reduce those conditions that may encourage an attack. Alkaline surface conditions may encourage fusarium, for example who has fusarium around bunkers (which are filled with high pH sand)? In addition, take-all patch is predominantly a problem on high pH greens.

Each and every disease has its own set of preferred conditions which aid its rapid development. Unfortunately conditions to reduce one disease may assist the development of another, for example autumn nitrogen of the wrong type and out of balance with other nutrients can encourage fusarium, whilst the presence of nitrogen in winter can suppress anthracnose.

Careful selection and application of materials can help: the use of iron to toughen the plant from the outside is well known and widely used, but what of potassium for cell wall thickening and therefore protection from the inside?

Work in Australia has concentrated on selecting the appropriate ‘antagonistic’ organism from the soil, multiplying it and re-applying it in a top dressing to effectively attack the disease biologically. At present there are no known topdressings commercially available incorporating this system but such introduction must only be a matter of time.

Work in the USA has developed along the route of organic fertilisers, which are thought to encourage the development of micro-organisms antagonistic to turfgrass disease causing factors. These may also be an aid in disease control by providing additional nitrogen to the plant (a point mentioned earlier), but as yet the actual mode of action is unknown. Current work on this front has shown some suppression of dollar spot and brown patch on bent-grasses, but there is still some way to go in producing effective recommendations.

Do not write off chemicals. All manufacturers are actively looking at new actives (and at new uses for old ones), with undoubtedly one of the more interesting developments being the use of microbes to manufacture actives. This has the advantage of reducing harmful wastes and producing purer actives which can truthfully be said to have been ‘naturally made’.

The first herbicidal product to be made in this way is already marketed and in use in agriculture and is proving very effective.

In summary, may I suggest that greenkeepers should be vigilant in avoiding conditions that favour disease whilst encouraging those conditions that hinder such diseases, and avoiding the possibility of chemical resistance; perhaps by varying the chemical groups that are used.

Finally it must be a case of ‘watch this space’, for it will only be a matter of time before alternative treatments and methods are here to help us.

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