



Co-existence and socio-economic aspects

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- Co-existence- concept
- General principles for the development of coexistence strategies
- Bulgarian strategic view on co-existence
- Present legal basis
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As introduction...

- ❑ 1994 – 1st commercialisation of a transgenic plant (FLAVR-SAVR tomato)
- ❑ 1995 - Bulgaria signed an agreement with EU, which paved the way of the negotiations for EU accession
- ❑ 1996- Bulgaria adopted the first legislative GMO regulation in CEE
- ❑ 2000 – Commencement of the negotiations with EU
- ❑ 2000 - Bulgaria is the first country that signed and ratified the Cartagena protocol on biosafety
- ❑ 2003 – EC recommendation on guidelines for national strategies on co-existence
- ❑ 2004 – Interministerial strategic view on co-existence for the Bulgarian agriculture
- ❑ 2005 – novel GMO Act

The concept of co-existence

- the ability of the agricultural sector to maintain different production systems (**GM crops, conventional, organic**) with the aim of providing a high degree of consumer choice
- Co-existence is not biosafety
- Co-existence has scientific, economic and policy aspects

Why co-existence?

- Today's global area of transgenic crops is **114.3 million ha** (2007) and the global value of the biotech market is projected at more than **6.9 billion USD** for 2007.
- the value of the organic market rose from 3.3 million USD to **11 million USD** (1996-2002)
- **EU** consumers: **1/3** refuse absolutely to buy any products containing GMOs, **1/3** would accept if they were convinced on their benefits, **1/3** do not have any rejection against GM products

Why co-existence?

Increase yield for Spanish maize farmers

- Yield advantage where there is insect pressure. In 2003, due to high insect pest pressure, many farmers reported an increase in yield of up to 19% in comparison between their conventional and Bt maize of the same hybrids.
- *"This year I planted half of my crop to the Bt variety and the other half to the conventional equivalent. Next year I will plant all of my crop to the Bt variety, allowing of course for an IRM (Insect Resistance Management) zone of 20%." Gonzalo Niubó (Spanish maize farmer), 2 October 2003.*
- Cost savings. Graham Brookes' study found that the additional cost (€18.5/hectare) of Bt seed is more than offset by the cost savings (between €24 and €102/hectare) on no longer needing to spray for corn borer infestation.
- Increased farmer income. Based on yield advantage and cost savings a number of studies have shown substantial farmer income benefits resulting from the use of Bt maize. Graham Brookes' study found that in areas of high insect pressure, farmers earn on average €146.5/hectare more with Bt maize than conventional maize. In another similar study, it was calculated that the average increase in earnings per hectare was €170.

<http://www.bioportfolio.com/news/btmaizeinspainfinalreport16september.pdf>

Why co-existence?

Increased yield and profits for Romanian soybean farmers

■ Reduced costs

- Across all farm sizes, the average cost saving where equivalent herbicide applications existed, has been €53 per hectare. For farms smaller than 5000 hectares; the average saving was €61.5 per hectare (equal to a reduction of variable costs of 29%), while for farms larger than 5000 hectares; the average saving was €44.4 per hectare (equal to a reduction of variable costs of 28%).

"Almost all farmers are deriving cost savings benefits from reduced herbicide use and fewer spray runs." (Graham Brookes)

■ Improved crop quality

- Soybean seed with the Roundup Ready gene has resulted in improved crops with less damage and lower levels of weed impurities in the seed. As a result, oilseed crushers have placed a price premium of between 2% and 3% per tonne on this higher quality crop.

■ Profit increase

- Taking into account the yield increase, the cost savings and the improved price for the higher crop quality, with the use of certified seed, average gross margin improvements of between €191.5 per hectare and €200.5 per hectare (between +127% and +184%) are earned by the farmer.

<http://www.bioportfolio.com/pdf/FarmlevelimpactRRsoybeansRomaniafinalreport.pdf>

The concept of co-existence, main questions

- What would be the **% of adventitious presence of GM crops in non GM crops** in a situation where GM crops are introduced and current farming practices continue without significant changes?
- If there are cases where estimations for adventitious presence are fairly above the threshold, **what are the agronomical measures** needed to meet the threshold and at **what cost**?
- who will take the **financial burden** in case of non-compliance?

Policy aspects:



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 23 July 2003

**COMMISSION RECOMMENDATION
of 23 July 2003**

on guidelines for the development of national strategies and best practices to ensure the co-existence of genetically modified crops with conventional and organic farming

Policy aspects - basic considerations:

- ❑ **No form of agriculture**, be it conventional, organic, or agriculture using GMOs, **should be excluded in the European Union**.
- ❑ The ability to maintain different agricultural production systems is a prerequisite for providing a **high degree of consumer choice**.
- ❑ The issue of co-existence addressed in this Recommendation concerns the potential economic loss and impact of the admixture of GM and non-GM crops, and the most appropriate **management measures** that can be taken to minimise admixture;
- ❑ Farm structures and farming systems, and the economic and natural conditions under which farmers in the European Union operate, are **extremely diverse**, and **efficient and cost-effective measures for co-existence vary greatly** between the different parts of the European Union.
- ❑ The European Commission considers that measures for co-existence **should be developed and implemented by the Member States**

General principles for the development of coexistence strategies:

- Transparency and stakeholder involvement
- Science-based decisions
- Building on existing segregation methods/practices
- Proportionality
- Appropriate scale
- Specificity of the measures
- Implementation of measures
- Policy instruments
- Liability rules
- Monitoring and evaluation
- Provision and exchange of information at European level
- Research and sharing of research results

