Summer Turfgrass Stress Reduction With

Summer Stress Factors on Turfgrass

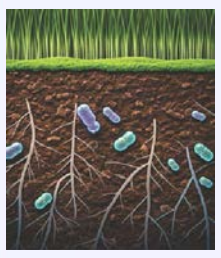
Heat Stress
Prolonged high temperatures impair photosynthesis, reduce root mass and weaken overall plant health.

Turf becomes more susceptible to disease, thinning and discolouration.

Drought & Water Restrictions
Limited water availability can lead to reduced turf density and wilting.

Increased Wear & Tear
High footfall from peak playing seasons places additional mechanical stress on the turf.

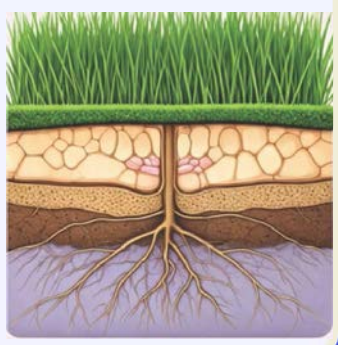
How OceanGlas Helps Alleviate Summer Stress

Increased Beneficial Soil Microbiology


Stimulates microbial activity in the rootzone, helping with nutrient cycling even during dry periods.

Supports long term soil structure and health for faster recovery post stress.

Strengthens Root Development
Encourages deeper and stronger roots to access moisture and nutrients more effectively. Supports stability under heavy traffic and mechanical stress.



Enhances Heat & Drought Tolerance
Bioactive compounds such as alginates and mannitol help improve osmotic regulation and water retention.

Increases proline accumulation to support internal plant resilience under drought conditions.

Boosts Turf Colour & Recovery
Increases chlorophyll production and content, improving turf colour, even under stress.

Faster post wear recovery through enhanced turf metabolism and energy transfer.

Application Advice for Summer Months

Rate
20L - 30L Per Hectare.
4-6oz per 1000sq.

Frequency
Every 10-14 days (Adjust depending on stress severity).

OceanGlas Drought Stress Research

Trial Setup

Turfgrass was grown in controlled conditions. OceanGlas was applied three times before introducing drought stress.

Recovery Analysis

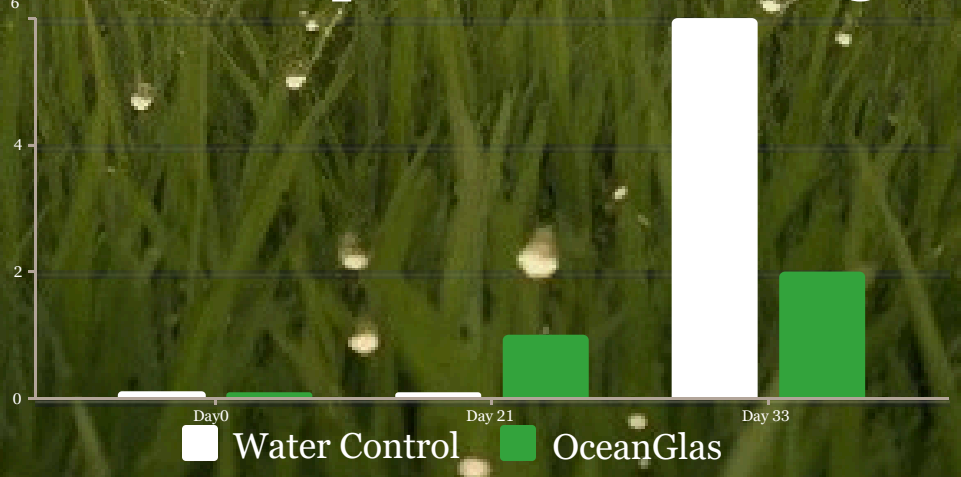
After drought stress, OceanGlas-treated turf demonstrated 72% coverage compared to 56% in untreated samples, with noticeably reduced wilting symptoms.

1 2 3

Proline Measurement

Proline levels were measured at days 0, 21, and 33. OceanGlas treated turf showed 66% less proline accumulation compared to untreated controls under drought conditions.

Proline Response Under Drought



OceanGlas Benefits

- Reduces physiological stress response intensity by - 66%
- Supports faster recovery after drought periods
- Increases overall turf coverage and visual quality
- Primes turf through subtle stress signalling, preparing it for future stress events
- Delays visual wilting symptoms during drought conditions

The slight proline increase in well watered OceanGlas treated turf suggests beneficial stress priming, activating the plant's natural defence mechanisms before severe stress occurs.

