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New World Map of Genetically Modified Organism (GMO) Agriculture: North and South America = 85%

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Most (85%) of the global genetically modified organism (GMO) agriculture is accounted for by just four countries in North and South America. The 'big four' of the GM world are USA (with 40% of the global GMO hectares), followed by Brazil (26%), Argentina (12%), and Canada (7%) (Fig.1).

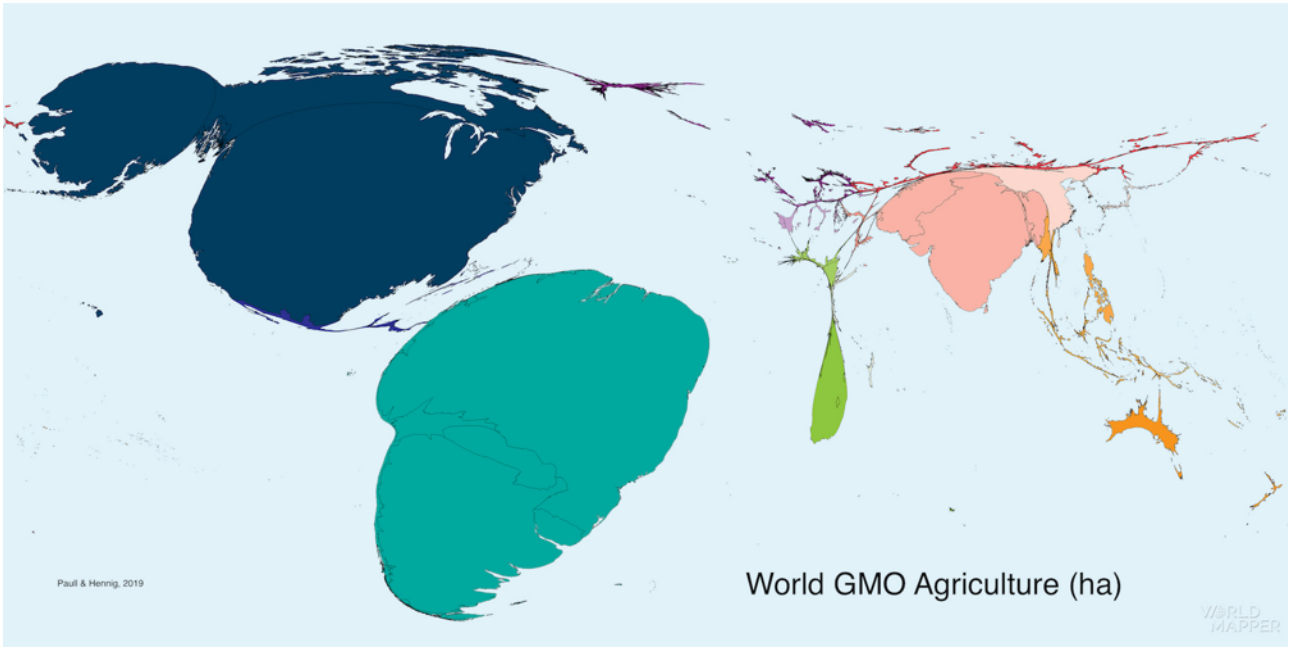

Figure 1. World map of GMO agriculture hectares (density equalising cartogram).

The latest global figures report that the world total of GMO agriculture is 189.8 million hectares from a total of 24 countries (ISAAA, 2018). The number of countries planting GMOs peaked in 2010, at 29 countries (ISAAA, 2010), and has been progressively declining year by year since then. Most countries (88%) have no GMO hectares.

Australia is just a vestigial presence on the map of World GMO Agriculture. Of the global total hectares of GMO agriculture, Australia accounts for 774,000 hectares, comprising 492,000 ha of GM canola and 282,000 ha of GM cotton (ABCA, 2019; Cotton Australia, 2019). Australia's share of global GMO hectares is 0.4%, and is declining. Australia's GMO agriculture accounts for 0.2% of Australia's total agriculture hectares (ABS, 2018).

The map of World GMO Agriculture is dominated by North and South America. Asia has a modest presence, led by India (cotton), Pakistan (cotton) and China (cotton, papaya). Africa has a diminutive presence led by South Africa (corn, soy, cotton).

Just four GMO crops account for almost all (more than 99%) of GMO agriculture hectares. The 'big four' of GM crops are: GM soy (50%), GM corn (31%, GM cotton (13%), and GM canola (5%). Most of the world's GMOs are herbicide tolerant (e.g. to glyphosate). USA leads the world with 12 GMO crops, Canada follows with six GM crops. Other countries have just three GM crops (n=5 countries), or two (n=5), or just one (n=12) (ISAAA, 2017).

Russia is a GMO-free country and has ambitions to be a lead exporter of organic produce and to reap the organic premium (RT, 2017).

In Australia, the Office of the Gene Technology Regulator (OGTR), within the Department of Health, has the role of approving the release of GMOs. There have been 167 GMO applications to the OGTR (2001-2019). The most typical determination of the OGTR is for "limited and controlled" release (n=79 applications). The most common status of applications is "surrendered" (n=97), with a lesser number "current" (n=47), and others "withdrawn" or "ceased" (OGTR, 2019).

The CSIRO has been the leading Australian-domiciled applicant (n=31 applications), followed by Australian universities (n=23). There has been a wide variety of GMOs applied for by Australian-domiciled entities, including GM wheat (n=23), GM cotton (n=21), GM barley (n=9), GM sugarcane (n=9), and GM bananas (n=5).

Australian consumers remain skeptical about GMO agriculture. The GMO enterprise in Australia, as elsewhere, lacks a social licence. In a survey (n=1,255) commissioned by the OGTR, just 10% of Australians regarded GMO agriculture as "safe" (Cormick & Mercer, 2017). Australian supermarkets are well aware of consumer sentiment and they do not stock GM products.

Consumer resistance to GMO food is a global phenomenon. This includes consumers in important Australian food export destinations. For Chinese food shoppers, 60% state that food being GM-free is important (GfK, 2017).

Technical note: The map is a density equalising map using a World Mapper algorithm (worldmapper.org). Equal areas on the map represent equal areas of GMO agriculture (see Paull & Hennig, 2016, 2018).

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