

Bio-ShieldTM XT



BIO-PROTECTORS FOR EXTENDING THE VIABILITY OF INOCULANT ON SEED TREATMENT.

Biological Nitrogen Fixation (BNF) is affected by various environmental stresses which thereby influence the survival of rhizobia and plays a role in the symbiotic relationship that exists between plant root and bacteria.

The key factors or stressors that have shown to affect rhizobia survival and viability include high seed storage and planting temperatures, poor adhesion of rhizobia to seed, toxic components that are secreted by the seed, dehydration of micro-organisms when placed on seed or when treated with seed-applied technologies like film coatings, various powders or salts (micro-nutrients) that accelerate dehydration, and lastly various chemical or biological seed care products including fungicides and insecticides.

Through research and innovative strategies, Bio-Shield XT has been developed to aid in cell protection against various environmental stresses and assists in preventing desiccation.



Bio-Shield XT contains hydrocolloids which aid in slowing dehydration and preventing desiccation. Bio-Shield XT assists in limiting heat transfer from the environment to the microorganisms due to the low thermal conductivity potential and slowing the drying processes due to their high-water activity.

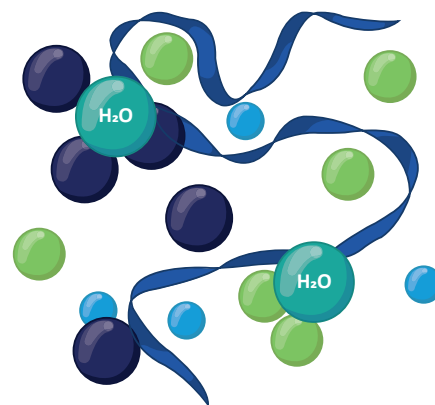


Figure 1: Graphic representation of a hydrocolloid strain

The term “hydrocolloid” is derived from the Greek words hydro meaning “water” and kola meaning “glue”. Hydrocolloids are hydrophilic (water-loving), high-molecular-weight molecules that generally contain several hydroxyl groups and are polyelectrolytes. These compounds can also be used to control aqueous solutions' functional properties (e.g., solubility, gelling, water binding, adhesion, film formation, or encapsulation). The presence of hydroxyl (-OH) groups on the hydrocolloid structure increase its affinity for water molecules. Moreover, gel formation involves the cross-linking of the polymer chains to form a three-dimensional network that immobilizes water within it.

Bio-Shield XT aids in cell protection against toxic seed coat factors as well as from various environmental stresses. Bio-Shield XT is easy to apply to seed and contains red colour pigment allowing for identification of treated or untreated seed. It also provides nourishment from inoculation to planting.

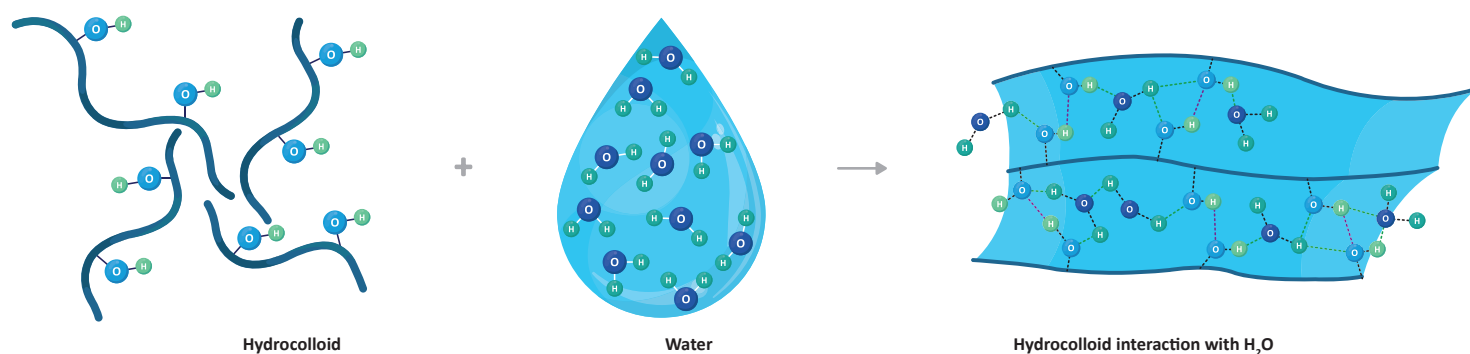


Figure 2: Graphic representation illustrating the affinity of hydrocolloid molecules to water

Applying Bio-Shield XT to seed changes the surface characteristics, as seen in Figure 3a compared to Figure 3b. This allows for better attachment of the organisms to seed.

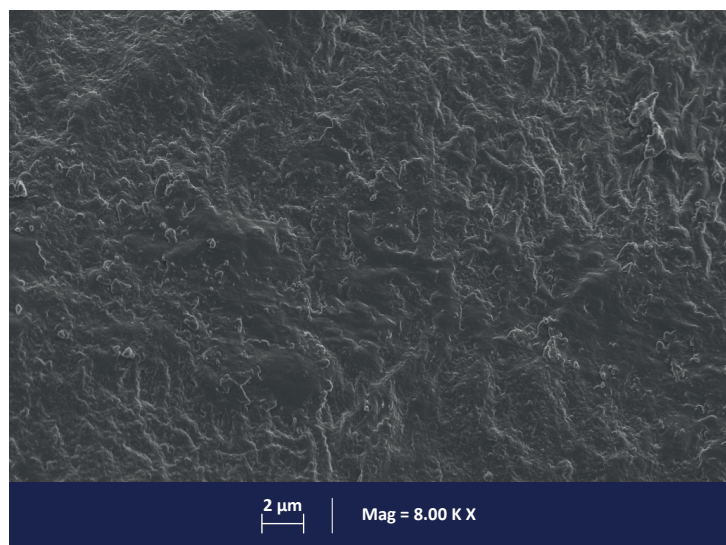


Figure 3a: Surface of seed treated with Induct EXO

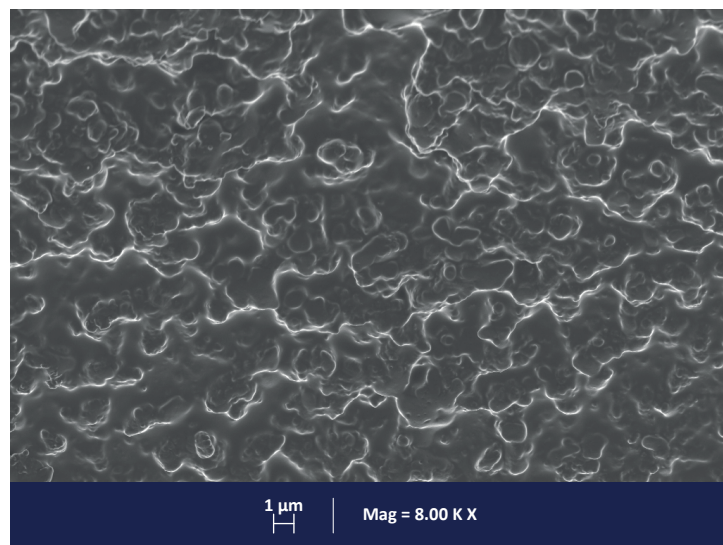


Figure 3b: Surface of seed treated with Induct EXO and Bio-Shield XT