**HERBICIDE TOLERANT CROPS**

**Types of Herbicide – Tolerant Crops**

**Herbicide Tolerant Crops** are the most current modification in genetically modified crops. Among the GM events, the herbicide-tolerant soybean event GTS40-3-2 has the highest approvals (52 approvals in 26 countries + EU-28). Although that facts, much countries ban their presence in their crops because of social and economic factors. Spain leads the transgenic cultivation in Europe with more than 30% of the cultivated field.

**EFSA centralizes the GMO analysis** based in the prevailing directive 2001/18/EC, that legislates the environmental release of GMO, and regulation No 1829/2003 provides rules of traceability and labelling of GMOs and the traceability of food and feed produced from GMOs. Analysis are made “case-by-case” comparing the thousands of varieties existing with the transformed ones. They consider the “Intended and Unintended effects” of the genetic modification.

There are many interests from private companies and social organizations for making that scientific approach a sweet product. Ones want to monopolize the market, others want funding pretending to ban these plants. This only leads to strong regulations hold by fear and social disapprovals.

Who have made that business so sweet?

**Figure 1:** Direct site mutagenesis of the two most used modifications in Ahas tolerant crops

**Figure 2:** A vector with AroA and Gox genes were introduced to A. Tumefacensis for plant transformation

**Figure 3:** A vector with bar or pat genes were introduced to A. Tumefacensis for plant transformation

**Figure 4:** Herbicide inhibition of essential branched amino acid

**Figure 5:** Genetically Modified Crops labeling and bans around the world

**Figure 6:** Specific method for glyphosate analysis in vivo.

**Figure 7:** A method for glyphosate recovery from water

**SUMMARY AND FUTURE GOALS:**

1. Develop herbicides less aggressive and harmful for human health and environment.
2. Continue investigating for developing new plant varieties resistant to less harmful herbicides.
3. Let world population to continue eating cultivated products although the huge population increase.
4. Fight against private companies and organizations whose aims only want to make plant biotechnology another commercial product.

**References:**


WHO, Short term and long term studies on Glyphosate, 2014.


**DATA ABOUT HERBICIDE – TOLERANT CROPS**

<table>
<thead>
<tr>
<th>Field Areas</th>
<th>Herbicide Tolerant Crops: 59%</th>
<th>Insect Resistant: 15%</th>
<th>Both Resistances: 26%</th>
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<tbody>
<tr>
<td></td>
<td>60%</td>
<td>50%</td>
<td>40%</td>
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**THE AIM OF THIS WORK IS:**

To analyze the basic techniques for obtaining Herbicide Tolerant Crops, analyzing its applications and repercussions. Also, the work wants to study the current legal perceptions about Genetically Modified Crops, companies business with seeds and makes emphasis in one big problem affecting human health: Herbicides.

**Pelicro Agronegocios**

Glifosato

*Suicida de brânquias* – *suicida de tecidos* – *suicida de células* – *suicida de vida*.

World Health Organization is warning about the harmful effects of glyphosate in human health. Recent investigations have demonstrated that ethoxylated alkylamines adjuvants can induce among others DNA damages. Tumours and pregnancy defects are now being related to the glyphosate presence.

Brazil, Colombia, France and Netherlands have been the first countries where glyphosate has been banned. Is It the end of that monopolistic commercial product?

New technologies has been developed for solve to main problems:

- The In Situ analysis persistence of glyphosate in water: The basic technique of lipophilization and mass spectrometry allows to detect glyphosate concentrations in water.
- The glyphosate recovery from water do to its solubility: A mixed system of nanofiltration membranes and pressure driven pumps leads the pilot scale process to recover a huge concentration of the glyphosate dilute.