FACT SHEET No.3 SALT MITIGATION

mineral magic

Making soils better & wetter - permanently

Salt Mitigation in Broadacre Crops

Amorphous silica, also known as non-crystalline silica or hydrated silica, can play a role in salt mitigation in broadacre crops through several mechanisms:

Ion Exchange: Amorphous silica has a high cation exchange capacity, which means it can exchange sodium ions (Na+) in the soil with other ions such as calcium (Ca2+), magnesium (Mg2+), or potassium (K+). This exchange helps reduce the concentration of harmful sodium ions in the root zone, preventing soil salinity.

Physical Barrier: When amorphous silica is applied to the soil, it can form a physical barrier on the soil particles. This barrier reduces the rate at which water and salt can move upwards towards the root zone.

As a result, it helps maintain a more favorable soil moisture balance and prevents salt accumulation near the plant roots**.**

Increased Plant Tolerance: Amorphous silica can also be taken up by plant roots and deposited in plant tissues. This deposition can improve the plant's tolerance to salt stress. It helps maintain plant cell turgor pressure and reduces the toxic effects of excess salt on the plant and all other biotic and abiotic stressors.

Reduced Transpiration: Amorphous silica can reduce transpiration rates in plants, which is the process by which water is lost through plant leaves. By reducing transpiration, it helps conserve soil moisture and prevents the upward movement of salts towards the root zone.

pH Buffering: Amorphous silica can also act as a pH buffer, helping to maintain a more stable pH level in the soil. This can indirectly influence salt solubility and reduce the risk of salt accumulation.

To use amorphous silica for salt mitigation in broadacre crops, it is typically applied to the soil as a soil amendment. The application rate and timing can vary depending on the specific crop, soil conditions, and the severity of salt stress. It's important to consider local guidelines and recommendations for silica application in agriculture.

Whilst amorphous silica can be a useful tool for salt mitigation, it is essential to integrate it into a comprehensive soil and water management plan, which may include other practices such as proper irrigation management, crop selection, and drainage improvements to effectively combat soil salinity in broadacre crop production.