



## **Silicon release from Biogenic Amorphous Silica – Turf’s new allrounder.**

Apart from the dramatic water and nutrient retention capability of Biogenic Amorphous Silica (BAS) known in Australia as **Mineral Magic™** there is another well researched benefit that could be equally as significant.

The latest research on biogenic amorphous silica highlights silica’s ability to increase resistance against both biotic and abiotic stressors through a variety of mechanisms. With turf systems being subject to a barrage of stresses, this increased resistance helps to minimise the occurrence of stress-induced reductions in growth and quality.

- To protect against insects and fungal attacks, silica strengthens cell walls by increasing the production of cellulose and hemicellulose. In relation to turf, the strengthening of cell walls due to silica can act as a preventative against many pathogens and predators reducing fungicide and pesticide treatments.

Reference : <https://academic.oup.com/jxb/article/64/5/1281/630847>

- When under drought stress, silica decreases leaf transpiration and increases stomatal conductance and maintains chlorophyll concentration.

Reference ; <https://www.tandfonline.com/doi/abs/10.1626/ppp.1.89>

- Some studies have shown it even enhances root growth and in turn nutrient uptake through more root surface area.

Reference: <https://academic.oup.com/jxb/article-pdf/52/361/1703/9431719/521703.pdf>

- Silicon is effective in controlling various pests and diseases caused by both fungi and bacteria in different plant species. Silicon also exerts alleviative effects on various abiotic stresses including salt stress, metal toxicity, drought stress, radiation damage, nutrient imbalance, high temperature, freezing and so on.

Reference: <https://www.tandfonline.com/doi/pdf/10.1080/00380768.2004.10408447>

- In saline conditions – which are increasingly occurring due to salt-laden irrigation waters in turf production and maintenance - silica reduces the translocation of sodium to protect photosynthetic process.

Reference:

[https://www.researchgate.net/publication/271632768\\_Beneficial\\_effects\\_of\\_silicon\\_on\\_salt\\_and\\_drought\\_tolerance\\_in\\_plants](https://www.researchgate.net/publication/271632768_Beneficial_effects_of_silicon_on_salt_and_drought_tolerance_in_plants)

- If plants are exposed to heavy metals silica, helps to ameliorate the toxicity from the roots to the shoots or participates in coprecipitation of metals such as aluminium, arsenic, and cadmium.

Reference:

[https://www.researchgate.net/publication/323756357\\_Silicon\\_Mechanisms\\_to\\_Ameliorate\\_Heavy\\_Metal\\_Stress\\_in\\_Plants](https://www.researchgate.net/publication/323756357_Silicon_Mechanisms_to_Ameliorate_Heavy_Metal_Stress_in_Plants)