



Instruction

Laboratory Selection Criteria for Pesticide Residue Testing

Links Update: September 13, 2018

1. Purpose

This document outlines the laboratory criteria recommended by the National Organic Program (NOP) for parties conducting pesticide residue analysis of organic agricultural products under the requirements at § 205.670 of the NOP regulations.

2. Scope

These procedures apply to certifying agents, State officials representing State organic programs, and representatives of the NOP who submit samples of organically produced agricultural products for pesticide residue testing.

3. Policy

Section § 205.670 of the NOP regulations specifies the conditions under which responsible parties should conduct testing of agricultural products that will be sold, labeled, or represented as “100 percent organic,” “organic,” or “made with organic (specified ingredients or food group(s)).” To meet this requirement, these parties are responsible for obtaining analyses of samples from organic agricultural products that are capable of detecting the presence of residues in violation of the NOP regulations as specified under § 205.105 or other applicable laws as provided for at § 205.670(e). To ensure consistency in the analytical approach and quality assurance of the data by parties conducting residue testing, the NOP is issuing the following instruction for the responsible parties to establish laboratory criteria as part of meeting the residue testing requirements under § 205.670 of the NOP regulations. Furthermore, under § 205.504(b)(6) certifiers must have procedures for sampling and residue testing to ensure that proper testing is routinely followed.

4. Procedures

4.1 Current Methods of Analysis

Analytical methods capable of determining multiple pesticide residues in a single analysis have been developed in recent years. The NOP recognizes that an international harmonized method for residue testing may not be possible at this time, but that sufficient policies and procedures must be in place to ensure that false positives and false negatives are not reported. To assess the incidence of pesticide residues remaining on foods, the NOP uses monitoring data compiled by USDA Agricultural Marketing Service (AMS), Science and Technology Program and U.S. state agricultural laboratories employing slight modifications to the QuEChERS method. The QuEChERS method has been readily accepted by many pesticide residue analysts and some



modifications to the original method have been subsequently introduced to ensure efficient extraction of pH dependent compounds, to minimize degradation of susceptible compounds, expand the spectrum of matrices covered, and improve recoveries of pesticides not analyzed in the original reports.

The NOP recognizes that not all registered pesticides can be reliably determined using the QuEChERS method and that at this time no method exists which will analyze all registered pesticides efficiently. In collaboration with the USDA AMS Science and Technology Program, NOP created a “target” analyte list (NOP 2611-1) by examination of all pesticides/metabolites/environmental contaminants that have been detected in samples analyzed for the USDA Pesticide Data Program. Laboratories employed by certifying agents should attempt to analyze as many compounds on this list as possible. If certifying agents suspect a prohibited substance was used that is not included on the NOP “target” list, they should initiate sampling/testing and investigation.

4.2 Laboratory Selection Criteria

Certifying agents should consider the following when selecting a laboratory for residue analysis of their samples:

1. Laboratories should hold current accreditation to either:
 - ISO/IEC 17025:2005, *General Requirements for the Competence of Testing and Calibration Laboratories*.
 - An alternate standard approved by the NOP on a case-by-case basis. Certifying agents should contact their NOP Accreditation Manager for additional information.

A copy of the accreditation certificate should be provided to the certifying agent prior to shipping samples and should be attached to laboratory results when they are reported back to the certifying agent.

2. Laboratories should participate in an international proficiency test program. A proficiency testing program is the determination of the calibration or testing performance of a laboratory by means of inter-laboratory comparison. A copy of the proficiency test results from the most recent round of proficiency testing should be available from the laboratory together with any corrective actions taken if the laboratory has failed the proficiency test. Contact information for two international proficiency programs is provided in the references below.
3. Laboratories should be capable of screening for the “target” analyte list of pesticides included on the document NOP 2611-1, analyzing the samples using gas chromatography (GC) and/or liquid chromatography coupled to a mass spectrometer (MS) or tandem mass spectrometers (MS/MS).



4. Laboratories should provide evidence that their analytical method is appropriate for the submitted sample and that suitable validation data are available. Correspondence should be available to the certifying agent documenting that the method meets the laboratories' minimum internal quality assurance requirements.
5. Certifying agents should direct the laboratory to provide analytical results as follows:
If no residue is detected, then the result should be provided as not detected (ND). The limit of detection should be provided.

If some residue is detected below the limit of quantification (LOQ), then the result should be provided as "Trace" or "BQL" (below quantifiable level).

If residue is detected at or above the LOQ, then the result should be reported in parts per million (ppm). Parts per million (ppm) is equivalent to milligrams per kilogram (mg/kg).

4.3 Suggested Laboratory Practices

Laboratories should use a unique identifier to track the sample throughout the handling and analysis. Before homogenization, the sample may be stored at 4 degrees Celsius for up to 72 hours, if fresh, or stored at ambient temperature in the case of samples normally stored at room temperature. If a sample was previously frozen and shipped on ice packs, then it should be homogenized upon receipt at the laboratory. The entire sample as received (up to 5 pounds (~2.5 kg)) should be homogenized by the laboratory to obtain a suitable representative portion for analysis. Homogenized samples should be stored at less than -20 degrees Celsius. Violative sample homogenates should be retained (preferably stored at -80 degrees Celsius) until the contamination issue is resolved by the certifying agent.

Samples should not normally be washed or peeled (e.g. bananas, oranges). However, certain commodities may be hulled (e.g. hazelnuts, fresh soybeans), and/or pitted (e.g. mango, avocado) prior to homogenization. In some cases a sample will have to be reconstituted (frozen concentrated juices). It should be noted that U.S. EPA establishes tolerances on specific raw agricultural commodities (RACs) and feedstuffs derived from crops listed in Table 1 of the Residue Chemistry Guidance that may not apply to the submitted sample. For example, tolerances on sweet corn are established from samples of sweet corn containing kernels and cob with the husk removed. A certifying agent submitting a sample of sweet corn for residue testing might chose to have the sample tested with the kernels, cob and husk and should direct the laboratory to do so. In those cases, sample results should indicate which part of the crop was tested.

5. References

Inspection and testing of agricultural product to be sold or labeled "organic", 7 CFR, pt.205. Print.



Allowed and prohibited substances, methods, and ingredients in organic production and handling
7 CFR pt.205. Print.

United States. Department of Agriculture. Agricultural Marketing Service. *AMS Pesticide Data Program Standard Operating Procedures: SOP No: PDP QC*. Revision 1. Washington, DC: United States Department of Agriculture, 2009. Print.

United States. Environmental Protection Agency. *OCSPP Harmonized Test Guidelines Series 860 - Residue Chemistry Test Guidelines*. United States Environmental Protection Agency, Aug. 1996. Web. 21 Dec. 2010.

"ISO/IEC 17025:2005 - General requirements for the competence of testing and calibration laboratories." ISO - International Organization for Standardization. 21 Dec. 2010.

AOAC INTERNATIONAL Homepage. 21 Dec. 2010 <<http://www.aoac.org/>>.

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Quechers.com | home. 21 Dec. 2010 <<http://www.quechers.com/>>.

Approval

A handwritten signature in blue ink, appearing to read "Miles V. McEvoy".

Miles V. McEvoy
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National Organic Program