OceanGlas represents an advanced approach to turfgrass management that works at the cellular level rather than merely improving surface appearance. By reducing proline accumulation, a well-documented stress biomarker according to Jazi et al. (2019). OceanGlas helps prepare and protect turf through physiological conditioning, enabling better performance under recurring drought conditions typical of modern climate challenges.

Enhancing Chlorophyll Content in Turfgrass Leaves

Supporting stronger, more vibrant turf under stress conditions

Why Chlorophyll Matters in Turfgrass

Chlorophyll is the pigment responsible for turf's vibrant green colour and is critical for **photosynthesis**, which drives plant energy production and health. Higher chlorophyll content means better colour, improved photosynthetic efficiency, and greater turf resilience 4 particularly under stress conditions.

Trial Results: The OceanGlas Difference

Turfgrass showed a significant response to OceanGlas, with more than 2x the chlorophyll content of the watered control. This represents a 120% increase in chlorophyll levels compared to conventional watering practices.

The Science Behind OceanGlas

Bioactive Compounds

OceanGlas contains mannitol, alginates, and laminarins that enhance chlorophyll biosynthesis and pigment stability in turfgrass leaves.

Stomatal Regulation

Helps regulate stomatal aperture, boosting photosynthetic efficiency even during periods of environmental stress.

Stress Resilience

Primes turfgrass for abiotic stress resilience, protecting against drought, disease, and high traffic damage.

These results are supported by scientific research (Hosseini et al., 2021; Elansary et al., 2017), which demonstrates that seaweed extracts can stimulate meaningful increases in chlorophyll even under non-stressful conditions.

Summary: The OceanGlas Advantage

- Boosts chlorophyll content by over 120% in turfgrass relative to watered controls
- Delivers visible improvement in turf colour and photosynthetic capacity
- Enhances turf health during periods of drought, disease, or high traffic stress

Backed by trial data and applied science, OceanGlas is helping turfgrass professionals achieve healthier, greener, and more resilient playing surfaces naturally.

The Gold Standard of Seaweed/Kelp: Ascophyllum Nodosum

Not all seaweed fertilizers are created equal. Ascophyllum nodosum is a brown seaweed species found along the North Atlantic coast and it's considered the gold standard when it comes to seaweed-based biostimulants.

What Makes Ascophyllum Nodosum Superior

Rich in Bioactive Compounds

Naturally contains, alginates, mannitol, laminarins fucoidans, amino acids, vitamins, and antioxidants that support turfgrass and crops during drought, salinity, and heat stress

Grows in Harsh Conditions

Thrives in the intertidal zone, developing high concentrations of stress-resistant compounds that directly benefit turf and crop resilience.

Cold-Water Species = High Potency

Unlike tropical seaweeds, Ascophyllum nodosum grows slowly, accumulating beneficial elements more densely for superior performance.

Proven Performance

Backed by decades of agronomic research and field trials in agriculture, turfgrass and horticulture applications worldwide.

At Ocean Knowledge, we hand-harvest Ascophyllum nodosum just 100 metres from our production facility, ensuring full traceability and preserving freshness. Combined with our cold extraction method, this ensures our products deliver the full potential of the ocean to your turf intact, unaltered, and highly effective.

What's Inside OceanGlas?
The Science Behind the Seaweed

When turf managers choose OceanGlas, they're not just applying a liquid seaweed extract they're applying a powerful concentration of naturally occurring bioactive compounds and amino acids that directly support plant health, stress resilience, and turf performance. OceanGlas works across multiple pathways to enhance turfgrass performance under various environmental conditions.

Key Bioactive Compounds

Alginates

These complex poly-saccharides function as powerful soil conditioners, significantly improving soil structure and water retention capacity. Alginates create an environment that supports the establishment of beneficial microbial communities in the rootzone, enhancing the soil health ecosystem.

Mannitol

This natural sugar alcohol acts as an osmoprotectant, helping turfgrass retain water and manage osmotic stress from drought or salinity conditions. Mannitol also plays a crucial role in nutrient translocation within the plant, ensuring resources reach where they're most needed.

Laminarins

These β-glucan molecules serve as plant defence activators, stimulating the plant's immune response to both pathogens and environmental stressors. Laminarins are known for their ability to prime the plant's defensive systems, enabling faster and stronger reactions when under pressure.

Amino Acids for Turf Vigour

OceanGlas contains numerous free-form amino acids, which are critical building blocks for energy metabolism, stress response mechanisms, and protein synthesis in turfgrass plants:

Leucine

This branched-chain amino acid promotes protein synthesis and aids in plant recovery following mechanical stress (like mowing) or environmental stress. It's particularly important for maintaining cellular integrity during periods of intense wear or challenging weather conditions.

