

Application of Ocean Glas in Combination with Ammonium Sulphate Improved the Nitrogen Uptake by Perennial Ryegrass

Aim: To assess if application of Ocean Glas liquid (*Ascophyllum nodosum* extract) can improve nitrogen uptake in turfgrass

Introduction

Nitrogen is a key element for turfgrass health and vigour in the sports and amenity industry, however due to a dramatic increase in the world's population in recent years and in turn, an increase in n excretion, n use must be closely monitored.

Excess Nitrogen can lead to water pollution and gaseous N entering the environment as N₂O which contributes to greenhouse effects. The above considerations have resulted in the need to use Nitrogen more sustainably and efficiently. *Ascophyllum nodosum* has been used for many years as a sustainable input to golf courses and sports pitches, however there is limited research on how it impacts Nitrogen Use Efficiency of turfgrass. Previous studies have been carried out on how application of ocean glas can improve Nitrogen use efficiency on agricultural crops and grasses and showed promising results.

In this trial we have assessed if using Ammonium Sulphate (21% w/w Nitrogen, 24% w/w Sulphur)

Methodology:

Pots used were constructed from drainage pipe with a 415cm² surface area and 24-inch depth, perforated steel was screwed to bottom for drainage.

Ryegrass seed was sown at a rate of 20g/m² into each of 12 individual pots (0.83g per pot)

The trial was performed under natural greenhouse conditions with the temperature ranging from 23°C - 30°C daily average, ryegrass cultivar Barolympic was sown into the pots filled with a mixture of soil and sand (7:3 by volume) as a growing substrate.

Once good sward coverage was achieved (30 days), grass clippings were collected from the 6 control pots (pots with Ammonium Sulphate only) and labelled 'Baseline Control', grass clippings were also taken from the 6 remaining pots (pots with Ammonium Sulphate and Ocean Glas) and labelled 'Baseline Seaweed'. These clippings were sent to a reputable lab for analysis of Nitrogen content in the leaf.

12 pots were sprayed with Ammonium Sulphate (21% w/w Nitrogen, 24% w/w Sulphur) at 25kg/ha (0.1g per pot) mixed in 600L/ha of water (2.49ml per pot). 6 of the 12 pots that were labelled as

'seaweed' had an additional treatment of 20L/ha (0.083ml) of Ocean Glas liquid. These treatments were applied on day 1, day 7 and day 14. Clippings were collected from the 6 control pots 'EOT control' and the 6 seaweed treated pots 'EOT seaweed' on day 16 (end of trial).

Final grass clippings were taken on day 16 from the 6 control pots (Ammonium sulphate only) and labelled 'EOT Control', final clippings taken from the 6 Ocean Glas treated pots were labelled 'EOT Seaweed'. Clippings were sent to lab for analysis of Nitrogen content in leaf tissue.

The results of the Baseline and end of trial for control vs seaweed were compared and a graph was constructed.

Results:

Nitrogen levels for grass clippings taken prior to treatments averaged at 4.56% for the 6 'Baseline control' pots and averaged at 4.30% for the

6 'Baseline Seaweed' pots (note these samples did not have any treatments prior to this analysis). (Figure 1).

Results from grass clippings collected 16 days after first treatment was

an average of 4.43% for the 6 'EOT control' pots and an average of 4.86% for the 6 'EOT seaweed' pots. (See Fig 1).

Analysis	Sample Code	Result (Average from 6 pots)
Nitrogen %	Baseline Control	4.56%
Nitrogen %	Baseline Seaweed	4.30%
Nitrogen %	EOT Control	4.43%
Nitrogen %	EOT Seaweed	4.86%

Fig 1: Table showing the Nitrogen levels in Ryegrass leaf tissue on day 0 (baseline) and day 16 (EOT).

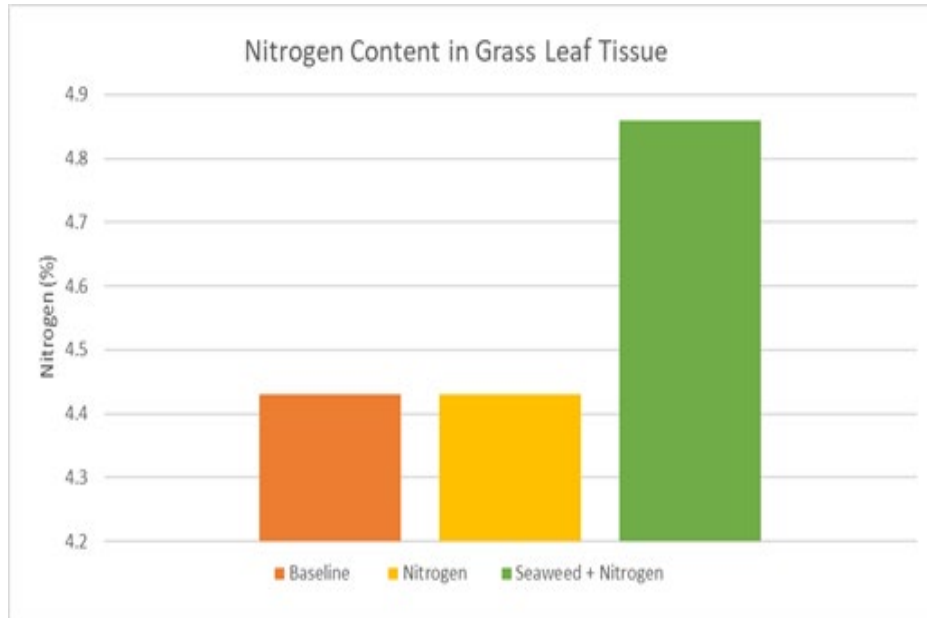


Fig 2: Graph depicting the nitrogen levels - Baseline (orange) is an average of the baseline for the 'Baseline Control' and 'Baseline Seaweed' turfgrass prior to any treatments being applied, Nitrogen (yellow) is grass treated with Ammonium Sulphate after 16 days, Seaweed + Nitrogen (green) is grass treated with Ocean Glas and Ammonium Sulphate after 16 days.

Conclusion:

An increase of 0.43% nitrogen was recorded in Ryegrass leaf tissue from day 0 to day 16 when Ocean Glas was applied with Ammonium Sulphate whereas a slight decrease of 0.13% from day 0 to day 16 was seen in Ryegrass treated ammonium sulphate and water.

The overall findings of this trial suggest that applying *Ascophyllum nodosum* extract (Ocean Glas) to Perennial Ryegrass at a rate of 20L/ha in combination with ammonium sulphate had a positive effect on nitrogen uptake in the leaf when compared with application of ammonium sulphate and water.

A more elaborate trial should be carried out to fully investigate the effects Ocean Glas has on Nitrogen Uptake by Perennial Ryegrass, however the outlook remains positive.