

European Coexistence Bureau
Summary of conclusions
of the 2nd meeting of
the Technical Working Group for Potato

2 - 3 of May 2016,
Seville, Spain

The 2nd Meeting of the Technical Working Group for Potato (TWG Potato) of the European Coexistence Bureau (ECoB) took place on 2 and 3 of May 2016 in Seville, Spain. Experts from the following Member States (MS) and European Commission (EC) services were represented:

- Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Germany (DE), Denmark (DK), Estonia (EE), Finland (FI), Greece (GR), Hungary (HU), Ireland (IE), Liechtenstein (LI, represented by CH expert), Lithuania (LT), Netherlands (NL), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES) and United Kingdom (UK);
- Directorate General for Health and Consumers (DG SANCO) (by VC);
- Joint Research Centre (JRC), Institute for Prospective Technological Studies (IPTS);
- Joint Research Centre, Institute for Health and Consumer Protection (IHCP) (by VC).

The main topics for discussion were:

1. Development of the Best Practice Document (BPD) for coexistence in potato production on the basis of the Background Document (BD);
2. Review, analysis and conclusion of the contributions of TWG Potato for the BD for coexistence in potato production;
3. Information about analytical protocols for extraction and detection of GM presence in potato harvests and honey;
4. Review, analysis and conclusion of the TWG Potato proposals for best practices for coexistence between GM and non-GM potato;

The welcoming address of JRC-IPTS-AGRILIFE briefly reviewed the ongoing activities of ECoB and informed that the secondment of the national expert responsible for conducting the work of ECoB is going to end.

DG SANCO welcomes the participants of the 2nd meeting of TWG Potato, underlining the importance of the activities undertaken by ECoB for implementation and development of the coexistence concept in EU legislative framework for GMO and briefly summarized the steps for consultation with EU Member States and stakeholders which need to be passed of the Best Practice Document for coexistence in potato production, under development.

1. Development of the Best Practice Document (BPD) for coexistence in potato production on the basis of the Background Document (BD).

The ECoB secretariat overviewed the steps for developing the BPD for coexistence in potato production from the BD, which includes:

- Introduction of: EU legislative provision on which the BPD is based; the role of the ECoB; and scope of the BPD document;

- Revision and editing where needed of the information provided in the BD;
- Conclusion of: best practices for coexistence of GM potato cultivation with conventional and organic potato farming; cost analysis of the proposed management practices.

Based on the discussion the structure of the table of content of BPD for coexistence in potato production was agreed, as follows:

Acknowledgements

Executive summary

1. Introduction

- 1.1. Legal background*
- 1.2. The role of the European Coexistence Bureau*
- 1.3. Scope of the BPD document*

2. Potato cultivation in the EU: demand and crop production

3. Potato biology, evolution and breeding

- 3.1. Taxonomy*
- 3.2. Reproduction*

4. Review of the available information on adventitious GM presence in potato crop production

- 4.1. Seed potato impurities*
- 4.2. Potential admixing during cultivation*
 - 4.2.1. Outcrossing to wild relatives*
 - 4.2.2. Outcrossing between GM and non-GM potato*
 - 4.2.3. Seed potato mediated gene flow*
 - 4.2.4. Volunteers*
- 4.3. Extent of mechanical admixture during planting, harvesting, transportation and use as feed*
 - 4.3.1. Planting*
 - 4.3.2. Harvesting and seed tuber dispersal*
 - 4.3.3. Transportation and storage (including sorting and sizing)*
 - 4.3.4. Via use as stock feed*

5. Existing segregation systems in potato production

6. Occurrence of potato pollen in honey

7. Detection of GM events in potato crops and honey

8. Best practices for coexistence in potato production

9. Cost analysis of the management practices

10. References

The significance of the different pieces of background information and their proper structuring in order to facilitate the identification and the follow-up management of the sources for co-mingling during potato farm production were extensively analysed. During this debate, were presented also opposite opinions about different challenges that arise during cultivation of plants derived from new plant breeding techniques and existing management practices for coexistence. As main challenge was indicated the impossibility to distinguish the final products from some of the new techniques from their conventional counterparts and consequent need of additional traceability systems to be established for guaranteeing coexistence, if needed.