Bulgarian experience:

- Development of **national policy** for the co-existence of conventional, organic and GM crops based on economical, politico-geographic, biological, social & ethical factors



**recommendations according to several groups
of economically important crops**

Governmental policy

Co-existence

Recommendations

- the **conventional agriculture** shall keep being the main production system for the staple crops like ***wheat, rye, barley, rice and almost all vegetables***;
- for the crops ***maize and potato***, some steps towards commercialization of legal **GM** varieties can be envisaged
- for ***small fruits, oil rose, tobacco and grape*** a priority should be given to the **organic farming**

Bulgarian experience:

Organic farming: current situation

- ❑ Dramatic decrease of pesticide use
- ❑ Legal framework in place
- ❑ Products: herbs, mushrooms, small fruits, honey, yogurt, milk.
- ❑ Number of organic farms- 46/ total number of farms 654 808 (excluding the dairy farms)
- ❑ Production- for external market
- ❑ Problems with certified organic seeds and plant material
- ❑ Huge investments under SAPARD programme

Strongly supportive governmental policy – interest free credits

Genetech biotechnology

- ❑ Traditions and regional leadership in plant biotechnologies
- ❑ Legal framework in place since 1996
- ❑ Deliberate releases of GM maize (42 800 ha) and potato since 1998
- ❑ 100 000 ha planted with GM soybean in Romania, approvals for feed and food in Russia
- ❑ Independent risk assessment studies
- ❑ Economical surveys: GM HT maize bring net benefit of 40% in addition to that of the conventional varieties

No governmental support for research

Governmental policy, legislative framework

former *GMO regulation*

- ❑ **1996- Regulation** on deliberate release into the environment of GM higher plants, produced by recombinant DNA technology- in compliance with EC Directive 90/220
- ❑ **1998 – Council** for biosafety of GM higher plants – coordinating and regulatory body under the Regulation. Chairman: the Minister of Agriculture and Forests; expert commissions: on Herbology, Entomology, Food safety and independent commission for Council’s activities control.
- ❑ 1999-2004 **field trials**:
- ❑ **Small scale** – GM potato, GM sunflower, GM tobacco, GM maize (1998, 2002, 2003, 2004)
- ❑ **Large scale-** GM maize (1999, 2000, 2001) – 6 000- 19 000 ha
- ❑ **The Council has not granted approval for commercialization of any GM crop**

Present GMO legislative framework in Bulgaria

- GMO Law (Directive 2001/18/EC on deliberate release and placing on the market, 90/219 EEC, amended with 98/81 on contained conditions, 1946/2003 EEC on transboundary movement)

- Ordinance on contained use of GMOs
- Ordinance on deliberate release and placing on the market

Requirement for labelling: over 0.5% of GMOs

- Ordinance on labelling of novel foods – labelling over 0.9%
- Regulation 1829/2003/EC and Regulation 1830/2003/EC – labelling over 0.9%

- Bulgarian Feed and Veterinary Control Act

Bulgarian GMO Law, enacted since June 2005 bans:

- ❑ the research that involves genetic modification with specific plant species: tobacco, vine, and oil rose;
- ❑ The deliberate release into environment and placing on the market of tobacco, vine, cotton, damask rose, wheat, and all vegetable and orchard crops
- ❑ applying GMO-based farming “if organic farming is practiced on an adjoining field”
- ❑ the deliberate release of any GMOs into the areas included in the National Ecological Network, as well as into the adjoining areas within a zone of 30 km around any such areas.

Bulgarian GMO Law,

enacted since June 2005:

- ❑ Public register on the permits for deliberate release and placing on the market and register of the area planted with GMOs;
- ❑ The GMO farmer is to inform the Ministry of Agriculture and Forestry of the location and size of the areas planted
- ❑ The obligation to respect respective isolation distances (provided in Law) is onus to the GMO grower
- ❑ The isolation distances for maize, soybean and rape are 800, 20, and 400m, respectively. In comparison, field trials with GM maize (distance of 50 m) have been performed in the period of 1998-2004 on overall 42800,5 ha in different landscape regions in Bulgaria. The adventitious presence of GMOs, if any, in the non-transgenic fields was found to be under 0.5% (Atanassov et al., 2003).

Let's talk about thresholds ...

- For adventitious presence of GMOs in conventional products
 - In EU: 0.9 %;
 - in Bulgaria: 0.5%
- 0.9% threshold for adventitious or technically unavoidable presence of GMOs in the organic products is specified; most organic farmers voluntary apply 0.1% tolerance
- The EC still sustain in adopting EU wide thresholds for adventitious presence of seeds..

Conclusions

- Co-existence of conventional and organic farming can be achieved on a certain level if adequate labeling threshold values would be implemented
 - Bulgarian GMO Act: “haste makes waste” story with respect to co-existence;
in discrepancy with the principles of:
 - Science-based approach
 - Proportionality; appropriate scale
 - Stimulating research EC policy
- Need for amendments in the Bulgarian GMO Act**
- Misperception about the EU policy on GMOs: demand for more accurate decision-making and clearer messages on EC level

To summarize...

Co-existence in EU

3 segregating production lines:

- Conventional
- Organic
- GM (over 0,9 %)

Co-existence in Bulgaria

In theory: 3 segregating production lines

- Conventional
- Organic
- GM (over 0,5 %)

On the market:

- Conventional
- Organic
- ~~• GM~~

My wish...



ABI – 20 years of research experience

EC Centre of Excellence in Plant Biotechnologies



Research on:

- Transgenic plants
- Conventional breeding
- Organic farming

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