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New paper highlights substantial environmental and economic losses that would arise if restrictions on glyphosate use resulted in glyphosate-tolerant crops no longer being grown

A new paper published in the journal *GM Crops and Food*¹ points to significant increases in carbon emissions and a worse environmental impact associated with weed control practices, if farmers around the world stopped planting glyphosate-tolerant crops. Decreased production of important agricultural commodities, higher prices and lower farm incomes are also expected.

The peer reviewed paper written by Graham Brookes of PG Economics Ltd and Farzad Taheripour and Wally Tyner of Purdue University identifies two main 'rounds' of impact:

Loss of 'first round' benefits associated with the adoption of GM herbicide tolerant (to glyphosate) crops

- An annual loss of global farm income of \$6.76 billion
- Lower levels of global soybean, corn and rapeseed/canola production equal to 18.6 million tonnes, 3.1 million tonnes and 1.44 million tonnes respectively
- An annual environmental loss associated with a net increase in the use of herbicides of 8.2 million kg of herbicide active ingredient (+1.7%), and a larger net negative environmental impact, as measured by the environmental impact quotient (EIQ²) indicator of 12.4%
- Additional carbon emissions arising from increased fuel usage and decreased soil carbon sequestration, equal to the equivalent of adding 11.77 million cars to the roads

Wider global welfare 'second round' impacts arising from land use changes

- Global production of soybeans and rapeseed/canola falling by 3.7% and 0.7% respectively, partially offset by increases in production of other oilseeds (notably palm oil)
- World prices of all grains, oilseeds and sugar are expected to rise, especially soybeans (+5.4%) and rapeseed/canola (+2%)
- Global welfare falling by \$7,408 million per year
- Land use changes will arise, with an additional cropping area of 762,000 hectares, including 167,000 hectares of deforestation
- These land use changes are likely to induce the generation of an additional 234,000 million kg of carbon dioxide emissions

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¹ <http://www.tandfonline.com/doi/full/10.1080/21645698.2017.1390637>

² Kovach J et al^{all}