2. Review, analysis and conclusion of the contributions of TWG Potato for the BD for coexistence in potato production.

The ECoB secretariat presented a summary of the TWG for Potato contributions to the Background part of the Best Practice Document (First draft 22/04/2016) based on the comments received from: BE, BG, DE, DK, ES, EE, FI, FR, GR, HR, IE, LT, NL, SE, SK, UK and JRC-IHCP. Five members of TWG for Potato: DE, UK, NL, BE and SE provided overall comprehensive reading of the BD draft followed with detailed comments.

The particular comments and recommendations per chapter are as follows:

Chapter 1. Evolution and breeding of Solanum tuberosum subsp. tuberosum (potato)

Not only cis-genesis, but also other New Plant Breeding Techniques such as transcription activator-like effector nuclease (TALEN), oligonucleotide directed mutagenesis (ODM) and targeted mutagenesis by the Crispr-Cas system are being used in potato to engineer novel traits.

Chapter 2. Potato reproductive biology

In particular, should be considered: cold sensitivity of tuber; toxicity content of potato berries; fertility of berries, the role and importance of the true potato seeds for their commercial reproduction and cultivation; text editing and rephrasing of some paragraphs in order to prevent redundant information.

Chapter 3. Insect impact on cross-pollination

Recommendations for: rephrasing of paragraphs with repetitive and complimentary information; more precise definition of efficiency of pollinators; adjustment of some reference.

Chapter 4. Crosspollination

Were suggested: presentation of more detailed information about the pollinators and weather conditions for the cited studies; highlighting the impact of extended dormancy of true potato seed (TPS) on competitiveness of resulting seedlings; use of TPS for development of hybrid potatoes; more clear pointing out effects of potato stems (haulms) cutting, which take place before potatoes are harvested and potato berries are mature; reference adjustment.

Chapter 5. Potato volunteers

It was recommended: presentation of more detailed information about the region and settings of cited studies; repeatedly to be highlighted importance of volunteers from TPS and their long time survival in soil; rephrasing of paragraph for better clarity of interplay between aphids and potato volunteers.

Chapter 6. Agronomical performances of potato

It is expected: precision in naming the species of the mentioned insects.

Chapter 7. Potato production in EU and demand

In addition to already submitted, all members of TWG for Potato agreed to provide national data.

Chapter 8. Crossing with wild relatives

Precision in naming wild potato relatives.

Chapter 9. Volunteer management

It was recommended: categorization of the volunteer management practices as preventive and curative; highlighting the differences in existing crop rotation

requirements among EU countries; to be underlined that field with soil type that support survival of potato tubers should be under more intensive treatment.

Chapter 10. Machinery and process management

To be provided more clarity in wording

There followed a *tour de table* which allowed all of the participants in the meeting to: reasoned their written recommendations and remarks on the first draft of the Background Document; to present up-to-date overview of potato production in their countries – trends and scale of production; common agricultural practices; experience and existing systems for segregation for cultivation of GM potato.

3. Information about analytical protocols for extraction and detection of GM presence in potato harvests and honey

JRC-IHCP reviewed the reference methods for GM potato validated by European Union Reference Laboratory for GM food and feed (EU-RL GMFF):

- PCR event-specific method for potato EH92-527-1 (starch potato *Amflora*);
- PCR event-specific method for potato AM04-1020 (starch potato *Amadea*) – method validated but not published due to withdrawal of application.

The reference gene, which was used is UGPase (UDP-glucose pyrophosphorylase), shows suboptimal characteristics and alternative reference gene ST-LS1 was identified, but because of the lack of demand, ongoing work is frozen.

Since the cultivated potato is tetraploid the conversion of analytical results expressed in GM copy numbers per tetraploid genome equivalent into results expressed in GM mass fraction and vice versa is necessary. The particular conversion factor from numbers of copies to mass percentage is event specific. Therefore the approach followed is to link a result that has been expressed in copies to a certificated reference material (CRM) using a conversion factor, thereby providing suitable traceability to the CRM.

There is no ongoing work for GM potato pollen detection, since it is not requested.

The sampling schemes are adopted at national level and are not in the scope of EU-RL GMFF.

