



# Summary of Co-Extra results and perspectives

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# The baseline for Co-Extra work

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- Coexistence should provide farmers and consumers with freedom of choice. Traceability (analytical and documentary) is a set of tools supporting coexistence.
- Coexistence of supply chains is not a new issue, and is thus in place. Accordingly information has to be retrieved from stakeholders.
- As an EU policy support research program, Co-Extra has to pay attention to implementation issues, and to facilitate the integration of its results.





# Co-existence at the field level

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- Several biocontainment measures efficient in reducing pollen flow:
  - Several maize CMS, additional interest: e.g. in the HybridPlus system,
  - Rapeseed cleistogamy,
  - Plastid transformation.
- Maize pollen dissemination over large distances and fragmented landscape studied. Statistical models validated.
- Effect of seed admixtures and stacked genes on farms' outcomes and dispersion models.
- Protection of farms saved seeds systems, genetic resources preservation and compensation systems





# Follow up...

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- Coexistence possible if
  - conventional varieties inbred (by who?) and available,
  - high purity seeds,
  - Valorisation of all supply chains possible (e.g. labelling of animals fed or not with GMOs)
- Biocontainment measure depending on their commercial availability, disease sensitivity, limited to small surfaces for non food GMOs...
- Compliance of field outcomes with the practical contractual threshold (ca. 0.1%)
- Seeds threshold defined for field outcomes compliance, effect of DNA measurement unit on GMO content (stacked)...





# Coexistence in the Supply chains

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- European companies (except SMEs) well aware of traceability (178/02) and segregation markets.
- Using as usual the very common measure of a practical contractual threshold ca. 1/3<sup>rd</sup> to 1/10<sup>th</sup> of the 0.9% labelling threshold, more generally 0.1%. Hard IP with 0.01% containerised lots.
- Model for efficient and cost-effective segregation with 3 possible strategies using different GMO content of field outcomes.
- Documentary traceability mostly used with some initial analyses on raw material and critical point identification. Certified traced imports (IP systems).





# Supply chains coexistence

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- Supply chain coexistence depending on field coexistence and GMO final content (thus from GMO pressure).
- Coexistence viable if price differentiation.





# Supply chains coexistence

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- Companies cost-benefit analyses
  - “forgotten” positive impact
    - on prices of other regulatory frames,
    - of GM non-GM products segregation on image, consumer confidence...
  - Outline of additional costs for coexistence not sustained with the current GMO pressure. Overestimation of number and cost of analyses.
  - Thus,
    - according to companies, only additional costs to be expected for non-GM products.
    - Future prices mostly dependant on GMO pressure in the EU.
  - Consumers studies acceptance studies, compensation requests for consuming GMO...





# Traceability and controls

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- Sampling and control plan surveys, huge experimental comparisons of control plans, drastic control plans usable for less drastic needs...
- Software developed e.g. for sub-sampling optimisation, integrating a cost-function, data validation and controls...
- Assessment of measurement uncertainty from JRC-CRL inter-laboratory studies (factor 2 at a minimum), explaining with sampling associated uncertainty the practical threshold used by operators,
- Ways to assess and easily implement in accredited labs the validated methods







# Traceability and controls

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- Assessment of the overall variability of globally used modular approach, used in validation and for implementation purposes,
- Comparison of several QRT-PCR devoted chemistries and apparatus,
- Search for, and assessment of
  - Most cost-effective,
  - Shortest duration,
  - Most reliable, least sensitive to DNA quality,
  - Most sensitive detection methods





# Traceability and controls

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- Methods less sensitive to inhibitors, on field running, 100 times more sensitive, combination of DNA amplifications methods such as MDA with e.g. statistical methodologies, several multiplexing ways with e.g. microarrays, CGE
- Several inter-laboratory validations ongoing,
- First ISO 5725 inter-laboratories validation of a micro-array detecting approved GMOs and enabling results discrepancies study for detecting unapproved GMOs,
- Sub-sampling, statistical approach to detect stacked genes in GMO containing lots, but cost issue...
- Trend towards more qualitative, screening, methods, with sub-sampling strategies: mandate of CRL to be reconsidered





# Traceability and controls

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- Detecting unapproved GMOs:
  - A rationalised approach, linked to knowledge level...
  - matrix approach, dQPCR, profiling, sequencing...
  - from low cost, routinely used to high cost more sophisticated methods, to be reserved for safety issues...





# Legal aspects and governance

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- Co-Existence as a new project of techniques governance towards pluralism of technologies: to be officialised and made sustainable.
- A need to take into consideration the requests of all partners of the supply chains.
- A better share of costs along the supply chains, with an essential principle: newcomers have to support additional costs.
- With “alliance law”, “rulers law” and “ruled law”.
- The usual paradox: Need to establish a restrictive framework so as to provide freedom and mutual tolerance





# Legal issues and governance

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- Science is being questioned more and more as a basis for legal decisions, there are needs:
  - To have a clear vision of what judges need in terms of risk assessment,
  - To look at the implication of judges acting more and more as arbitrators of good scientific expertise and practices.
- European MS and third countries legal frames and practices of liability and redress surveyed:
  - Issues of overlapping systems, of interconnections with international treaties,
  - Harmonization by European legal frame and private standards
  - Important political impact on national legal frames





# Legal issues and governance

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- Several good practices in third countries, usable by MS.
- Large diversity on how to approach and implement coexistence measures.
- Candidate countries are expecting reliable exploitable models from the EU





# Communication with stakeholders

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- Dialogue with stakeholders through website, newsletters, SAB, focus groups and interviews for retrieving information and disseminating Co-Extra results (in addition to peer-reviewed papers and speeches or posters in meeting / conference)
- Focus groups held in 7 MS
  - Utmost importance of seed threshold(s)
  - Concerns about extra costs due to coexistence
  - Concerns about lack of standardized / harmonized control plans
  - Ways to manage UGM and to avoid contamination thereof
  - Legal definition of “fortuitous” presence and “technically unavoidable”





# Dialogue with stakeholders

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- Dual system not defended but flexibility requested
- Harmonisation of coexistence practices, liability and redress measures
- Farmers wish to avoid any additional administrative burden, and reluctant in front of mandatory certification or any measures to allow GM production
- Coexistence felt as economic and choice question, some perceive it more as an environmental issue







# Data integration

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- Numerous results as methods, models, raw data to be implemented and mastered in laboratories, companies... by numerous stakeholders with different knowledge levels...
- DSS should help implementation, mastering data in a cost-effective way
- Numerous modules integrated in the DIXI system by JSI in Slovenia in collaboration with several Co-Extra partners
  - Model on transport
  - Model of supply chain segregation and management
  - Module to address the need for detecting UGM in a sample
  - Several analytical modules addressing in particular the detection of UGM





# Conclusion

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- Still work on final book, movie on coexistence & traceability, some experimental parts, pre-validation and validation of DSS...
- Huge amount of results to be first digested by stakeholders
- Some issues still pending which will affect the future
- Several perspectives: discussion open, even though the ExC has already some ideas...

