NOTEBOOK...

Root mimic aids irrigation

JUDGING the irrigation needs of turf has always been guesswork. A Van Walt Tensiometer will help greenkeepers time irrigation better and avoid excess or insufficient watering of turf.

A tensiometer operates on well founded scientific principles by mimicking a plant root and so gives a direct reading of the soil moisture levels as experienced by plants.

The business end of the tensiometer is a porous ceramic tip fed by a water reservoir held in the body of the meter. As the soil dries water is pulled from the tensiometer through the porous tip. The drier the soil the greater the pull. An easy to read pressure gauge at the top gives a clear reading of the moisture level of the soil.

Tensiometers are easy to use - just insert into the soil and walk away. It will give a constant reading of moisture levels day or night and is maintenance free.

It is recommended that at least two tensiometer be used - a short and a long one to measure near the top and the bottom of the root zone. The reading from these two will give an indication of the moisture profile through the soil.

Tensiometers are priced from £38.85 + VAT phone: 0428 53404.

Ministry okays NTC pesticide code

AS the Minister at the Ministry of Agriculture Fisheries and Food with responsibility for Part 3 of the Food and Environment Protection Act, the parliamentary secretary (Lords), the Baroness Trumpington has welcomed the initiative taken by the National Association of Agricultural Contractors and the National Turfgrass Council in producing and publishing a Code of Practice for the use of Approved Pesticides in Amenity Areas.

"It is an indication of the responsible attitude within their sector that NAAC and NTC have taken the draft Code of Practice produced by the Ministry for agricultural and commercial use of pesticides and have adapted that draft guidance to the circumstances of amenity users" says Lady Trumpington in her foreword to the Code.

The Code is a short, easily read A4 publication covering storage transport, application and disposal of pesticides.

"It has been produced in consultation with all our member organisations concerned with pesticide use on amenity grass", said John Shildrick, secretary to NTC.

More information from John Shildrick, on (0274) 565131.

THE WIND FACTOR

Seaside links are more exposed to the elements

IT'S quite common to see a golfer, before teeing off, pick up a few grass blades and toss them into the air to determine which way the wind is blowing. For having some idea of wind direction is critical to the experienced player.

Wind is one of the major factors contributing to the playing strategy of a golf course, particularly the seaside links, which are more exposed to the elements. In windy conditions, golfers find it difficult to remain steady and maintain a smooth swing. The flight of a ball is affected by a cross-wind,and even putting is difficult in blustery conditions.

According to the records, Andrew Lang, the poet who wrote so much about St Andrews, drove into a high wind that carried his ball backwards into a bunker behind the tee.

Yet, when American Craig Wood was involved in a play-off for the 1933 Open Championship at St Andrews, he was assisted by such a strong following wind that he drove his ball into the bunker on the face of the hill just short of the fifth green - an estimated 430 yards!

Wind is essentially air in motion, with both velocity and directional components. It consists of a succession of gusts and lulls, rather than a uniform velocity. Wind is usually the result of differences in the density of pressure of the atmosphere.

A diurnal variation in wind velocity is frequently observed in temperate climates, with maximum velocity generally occuring around noon and the minimum at daybreak and dusk.

Warm, damp winds from the south and west are usual in Britain at all times of the year and are largely responsible for the mildness of the climate. Easterly winds are less common than winds from the south and west, and are usually drier and colder.

The North Sea is shallow and cold, so, when the wind is blowing from the east, east coast areas are cool in summer and cold in winter.

Wind affects turf growth in a number of ways, according to the location, and it generally influences the turf by cooling, increasing transpiration, abrasive action or the displacement and transport of soil, sand, snow, pollen, seeds etc.

Turf can be protected from the drying action of winds by using protective windbreaks. Strategic placement of trees and shrubs can serve as wind-breaks.

It's important to have a reasonable circulation of wind and air in the proximity of greens. Those which are constructed in sheltered locations can have problems with restricted air flow, making them more prone to prolonged moisture and fungal disease.

In the United States and Canada, wind is also a serious hazard in the transfer and deposition of snow on golf courses in the winter. Elevated, exposed areas do not receive as much precipitation as hollows and protected places due to snow removal by the force of the wind.

This often results in areas of maximum exposure being characterised by dry soils and severe winter dessication problems. Snow fences and brushwood are often used on courses to protect turf from the drying action of the wind as well as providing more uniform snow distribution.

