



Guidance on Use of Micronutrients in Organic Crop Production

Effective nutrient management in organic crop production relies both on long-term agronomic strategies, such as crop rotation and cover crop planning, and responses to seasonal needs, such as the use of plant and animal materials, mined substances of low or high solubility, and allowed synthetic materials (used according to any applicable restrictions). As per §205.601(j)(6), in cases of a documented soil deficiency, this may include the use of synthetic micronutrients* as a plant or soil amendment.

Micronutrients for Organic Crop Production

Nutrients are essential building blocks for crops; micronutrients are substances that are needed in small quantities for plant growth and development (e.g. boron, copper, zinc), relative to other nutrients that are needed in larger quantities (e.g. nitrogen, phosphorus, potassium). Soil organic matter and complex plant and animal materials are excellent sources of micronutrients; incorporating practices that improve soil health (e.g. use of cover crops, reduced/conservation tillage, minimizing erosion, avoiding soil compaction) is a holistic strategy to protect crops from micronutrient deficiencies.

However, specific soil types, geographic regions or crops may be deficient in some micronutrients; this could be due to several reasons, including the geology of the region, historical management practices or soil conditions limiting plant nutrient uptake. In cases where operators have a documented soil deficiency in specific micronutrients, NOP regulations allow organic operators to use approved soil or plant amendments containing synthetic micronutrients.

Allowed Micronutrients*

Allowed micronutrients include soluble boron products and sulfates, carbonates, oxides, or silicates of zinc, copper, iron, manganese, molybdenum, selenium, and cobalt. These may not be used as defoliant, herbicides, or desiccants.

Managing Compliance with Micronutrient Use

When using synthetic micronutrients as plant or soil amendments in organic crop production, a soil deficiency in each micronutrient must be documented by soil or tissue testing or other documented and verifiable method as approved by the certifying agent. Soil deficiencies are typically documented by performing a soil test for a specific micronutrient, or several micronutrients, and comparing the test results to stated desired levels for a particular crop or soil type. Records from the test performed, and of the fertility materials used, must be available for inspection; these records must be sufficient to demonstrate compliance. Please note that different labs may use different testing methods and rating systems; your test results must clearly display the needed information. If the results are unclear, additional guidance or paperwork from the lab may be needed to determine compliance. PCO may also accept alternative justification, such as sap or tissue test results. Please see the “Frequently Asked Questions” section for more information or contact your Certification Specialist for additional guidance.

Pennsylvania Certified Organic (PCO)

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Frequently Asked Questions

1. How can I determine whether a soil fertility material is restricted because it contains synthetic micronutrients?

Always contact PCO prior to using a new fertility material. PCO can confirm whether the material requires soil testing prior to use. If the label lists any of the following ingredients, the product will be restricted: Sulfates, carbonates, oxides, or silicates of zinc, copper, iron, manganese, molybdenum, selenium, and cobalt. Most fertility products containing boron will also be restricted, although non-synthetic, and therefore unrestricted, versions of boron may be available.

2. How long are soil test results considered current?

PCO considers soil test results to be valid for a period of three years. If a soil test is used as justification, it must be dated within three years of the material's application date.

3. Am I required to test soil from every field or section of my farm?

Organic operators should follow best practices for taking soil samples for testing – this includes creating a sampling plan for your farm that will provide the most accurate snapshot of the production environment. It may make sense, based on production practices or the soil types on your farm, to take samples from every field on your farm or you may take samples from representative areas that share similar properties or historical management. Cooperative extension (e.g. Penn State, Ohio State, Cornell, etc.) offers guidance on creating these sampling plans, which include how to take composite samples, how to group areas of your farm into “like” sampling areas, recommended sampling depth and avoiding sampling practices that skew the results.

4. What type of information is PCO looking for on my soil test results?

Soil test results must include a quantitative and qualitative rating for each synthetic micronutrient used for soil fertility. That is to say, there must be enough information reported, and in a clear format, for PCO to determine whether the soil micronutrient levels are at optimum/desired levels or below optimum/desired levels. In addition, PCO will be looking at the date of the results and the fields or areas that were sampled, compared to the fields or areas to which the synthetic micronutrient was applied. Additional information may be required, depending on the lab you use or if information is unclear.

5. What if my soil test results do not show a soil deficiency, but my crop exhibits signs of micronutrient deficiencies?

Several factors can affect plant uptake of nutrients, including soil pH and soil compaction. In addition, sampling errors or anomalies may produce results that are not reflective of the soil environment. It would be expected that organic operators investigate the root cause of nutrient deficiencies or sampling anomalies while responding to the immediate needs of a crop. In these situations, PCO can accept additional justification for the use of synthetic micronutrients. This includes the use of plant tissue or sap testing to document the deficiency. It may also be permissible to document the symptoms you are observing (to establish the deficiency) and obtain documentation from an independent, scientific source that supports your observation (to establish testing performed). Consult with your Certification Specialist on your plan in order to remain in compliance.

6. What are some examples of “independent, scientific” sources of justification?

Micronutrient deficiencies must be documented, and testing done in pursuit of research or education by independent, scientific sources may be acceptable justification. Some acceptable sources may include cooperative extension agents, licensed/professional agronomists, certified crop advisors and academic publications.

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