

## A Risk-Based Approach to Pesticide Residue Testing in Organic Certification

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### **Executive Summary**

In recent months, several organic farmers and handlers have expressed concerns about the increasing burdens posed by pesticide residue testing protocols, particularly when unavoidable residual environmental contamination (UREC) is a factor. The current pesticide testing practices, combined with advanced residue detection methods, have imposed significant financial and operational challenges on farmers. This white paper recommends adopting risk-based pesticide residue sampling protocols to address the realities of environmental contamination while maintaining the integrity of the National Organic Program (NOP).

Key recommendations include establishing risk-based thresholds for pesticide residue testing and streamlining investigation procedures to ease the burden on organic farmers while ensuring compliance with NOP standards.

### **Introduction**

The USDA National Organic Program (NOP) has mandated periodic pesticide residue testing to ensure organic integrity. Since the 2013 implementation of the 5% residue testing rule, both certifiers and farmers have encountered challenges due to increasingly sensitive detection technologies that detect minute levels of pesticides, sometimes below the thresholds of regulatory concern.

This white paper explores the balance between rigorous enforcement and the practical realities of farming in regions with environmental contamination. We propose that certifiers adopt risk-based approaches to sampling and investigation procedures to ensure a fair and equitable organic certification process while maintaining the highest standards of organic integrity.

### **Background**

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Under the Organic Foods Production Act (OFPA) of 1990, **organic certification is a process-based standard**, but consumer and stakeholder expectations have increasingly demanded zero pesticide residues in organic products. The National Organic Program (NOP) has responded by implementing the following regulations:

- OFPA Section 6506(a)(6): Mandates periodic residue testing by certifying agents.
- 7 CFR § 205.2: Defines unavoidable residual environmental contamination (UREC).
- 7 CFR § 205.403: Outlines on-site inspection requirements.
- 7 CFR § 205.670: Specifies protocols for the inspection and testing of agricultural products.
- 7 CFR § 205.671: Provides for exclusion from organic sale if prohibited substances are detected.

Despite the clear regulatory framework, technological advances in pesticide detection have led to increased findings of trace residues, creating challenges for organic farmers who cannot fully control environmental contamination from neighboring lands or regional pesticide applications. However, as a participant in the Codex Committee on Food Labeling discussion to establish CODEX GL 32-1999: GUIDELINES FOR THE PRODUCTION, PROCESSING, LABELLING AND MARKETING OF ORGANICALLY PRODUCED FOOD, the U.S. agreed to the international baselines in the guidelines and is obligated to abide by these guidelines. It is clearly stated in the Forward of the document two key principles:

- “Organic agriculture practices cannot ensure that products are completely free of residues, due to general environmental pollution. However, methods are used to minimize pollution of air, soil and water.”
- “...the regulation of a process, rather than a final product demands responsible activity by all involved parties.”

## **Current Challenges**

### 1. Sampling Practices:

The 5% pesticide residue testing requirement has led to both risk-based and "drive-by" sampling by some certifiers. The latter occurs when testing is conducted without considering environmental or seasonal risks, for example, resulting in overly onerous investigations and findings with yield no actionable results. Many of these tests detect residues at levels as low as 0.01 ppm, far below thresholds that are likely to harm consumers and indicate a compromise to organic integrity.

**2. Residues Detected at Low Levels Not Approved for the Crop:** Advances in pesticide residue testing methodologies have resulted in the detection of trace amounts of substances at levels well below regulatory thresholds. In some cases, these substances are not approved for the crop being tested but are present due to unavoidable residual environmental contamination (UREC). For example, residues from pesticides applied to neighboring conventional farms or carried through atmospheric drift are increasingly detected, even in cases where farmers have taken all reasonable precautions to prevent contamination.

Such detections often trigger rigorous investigations, even though they do not indicate intentional misuse of prohibited substances. This creates a significant burden on certifiers and farmers, as they are required to prove the absence of fraud or mismanagement, despite clear evidence that the residues stem from environmental factors outside the farmer's control.

**3. Environmental Contamination:**

Environmental pesticide residues, including those considered unavoidable, are increasingly detected due to advances in testing methodologies. Farmers report that investigations following residue detections often yield no actionable results, yet the requirements of these investigations place significant operational and financial strain on farmers.

**4. Investigative Burdens:**

Farmers are often required to conduct extensive documentation and investigations following residue detections, including interviews with neighbors and consultations with agencies, all of which detract from their primary farming activities and, in many cases, provide little additional clarity on contamination sources.

