TURF TRIAL INFORMATION

Eqo.s coated fertiliser demonstrates reduced nitrate-N leaching compared to other fertilisers.

SUMMARY

- Independent trial completed at Reaseheath College, UK.
- Glasshouse based pot-trial completed on *Lolium perenne* established in sand-based rootzone.
- Following a 28-day establishment period, the response to a single application of eqo.s coated fertiliser, was compared to a single application of slow-release fertiliser, a single application of inhibited- release fertiliser, two applications of conventional-release fertiliser and three applications of organic fertiliser all at matched N levels of 100 kg N/ha.
- Leaching of nitrate-nitrogen over an eight-week period following application was significantly ($p<0.05$) lower for eqo.s coated fertiliser than all other fertilisers.
- An assessment of mean dry root biomass at week nine after fertiliser application demonstrated significantly ($P<0.05$) greater rootmass than inhibited nitrogen fertiliser and organic fertiliser applications.

METHODS

The trial was set up in the climate-controlled glasshouses at Reaseheath College, UK. Lighting was set to a 16:8-hour day-night cycle using installed LED lighting. One-litre pots were filled with equal volumes of 80:20 sand:compost based rootzone. *Lolium perenne* (var. Groundforce) was seeded at a rate of 50 g/m^2 and the starter fertiliser Sportsmaster 8-12-8 added at 30 g/m^2. Pots were established with regular watering and light clipping to 25 mm up to day 28 from seeding.

After the 28-day establishment period, five types of granular fertilisers (Table 1) were applied to the soil surface and watered in (day 0). An additional application of conventional and organic fertiliser was made on day 21, and the third application of organic fertiliser was made on day 42 to allow matched nitrogen inputs. Each treatment was replicated six times.

Trial treatments

Treatments	**Nitrogen type**	**Analysis**	**Rate** (g/m^2)	**Total N applied** (kg N/ha)	**Total fertiliser weight** (kg/ha)
Control	N/A				
eqo.s	Coated urea, controlled release fertiliser	33-0-0	30	99	300
SRF	Slow-release fertiliser containing methylene urea and isobutylidene diurea	20-5-8	50	100	500
Inhibited	Urea containing NBPT urease inhibitor, and DCD nitrification inhibitor	46-0-0	22	101	220
Conventional	Ammonia-based conventional granular	9-7-7	55 (×2)	99 (49.5×2)	1100
Organic	Turkey litter-based granule	5-2-4	66 (×3)	99 (33×3)	1980

For more information please contact Dr Andy Owen,
International Technical Manager Turf & Landscape
andy.owen@icl-group.com | **www.icl-growingsolutions.com**

Turf colour was assessed visually every 7 days on a 1–10 scale. Pots were clipped weekly to 25mm, and dry biomass from clippings was recorded. Once a week, pots were watered to field capacity with a pre-calculated volume of water, and all leachate collected for 24 hours. Leachate volume was measured and the nitrate-nitrogen content measured by colorimetric hydrazine assessment via a Thermo-Scientific Gallery auto-analyser. At day 56 the columns were dismantled and the rootzone carefully washed out to collect the roots. Dry root biomass was measured per pot.

RESULTS

Mean dry biomass clipping weight was characterized by flushes of initial growth for the SRF and the inhibited urea products. The conventional fertiliser produced a dual flush of growth at each application. Biomass dry weight was lower and more consistent week to week for the CRF treatment (data not shown). Mean turf colour showed a similar response initially for all fertiliser treatments with scores around 7. The inhibited urea treatment had the fastest decline with turf colour scores below 5 at week 4. The SRF treatment turf colour dropped to below 5 at week 6. Both the conventional and the organic fertilisers maintained scores between 7 and 5 throughout the trial because of the multiple applications. The CRF treatment was the most consistent and maintained a turf colour score between 7 and 6 throughout from the single application (data not shown).

The amount of nitrate-nitrogen leached was significantly ($P<0.05$) lower for the CRF and the organic fertiliser treatments (Figure 1). Conventional fertiliser, SRF fertiliser and inhibited fertiliser demonstrated high leaching with a significant portion of the nitrogen applied being lost from the system and therefore unavailable for plant utilisation.

Mean dry root biomass at week eight was significantly ($P<0.05$) better for CRF treatment than the inhibited urea and the organic treatments (Figure 2).

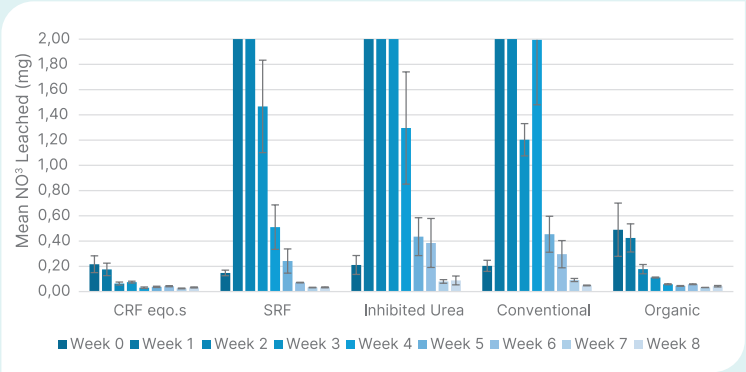

Figure 1: Mean nitrate leached (mg) per week of the trial. Error bars show standard error. NB: Y axis has been shortened to allow better visualisation.

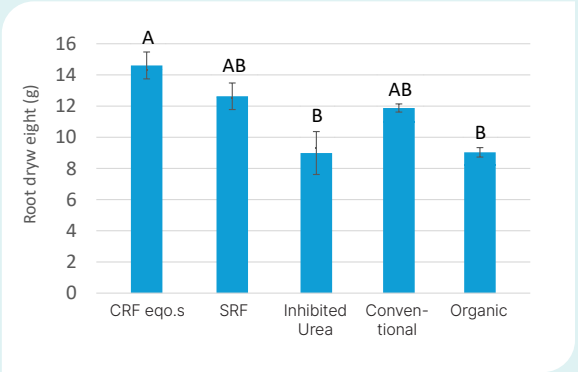

Figure 2: Mean dry root biomass at week eight. Treatments that share a letter are not significantly different.

CONCLUSIONS

The nitrate leaching data clearly demonstrate that fertiliser formulation and application strategy have a substantial impact on nitrate mobility and environmental risk in turfgrass systems. Despite all treatments receiving equivalent total nitrogen inputs, the timing and mode of fertiliser nutrient release markedly influenced the extent of nitrate loss. A single application of CRF controlled release urea had significantly lower leaching than all other treatments and also provided consistent colour and growth. The selection of a CRF fertiliser also provided the best rooting, probably due to a consistent supply of nitrogen throughout the trial period. The better rooting should lead to a healthier plant, being better adapted to moisture scarcity and providing better turf resilience.

For more information please contact Dr Andy Owen,
International Technical Manager Turf & Landscape
andy.owen@icl-group.com | **www.icl-growingsolutions.com**