of Commercialized Biotech/GM Crops in 2017: Biotech Crop Adoption Surges as Economic Benefits Accumulate in 22 Years. *ISAAA Brief* No. 53. ISAAA: Ithaca, New York.

For more information, contact:

ISAAA *SEAsia*Center
GS Khush Hall, IRRI
Los Baños, Laguna 4031 Philippines
Telefax: +63 49 5367216
Email: knowledge.center@isaaa.org

www.isaaa.org