FW Agronomy
Solutions | Through Science

Can osmolytes reduce the impact of drought, heat, salinity and frost on a variety of crops?

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Shortage of water, the most important component of life, limits plant growth and crop productivity, particularly in arid regions more than any other single environmental factor. Reduced precipitation together with the higher evapotranspiration is expected to subject natural and agricultural vegetation to a greater risk of drought in those areas. Even a short-term drought can cause substantial losses in crop yield. With greater demand on irrigated crops to feed the growing population any limit on water availability can have serious commercial and social impacts. Decreasing water supply either temporarily or permanently affects morphological and physiological processes in plants adversely. However, many plants have evolved systems to live and thrive in harsh conditions. The accumulation of low molecular weight water-soluble compounds known as “osmolytes” is the common strategy adopted by many organisms to combat the environmental stresses. The most common compatible solutes are betaines, sugars (mannitol, sorbitol, and trehalose), polyols, polyamines, and amino acid (proline). Their accumulation is favored under water-deficit or salt stress as they provide stress tolerance to cell without interfering cellular machinery. Osmolytes are also an important component of the suite of traits utilized by plants to maintain growth under cold temperatures.

- **What does an osmolyte do?**
  - Maintains water balance in cells, helps prevent cellular dehydration
  - Quickly transported during osmotic stress into the cell or synthesized in the cell
  - Increases the osmotic strength of the cell
  - Has no adverse effect on cell function
  - Protects macromolecules (e.g. cellular enzymes) from osmotic inactivation

Glycinebetaine (GB) accumulates in a variety of organisms under abiotic stresses and has been studied in detail and is the most common osmolyte in plants. Plants known to accumulate **Glycinebetaine** naturally have been reported to grow well under drought and saline environment.

Foliar application of Glycinebetaine improves the growth and survival rate of plants under a variety of stresses.

Armament FW is the brand of natural **glycinebetaine** (GB), formulated by **FW Agronomy**. When used in agricultural & horticultural applications on a range of crops, **Glycinebetaine (GB**) is a proven solution to improve **drought**, **heat, salt tolerance** and a **protectant** of plants against **frost. Armament FW** has also demonstrated success in reducing cracking of fruits in regions including Spain and Australia.

We have had a long involvement in the research around applying exogenous **glycinebetaine**. From vegetables, row crops, fruit trees, oilseeds, cereals through to even pasture. From less water, to heat, salinity and frost we have been able to detail the best dose rates and application timings. So, we have some confidence in the attributes **Armament FW glycinebetaine**. The type of responses you see are:

- Reduced flower drop, due to heat
- Increased yield
- Improved water use
- Less damage from frost
- Improved quality

If you have any questions, please feel free to contact me.

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