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Notes and Comments

Only "glyphosate" can stop glyphosate

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After 50 years of research on glyphosate as an herbicide, controversy over its unwanted effects does not hinder sales. Glyphosate has become the largest pesticide in use in the world, with over 800,000 tons applied annually. Questions about glyphosate causing cancer have led scientists and politicians into a battle over its ban. Between 2006 and 2015, there were 875 publications related to glyphosate poisoning (Zyoud et al., 2017).

In Brazil, the 2020/2021 grain crop will once again be a record with an estimated 271.7 million tons (Brasil, 2021). Glyphosate-tolerant soybeans are the main crop, and their planting expansion may be motivated by international policy (Fuchs et al., 2019). Being Brazil, the largest consumer of pesticides in the world, there are 118 commercial products based only on glyphosate in here (Brasil, 2020). In 2017, over 173 thousand tons of glyphosate (IBAMA, 2016) were sold in Brazil, about 20% out of the total world volume. The largest Brazilian agricultural research agency published a new scenario of glyphosate weed resistance in Brazil. The maintenance costs of crops resistant to this herbicide are high due to the increasing cases of resistance, over 400% in areas infested with two important resistant weeds: genus *Conyza* and *Digitaria insularis* (Adegas et al., 2017). The release of new pesticides in 2021 may finally make glyphosate unfeasible for transgenic crops. The cost of this transition may be the difficulty in handling the residues of these new products in the environment, both for non-target sites and for sequential susceptible crops.

Despite health or environmental impact arguments to stop or at least decrease glyphosate use (Kniss, 2017), the selection of biotypes resistant to this herbicide, due to overuse and without rotation of mechanisms of action, may be the real reason to decrease it and perhaps make its use unfeasible. The alternative would be the use of pre-emergent herbicides with residual effect (practiced in the 1980s and 1990s) or the abandonment of transgenic cultivars to glyphosate. Thus, a significant issue will be how to manage residual herbicide sprays in agriculture that depends on crop succession, with different edaphoclimatic conditions (as in Brazil) without harming the environment? The plurality of crops, precision agriculture, rotation of action mechanisms, ecological awareness, and practice of environmental services are believed to be fundamental tools for this possible post-glyphosate era.

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