

# The Turf Disease Centre

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## SAMPLE ANALYSIS REPORT

Date received:	20 June 2019	Sample number:	SA190620
Sent by:		Result to:	
Sample taken from:	Novogreen Comporta Farm	Result delivered by:	Email
Location:	Pivot 1, 2, 3, 5, 6 & 7	Number of Pages:	2

### THE RESULT REFERS ONLY TO THE SAMPLE(S) RECEIVED

Six samples were received for nematode analysis. The rootzones were extracted to determine the presence of any plant parasitic nematodes and the washed roots were assessed visually for endoparasitic nematode species.

#### NEMATODE ANALYSIS

A simplified Baermann funnel method is used for extracting active nematodes from a known volume of the received rootzone sample. The total number of nematodes in the rootzone sample is determined and the populations of the parasitic species are recorded. All non-parasitic nematodes present in the sample are recorded as 'bacterial/fungal' species.

The washed rootzone sample is assessed under a dissecting microscope for the presence of mature Cyst nematodes.

In addition, the washed turfgrass roots are assessed visually under a dissecting microscope for symptoms of root deformity and for the presence of endoparasitic nematode species.

Nematode infection can lead to reduced root depth, reduced root quality and reduced nutrient & water uptake. This tends to show as a general decline in plant health or chlorosis of the affected turf.

Most rootzones will contain plant parasitic nematodes but the presence of these nematodes does not necessarily mean that the turf will show damage. That said, as nematode populations build, the feeding effect of these parasites is likely to have a greater effect on turf health. The expression of any symptoms associated with nematode-induced turf weakness will be heavily modified by environmental stresses such as temperature and rootzone moisture content.

#### PLANT PARASITIC NEMATODES

There are two main types:

**Ectoparasites** – These species live in the rootzone and do not enter the plant tissues. They feed by inserting a feeding tube (stylet) in to the plant cells and withdrawing the cell content. Their feeding activity can result in reduced root development and function.

**Endoparasites** – These species spend a large proportion of their life cycle inside the plant tissues. They too feed on the content of plant cells but their presence within the plant tissues and, in some cases, their migration through the plant tissues, results in a significant change to normal root development and function.

Populations of plant parasitic nematodes that are recorded in received turf samples are shown in the table below.

The Nematode Damage Index (NDI) provides an indication of the overall level of nematode-induced stress within the turf. It takes in to account the individual Threshold Values for each species (i.e. the population that is likely to cause significant damage to turf) and the recorded populations of each species. An NDI of <1 indicates that significant nematode damage is not currently likely. If the NDI >1, then there is currently a potential for damage. This potential damage will increase as the NDI rises and/or other biotic/abiotic stresses affect the turf. An NDI >10 indicates that nematode damage symptoms are likely to be currently visible on the turf.

#### RESULTS

Parasitic nematodes were only recorded in the rootzone from the sample Pivot 5. In this sample, Stubby Root nematodes were present in low numbers and the roots showed symptoms of increased branching development. These nematodes feed at the root tip and it is possible that there is a higher population around the root tip area of the rootzone profile than that recorded in this combined sample.

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## Number of nematodes (per 100ml rootzone) recorded in the sample

Nematode Species	Endo- or Ecto-parasite	Pivot 1	Pivot 2	Pivot 3	Pivot 5	Pivot 6	Pivot 7	Threshold Value
Bacterial / Fungal	-	560	3080	280	882	616	1624	Not relevant
Non-parasitic nematode species								300
Tylenchus	Ecto-							40
Heterodera J2s + males (cyst)	Endo-							100
Punctodera J2s + males (cyst)	Endo-							150
Hoplolaimus (lance)	Ecto-							100
Pratylenchus (lesion)	Endo-							20
Longidorus (needle)	Ecto-							300
Paratylenchus (pin)	Ecto-							600
Criconemella (ring)	Ecto-							20
Meloidogyne J2s + males (root-knot)	Endo-							80
Subanguina J2s (root gall)	Endo-							80
Hemicycliophora (sheath)	Ecto-							400
Helicotylenchus (spiral)	Endo- / Ecto-							500
Rotylenchus (spiral)	Endo- / Ecto-							100
Paratrichodorus (stubby-root)	Ecto-				14			300
Tylenchorhynchus (stunt)	Ecto-							80
Pratylenchoides	Endo-							100
Xiphinema (dagger)	Ecto-							10
Belonolaimus (sting)	Ecto-							300
Gracilacus (pin)	Ecto-							300
Aphelenchoides	Endo- / Ecto-							400
Ditylenchus	Endo- / Ecto-							40
Heterodera cysts	Endo-	-	-	-	-	-	-	20
Meloidogyne galls	Endo-	-	-	-	-	-	-	20
Subanguina galls	Endo-	-	-	-	-	-	-	20
<b>Nematode Damage Index (NDI)</b>		<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	

NOTE: The results in the table above indicate (via the NDI value) the combined effect on the turf of the nematode species (and populations) present in the received samples