4. Review, analysis and conclusion of the TWG Potato proposals for best practices for coexistence between GM and non-GM potato

Before the meeting, the ECoB secretariat received 14 written proposals for best practices for coexistence between GM and non-GM potato from: BE, BG, CZ, DE, DK, FI, GR, HR, IE, LT, NL, SE, SK, and UK. The ECoB secretariat summarised these proposals and highlighted below their main elements:

- The adventitious admixture of GM potato in non-GM harvests can be efficiently managed only if the whole production chain in farm is covered. The seed production is a very important factor but is not included because this is already catered by the EU requirements to ensure varietal purity.
- Of primary importance for potato production is coexistence within-field, where GM and non-GM crops are grown in the same field over time. The coexistence field-to-field, where GM and non-GM potatoes are grown in adjacent fields at the same

time has no direct impact on the harvested crop during one cultivation cycle, since cross-pollination does not affect the harvested parts (tubers) of the potato plant.

1. The isolation distances (buffer zones) are required not only to limit cross-pollination, but also to refrain the spreading of potato volunteers because of field work, machinery utilization, and animal and bird activities. The size efficiency of the isolation distances (buffer zones) is mainly determined by existing agricultural practices and differences in flower abundance among the cultivars (with: poor, medium and rich flowering). The available information from literature and current practices shows that for limitation of the adventitious GM presence, caused by spatial dispersal of GM reproductive material: pollen (cross-pollination) and fertile potato tubers, TPS or vigour particles of them (mechanical dispersal) to 0.9%, 5 m between the fields is enough and to achieve lower thresholds (0.1%), 10 m isolation will be efficient;

2. The current practices in honey production and marketing in Europe are sufficient to ensure that adventitious presence of GM potato pollen in honey is far below the legal labelling thresholds and even below 0.1 % as was concluded in Best Practice Documents for coexistence of GM maize and honey production (Rizov, I. and Rodriguez-Cerezo, E., 2013). Therefore, there is no need for additional spatial segregation between GM potato fields and beehives in addition to what is proposed in the previous point.

3. Potato volunteer management, in a respect that the GM potato presence in the consequent crop meets a certain threshold of admixture is a main challenge for achieving coexistence among different potato production systems.

For 0.9% threshold a cultivation break of 3 years in rotation has to be applied, followed by control check of GM potato presence during the 3rd year, when this coexistence measure is newly introduced in a particular region. If the expected threshold is not achieved, this period should be followed by one more year of cultivation break succeeded by new examination of the factual GM potato presence. This step could be substituted or complemented by sprout inhibitor utilization followed by a control of the efficiency of the remedial steps. This step should be repeated till reaching or going below the 0.9% threshold. Once, the optimal crop rotation scheme, in compliance with targeted threshold of 0.9%, is identified for a particular region, there is no need for further volunteer inspection.

For a threshold of 0.1% a cultivation break of 4 years in rotation has to be applied, followed by a control check of GM potato presence during the 4th year, when this coexistence measure is newly introduced in a particular region. The optimization of crop rotation scheme shall follow the same logic for achieving of 0.9% threshold, again with the option of complementary use of sprout inhibitor.

This approach for the optimization of a crop rotation scheme is selected because cultivation break is highly dependent on climate conditions.

4. Handling and maintenance of machinery, tractability of different harvested lots (including labelling for this purposes) during harvesting, transportation and storing on farm level significantly impact possibility for coexistence.

For 0.9% threshold: separate treatment, storage and stock of GM potatoes (including potato seeds) are required; planting and harvesting machines should be properly cleaned before and after use (on the plot where GM potatoes were handled); material collected during cleaning of harvested potatoes should be properly destroyed.

For achieving of 0.1% threshold in addition to requirements for 0.9%, the machinery sharing is restricted for planting and harvesting of GM and non-GM potatoes.

5. As reference method for analysis/detection/quantification of GM potato presence including GM potato pollen in honey should be used only quantitative PCR-based approaches such as EU-RL GMFF validated methods.

Working procedure for the BPD for coexistence in potato production

After the extensive discussion on the background document and proposals for the best practices of members of TWG for Potato, the road map for finalization of BPD for coexistence in potato production was agreed.

The first draft of the BPD for coexistence in potato production will be circulated among the members of TWG Potato by the end of June. The consultation process will take place till 15th of July and if it will be needed the final consultation will be done in second half of July 2016.