

PURPOSE:

Measure the capacity of Suståne's organic 4-6-4 fertilizer to reduce plant pathogenic nematodes (PPN) and promote healthy turf growth.

METHODS:

The St. Mary's stadium field and several practice pitches at the Southampton FC were fed with Suståne, an organic compost-based fertilizer. Applications of Suståne 4-6-4 were 35 g / sq. m were made every four weeks to maintain and strengthen the turf.

During the season, applications to the stadium field were stopped in the fall of 2016 and resumed in the spring of 2017. This provided the opportunity to assess the impact of Suståne 4-6-4 on turf nematode populations and the damage that the pathogenic types can cause. Soils from each pitch were examined over the course of several months to see how nematode populations changed over time in the stadium and the practice pitches.



Figure 1: The well-maintained turf at St. Mary's Stadium in early October 2016.

Soil samples were sent to the Turf Disease Center (Hampshire, UK) for assessments. As expected, nearly all samples were found to have plant pathogenic nematodes, though the abundance and calculated nematode disease index (NDI) varied substantially across samples and time points.

RESULTS:

While overall turf conditions were good throughout the growing season, below the surface plant pathogenic nematodes presented a continuing threat to the health of the turf. Root knot nematodes (*Meloidogyne* spp.) and sheath nematodes (*Hemicyclophora* spp.) were the most common pathogens, being found in 96% and 75% of all samples, respectively.



Figure 2: The turf at St. Mary's Stadium looks great in April 2017 thanks to two reapplications of Suståne.

As expected, the numbers of plant pathogenic nematodes increased during the playing season when use and stress are greatest. Populations of plant parasitic nematodes increased under the practice fields (Table 1) and in the stadium (Table 2), but careful management with Suståne prevented this seasonal problem from compromising playability.

Now during the playing season, Sustane was not be applied to the stadium pitch. So, the turf took a bit more a beating. (Figure 3)

The numbers of pathogenic nematodes and the damage they inflicted on the turf was much worse in the stadium ($P < 0.01$) than in the practice fields after applications of Suståne 4-6-4 were stopped in the fall of 2016 (Table 3).

In fact, root knot nematode populations and the nematode damage index were 12 to 22 times higher in the stadium pitch than in the practice fields that were still receiving Suståne 4-6-4. Similar patterns were observed for sheath nematodes, but were less dramatic. Following reapplication of Suståne 4-6-4 in February, the pathogenic nematode populations dropped off by more than 90%, and the nematode damage index returned to a practically unimportant level.

Previous university studies have shown that applications of Suståne Natural Fertilizers help reduce the incidence of certain common turf grass diseases. This study goes one step further, clearly demonstrating that regular use of Suståne 4-6-4 can effectively prevent the development of turf damage caused by root knot nematodes.

Compost-based fertilizers are used worldwide by professional turf managers for one simple reason: they work. With balanced fertility, natural humates, and natural complement of compost-based beneficial bacteria, there simply is no better way to establish and maintain turf than with Suståne Natural Fertilizers.

For more information on this project,
 contact us at help@sustane.com
 Or Southampton Football Club Head Groundsman, Andy Gray
 at agray@saintsfc.co.uk

Nematode	Sep-16	Nov-16	Jan-17	Apr-17
Bacterial	2125	4354	5986	3388
Meloidogyne	147	222	292	167
Hemicyclophora	235	146	114	27
NDI	11	13	15	8

Table 1: Nematode assessments of turf samples taken from practice pitches. Note the modest seasonal increases in nematodes and associated damage (NDI) during the main playing season on pitches receiving regular applications of Suståne 4-6-4.

Nematode	Sep-16	Nov-16	Jan-17	Apr-17
Bacterial	1831	3924	9086	7429
Meloidogyne	234	4876	3603	262
Hemicyclophora	287	249	191	37
NDI	16	247	184	14

Table 2: Nematode assessments of turf samples taken from the Stadium pitch. Note the dramatic increases in nematodes and associated damage (NDI) during the main playing season when Suståne applications were withheld between October and February.

Nematode	Sep-16	Nov-16	Jan-17	Apr-17
Bacterial	-294	-430	3100	4041
Meloidogyne	87	4654	3311	95
Hemicyclophora	52	103	77	10
NDI	5	234	169	6

Table 3: Differences in nematode populations and associated damage (NDI) between Stadium and Practice pitch turf samples. Significant differences are highlighted in bold ($P < 0.10$). Note the large positive differences between October and February indicating the loss of nematode suppression when Suståne applications were stopped.

Figure 3. Stadium turf recovering from stress in March 2017. Despite the damage, turf health was maintained by the preseason applications of Suståne 4-6-4.

