Dr Catherine York, Turfgrass Pathologist at the STRI, examines some of the reasons behind turfgrass disease, and asks "Is Ditylenchus a pest on your turf?"

Nightmares from nematodes

Working as a turfgrass pathologist can be quite a lonely profession, especially when you consider the rarity of the "breed". Confirmation of your knowledge and improvement of your understanding can be developed over time through reading and receiving unusual turf problems. However, to be able to receive information directly from someone who has written the books that you've learned from, provides obvious confidence in you abilities.

Figure 1

It was a pleasure to have had the opportunity this year to work with Dr Noel Jackson, who came over to the STRI in April on sabbatical leave from Rhode Island, USA. Dr Jackson, who was the Biologist at STRI in the 1950's, initially accepted a two year position at Rhode Island - but decided to stay and is now Professor of Turfgrass Pathology & Turfgrass Management.

He came over to do a couple of months research with us looking specifically at dollar spot and anthracnose diseases, but generally at all disease problems that can be found on turf at that time of the year.

The Biology laboratory at the STRI is kept busy during the year, mostly with identifications and confirmations of disease problems that occur amenity turf. It is interesting, however, when samples arrive in the laboratory and the problem is not "routine" but something a bit different. In the first few months of 1998, we had two rather interesting samples arrive on the laboratory bench - one from a golf green and the other from a golf fairway. Both were problems caused by nematodes.

Nematodes are microscopic roundworms which are generally between 0.5 mm and 2.0 mm in length. There are many types of nematodes which naturally inhabit our soils but it is only a relatively small number which actually cause problems on turf in the UK. Their activity is favoured by warm soil temperatures and restricted by soils which are either dry or waterlogged. They also prefer light, sandy soils rather than heavy and compacted rootzones. Nematodes move through soil in a similar way to that achieved by the common earthworm although they can be spread across large distances in surface water, or soil movement, due to their small size. It is probably fair to say that, until recent years, nematodes had not been considered a problem for turf in this country. Recently, however, we have seen nematode problems on both coarse and fine turfgrasses. The symptoms caused by nematodes vary depending on the type which have infected the tissues but they basically fall into one of two types - ecto-parasites (which attack and remain outside the plant) and endo-parasites (which enter the plant tissues). Over the past couple of years we have seen problems caused by the stubby root nematode which causes symptoms as described by its name. The nematode attacks the roots on the outside and causes the root to 'react' in such a way as to protect itself from further attack. The infected area swells and the nematode moves on to attack the root at another point. The result of these attacks is to have a restricted root system which is swollen all over. This type of attack, however, is not the type which we have seen in recent months.

The first problem sample to come into the laboratory was from a green from Bedale Golf Course in North Yorkshire. The problem was found on one of the five greens constructed about five years ago on land which had previously been farm land. The only symptoms observed on the turf surface were those of weak, patchy Poa annua. An inspection by our agronomist, Emma Kirby, identified some unusual growths on the roots of the turf. The affected turf was Poa

Figure 2

annua and the symptoms observed were small nodules on the roots (Figure 1). The nodules were in the order of 2mm wide and 3mm long and each had a small portion of the root extending from the lower part of the nodule. When viewed under the microscope, the nematodes could be clearly seen and were identified as Ditylenchus radicicola. This nematode is not a new problem on turf and indeed was discussed in the 1959 Journal of the Sports Turf Research Institute as one of the gall-forming nematodes of grasses in Britain. It is of interest that this nematode is colonising turfgrass roots and affecting turfgrass quality. It would be useful to know just how extensive the problem is country-wide.

The second sample that arrived in the laboratory, was from Thetford Golf Course in Norfolk. The turf in the affected areas had changed colour to a ginger-brown and the symptoms had been seen on two roughly parallel fairways. The Course Manager had seen the same symptoms during 1997 around two bunkers and he had thought the damage likely to be due to drought or possibly chafers. This year, however, the symptoms developed earlier in the season, around late March/early April and whilst looking for chafers, the Course Manager had noticed swellings at the base of the fescue plants (Figure 2). Our regional agronomist, Dr Tim Lodge, had telephoned me prior to the sample arriving in the laboratory, asking if I had ever seen swollen bases on fescues and if so, what the problem was. I had to confess at the time that this was a new one on me. I asked Dr Jackson for his thoughts but speculation was not going to identify the cause of the problem formally. When the sample of turf arrived, it was found that the stem bases were infected with the stem nematode Ditylenchus dipsaci. This nematode occurs worldwide in temperate areas and is capable of infesting many plant species. As far as I am aware, it has not been commonly found on Festuca spp. in the UK and because of this, we were extremely interested in this "find". This nematode has a relatively short life cycle and can therefore rapidly increase its population size in a year. It is possible for the nematode to remain viable for several years.

As with other nematode problems, there are no chemical controls which have approval for use against these two nematodes on turf in the UK. Control options for agricultural crops include alternation of the plants grown, but for a turf situation, this is not possible. Generally, nematode problems will affect the plants water and nutrient uptake ability and therefore affect the colour and vigour of the turf. It is likely that, if you have an area of turf which is well fed and watered but which is not responding and appears a little "off-colour", nematodes are at the root of the problem. I am presently trying to gauge the severity and extent of nematode problems on amenity turf across the UK and would appreciate any assistance that you can offer. If you have any areas of turf on your course which continually seem to be "lagging", even after all of your efforts, please give me a call or drop me a line and I'll get back to you.