**5. Certification Overreach:**

Some certification agents are effectively mandating operator-driven pesticide residue testing programs as a de facto element of fraud prevention plans. While such programs may contribute to fraud prevention mitigation, we believe mandating such actions when other mitigative measures will suffice places an unfair burden on operators.

**Comparative Approaches**

In comparison, the European Union and Canada also mandate strict pesticide residue testing but provide greater flexibility for certifiers. Their organic certification programs emphasize risk assessments and contamination context when

determining regulatory actions. This approach aligns enforcement with practical realities, ensuring that organic farmers are not unfairly penalized for environmental factors beyond their control.

**Canada Directive 14-01:** Procedure for follow-up on positive chemical residue results in organic products

- compliance regarding prohibited substances must be verified through sampling and testing by the certifying body **when there is reason to suspect the presence of a prohibited substance**; as well CFIA samples and test organic products as part of its monitoring and surveillance programs for chemical residues which are sent to the certifying bodies for follow up.
- Section 4,2 CB details actions when chemical residues are detected AA at levels between 0.01ppm and 5% of the **applicable** MRL (inclusive) or between 0.01ppm and 0.1 if no MRL is specified (inclusive), the operator investigates the source of the contamination, and the CB may follow up with an inspection and samples. If the follow up indicates that **the presence of the prohibited chemicals is not due to deliberate use**, the operator remains in compliance.
- Section 4.3 CB actions when chemical residues are determined to be above 5% of the **applicable** MRL or **above 0.1ppm if no MRL is specified**, the CB immediately initiates an investigation to determine why the chemical residues are present, inform the operator of the detection, and place the product on hold during the investigation (or if perishable, downgrade to conventional sale). If the results of the investigation indicate that the presence of prohibited chemicals are **not due to deliberate use**, the CB shall issue a non-conformity and request corrective action.

According to section 7.11.1 (b) of ISO/IEC 17065 if chemical residues are detected above 5% of an applicable MRL or above 0.1ppm if no MRL is specified, the products shall lose their organic status.

**EU Implementing Act 2021-279, Annex I:**

- competent authorities classify cases of non-compliance based on whether the precautionary measures are proportionate and appropriate, and the controls that the operator has put in place are efficient; how the non-compliance affects the integrity of the organic or in-conversion product; if the traceability system can locate the affected product in the supply chain; and the response of the operator to minor or major non-compliances. If the non-compliance is based on sampling and testing, the **level of the residue detection is the threshold allowed in food (or feed) in general**. There is a

standard chart of actions to be taken by the competent authority based on whether the non-compliance is minor, major or critical.

#### **EU Delegating Act 2021-1698:**

- defines sampling methods for residue testing and Article 12 (3) provides that “the selection of operators and groups of operators where samples have to be taken shall be **based on risk assessment** including the likelihood of non-compliance with the organic production rules, taking into account all stages of production, preparation and distribution.”

#### **Economic Impact**

The current pesticide residue testing regime places a significant financial burden on organic certifiers and producers. The costs associated with testing, documentation, and investigations—often related to UREC—are absorbed by certifiers or producers, impacting their operational budgets and ability to allocate resources effectively. This financial strain can indirectly affect farmers through certification fees or delayed certification processes, as certifiers pass some of the operational costs downstream.

**Cost of Testing for Certifiers:** The average cost for pesticide residue testing ranges from \$200 to \$500 per sample. Certifiers are required to test at least 5% of the operations they oversee, with some certifiers opting to test at a higher percentage based on risk. These testing costs can quickly escalate, particularly in areas where environmental contamination from conventional farming is prevalent. In many cases, testing leads to findings of trace residues that do not indicate intentional application or significant contamination, necessitating follow-up investigations and further expenses.

**Operational and Administrative Costs:** Certifiers also bear the costs of conducting thorough investigations following pesticide detections. These investigations require significant staff time to gather and review documentation, interview farmers and neighbors, and submit reports. The time and resources allocated to these activities reduce certifiers' ability to focus on more significant issues of organic fraud or willful non-compliance. This can create inefficiencies and divert resources from more pressing compliance concerns.

**Impact on Certification Timelines and Fees:** While the direct cost of testing is absorbed by certifiers, the financial and operational burden may indirectly affect farmers. Delays in the certification process due to lengthy investigations can prevent farmers from bringing their products to market as organic, leading to lost revenue. Furthermore, certifiers may adjust their fee structures to account for the

increasing costs of testing and compliance, ultimately raising the cost of certification for farmers.