Greenkeepers on seaside courses are aware of the problems of sowing grass seed on light sandy soils when seeding can often be lost in brief periods of high winds. Practices that help to minimise this problem are keeping the seedbed perpendicular to the prevailing winds or using windbreaks.

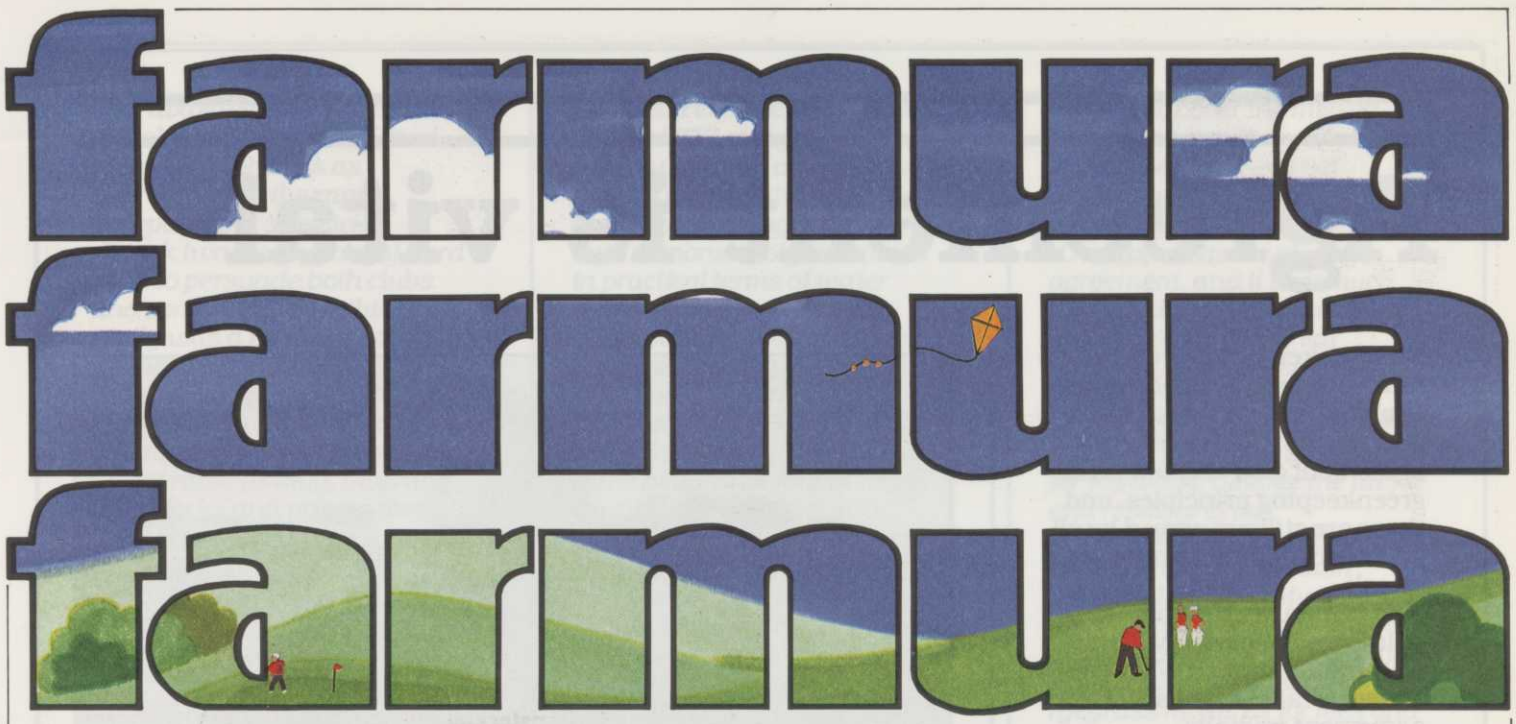
Wind dissemination of weed seeds is an avenue for the constant spread of weeds into fine turf. Light seeds, or seeds with a wing-like structure, are ideally adapted to wild transport.

The parachute-like pappus of the dandelion is a typical example. Wind is also important in the dissemination of spores of many turf pathogens.

Playing on links courses in windy conditions, many golfers have experienced the blinding effects and stinging sensation on their cheeks caused by windblown sand from dune areas and bunkers in exposed situations.