Lysine

Essential for cell wall structure and chlorophyll formation, lysine directly supports photosynthetic efficiency and overall turf coloration. This amino acid contributes to the vibrant, healthy appearance that course managers and players appreciate.

Aspartic & Glutamic Acid

These two amino acids help optimise nitrogen assimilation, increasing nutrient efficiency and stimulating balanced root and shoot development. They're particularly valuable in reducing fertiliser requirements whilst maintaining turf quality.

The Extraction Difference

OceanGlas is produced using a unique cold extraction process. This gentle approach preserves the full complexity and efficacy of the seaweed's natural components, ensuring that superintendents receive the maximum biological activity from every application.

Stronger Root Development

The combination of alginates and specific amino acids promotes extensive root growth, improving nutrient acquisition and anchoring strength.

Enhanced Stress Tolerance

Regular applications create cumulative protection against drought, salinity, heat and disease pressure, reducing irrigation requirements and recovery times.

Improved Soil Biology

OceanGlas stimulates beneficial microbial activity in the rootzone, creating a more sustainable growing environment with improved nutrient cycling and organic matter management.

OceanGlas represents the pinnacle of a seaweed biostimulant, a solution engineered by nature and perfected through careful processing to deliver consistent, reliable results for the most demanding turf management professionals.

OceanGlas & Beneficial Microbacteria: A Healthier Rootzone for Resilient Turfgrass

At Ocean Knowledge, our research continues to explore how OceanGlas, our 100% Ascophyllum nodosum extract, strengthens the biological foundation of turfgrass systems. One key benefit we've identified is OceanGlas ability to support the development of beneficial microbacteria in the rootzone, improving plant health from the ground up.

1

Proteobacteria

This diverse bacterial phylum includes crucial species such as Rhizobium, which convert atmospheric nitrogen into plant available forms through biological nitrogen fixation. OceanGlas significantly enhances the presence of these nitrogen-fixers, supporting consistent turf nutrition without reliance on synthetic inputs.

- Members of the Pseudomonas genus produce auxins and other plant growth-promoting compounds
- These bacteria suppress soil-borne pathogens, enhancing turf resilience during stress periods
- Provides natural growth regulation without excessive top growth

2

Bacteroidetes

Bacteroidetes are specialised decomposers, highly efficient at breaking down complex organic materials such as cellulose and hemicellulose in thatch layers. This decomposition process releases key nutrients into the soil profile, improving nutrient availability and uptake by turfgrass roots.

- Increases soil organic carbon content through organic matter breakdown
- Improves water-holding capacity and soil aeration
- Enhances root penetration through improved soil structure

3

Plant Growth Promoting Rhizobacteria (PGPR)

OceanGlas applications, particularly by the second treatment in a programme, have demonstrated significant increases in PGPR populations. These beneficial bacteria colonise the rhizosphere and directly stimulate plant growth through multiple mechanisms.

- Initial applications may cause temporary growth regulation
- Subsequent treatments lead to marked improvements in turf health and vigour
- Supports academic research findings on biostimulant-microbial interactions

Benefits for Turfgrass Managers

- Improved nutrient efficiency through biological nitrogen fixation
- Enhanced rootzone health with greater microbial diversity and density
- Stronger disease resistance and improved plant growth regulation
- Better soil structure and water management under stress conditions

By enhancing these key bacterial communities, OceanGlas delivers benefits that extend far beyond simple nutrition. It effectively unlocks the soil's biological potential, building stronger, more sustainable turf systems from the root up. This biological approach aligns with modern sustainable management practices that focus on soil health as the foundation for turfgrass performance.

OceanGlas & Beneficial Microbacteria: A Healthier USGA Rootzone for Resilient Turfgrass

At Ocean Knowledge, our research continues to explore how OceanGlas, strengthens the biological foundation of turfgrass systems. One key benefit we've identified is OceanGlas's ability to support the development of beneficial microbacteria in the USGA rootzone, improving plant health from the ground up.

1

Sphingobium

These bacteria species perform essential biodegradation of organic material that accumulates in turf systems. By effectively breaking down this organic material, Sphingobium creates cleaner soil environments that encourage root development.

- Restores and rebalances soil microbial ecosystems
- Stimulates growth of other beneficial microbes
- Enhances nutrient cycling in the rhizosphere
- Improves turf resilience against drought and pathogen pressure

2

Flavobacterium succinicans

F. succinicans significantly contributes to soil fertility through efficient nutrient cycling processes. These bacteria transform complex organic matter into plant available nutrients, providing sustained nutrition that results in improved turf colour, strength and density.

- Enhances natural disease suppression by outcompeting pathogens
- Produces antimicrobial substances that protect root systems
- Improves root structure and development
- Increases drought resilience and nutrient uptake efficiency

Why This Matters?

