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Best Practices for GMO Contamination Risk Analysis for Crops

Version 1.1, Published November 2022

Purpose

The Accredited Certifiers Association (ACA) Best Practices (BP) for Genetically Modified Organism (GMO) Contamination Risk Analysis for crops was developed as a resource for United States Department of Agriculture (USDA) National Organic Program (NOP) accredited certifiers in addressing GMO contamination and risk. There are two main parts and goals in developing this BP:

1. Support certification bodies with assessing GMO risk in US production systems.
2. Support certification bodies with resources and information for exporting USDA-certified products to other countries that may have specific tolerance or labeling requirements.

Background

The use of GMOs is prohibited under NOP regulations and is defined as “excluded methods”. Organic certification is a process-based standard, and the NOP has not established policy levels for enforcement. In absence of action levels, the presence of GMO in the seed at some level does not immediately disqualify the crop from certification. Crops grown on certified organic operations may be sold, labeled, and represented as organic even with the inadvertent presence of GMOs, provided that all organic requirements under 7 CFR Part 205 have been followed.

Risk Levels for Crops

A current list of testable high risk-crops and non-testable high-risk crops can be found on the Non-GMO Project website What are High-Risk Crops & Inputs? – The Non-GMO Project (nongmoproject.org). Please note that this is provided for informational purposes and is not a sufficient verification of GMO status.

According to the Non-GMO Project, risk is determined by testability. The standards state:

> *3.3 Testability: Inputs and Ingredients are either Testable or Non-Testable. Testable Inputs and Ingredients have a point in the supply chain where the Input or Ingredient contains sufficient intact deoxyribonucleic acid (DNA) or protein to return valid molecular or immunological test results, and acceptable molecular tests or immunological tests are publicly commercially available to cover all events for which the Project requires testing. Non-Testable Inputs and Ingredients do not have a point in the supply chain where the Input or Ingredient contains sufficient intact DNA or protein to return valid molecular or immunological test results and/or no acceptable molecular tests or immunological tests are publicly commercially available. Some organisms and their derivatives are both Testable and Non-Testable according to the above criteria.*

ACA maintains a list of high-risk and low-risk crops found here: ACA GMO Risk Level- Crops - Google Sheets. Risk is determined based on whether a specific crop is available in the United States or its production location if outside of the United States.

When should testing occur?

Certifying agents should establish and evaluate internal policies relating to frequency, reasoning, and enforcement policies for testing for excluded methods (GMO presence). However, the following is recommended as parameters for sampling:

- Compliance history;
- Suspicion of willful violation (planting GMO commodity);
- Specific observations, such as buffers, adjacent land use, Organic System Plan deficiencies, or observations on inspection;
- History of positive results; and/or
- Destination market of the commodity (and relevant threshold).

The ACA Best Practices for Developing Consistency in GMO sampling outlines considerations for sample collection and follow-up actions with the operator based on results. Certifiers should be aware of considerations outlined in this Best Practice when developing their internal procedures for sample collection, review, evaluation, and compliance.

Sources of Contamination for Crops and Seeds

The following are all potential sources of contamination with GMO material. It is important to consider all aspects of the production chain, growing conditions, and practices in determining

possible contamination sources. The bullets below outline potential contamination sources and considerations for the certification body in assessing risk and sources.

Seed Contamination

- Seed source - the seed shows detectable GMO DNA
    - Planting seed that has unavoidable contamination is not the same as deliberately using a GMO. This does not however absolve farmers and ACAs from exercising responsibility to minimize contamination from such sources. Both should perform enough diligence to monitor potential contamination, establish the source/root cause, and find better alternatives.
    - ACAs should collectively share anonymized farmer information about the incidence of contamination by crop, region, seed source, etc. - both for planted seed and harvested crops.
- Pollination (wind, insects, GMO crop proximity, etc.)

Fields and Production Practices

- Focus on crops with the highest risk.
- Take into account geography and topography (flat land, hills, adjoining land use, and physical barriers (treelines-deciduous trees vs. evergreen trees, prevalence of wind).
- For pollen drift, consider the region, topography, and weather factors; an operation may need a substantial buffer and prevention plan to prevent contamination.
    - Production practices of neighboring operations.
    - Production of cross-pollinating crops adjacent increases risk level.
    - Planting dates/maturity timeline of the crop.
    - Density of agricultural activity near certified land versus remote production.
- Production goal of commodity:
    - The purpose of the harvested commodity may increase contamination risk and measures necessary to prevent contamination.
    - Seed production increases the risk significantly because the crop must fully mature.
    - Harvest before the opportunity to cross-pollinate reduces environmental contamination risks.

