

Framework for assessing the socio- economic impacts of Bt maize cultivation

2nd Reference Document
European GMO Socio-
Economics Bureau

29 April 2016
Advisory Group Meeting

Joint Research Centre
the European Commission's
in-house science service



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European GMO Socio-Economic Bureau (ESEB)

- Mission: organize and facilitate the exchange of technical and scientific information regarding the socio-economic implications of the cultivation and use of GMOs between Member States and European Commission.
- Technical working group: experts from Member States, managed by JRC. Started work in 2013.
- Outputs: Reference Documents containing topics and indicators along with methods to estimate impact of GM crop cultivation in all sectors of the EU economy/society.

Reference Documents

1. General framework (July 2015). Applicable to all GM crops that have been or might be grown in EU
2. Bt maize (expected 2016). Only GM crop grown commercially in EU

<https://ec.europa.eu/jrc/en/eseb/documents>

Procedure for Bt maize Reference Document

Step	Date
ESEB Secretariat prepares structured table of content	Dec-14
Members submit contributions to each chapter	Mar-15
ESEB Secretariat prepares 1 st draft	Jul-15
Members submit comments on 1 st draft	Aug-15
Plenary meeting to discuss 1 st draft	Sep-15
ESEB secretariat prepares 2 nd draft, final consultation with members (online)	Oct-15
ESEB secretariat prepares final draft, submit to DG SANTE	Dec-15
Consultation of Competent Authorities	Apr-16
Consultation of Stakeholders	Apr-16
Publication	

Framework for assessing the socio-economic impacts of Bt maize cultivation

Section 1: Introduction

- Bt maize mainly grown in Spain, few other Member States
- Many potential socio-economic impacts, evidence available for some

Section 2: Background

- Legislative context: Directive 2001/18/EC and 2015/412, Regulation 1829/2003
- ESEB mandate, technical working group of experts from MS
- Scope of document:
 - Impacts in the EU of cultivation in the EU
 - Methodological guidelines and data sources
 - Catalogue of topics, filtered by criteria: 1) measurable indicators 2) plausible causal impact mechanism 3) sound methods to assess the impact

Section 3: Maize in the EU

- Maize cultivation: production statistics, cultivation practices
- Plant protection: pests and control measures, Bt maize
- Maize supply chain: upstream industries, farmers, downstream industries, consumers; types of maize products (feed, food, industrial)

Section 4: Methodology for assessments 1/2

- Approach:
 - ex-ante/ex-post, assessment period, multiple scenarios
 - Separate Bt maize cultivation effect on indicators from other effects
 - Impact = (value of indicator under impact scenario with Bt maize cultivation) – (value of indicator under baseline scenario without Bt maize cultivation)
 - Adoption rates as crucial parameter to be estimated
 - Adoption along intensive and extensive margin
 - Catalogue approach: a menu of topics to choose from, no synthesis recommendations

Section 4: Methodology for assessments 2/2

- Methods and data sources:
 - Farmers: statistical techniques, farm surveys, field trials, literature, experts, modeling
 - Industries: more complex models, primary and secondary data, partial and general equilibrium models, segregation
 - Consumers: stated and revealed preferences
 - Data collection, representativeness

Section 5: Effects on crop farming

Adopters

- Adoption rates
- Typology (farm size, location etc.)
- Income effects (cost, yield etc.)
- Crop rotation, tillage and resistance management
- Input use and efficiency (land, insecticides, labour etc.)
- Coexistence management (cost of regulations, insurance and penalties)
- Time management

Non-adopters

- Typology
- Economic impact of GM cultivation (e.g. prices, pest spillovers, segregation)
- Opportunity costs of non-adoption

Section 6: Effects outside the crop farming sector

Upstream

- Innovation capacity (field trials, pipeline etc.)
- Seed industry (economic welfare, cost etc.)
- Agro-chemical industry
- Land markets

Downstream

- Exports and imports
- Segregation and IP by processors
- Feed industry (cost etc.)
- Livestock producers
- Food industry
- Biofuel/-energy industries
- Retail sector

Consumers

- Consumer choice
- Consumer prices
- Consumption patterns
- Public understanding and acceptance

Government budget

Section 7: Aggregate consumer and producer surplus

- Sum of consumer surplus and producer surplus
- Distribution among different groups (e.g. farmers, seed industry, consumers)

Section 8: Final remarks

- Second ESEB document provides framework for assessing socio-economic impacts of Bt maize cultivation
- Document contains topics, indicators, methodological guidelines and potential data sources proposed by MS
- Over 30 topics and 100 indicators identified, along with methodological recommendations
- Methodologies have been developed by scientific community for most topics/indicators
- Some evidence of impacts already exists. Evidence for most other topics very limited. Main constraint is lack of data.

Evidence on Bt maize impacts

- Evidence available on
 - Adoption, typology, income effects (insecticide use, cost, yield, gross margin), efficiency (land, other inputs)
 - Mostly Spain, few other MS
- Less evidence available on
 - Crop rotation, crop protection spillovers & opportunity costs for non-adopters, seed industry revenue, imports, animal health, consumer prices, aggregate surplus
 - Mostly Spain (and USA), few other MS

Thank you for your attention

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