Gene flow among transgenic and non-transgenic cultivars of soybeans

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GM in Brazil

- Some breeding enterprises developed GM cultivars
- A lot of soybean areas use GM cultivars (around 16 millions ha)
- Concentrated in the South & Central West regions of Brazil
Material & Methods

Soybean cultivars: CD 201 & CD 212 RR

Field design
Concentric rings; central area sown with non transgenic cultivar;
around central area, sown with RR cultivar
periphery, non transgenic cultivar up to 50 m
8 geographical orientations (S,W,E,N,NE,NW,SW, SE)
65 sampling points;
collected samples CD 201; 97500 seeds tested.
Laboratory evaluations:

Germination test
- Seeds in paper towel imbibed with sol. glyphosate herbicide at 0.03%.
- 30 rolls of 50 seeds
- 65 samples
- 1,500 seeds in 30 rolls
- 1,500 X 65 = 97,500 seeds
GM seedlings

- Hypocotyl well developed
- Strong secondary roots
- Primary root
NO-GM SEEDLINGS

- Absence of secondary roots
- Enlarged hypocotyl
- Reduced hypocotyl development
EASY DETECTION
Results & Discussion
What happened?

From + 97,500, just four seeds were contaminated.

Maximum distance of contamination: four meters.

How does cross-pollination occur? Hymenopterous order members.
Other considerations:

- Use of insecticides diminished insect pollination?
- Pollination not by wind (density of pollen).
- Genetic dominance by transgenic characteristic (heterozygose $A_\_)$.
- Molecular analysis must be done, like PCR.
- There is no problem of contamination, if distance is considered.
Final considerations

It is not necessary the soybean producers to worry about contamination of transgenic plants with non transgenic ones. The rate of genetic contamination of 0.027% does not appear to be concerned with.

The norms for certified seeds should be changed its geographical isolation from three to five meters of distance.
Thanks for your attention

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