

## What is ION<sup>-</sup>?

ION<sup>-</sup> is a unique conditioner for irrigation water. Containing a combination of hydration and infiltration surfactants and monocarbamide dihydrogen sulfate (MCDS), ION<sup>-</sup> reduces the pH of irrigation water and improves the infiltration of water into and throughout the root zone.

## Why do you need ION<sup>-</sup>?

Most irrigation water contains dissolved salts. Some may be beneficial to turf, such as calcium (Ca), magnesium (Mg), sulfates (SO<sub>4</sub>) and nitrates (NO<sub>3</sub>). Others such as sodium (Na), chloride (Cl<sub>2</sub>) and boron (Bo) must be managed to avoid plant phytotoxicity.

Carbonates (CO<sub>3</sub>) and bicarbonates (HCO<sub>3</sub>) are usually present with these salts and may interact with them, forming insoluble precipitates that can destroy soil structure and can cause potential damage or clogging of irrigation equipment, in addition to sealing soil surfaces and tying up plant nutrients.

Turf managers utilizing irrigation water with high levels of carbonates and bicarbonates and moderate to high levels of sodium, calcium or magnesium should condition their irrigation water with ION<sup>-</sup> to address these issues.

## What are the benefits of using ION<sup>-</sup>?

Injecting irrigation water with ION<sup>-</sup>:

- Improves irrigation infiltration and soil hydration
- Opens soils sealed by alkalinity
- Liberates beneficial Ca and Mg
- Removes harmful Na
- Alleviates dry spots
- Improves turf color and quality



**Without ION<sup>-</sup>**



**With ION<sup>-</sup>**

*Precision Laboratories is a leading provider of specialized chemistries applied to plants, seeds, soil and water to maximize resource and biological performance potential while stewarding the environment.*



## How does ION<sup>-</sup> work?

The infiltration and hydration surfactants in ION<sup>-</sup> reduce the surface tension of irrigation water, allowing the buffered water to more effectively move through the thatch and throughout the soil. As the MCDS reduces the pH of the irrigation water, it evolves the carbonates (CO<sub>3</sub>) and bicarbonates (HCO<sub>3</sub>) off as harmless CO<sub>2</sub> and water, allowing any calcium (Ca) or magnesium (Mg) to remain soluble so they can displace sodium (Na) from the soil. This reaction also allows soil-applied amendments to produce soluble calcium, rather than being precipitated as lime. Finally, the surfactants in ION<sup>-</sup> help leach the replaced sodium (Na) from the plant root zone, resulting in improved plant health, water efficiency and improved nutrient uptake.

## How does ION<sup>-</sup> differ from mineral acids and other products containing MCDS?

ION<sup>-</sup> results from a precisely controlled manufacturing process that combines urea, sulfuric acid and specialized surfactants. ION<sup>-</sup> is free of contaminants and contains additives to control metal corrosion. The acid complex in ION<sup>-</sup> is safer than dangerous mineral acids, reducing hazards associated with shipping and handling.

## Can ION<sup>-</sup> be used in conjunction with other soil surfactants?

The specialized surfactants in ION<sup>-</sup> improve the performance of the product's unique acid complex. Where water quality issues exist, including ION<sup>-</sup> in a comprehensive water management program with other Precision Zone Surfactants can result in improved plant health.

## Product Specifications

Product name: ION<sup>-</sup>

Common name: non-ionic surfactants and monocarbamide dihydrogensulfate solution (MCDS)

Physical properties:

- Weight per gallon: 12.7 lbs
- Crystallization temperature: 42°F +/- 3°
- Viscosity: 49 cps
- Specific gravity: 1.52
- Gallons per ton: 158
- Color: Orange

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