

Risk assessment of new crops¹

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Any new crop introduced in the environment represents certain risk. The task of science consists in assessing the risk of a new crop before it is introduced in the praxis. Long term observations then tune the assessment. In order to compare new crops from the point of risk they bring to the environment and to human and animal health identical testing is indispensable.

This is exactly opposite to the praxis in EU. New crops developed by transgenesis are tested in very detail due to political paradigm that they bring some irrational risk not present with crops developed by other breeding techniques. Certain uncertainties resulting from detail tests of GMOs are in turn employed in support of above paradigm, as they are not observed with crops developed by other methods - simply because they are not tested in such way.

Practical measures are based on consensual acceptable (tolerable) level of risk. It is generally based on the risk/benefit ratio. Anything below such level is allowed, the items in the zone above should be restricted or prohibited. Acceptable risk of GMOs cannot be rationally defined, because EU rules are focused solely on risk and do not consider their benefit. Consequently acceptable risk is wilfully set by politicians to serve their interests.

To call such system “scientific” means deception of public. In fact risk higher than claimed for GMO is connected with radiation mutants as explained in table 1. As this risk of radiation mutants is in majority of cases below the acceptable level, the risk of GMO is far below. Thus the tough regulation on the level of toxins, explosives and narcotics has no scientific background.

¹ Příspěvek na Semináři Czech Science for the 7th Framework Programme: **Agro-Biotechnology – Risk Assessment Indispensable for the Implementation of GM Crops and the Follow-yup Research on Agriculture Sustainability**. Brussels September 26 2009.

Table 1
Risk assessment factors of crops.
Example of glyphosate tolerable GMO and radiation mutant

FACTOR	HT CROP	RADIATION MUTANT
New Genes		
Number of new/altered genes	Known	Not known
New for the environment	No ¹⁾	Yes
Localisation in the genetic map	Uncertain	Not known
Horizontal transfer	Possible	Possible
Trans-effect	Possible	Possible
New Proteins		
Number	Known	Not known
Structure	Known	Not known
Can be tested	Yes	No
New for food/feed	No ¹⁾	Yes
Probability of acting as allergen	Very improbable ¹⁾	Probable ²⁾

Explanations:

¹⁾The introduced gene to glyphosate-tolerant crops is 5-enolpyruvylshikimate-3-phosphate synthetase EPSP of bacterial type. This enzyme is present in most of soil bacteria (about 10^8 /Gm of soil). Our food contains up to 10^7 colony forming bacteria per gram. Most of them are soil bacteria. Consequently EPSP is commonly present in our food. Therefore it is very improbable to act as allergen.

²⁾Most common mutations induced by radiation are substitution or deletion of an amino acid. This may cause (a) impair of proteolytic digestion, (b) changes in glycosylation, (c) alteration of molecular shape. All these are important factors of immunity response.