The disposition of wind-blown sand can have serious effects on surrounding turf, for it may smother the grass completely and cause severe damage. The abrasive action of windblown sand can also have a damaging effect. Turf plants are frequently sheared off at the soil surface by the abrasive blasting action of gale-force winds. Only the tough, indigenous dune grasses are adapted to these conditions.

Salt spray is sometimes a problem on coastal courses, too, and this is caused by the action of the sea dashing against the rocks and shoreline, which produces a salt spray that drifts inland. Succulent grasses that are not adapted to these conditions are very susceptible to foliar injury from the windborne salt spray.



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farmura pre-plant 6

When trees or shrubs are lifted prior to transplanting a large proportion of the finer root structure is lost and consequently the plant is subject to much stress and re-establishment becomes more difficult. FARMURA PRE-PLANT is a creamy liquid root dip which reduces dehydration of the roots and provides a protecting semi-permeable 'skin' protecting the roots from damage yet allowing them to breathe and take in moisture.

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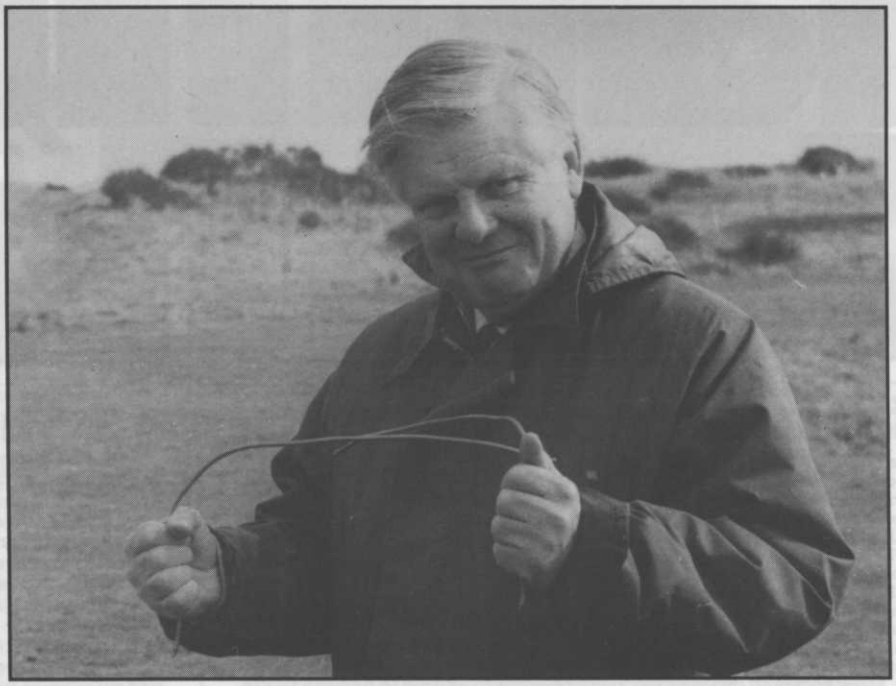
Agreement is vital

IT has taken twenty years of hard slogging, by exhortation, explanation , demonstration and results to achieve broad agreement on a very few basic greenkeeping principles, and these are still not agreed by all and are constantly under attack.

What then are the basic points we have largely, if not universally, agreed. Very few, if one is realistic, yet such agreement is vitally important if greenkeeping is not to suffer cyclic patterns of disaster and recovery. Disagreement leaves greenkeepers and greenkeeping vulnerable to the malign influences of members, professionals and the unqualified pursuing misguided objectives with irrelevant methods.

Education is the secret, but at all levels, and perhaps nowhere more importantly than with members, from whose ranks are recruited future chairmen and conveners as well as captains. Continuity is a sure fire winner where it is combined with a proper understanding of greenkeeping principles and a full acceptance of what constitutes ideal golf course conditions.

Where then have we achieved some measure of agreement on greenkeeping practices? *Firstly, on fertiliser useage, where most greenkeepers and advisers have accepted the fact,Sproven by research, that annual meadow grass increases and finer species decrease with increasing phosphate and potash levels. There are still some who advise use of NPK fertilisers including some inexperienced advisers and fertiliser firms, but a gratifying number of the latter advise and supply nitrogen only for golf greens. Investigations at the STRI, backed by R & A funds, linking chemical and botanical characteristics of golf greens*



in profile analyses at different depths, confirm the link between high phosphate and annual grass dominance. It is known that phosphate levels as low as 10-15 ppm are quite adequate to support fine leaved agrostis and fine fescues. A recent analysis of the greens on a frequently televised links course shows figures from over 800 ppm to well in excess of 1,000 ppm.There are no prizes for guessing the grass type , virtually pure poa annua, and the Club has no chance of changing that situation without a complete rebuild of all the greens. Those greenkeepers still using NPK fertilisers in large quantities are leaving a dreadful legacy behind them.