Recommendations for Mitigating Economic Burden: By adopting risk-based sampling protocols and streamlining investigative procedures, certifiers can reduce unnecessary testing and focus their resources on higher-risk cases. Risk-based approaches will help certifiers manage their budgets more effectively, ensuring that funds are allocated to cases where genuine risks of contamination exist, while reducing unnecessary testing and investigations for low-risk operations.

### **Policy Implications**

The adoption of risk-based pesticide residue testing aligns with several existing USDA and federal policy goals, including reducing regulatory burdens on farmers while maintaining food safety and integrity standards. By making these adjustments, the USDA NOP can lead the organic sector toward a more efficient and equitable certification process.

#### **Alignment with USDA's Broader Objectives:**

The USDA has been working toward reducing unnecessary regulatory burdens on farmers under the current administration. Risk-based testing directly supports this goal by ensuring that farmers are not overburdened by compliance requirements that provide little to no additional benefit to organic integrity. Furthermore, streamlining investigative procedures for UREC is consistent with USDA's push to modernize agricultural systems, improve efficiency, and enhance farmer livelihoods.

#### **Supporting the Growth of the Organic Sector:**

As consumer demand for organic products continues to grow, it is essential to ensure that certification processes remain attainable for all farmers, especially small- and mid-sized operations. Implementing risk-based residue testing and investigation procedures will prevent over-regulation that could deter new entrants to the organic sector or push existing farmers out of the market. By maintaining a balanced approach, the USDA NOP can continue to foster the expansion of organic agriculture while preserving consumer trust.

#### **International Competitiveness:**

The proposed changes would also improve the U.S. organic sector's competitiveness on the global stage. By aligning with international standards that focus on risk-based assessments and streamlined documentation for UREC cases, U.S. organic producers will face fewer barriers when exporting to major organic markets like the European Union and Canada. Ensuring consistency in residue

testing protocols with global counterparts will reduce certification discrepancies and help U.S. farmers gain better access to international markets.

## **Recommendations**

### **A. Establish Risk-Based Thresholds for Residue Testing:**

NOP should update and revise applicable guidance directed to certifiers such that certifiers are able to adopt risk-based policies guiding the timing and frequency of residue sampling to account for unavoidable environmental residues. By doing so, certifiers can focus their efforts on genuine risks of pesticide contamination, such as cases involving nearby conventional agricultural practices or fraudulent organic claims. Risk-based thresholds will ensure that enforcement is both practical and scientifically sound.

To align with evolving industry practices and ensure effective resource allocation, we recommend that NOP Guide 2613 be amended to incorporate guidance enabling certifying agents to adopt risk-based policies for residue testing. Specifically:

#### **1. Risk-Based Residue Testing Policies:**

Certifiers must implement risk-based thresholds and procedures to guide the timing, frequency, and scope of pesticide residue testing. These policies should prioritize scenarios where the risk of contamination is elevated, such as:

- Proximity to conventional agricultural operations known to use prohibited substances.
- Supply chains with historical or documented issues of contamination.
- Operations under investigation for potential fraudulent organic claims or with prior noncompliance findings related to prohibited substances.

#### **2. Consideration of Unavoidable Residues:**

Certifiers must account for the potential for unavoidable environmental residues, such as drift from nearby operations or residual contamination in soil or water.

- Certifiers must document the basis for establishing risk-based thresholds, including scientific evidence or regional data supporting unavoidable residues.
- Testing thresholds must be consistent with established EPA tolerances, FDA action levels, and the NOP's zero-tolerance approach for the application of prohibited substances to organic crops.

### 3. **Proactive and Scientifically Sound Enforcement:**

Risk-based policies should allow certifiers to:

- Focus residue testing on high-risk crops, regions, or operators while minimizing unnecessary testing in low-risk contexts.
- Enhance the efficiency of compliance verification efforts without compromising the integrity of the organic label.

### 4. **Transparency and Accountability:**

All risk-based policies adopted by certifiers must be:

- Approved as part of the certifier's annual Organic System Plan review process.
- Documented and auditable to ensure alignment with the NOP's mission and regulatory framework.

By incorporating risk-based thresholds into residue testing policies, certifiers can more effectively target genuine risks of pesticide contamination while maintaining robust enforcement practices and adhering to the NOP's commitment to organic integrity.

