Abiotic Stress

BioLiNE®
Science. Solutions. Success.

Foliar Application of BioLiNE® Gold

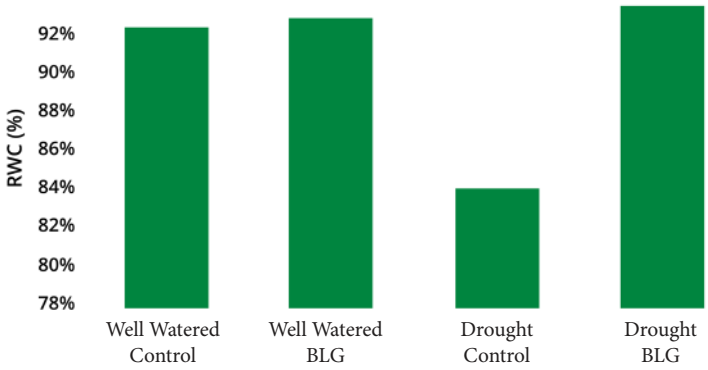
This is a proven method to ameliorate the adverse impact of abiotic stress. We use our proprietary Fulv-IQ™ process to purify and isolate targeted fractions of fulvic acids that are most effective in transporting nutrients and protecting crops against heat and drought stress.

Heat & Drought Stress - Common Threat to Crop Yields

Seasonal drought stress is a problem that many growers worry will reduce their crop yields and quality. Fortunately, plants have developed natural defenses against seasonal heat and drought stress. Foliar application of BioLiNE® Gold shortly after the onset of heat and drought stress strengthens these natural defenses in several ways, ultimately helping your crops withstand the stress.

BioLiNE® Gold is an effective and affordable tool for helping growers manage their crops. Our fulvic acids are essential in defending crops against abiotic stress and water deficiency.

Relative Leaf Water Content after a single Foliar Application of BioLiNE® Gold on Corn



BioLiNE® Gold at Planting Improves Crop Establishment

BioLiNE® Gold should be used in seed treatments or applied during or shortly after planting (in-furrow) in climates where early season heat and drought stress are likely to occur. Fulvic acids improve germination, and early root and shoot growth in crops negatively impacted by early season drought stress.

Foliar Applied BioLiNE® Gold Strengthens Crops Against Abiotic Stress

- Maintains the relative leaf water content (RLWC) and enhances nutrient transport.
- Greatly increases the carbon dioxide assimilation rate (leaf gas exchange), which is necessary for photosynthesis.
- Improves water use efficiency (WUE) of crops grown under both well-watered and drought stress conditions.
- Drought stress reduces soluble protein concentration in crops. BioLiNE® Gold protects the treated crops, resulting in higher concentration of soluble proteins compared to untreated crops.
- Increases antioxidant enzymes improving the plant's ability to defend against oxidative stress caused by abiotic stress.

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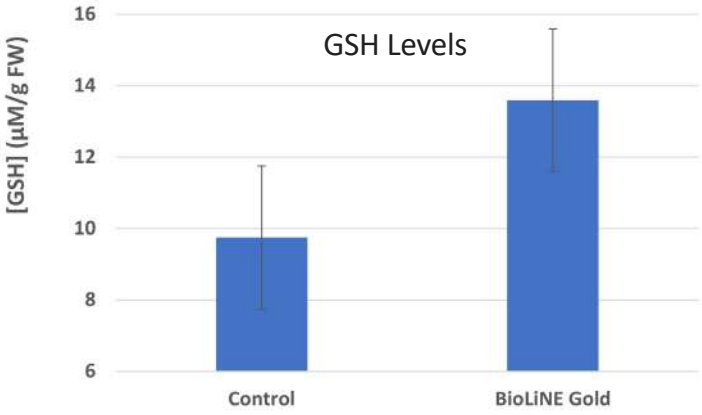
FULV-IQ®
Purity. Precision. Power.

Trial Results

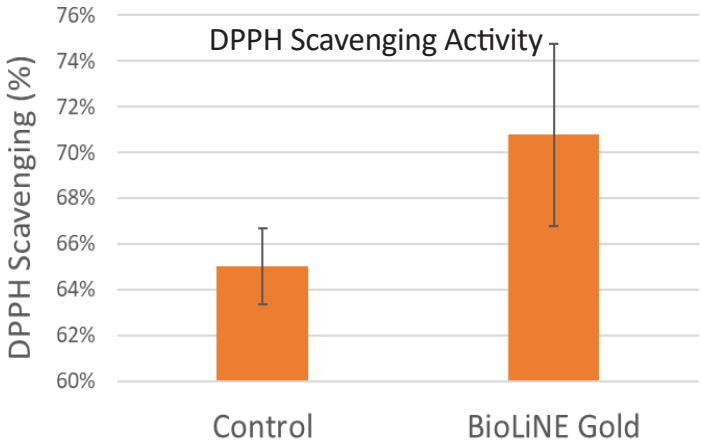


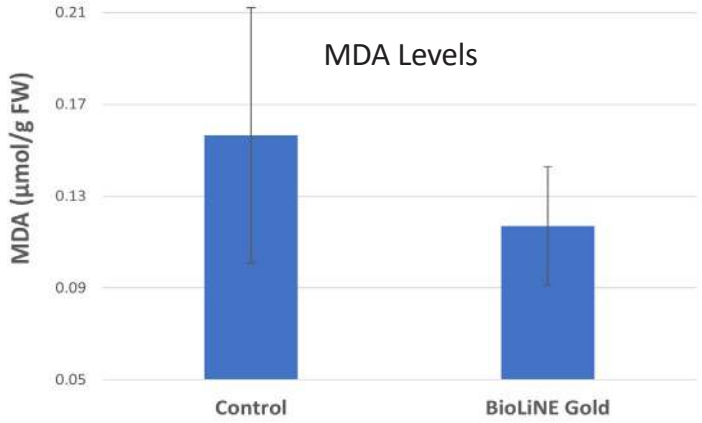
GSH

Antioxidants such as Glutathione (GSH) are important in the transformation and detoxification of ROS to prevent damage to the plant. Plants produce antioxidants when experiencing abiotic stress such as drought. When plants were treated with BioLiNE®, GSH levels significantly increased which will help improve the crop's stress response by mediating ROS and limiting damage.

DPPH

The scavenging of the DPPH radical was also assayed and resulted in a significant increase in the BioLiNE® treated plants relative to the control. This assay measures overall radical scavenging activity, so an increased scavenging percent results in increased protection from high ROS concentration.





MDA

The measurement of malondialdehyde (MDA) content has long been used as a lipid per-oxidation marker in studies related to oxidative stress, particularly in those focused on plant responses to abiotic stress. Lower levels of MDA signify lower levels of lipid per-oxidation, and less stress to the plant. When plants were treated with BioLiNE®, antioxidant levels increased which helps reduce oxidative stress and therefore lipid per-oxidation.

ROS

Radical oxygen species (ROS) play an important role in plant growth and development. However, when their concentration increases from abiotic stress, oxidative stress occurs in the plant which can lead to lipid per-oxidation and cell damage and yield loss.

Control VS BioLiNE® Gold in our most recent trial.

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