It is all too typical of the failure by those setting themselves up as advisers, to see basic truths, claiming that those previously advising nitrogen only have changed their minds. This is based on, amongst other factors, a lecture given by STRI on the management of pure sand greens where, because the grass is grown hydroponically, both phosphate and potash are needed, or the grass dies. Annual meadow grass invades as a result and this is one reason why pure sand greens have no relevance outside hot, arid zones of the world - but of that, more anon!

Another point on which there is basic agreement is the need for intensive aeration to combat the consolidating effects of traffic. Again we can argue about how to do it but not about how often, which admittedly varies. On one famous links the fescue dominant greens are very unconsolidated, and aeration is confined to six greens once per year with excellent results, because there is little play and so little resultant compaction. With more intensive use, we need much more frequent and deeper aeration, hence the dramatic success of the Vertidrain, a machine which I had the greatest difficulty in introducing into Britain from Holland, to the extent even that a last minute cancellation by one club, stopped a Dutch contractor coming over to Vertidrain six courses before the machine

was available over here. It is this slow acceptance of good new ideas which is as depressing as the rapid acceptance of gimmicks.

It took two more years of hard graft to persuade both clubs and contractors that this really was a better deeper method of aeration to get at deep seated pans - yet it is only mechanising the method widely used 60 and more years ago of raise-forking, inserting hand forks and prising them back. Today of course everyone is in on the act, many contractors and some clubs with their own machines yet what a task it was to start it - as its inventors are now finding in the United States.

A third measure of agreement is to irrigate sparingly, and in the case of pop-ups, to use them to the minimum possible level nightly in drought periods. Yet there are advisors not the STRI or myself, who advise watering only once or twice a week, saturating the greens and letting them dry out - demonstrably ridiculous in practical terms of water demand and potential absorption by greens as well as being technically incorrect. There are still firms, not members of the British Turf Irrigation Association, fitting three heads, not four or more, to greens larger than 400 sq.yds. This is in direct contravention of BTIA standards. The result of spacing heads further apart than the technical maximum, the so called head-to-head cover, is uneven coverage and missed areas, especially under marginal operating conditions, such as wind. Then we find the pop-ups turned on for longer periods in a vain attempt to cover the missed areas. The result, inevitably, is that the wet areas get waterlogged and the missed areas stay missed.

Our last measure of agreement, and it took much longer to achieve, is that there is no place for perennial ryegrass, even the so called dwarf strains, on any golf course in Britain. Yet one golf architect is still using ryegrass for fairways, despite the awful end result and the impossibility of imparting back spin from such lush meadowland lies. My advice to greenkeepers and others is to only buy seed from firms who specifically recommend non-ryegrass mixtures for tees and fairways.

Our next objective must be to agree on green construction and I will discuss that in my next article.

