March 31, 2019

Project Update:

An Environmental Assessment of the Australian Turf Industry

Thank you for your continued participation in Hort. Innovation project no. TU16000- An Environmental Assessment of the Australian Turf Industry.

Having completed the Benchmarking report and four case studies, we are now working on the Lifecycle assessment aspect of this project. The team has completed its assessment of five turf installation sites and a further growing site was examined for nutrient travel through the soil. This has involved taking soil samples soon after installation and then again after the summer growing season.

The five sites include one sports field, two recreational turf and two golf course fairway installations.

The sports field is more intensively maintained and there is significant variation in the maintenance of all sites. Data derived from these study sites are given in the following tables for recreational turf (lawns) and sports fields.

Soil sampling at an installation site

Maintenance				**Recreational turf lawns**
Inputs	**per year**	**Expected**		**Comments**
Hand mowing	MJ/m^2	0.61		11.9 L of petrol per Ha (15 mows over the year – biweekly in Spring and monthly after 15 Dec)
	L/m^2	0.018		
Watering	L/m^2	100		Fortnightly watering to 5mm for 20 weeks per year
Fertilising	kg/m^2	0.024		4 kg All Purpose Fert per 500m2 = 0.008 kg/m^2 three times per year
Nitrogen	kg/m^2	0.0036		Nitrogen 15%
Phosphorus	kg/m^2	0.0012		Phosphorus 5%
Potassium	kg/m^2	0.0012		Potassium 5%
Mineral additives	kg/m^2	0.015		Assume ag lime or similar product addition at 150 kg/Ha (0.015 kg/m^2)
Ag chemicals	kg/m^2	0.00015		Weedicides at 150 g/Ha

Maintenance				Maintenance schedule of a sports field
Mowing fuel consumption	L/m²/y	0.0128		Mowing 2x per week over growing season (32) at 0.4ml/m²/mow (diesel fuel)
Rolling, aerating	L/m²/y	0.0064		Once per week equivalent energy use of mowing
Watering	L/m²/y	140		23,300 L/Ha/day for 20 weeks over the growing period
Fertiliser	kg/m²/y	0.50		Regular fortnightly fertilisation at 48 kg/Ha of 15:3:15 plus one off additions.
Nitrogen	kg/m²/y	0.052		NPK 5-5-5 added
Phosphorus	kg/m²/y	0.014		Super phosphate added
Potassium	kg/m²/y	0.056		Granular slow release granular fertiliser
Mineral additives	kg/m²/y	0.082		Gypsum, kieserite, trace elements
Ag chemicals	kg/m²/y	0.00019		Weedicide, pesticides, fungicides, preventative herbicides

Soil sampling taken after the summer growing season gave mixed results for the retention of nutrient nitrogen and sequestered carbon in soils. The average retention of carbon in the soils was 2.5 tonne per hectare compared to a US study that gave a figure of 1.4 tonne per hectare.

This has to be balanced out against the carbon dioxide emissions from other maintenance activities such as mowing, irrigation and fertilisation, all of which take energy and result in greenhouse gas emissions.

We are putting this data into a lifecycle assessment model that should provide a net environmental impact over a year of the turf lifecycle.

Turf installation in a new housing estate

Details of the figures we have developed and the assumptions we have used are given in a lifecycle analysis *Goal and Scope* report. This is available to the industry for comment. Please contact me (john@infotechresearch.org) for a copy.

Kind regards
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