

## **Sulfuric Acid Guidance for CNG Produce Farms**

It is rare for CNG to deviate from the National Organic Program (NOP) standards, but when we do, it's due to the experiences of our farmers, the barriers they face, and the sustainability of the solutions available to them. CNG has decided to allow the use of sulfuric acid to reduce the pH of irrigation water in extreme situations when other, NOP approved pH remediation practices have proved ineffective. These techniques include the use of citric, acetic, or sulfurous acid to acidify water, the addition of elemental sulfur to reduce soil pH, and the removal of greenhouse plastic in winter to leach soil.

Many growers will tell you that their hoophouse space is their most valuable ground, vital to keep in production and steward the soil fertility in order to maintain maximum yields. Produce and flower farmers in areas with high pH, limestone-based soils and groundwater, common in Appalachia and parts of the West, are facing an extreme fertility challenge in their hoophouses. As they irrigate, the pH of their already basic soil increases quickly, since the irrigation water is also at a high pH. Nutrient availability is highly influenced by pH, and as pH increases, many essential plant nutrients such as boron, copper, iron, manganese, phosphorus and zinc become unavailable. Deficiencies in these nutrients causes a variety of symptoms, drastically reducing the yields of these farms' highest value crops. This basic irrigation water also means that farmers are unable to address these deficiencies through fertigation (injecting organic fertilizers into irrigation systems, a very common fertility strategy) because the nutrients in the fertilizers won't be available at such a high pH.

Reducing the pH of the soil and water is necessary in order for these growers to maintain their hoophouses as viable, productive growing space, but the products and technology available to organic and CNG growers are limited and often ineffective and impractical.

Certified organic farmers are currently not allowed to use sulfuric acid as a direct farm input, but the NOP does allow the use of sulfuric acid for producers of organic kelp and fish-based fertilizers to lower the pH of these products. Though sulfuric acid is a hazardous substance to work with, farmers demonstrating appropriate handling practices can apply it safely. Sulfuric acid, once neutralized (as it would be after its addition to irrigation water) is considered a GRAS substance (Generally Regarded as Safe) by the EPA and does not pose risks to human health nor cause residues on food crops. It is also not considered an environmental contaminant.

For these reasons, CNG farmers are permitted to use sulfuric acid in order to acidify irrigation water, providing they adhere to the following guidelines.

- Sulfuric acid must only be used when other pH remediation techniques have been ineffective.
- Sulfuric acid is a dangerous substance to work with, so farmers must follow all safety precautions when handling this product.
- CNG producers must include sulfuric acid on their annual inspection input list and in their publicly available application.