by Jim Arthur

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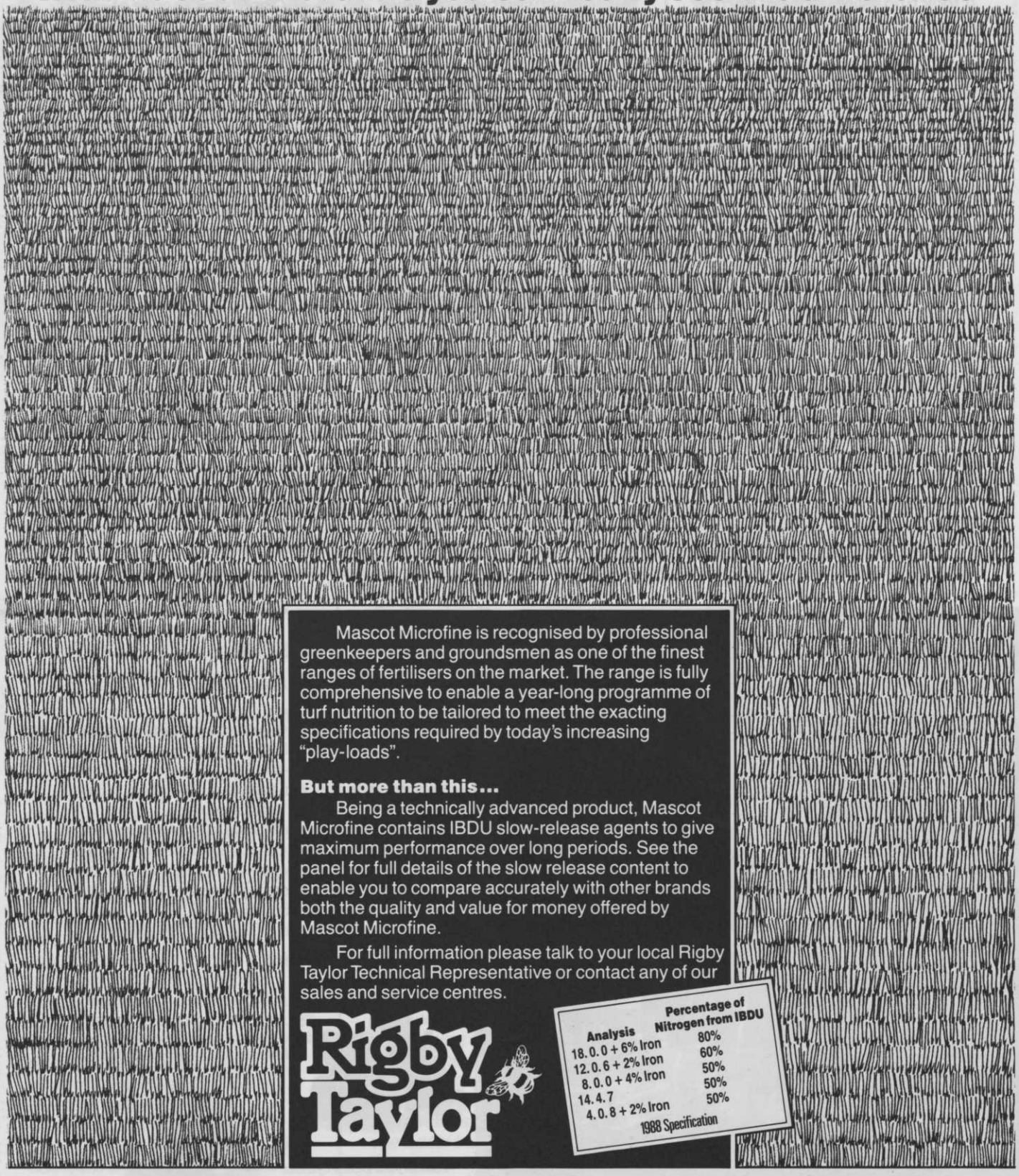

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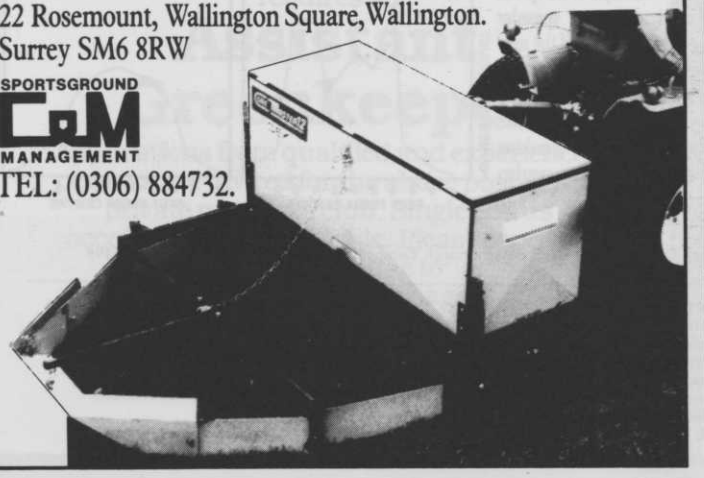

