



Management of Excess Sodium in Soil & Irrigation Water with Enhance Max™

Excessive sodium in soil and water is a major issue across many parts of agriculture in Australia and globally. There are few options to managing its effect on crop production, but Enhance Max™ is a tool that can be utilised very effectively and its mode of action is explained below in this Technical Document.

Enhance Max™ has a 3 step action in helping you manage excess sodium.

1. **Soil** - Enhance Max™ is a sequestering agent and has the ability to sequester sodium so it is non-reactive. It undertakes the process by breaking the bond of the sodium from the clay colloid and sequestering the sodium ion (Na^+) into an organic structure. This may be referred to as Sodium Buffering. Different organic sources (organic acids, compost, biochar, etc) have different structures that may or may not prefer any particular cation. Enhance Max's humic acid component, Enhance THA™, is proven for sodium over the past 30 years.

Note:

Sequestering and chelation have two distinct actions.

- Chelation is the process of attaching to a molecule.
- Sequestering is the process of surrounding a molecule, i.e. forms a ring around the sodium which is known as a tetrahedral benzoic ring.

Q: Once the sodium is bound with Enhance Max, why doesn't the aggregate of the Enhance Max and Sodium break up when contact with water?

A: Because Humic Acid molecules are amphiphilic – one end of the humic molecule is hydrophilic (attracts water) and the other end is hydrophobic (repels water). As the Enhance/Sodium aggregate structures itself to be hydrophilic on the outside, it can move with water deeper into the soil profile and out of the rhizosphere (root zone).

Irrigation Water: When sequestering sodium in-situ of irrigation water, the process is less energy intensive as sodium ions do not need to be first removed from the colloid in soil. This will often result in less use of Enhance Max and greater value over time. "Quick" fixes require both approaches.

2. Enhance Max™ contains our soil penetrant Penmax® which provides a self-regulating distribution system in the soil– greater distribution provides greater contact with salt and more complete remediation of the rhizosphere.

Q: Once driven from the rhizosphere, where does the sodium go?

A: The "storage" mechanisms for sodium deep in soil which prevents it from rising back the soil surface (wicking). As the Enhanced aggregate moves deep into the soil and is slowly broken down by microbiology, the sodium can react (biologically and/or chemically) into an insoluble compound (the earth's crust is 3% sodium).