**B. Define UREC and Establish Guidelines for Managing Low-Level Residues:** The USDA NOP should provide a clear and standardized definition of Unavoidable Residual Environmental Contamination (UREC), including specific guidance on how to handle cases where low-level residues of substances not approved for the tested crop are detected. These guidelines should recognize that such residues often result from environmental contamination rather than intentional misuse of prohibited substances.

Certifiers should have the option to classify these findings as UREC under certain conditions, allowing them to avoid unnecessary investigations or enforcement actions when evidence clearly indicates environmental contamination. This would ensure that resources are focused on cases with higher risks of fraud or deliberate non-compliance, reducing the burden on certifiers and maintaining fairness for farmers operating in areas subject to environmental contamination.

To provide greater clarity and fairness in responding to pesticide residue findings, we recommend the following language be incorporated into NOP Guide 2613:

#### 1. **Definition of UREC:**

Unavoidable Residual Environmental Contamination (UREC) refers to the presence of low-level residues of prohibited substances in organic products resulting from environmental contamination rather than the intentional use or application of those substances, such as the presence of minute or *de minimus* levels of substances which are deposited in soil or crops without any distinct or specific and knowable source.



## 2. **Threshold for UREC Classification:**

To determine whether a residue qualifies as UREC, certifiers should consider the following factors:

- The residue level detected is below a specified threshold that is consistent with scientific data and regulatory tolerances (e.g., EPA tolerances or other established limits).
- Evidence indicates no prohibited substance has been intentionally applied to the crop or product.
- Documentation supports the likelihood of environmental contamination as the source (e.g., proximity to conventional operations or other environmental factors).

## 3. **Guidelines for Managing UREC Findings:**

When residue levels meet the UREC criteria, certifiers may take the following actions:

- Classify the finding as UREC and document the rationale for this classification, including any supporting evidence provided by the operation.
- Notify the operation and record the finding in the certifier's compliance database for monitoring purposes.
- Avoid initiating noncompliance actions unless additional evidence suggests intentional misuse or a pattern of contamination due to inadequate preventive measures.

## 4. **Focus on Risk-Based Investigations:**

By defining UREC and providing guidelines for its classification, certifiers can allocate resources toward high-risk cases involving potential fraud or deliberate non-compliance. This approach ensures enforcement remains targeted and effective without placing undue burdens on operators exposed to unavoidable contamination.

## 5. **Transparency and Consistency:**

- The UREC criteria and procedures should be standardized across certifying agencies to ensure consistency in implementation.
- Certifiers must disclose UREC findings in their annual residue testing reports, including aggregated data to identify trends in environmental contamination.

## 6. **Guidance for Operators:**

Operators should implement preventive measures to minimize the risk of environmental contamination, such as buffer zones or improved storage practices. Certifiers may require evidence of sound and sensible measures when classifying findings as UREC.

By defining UREC and offering clear, actionable guidelines, the USDA NOP can ensure a balanced approach to residue testing that maintains organic integrity while addressing the challenges of environmental contamination.

### **C. Streamline Investigation Procedures for UREC:**

NOP should update and revise applicable guidance directed to certifiers such that certifiers are able to streamline their investigative procedures for residue detections that are clearly linked to UREC. This includes adopting de minimis principles for pesticide residues below regulatory concern and focusing investigative resources on cases where contamination presents a genuine risk to organic integrity. Simplifying these processes will reduce the burden on farmers while maintaining NOP standards.

To ensure efficient and focused enforcement of organic standards, NOP Guide 2613 should be revised to provide certifying agents with clear guidance for streamlining investigations related to Unavoidable Residual Environmental Contamination (UREC).

Specifically:

#### **1. Adopting De Minimis Principles for Low-Level Residues:**

Certifiers must classify pesticide residues below a specified de minimis threshold as not requiring further investigation, provided the following conditions are met:

- The residue level is determined to pose no risk to organic integrity, based on established scientific and regulatory thresholds (e.g., below EPA or FDA levels of concern).
- Evidence supports that the residue is a result of environmental contamination and not intentional misuse.

#### **2. Streamlined Investigative Procedures for UREC:**

For cases involving residues classified as UREC, certifiers may:

- Expedite the investigation by focusing on verifying the source of contamination (e.g., proximity to conventional operations or historical land use).
- Document the finding as UREC without requiring extensive follow-up actions when evidence indicates no intentional application of prohibited substances.
- Prioritize resources for higher-risk investigations, such as cases involving repeated contamination, lack of preventive measures, or operations with prior compliance issues.

