TURF TRIAL INFORMATION

H2Pro TriSmart

H2Pro TriSmart registered as **non-microbial plant biostimulant.**

SUMMARY

- H2Pro TriSmart was tested in four separate field trials completed in Summer 2022 by STRI, Bingley, UK.
- Each treatment had an 8x replication per trial.
- The four trial sites differed in soil / rootzone type and turf species, drought was imposed by withholding irrigation and covering the trial if was rainfall forecast.
- H2Pro TriSmart was applied initially at 25L/ha in 500L water followed by monthly applications of 10L/ha in 500L water and compared with a droughted control treatment and an irrigated control treatment.
- In all four trials H2Pro TriSmart significantly ($P<0.05$) improved turf quality, turf colour, turf density, turf uniformity, NDVI, shoot dry weight and volumetric moisture content (VMC%) compared with the droughted control.
- The research data set is significantly robust to allow a classification of H2Pro TriSmart as a 'non-microbial plant biostimulant' within the new fertiliser regulations (2019/1009).

METHODS

Four independent field trials were carried out at STRI, Bingley, UK. Each identical trial was located on a separate experimental area and so represented four slightly different soil types; sandy loam, loamy sand, and two varying sand constructions, and four different turf mixtures, varying amounts of *Agrostis*, *Festuca* and *Poa annua* mixes.

A randomised block trial with eight replications was designed where irrigated/rainfall control plots (evapotranspiration replacement irrigation programme when required), were compared with deficit-irrigation droughted control plots and deficit-irrigation droughted plots receiving an H2Pro TriSmart surfactant programme.

Forecast rainfall was prevented from impacting the trial by using trial covers. H2Pro TriSmart was applied at 25L/ha in 500L water followed by monthly applications at 10 L/ha in 500L water. The trial ran from June 2022 to September 2022. Regular monthly assessments of turf quality, turf colour, turf uniformity (all assessed visually 1-10 scale), turf uniformity(% live grass cover), NDVI (handheld meter), Volumetric moisture content (Delta-T theta probe to a 60 mm depth) and clippings dry weight, were made.

Trial area 2 at two different time points illustrating the effectiveness of the imposed drought stress during the trial.

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RESULTS

The imposed drought stress across all four trials utilising rain covers during forecast rainfall was effective with clear abiotic stress showing over all unirrigated plots on the trials (see images). Volumetric moisture content (VMC%) results were significantly greater (P<0.05) for 'control-irrigated' plots when compared with 'control-deficit' plots for both dates shown demonstrating that the drought stress regime was effective in reducing soil moisture contents (Table 1). H2Pro TriSmart treated plots which received the equivalent moisture as 'control-deficit' plots maintained significantly greater VMC% for all four trials on both dates shown demonstrating that the moisture saving value of such a programme.

A range of additional measured turf characteristics all showed significant differences between 'control-deficit' and 'control-irrigated' for all four trial sites, demonstrating that the imposed drought-stress significantly reduced turf quality, colour, uniformity, density and NDVI on a number of measurement dates (only August data shown). The addition of an H2Pro TriSmart programme significantly increased measurements of turf colour, quality, uniformity, density and NDVI on every occasion for nearly all trial sites (only trial area 1, turf density was not significant) demonstrating the value of following such a wetting agent programme.

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July 22	Trial 1	Trial 2	Trial 3	Trial 4
Control (deficit)	16.1a	14.7a	16.6a	17.1a
Control (irrigated)	28.1b	24.1b	18.6b	36.9b
H2Pro TriSmart	19.4c	18.0c	19.3c	23.0c
September 22				
Control (deficit)	12.0a	9.1a	8.3a	14.9a
Control (irrigated)	22.6b	13.8b	14.6b	27.4b
H2Pro TriSmart	14.9c	11.0c	13.0b	23.4c

Table 1. Mean volumetric moisture content (%) for two assessment dates (July & September). Different letters indicate significant (P<0.05) difference between means.

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		Trial 1	Trial 2	Trial 3	Trial 4
Turf Quality (1-10)	Control (deficit)	2.6a	2.5a	2.3a	3.0a
	Control (irrigated)	6.7b	4.6b	6.0b	6.8b
	H2Pro TriSmart	3.2c	4.1b	4.1c	4.5c
Turf Colour (1-10)	Control (deficit)	2.0a	2.5a	2.1a	2.8a
	Control (irrigated)	7.1b	4.6b	6.5b	6.8b
	H2Pro TriSmart	3.1c	3.8b	4.2c	4.5c
Turf Density (%)	Control (deficit)	31.2a	22.5a	25a	36.2a
	Control (irrigated)	61.2b	47.5b	62.5b	72.5b
	H2Pro TriSmart	31.2a	45.0b	42.5b	55c
Turf Uniformity (1-10)	Control (deficit)	1.6a	2.1a	1.8a	2.7a
	Control (irrigated)	5.7b	4.7b	5.5b	6.5b
	H2Pro TriSmart	2.5c	3.7b	4.1c	4.3c
NDVI	Control (deficit)	0.48a	0.50a	0.43a	0.68a
	Control (irrigated)	0.72b	0.68b	0.72b	0.81b
	H2Pro TriSmart	0.54c	0.62b	0.60c	0.78b

Table 2. Turf assessment results for a single date (August 22). Different letters indicate significant (P<0.05) difference between means.

CONCLUSION

Four separate wetting agent trials at the STRI were able to impose drought conditions throughout the summer which led to significantly reduced VMC% content in their rootzones. The use of an H2Pro TriSmart programme in each of these trials clearly showed the benefit of utilising a good quality residual surfactant under these conditions. An increase in VMC% associated with significantly improved turf quality, colour, uniformity, density and NDVI was achieved.

These improvements in plant quality traits allow H2Pro TriSmart to be classified as a 'non-microbial plant biostimulant' under the new fertiliser regulations (EU 2019/1009). This is the first instance of a product being classified as both a 'wetting agent' and 'non-microbial plant biostimulant'.