Equipment

- Planters, harvest, combines, balers, augers, elevators, bins, grain dryers, rotary screen cleaners, mills, etc.
    - Shared production (organic and nonorganic)
    - Cleanout or purge processes

- Planting and processing equipment - not cleaned properly

Storage and Transportation

- Storage in containers not properly cleaned - residual contamination (including dust)
- Transportation of products without proper segregation - potential commingling during transportation.
- Take into account previous use (ex. wagons, trailers, trucks)

Documentation and diligence

- Written proof that seed is not the product of excluded methods
- There will likely not be a "perfect" solution here especially regarding the new gene-edited varieties
- Look closely and ask questions

Practices to Avoid the Unintentional Presence of GMOs:

There are many practices that producers can implement to minimize the risk of unintentional GMO contamination. The following list is not meant to be exhaustive but rather provides some baseline practices that certifiers should ensure are part of the Organic System Plan in ensuring the operation has a system in place to prevent contamination exposure.

- Testing seed sources;
- Delayed or early planting to avoid maturity or pollination overlap with GMO crops;
- Cultural measures, such as cooperative agreements with neighbors to avoid planting GMO crops adjacent to organic crops;
- Mechanical measures, such as cutting or mowing alfalfa prior to flowering, the removal of flowering component, physical barriers, etc.;
- Posting signs to notify neighboring farmers of the location of organic fields;
- Thorough cleaning or purging of farm equipment (ex. Seed planters, harvesting equipment, mills) that have been used in non-organic crop production.

Actionable Thresholds

While there are no tolerance thresholds defined for GMO contamination under the USDA NOP, certifiers can benefit from research and information in the public domain regarding when to take action or investigation based on the levels found. ACA should consider collecting data from certifiers and analyzing patterns, publishing collective data while certifiers remain anonymous, allowing for identification of patterns that can inform future best practices for prevention. The

following are actionable thresholds defined by the Non-GMO Project and could be used by certifiers as a baseline to start an investigation into contamination sources.

ACA Best Practices for Developing Consistency in GMO Sampling (page 3) *Evaluating Positive Test Results* states: *"*While any level of GMO detection requires investigation, there is no specific limit that requires a noncompliance to be issued. Standard background levels and other GMO thresholds (e.g., international thresholds or those used by the Non-GMO Project), while they may be informative, should not be used as benchmarks for compliance."

**Please note, certifiers would not accept Non-GMO Project as verification of GMO status. Resources are included here for informational purposes only.*

Non-GMO Project Action Thresholds

Category Action	**Threshold (a)**
Seed and vegetative propagation materials	0.25%
Wholesale or retail goods for human or pet use that are either ingested or topically applied including OTC drugs and homeopathic remedies	0.9%
Livestock, poultry, bee, and seafood feed and supplements, including those used for animal-derived Inputs and Ingredients to all Products	5% (b)
Wholesale or retail goods for human or pet use that are not ingested or topically applied including, but not limited to, Inputs and Ingredients to packaging, cleaning supplies, and textiles	1.5%

a. For all crops not listed in Appendix B.1.1 and Appendix C.1.1, there is no allowable presence.
b. Compliance with this Action Threshold may be based on the quarterly average of all lots tested.

Another important criterion for evaluating the adequacy of a production system relating to GMO risk is the destination market of the commodity. The following table is intended to provide

guidance for identifying the regulatory thresholds in some markets. This table is for information purposes only.

GMO Risk for International Markets

1. Establishing a consistent process for GMO risk for export markets such as Europe
2. Cotton analysis for GMO for textile production.
3. Follow-up for positive GMO samples

Resources

GMO Resources List - Google Docs

References

https://www.fas.usda.gov/data/2020-agricultural-export-yearbook
https://www.fas.usda.gov/sites/default/files/inline-files/2020-ag-export-yearbook.pdf

About ACA Best Practices

ACA Best Practices describe actions certifiers should take to verify operator compliance, as well as producer activities that can easily be approved by certifiers. The ACA strives to ensure that all Best Practices are consistent with the Organic Foods Production Act (OFPA) and the USDA Organic Regulations. These Best Practices are not legally binding, but if a producer presents plans that fall outside of these Best Practices, then the Organic System Plan (OSP) should provide a rationale for alternative methods and an explanation for how their system fulfills the applicable portion(s) of the related regulations. Certifiers will evaluate whether the differences can be justified. Similarly, if certifiers take an approach that is different from what is presented here, they should be able to articulate how the differing approach is justified according to the OFPA and the USDA Organic Regulations. The ACA recommends all accredited certifiers adopt ACA Best Practices for consistent implementation of the USDA Organic Regulations. ACA Best Practices are reviewed periodically to ensure they are accurate and up to date. Concerns with this or any ACA Best Practice or guidance document should be submitted to the ACA Coordinator.