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Sustainable, profitable and productive agriculture continues to be boosted by the contribution of biotech crops[1]

The latest annual update report of global biotech crop impacts shows the technology continues to provide important economic and environmental benefits and is making positive contributions to global food production and food security

Biotech crop adoption continues to contribute to reducing the release of greenhouse gas emissions from agriculture, decreasing pesticide spraying and significantly boosting farmers' incomes, especially in developing countries" said Graham Brookes, director of PG Economics, co-author of the report. "The technology has also made important contributions to increasing crop yields, reducing risks, improving productivity and raising global production of key crops"

Previewing the findings of the study, the key findings are:

- Biotech crops have contributed to significantly reducing the release of greenhouse gas emissions from agricultural practices. This results from less fuel use and additional soil carbon storage from reduced tillage with biotech crops. In 2009, this was equivalent to removing 17.7 billion kg of carbon dioxide from the atmosphere or equal to removing 7.8 million cars from the road for one year;

- Biotech crops have reduced pesticide spraying (1996-2009) by 393 million kg (-8.7%) and as a result decreased the environmental impact associated with herbicide and insecticide use on the area planted to biotech crops by 17.1%;

- Herbicide tolerant biotech crops have facilitated the adoption of no/reduced tillage production systems in many regions, especially South America. This has made important contributions to reducing soil erosion and improving soil moisture levels;

- There have been substantial net economic benefits at the farm level amounting to $10.8 billion in 2009 and $64.7 billion for the fourteen year period. The farm income gain in 2009 is equivalent to adding 4.1% to the value of global production of the four main biotech crops of soybeans, corn, canola and cotton;

[1] Report available to download at www.pgeconomics.co.uk. Shorter versions will also soon be available from the peer review journals the International Journal of Biotechnology (on the economic impacts) at www.inderscience.com and GM Crops.2:1 January-March 2011 (on the environmental impacts) at www.landesbioscience.com/journal/gmcrops

- Of the total farm income benefit, 57% ($36.6 billion) has been due to yield gains, with the balance arising from reductions in the cost of production. Two thirds of the yield gain derive from adoption of insect resistant crops and the balance from herbicide tolerant crops;

- The share of the farm income gains, both in 2009 and cumulatively (1996-2009), has been about 50% each for farmers in developing and developed countries;

- The cost farmers paid for accessing GM technology in 2009 was equal to 30% of the total technology gains (a total of $15.3 billion inclusive of farm income gains ($10.8 billion) plus cost of the technology payable to the seed supply chain ($4.5 billion[2]));

- For farmers in developing countries the total cost of accessing the technology in 2009 was equal to 18% of total technology gains, whilst for farmers in developed countries the cost was 39% of the total technology gains. Whilst circumstances vary between countries, the higher share of total technology gains accounted for by farm income gains in developing countries relative to the farm income share in developed countries reflects factors such as weaker provision and enforcement of intellectual property rights coupled with higher average levels of benefits in developing countries;

- Since 1996, biotech traits have added 83.5 million tonnes and 130.5 million tonnes respectively to global production of soybeans and corn. The technology has also contributed an extra 10.5 million tonnes of cotton lint and 5.5 million tonnes of canola;

- If GM technology had not been available to the (14 million) farmers using the technology in 2009, maintaining global production levels at the 2009 levels would have required additional plantings of 3.8 million ha of soybeans, 5.6 million ha of corn, 2.6 million ha of cotton and 0.3 million ha of canola. This total area requirement is equivalent to about 7% of the arable land in the US, or 24% of the arable land in Brazil.

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[2] The cost of the technology accrues to the seed supply chain including sellers of seed to farmers, seed multipliers, plant breeders, distributors and the GM technology providers