



## GOLF COURSE GREENS TRIAL SUMMARY

### OBJECTIVE

This golf course greens trial was performed to determine the effect of **TrueSolum** on creeping bentgrass greens during extreme heat conditions.

### TRIAL SPECIFICS

**Location:** Osaka Shi, Osaka, Japan

**Trial Initiation:** September 2023

**Length:** 6 weeks

#### Treatments:

- Control – Greens management standard program
- Treatment – Greens management standard program + 1.3 gal/acre of **TrueSolum** applied weekly

### OVERVIEW

Creeping bentgrass is a turfgrass species used in golf course putting greens, fairways and tees worldwide. Bentgrass is sensitive to heat stress which causes reductions in root growth and general overall appearance. Optimizing phosphorus and iron levels may play a key role in helping bentgrass tolerate heat stress.

Phosphorus is a structural component of cell walls and DNA. It is also a critical component of the energy-producing ATP molecules that drive metabolic functions inside plants. It is essential for root growth, photosynthesis and respiration. Additionally, phosphorus in the phosphite form acts as a fungicide.

When plants are deficient in phosphorus, photosynthesis and stomatal conductance are decreased. In addition, root and shoot growth can be reduced because plants are forced to activate alternative energy production pathways such as phosphorus-dependent glycolysis and mitochondrial respiration in the cytoplasm.

Iron plays an irreplaceable role in alleviating stress imposed by heat, drought, salinity and heavy metals. This is because it activates plant enzymatic antioxidants like catalase (CAT), peroxidase and superoxide dismutase (SOD) that act as scavengers of reactive oxygen species (ROS), thus reducing lipid peroxidation and neutralizing hydrogen peroxide - a by-product of photosynthesis. Additionally, in a similar manner to phosphorus, iron is critical to the creation and transport of energy for many metabolic processes in plants.

### RESULTS

The **TrueSolum** treated plots demonstrated less root loss due to heat stress as well as enhanced visual appearance of the grass.



Manufactured by GreenTech Ventures, Inc.

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## DISCUSSION

Abiotic stresses such as heat or drought inhibit the uptake of phosphorus, iron and other key nutrients. **TrueSolum** helps grass overcome these challenges by signaling beneficial soil microbes like mycorrhizae and growth promoting bacteria in the *Pseudomonas* genus which assist with phosphorus solubilization and uptake. In addition, many *Pseudomonas spp.* also produce iron chelating siderophores which enhance the uptake of iron.

## CONCLUSIONS

The turfgrass industry needs new tools to help reduce chemical inputs while still maintaining optimum health and visual appearance of greens, tees and fairways. **TrueSolum** works in synergy with nature by signaling naturally occurring microorganisms that improve phosphorus and iron uptake to proliferate and associate with roots.

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