#### **3. Simplified Reporting Requirements:**

Certifiers may adopt simplified documentation and reporting processes for

UREC findings, ensuring compliance with NOP standards while minimizing administrative burdens. Key steps include:

- Maintaining clear records of UREC classifications, including supporting evidence and rationale.
- Including UREC findings in annual residue testing reports as part of aggregate data to track trends and inform future policy updates.

**4. Focused Allocation of Resources:**

Streamlining UREC investigations allows certifiers to allocate resources effectively by focusing on cases that present genuine risks to organic integrity, such as:

- Operations with documented intentional misuse or fraud.
- Residues exceeding de minimis levels cannot be reasonably attributed to environmental contamination.

**5. Maintaining Organic Integrity While Supporting Farmers:**

- Simplified procedures for UREC ensure that farmers operating in areas prone to unavoidable contamination are not unfairly penalized.
- Certifiers should provide operators with guidance on preventive measures to minimize contamination risks and document compliance with these measures.

By incorporating streamlined investigation procedures for UREC into residue testing policies, the USDA NOP can enhance efficiency, support organic farmers, and uphold the integrity of the organic label.

**D. Clarify the Mandate of Residue Testing Programs**

NOP should clarify for certifiers the extent to which certifiers may mandate pesticide residue testing programs in support of §205.201(a)(3), either as part of or apart from fraud prevention planning.

To ensure consistent and effective implementation of pesticide residue testing, NOP Guide 2613 should include explicit guidance clarifying the authority and scope of certifiers in mandating residue testing programs under §205.201(a)(3). The following updates are recommended:

**1. Certifier Authority to Mandate Residue Testing:**

Certifiers are authorized to require pesticide residue testing as part of their oversight responsibilities, in alignment with §205.201(a)(3). This authority may be exercised in the following contexts:

- As a component of compliance verification, ensuring adherence to the operator's Organic System Plan (OSP).
- As a tool for fraud prevention, particularly in cases involving high-risk commodities, regions, or supply chains.

## **2. Residue Testing and Fraud Prevention Planning:**

Certifiers may integrate residue testing into fraud prevention plans when there is a documented risk of misrepresentation or contamination. Certifiers should:

- Identify high-risk crops, operators, or supply chains based on historical trends, market conditions, or geographic proximity to conventional operations.
- Outline specific residue testing requirements as part of the operator's OSP, with an emphasis on transparency and proactive compliance measures.

## **3. Residue Testing Independent of Fraud Prevention Plans:**

Certifiers may also mandate residue testing programs apart from formal fraud prevention planning when:

- Residue testing is necessary to verify compliance with organic production standards.
- Environmental or operational conditions indicate a heightened risk of contamination.

## **4. Operational Requirements for Certifiers:**

Certifiers implementing residue testing programs must ensure:

- Testing protocols are clearly outlined in the operator's OSP and are consistent with the NOP standards.
- Procedures are non-discriminatory, scientifically sound, and focused on mitigating risks to organic integrity.
- Operators are informed of testing requirements and provided with guidance on preventive measures to minimize the likelihood of contamination.

## **5. Transparency and Reporting:**

- Certifiers must document all residue testing requirements, results, and actions taken in response to findings.
- Annual reports should summarize residue testing activities, including the rationale for testing and any trends observed, to inform future policy updates.

## **6. Balancing Oversight and Efficiency:**

Certifiers are encouraged to balance the need for oversight with the goal of minimizing undue burdens on organic operators. Residue testing programs should prioritize:

- High-risk contexts where testing provides the greatest benefit to organic integrity.

- Clear communication with operators to ensure understanding and compliance.

By clarifying the mandate for residue testing programs, the USDA NOP can provide certifiers with the tools and guidance needed to ensure compliance, prevent fraud, and maintain the integrity of organic production systems.

### **Conclusion**

To preserve the integrity and attainability of organic certification, certifiers must balance rigorous enforcement with practical realities. By adopting risk-based thresholds and streamlining investigations for UREC-related cases, certifiers can mitigate undue pressures on organic farmers while ensuring compliance with NOP regulations. These recommendations will help maintain a sustainable, equitable organic sector and uphold the principles of the National Organic Program.