OceanGlas doesn't just deliver surface level results, it activates a healthy root ecosystem. By naturally increasing populations of beneficial microbacteria like *Sphingobium* and *Flavobacterium succinicans*, it creates a biological advantage that supports the long term health and playability of high performance turf.

Research demonstrates that OceanGlas treated turf systems develop more extensive root networks, enhanced nutrient use efficiency, and greater resistance to environmental stressors. The establishment of these beneficial bacterial colonies represents a significant shift from traditional management approaches that often overlook soil biology in favour of chemical interventions.

Long-term studies indicate that turfgrass systems with enhanced microbial diversity maintain superior playability characteristics whilst requiring fewer inputs, presenting both environmental and economic advantages for turfgrass managers.

How OceanGlas Enhances Nutrient Uptake Efficiency

Turfgrass often faces challenges absorbing the nutrients they need, especially under stress conditions such as heat, drought, or poor soil biology. OceanGlas, has the capabilities to naturally support nutrient use efficiency, ensuring that applied nutrients are effectively taken up and utilised by the plant.

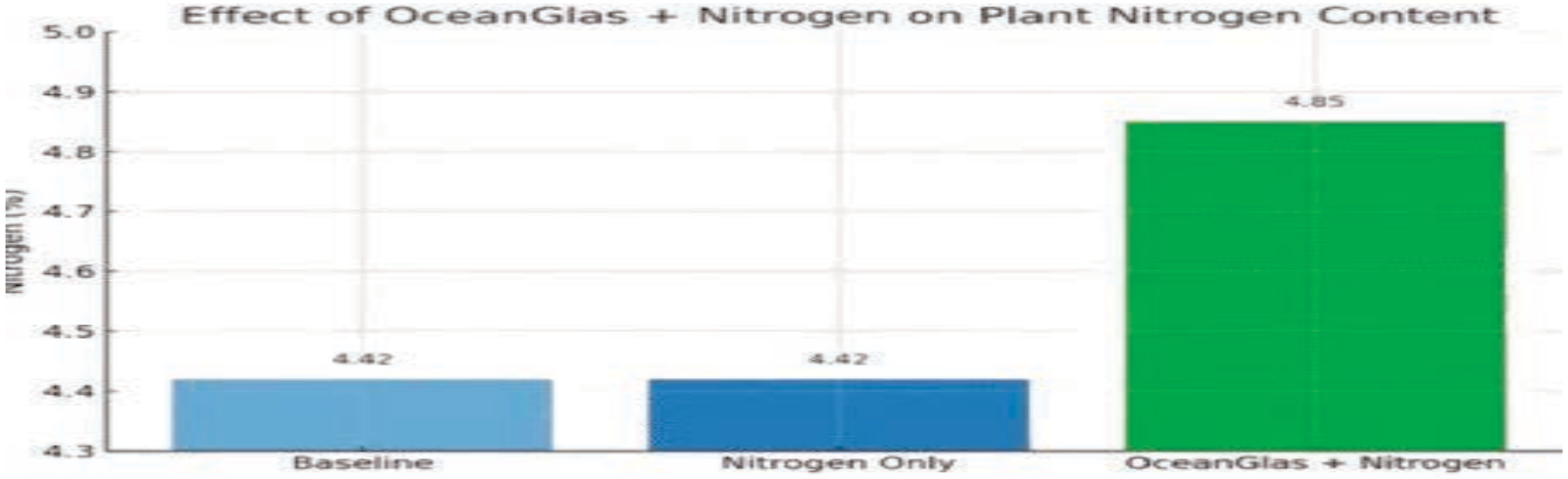
Key Benefits for Nutrient Uptake

1. Stimulates root development, creating a larger and more active root system.
2. Enhances cell membrane permeability, improving fertiliser absorption.
3. Supports beneficial microbial activity in the rootzone.
4. Reduces abiotic stress, allowing more efficient nutrient use.

OceanGlas applications result in visibly healthier turf with improved colour, density and root development.

Ocean Knowledge Nitrogen Uptake Trial

Ocean Knowledge conducted an in-house trial to study nitrogen uptake in turfgrass treated with OceanGlas + ammonium sulphate versus ammonium sulphate + water. After 16 days, the OceanGlas combination recorded a 9.7% relative increase in nitrogen content, demonstrating improved nutrient absorption. Visual improvements in colour and density were observed alongside the measured nitrogen increase.



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Better Turf Health

Healthier turf with reduced fertiliser requirements, leading to stronger plants even during challenging growing conditions.

Environmental Benefits

Reduced nutrient leaching means less environmental impact and more cost-effective management practices.

Consistent Performance

Improved colour, vigour and recovery rates, even during periods of environmental stress.