**Benefits of using Stressgard**

Stressgard® is an advanced formulation technology developed by Bayer. Proven in independent research to mitigate stress and deliver consistent turf quality for a better playing experience. Stressgard isn’t just one product, but a whole portfolio that gives you flexibility and versatility to deliver consistent, high quality playing surfaces under any conditions. Bayer Stressgard fungicides enhance plant processes such as photosynthesis and chlorophyll production. They work on the outside and inside of the plant to protect turf from fungal attack, heat, drought, shade, traffic and excess solar radiation, so you can play on, no matter what.

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**Benefits of using Stressgard**

Stressgard benefits provide: Versatility; Consistency; and Satisfaction.

**Versatility**
- Stressgard is available in a portfolio of fungicides spanning 6 different active ingredients across 6 different mode of action groups.
- The portfolio allows you to choose the right product for the right time of year based on agronomic need (abiotic and abiotic stresses)
- Since Stressgard products do not rely on a single active ingredient or class of chemistry to deliver results, the portfolio can be incorporated into any program, minimising concerns about resistance management and minimising the likelihood that diseases not currently expressing themselves reappear.
- Stressgard programs go beyond disease control to improve turf health and alleviate abiotic stresses including heat, drought, traffic, shade and excess solar radiation.

**Consistency**
- Stressgard programs deliver the consistent playing conditions your customers want and the day-to-day reliable turf quality you deserve.
- The proven proprietary pigment in Stressgard products delivers immediate aesthetic improvement and consistent, natural colour across the treated areas of your facility.
- Longer-term, Stressgard works to enhance chlorophyll content and improve plant physiological functions, especially in stressful environments. This means a greener, healthier turf surface better able to withstand the unpredictable tests of Mother Nature.
- Stressgard products are formulated specifically for turf applications and are effective in all environmental conditions with no phytotoxicity concerns.

**Satisfaction**
- Playing conditions are the primary driver of player satisfaction.
- Stressgard programs deliver extraordinary turf quality beyond traditional fungicides.
- The mitigation of abiotic stresses including foot and mechanical traffic results in better playing conditions.
- Turf managers using Stressgard have reported spending less time on tasks like hand watering and scouting, lower irrigation run times, less fertilisation requirements and more confidence with plant growth regulators throughout the season.
- With Stressgard, you can worry less about turf performance through those high stress periods.

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Over the past 25 years, one technology has helped shape an entire category of plant protection products for golf course superintendents. Bayer Stressgard fungicides offer plant health benefits that go beyond disease control to mitigate abiotic stresses across the golf course.

The physiological benefits of Stressgard have been proven in the laboratory, controlled environments, university field trials, and real-world golf course demonstration trials.

A New Era of Turf Health Research

Bayer continues to explore the beneficial effects of Stressgard with research projects across the globe. One communality across trials is that Stressgard fungicides consistently outperform other phosphonate-based products and pigments on factors involved in turfgrass stress responses. These factors included:

- Chlorophyll-related enzymes. Chlorophyll is built and destroyed in a cyclical pattern. Individual components of this process can be influenced by various abiotic stresses (heat, drought, traffic etc.). We can measure the enzymes associated with chlorophyll synthesis (the builders) and degradation (the destroyers) to gain a better understanding of what's going on during plant stress.

- Chlorophyll content: Chlorophyll is the machinery in the plant which carries out photosynthesis. Direct measurements of chlorophyll via extraction are most indicative of the health of the photosynthetic systems in the plant.

- Membrane stability: Measured via electrolyte leakage, membrane stability is a hallmark of the health of the photosynthetic systems in the plant.

The remaining question after years of research is exactly how Stressgard works physiologically. Now, by partnering with leading turfgrass physiologists and using modern advances in biochemical research, we’ve taken a deeper look into the underlying mechanisms that drive plant health to answer the question, How?

A 2019 research trial by Dr. Bingru Huang at Rutgers University investigated, in the absence of any disease pressure, the influence of Stressgard Xtra Stressgard and other phosphonate-based products and pigments on factors involved in turfgrass stress responses. These factors included:

1. Significantly HIGHER levels of chlorophyll indicating healthier photosynthetic systems during stress. (Figure 1)
2. Significantly LOWER chlorophyll degrading enzymes activity indicating protection or mitigation of chlorophyll destruction during stress.
3. Significantly LOWER electrolyte leakage indicating greater membrane stability during stress. (Figure 2)

Conclusion: Photosynthesis is the driver of all plant energy production and subsequent processes. The protection and maintenance of chlorophyll with Stressgard ultimately improves the turf’s ability to photosynthesize, which is beneficial to all turfgrass under any stress condition. Ten decades of research has continued to support the unique and unparalleled effects that Stressgard fungicides deliver beyond disease control.