

TURF TRIAL INFORMATION

Sierrablen[®]
Plus
Pearl

RECYCLED PHOSPHORUS BENEFITS FOR SPORTSTURF



SUMMARY

- One-year Masters-by-Research examining recycled phosphorus- struvite for sports turf as included in Sierrablen plus Pearl range.
- Independent project completed at Bangor University.
- Applied Struvite has a negligible effect on soil microbiology and mycorrhizal associations with plant roots.
- Using struvite as a phosphorus source can more than double turf root mass over a control (100% MAP). An 80:20 ratio of struvite and MAP provided the best root mass results.
- Significantly greater root mass is achieved if you incorporate your seed fertilizer to a depth of 6cm. Double the root mass of plots where fertilisers were surface applied, and 50% greater than at 3cm incorporation.
- It is proposed that higher proliferation of roots is in response to the continued supply of P from the slow-release struvite source.



METHODS

One year of laboratory and glasshouse trials completed at Bangor University Environment Centre Wales under the supervision of Professors Davey Jones and Dave Chadwick allowed MRes candidate Anna Ray to complete her Masters on use of struvite as a recycled phosphorus source for turfgrass. A range of experiments were completed focussed on turf rooting, effects on soil microbiology and best use of struvite found in Sierrablen Plus Pearl.

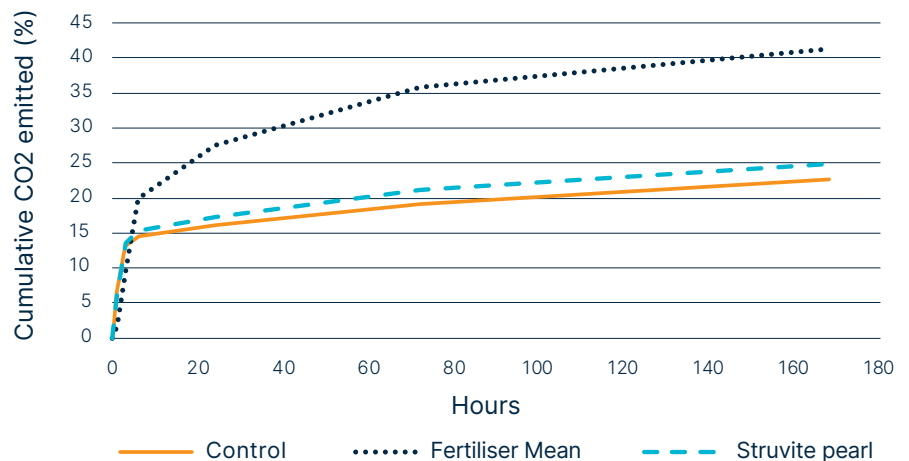
Image 1. Assessing turf quality in treated pots.

RESULTS

1

A series of ¹⁴C glucose addition trials demonstrated how struvite additions affected microbiology activity in a different way to conventional phosphate fertilisers. Cumulative CO₂ emission was similar to control tubes illustrating slower C utilisation and turnover. Benefits from addition of mycorrhizae was also demonstrated (data not shown) indicating no effect from use of struvite with mycorrhizal associations.

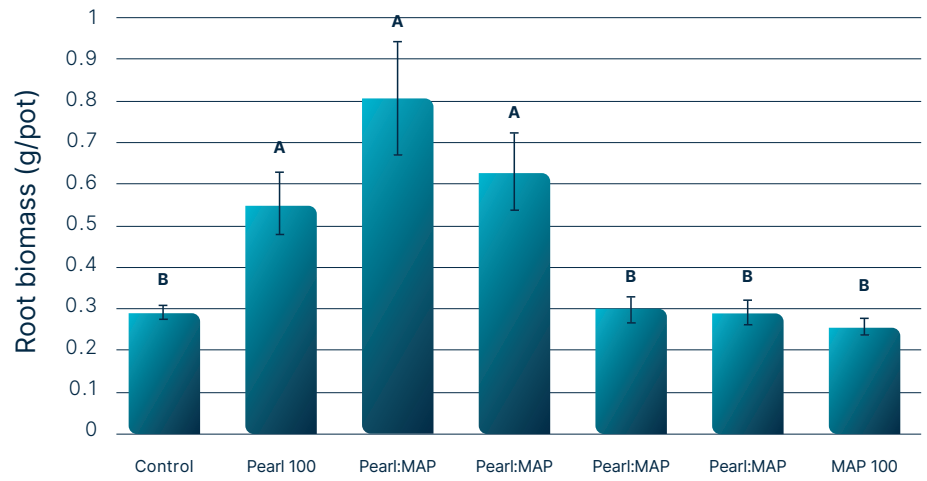
Figure 1. Cumulative CO₂ emission from rootzones following phosphate fertiliser addition. Error bars show SE of mean.



2

Root chamber trials for *Lolium perenne* in a sand based rootzone with different combinations of MAP (mono-ammonium phosphate) and pearl struvite at a rate of 60kg/ha P clearly illustrated significantly ($P < 0.05$) better rooting where higher proportions of pearl are utilised (100% pearl, 80:20 Pearl:MAP, 60:40 pearl:MAP). The greatest rootmass was measured for 80:20 combination.

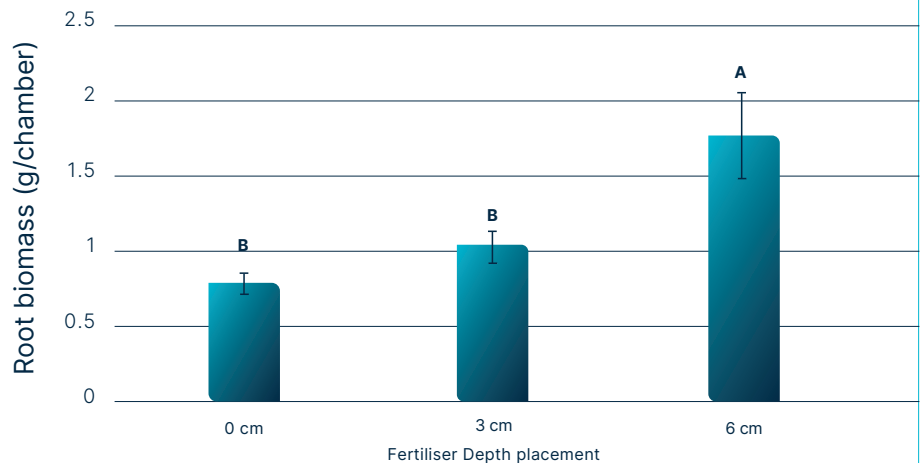
Figure 2. Root biomass (g/pot) for struvite pearl and MAP combinations. Error bars show SE from mean. Letters signify comparative significant difference ($P < 0.05$)



3

A second series of root chamber trials again with seeded *Lolium perenne* illustrated the importance of depth of incorporation of any seeding fertiliser. Significantly greater rootmass ($P < 0.05$) was measured when fertilisers were incorporated at 60mm compared with 30mm and surface application. Results were significant for all P fertiliser types measured (data not shown).

Figure 3. Root biomass (g/chamber) measured at different fertiliser placement depths. Error bars show SE from mean. Letters signify comparative significant difference ($P < 0.05$)



Conclusion

This Masters demonstrates the value in incorporating recycled phosphorus, struvite into turf grass fertilizers. The significantly greater rootmass is proposed to be derived from continual access to phosphorus from the slow-release struvite granule. Struvite pearl is found in Sierrablen Plus Pearl products.