

**National Organic Standards Board
Crops Committee
Sunset Recommendation
Chlorine Materials**

March 7, 2011

Current National List Citation

§ 205.601(a) As algicide, disinfectants, and sanitizer, including irrigation system cleaning systems

- (2) Chlorine materials - Except, That, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.
 - (i) Calcium hypochlorite
 - (ii) Chlorine dioxide
 - iii) Sodium hypochlorite

Committee Summary

Chlorine is a member of the salt-forming halogen series, combines readily with many other elements, and is extracted from chlorides through oxidation often by electrolysis. With metals, it forms salts called chlorides. As the chloride ion, Cl^- , it is also the most abundant dissolved ion in ocean water. In nature, chlorine is found primarily as the chloride ion, a component of the salt that is deposited in the earth or dissolved in the oceans — about 1.9% of the mass of seawater is chloride ions and is not infrequently found in higher natural concentrations as well. In industry, elemental chlorine is usually produced by the electrolysis of sodium chloride dissolved in water.

Chlorine compounds are the most common equipment and food contact sanitizers used in the food processing and handling and are recognized by the FDA as being appropriate for their intended use. They are also common disinfecting agents for farm equipment and tools. The health and environmental hazards associated with its manufacture and use are well researched and are mitigated through worker protection protocols, Good Manufacturing Practices, and oversight by local, state and federal agencies. The organic farming community, pre-NOP certification programs, and past NOSB decisions have determined that—coupled with these mitigating features—the proven efficacy and reliability of these chlorine materials in support of food safety concerns outweighs the risks.

Having said that, the annotation limiting the use of chlorine presently noted in §205.601(a) (2) do not align with a November 1995 NOSB recommendation on chlorine materials. This recommendation stated that chlorine materials should be allowed for use in organic crop production, organic food processing, and organic livestock production with the following annotation:

“Allowed for disinfecting and sanitizing food contact surfaces. Residual chlorine levels for wash water in direct crop or food contact and in flush water from cleaning irrigation systems that is

applied to crops or fields cannot exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (currently 4mg/L expressed as Cl₂)."

This annotation was crafted to acknowledge that levels of chlorine permitted in municipal drinking water were considered acceptable for organic food production and handling. The language used in the proposed NOP rule published in March 2000 did not include the terms "in direct crop or food contact" and "in flush water ... that is applied to crops or fields." The language used under §205.605 (handling uses) only mentions use in disinfecting food contact surfaces, leading some handlers to question whether chlorine could be used in direct food contact. The NOP responded in the preamble of the final rule (65 FR 80548, 80616, December 21, 2000) which stated that the use of the term "residual chlorine" referred to the chlorine that was present in water when it exited the facility as effluent.

The NOSB revisited the issue through a May 2003 recommendation. At that time, the NOSB noted that "residual chlorine" is a scientific term used when measuring chlorine. Residual chlorine (also called free or available chlorine) is the chlorine that remains available in solution after the disinfection step is complete, when the initial added chlorine material has been reduced by reaction, bound to the organic matter, or evaporated. The residual chlorine is what is still available to oxidize other substances. Residual chlorine is the fraction of available chlorine in solution derived from the disinfectant source. When calcium hypochlorite or sodium hypochlorite is used, the proper measure for residual chlorine is the sum of the concentrations of hypochlorous acid (HOCl) and hypochlorite ion (OCl⁻). For chlorine dioxide (ClO₂), all unreacted chlorine is considered to be free chlorine. Another frequently used term is total chlorine, which is a measurement of the free plus inactive forms.

In 2003, the NOSB stated: "The Organic Foods Production Act is not designed to function as a waste water regulation. Instead, it is a regulation designed to protect organic integrity. As such, processing operations must demonstrate compliance with the chlorine annotation by monitoring the chlorine content of the water which is in direct contact with organic products, not the wash water which is discharged from the facility."

In December 2010, the NOP issued draft guidance clarifying the use restrictions of chlorine materials in organic production and handling (the background of which is provided again within this recommendation). On review and consideration of this draft guidance, informed by public comment and review of a new TR provided by the NOP (supplied for Crops Committee sunset review), and with respect to the change in NOSB Policy and Procedures Manual, the Crops Committee wishes to recommend a change to the annotation to chlorine materials as noted below. This change of language is intended only to clarify the use allowances for chlorine compounds and bring them into alignment with NOP's intended guidance and provide a regulatory basis for ACA's to ensure compliance with historic and appropriate uses of the materials in organic farming operations.

Additionally, the Crops Committee would like to note that other chlorine compounds, such as hypochlorous acid, may be appropriate materials to add to the annotation upon appropriate review, recommendation and Board vote.

Committee Recommendation(s)

The Crops Committee recommends relisting chlorine compounds with a change to the annotation of the following substance in this use category as published in the final rule:

Chlorine materials (calcium hypochlorite; chlorine dioxide; and sodium hypochlorite)--Residual chlorine levels in the water in direct crop contact or as water from cleaning irrigation systems applied to soil should not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act. Chlorine products may be used up to maximum labeled rates for disinfecting and sanitizing equipment or tools.

Committee Vote

Motion: John Foster

Second: Tina Ellor

Yes: 5 No: 0

Abstain: 0 Recuse: 0 Absent: 2