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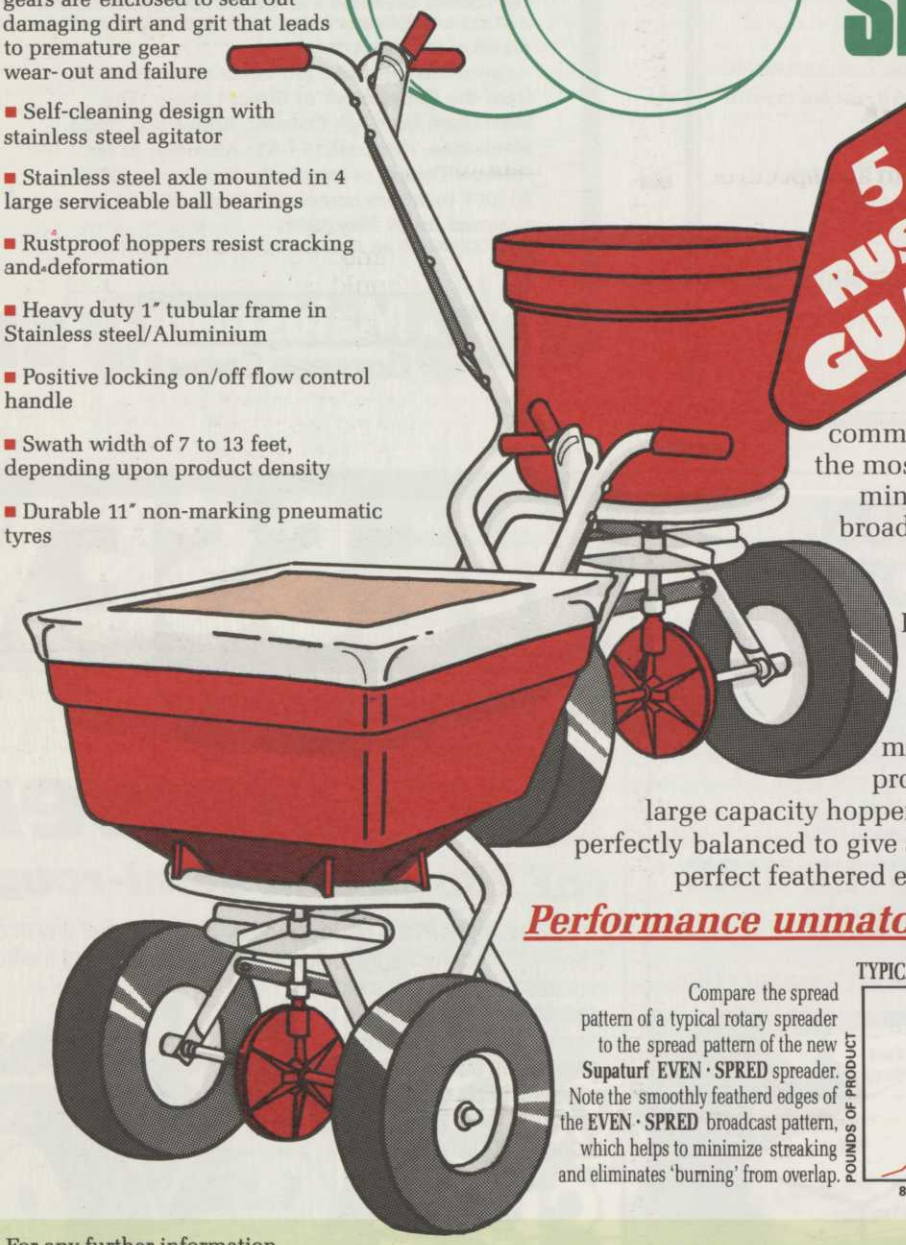

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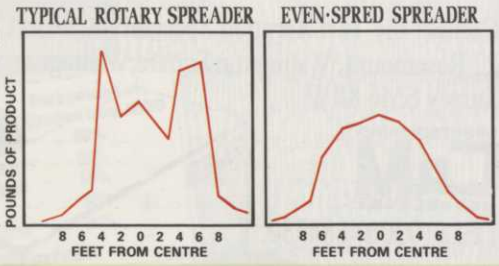

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RESEARCH UPDATE

Over the years there have been many attempts to control fairy rings on golf courses by applying fungicides. Although fungicides can suppress fairy rings for a time, eradication or complete control is difficult to achieve. Research at the STRI, sponsored by the Royal and Ancient Golf Club of St. Andrews, has been exploring new approaches to fairy ring elimination in which biological control techniques rather than fungicides are deployed. In this article, the most promising findings of this research are outlined and the potential of biological control discussed.

BY NEIL BALDWIN, PLANT PATHOLOGIST AT THE STRI

THE lush green grass rings or circles of mushrooms formed by fairy rings occur extensively on many golf courses in the UK and consequently they are easily recognised by most greenkeepers. Many first impressions are that as they occur on less intensively managed areas, such as fairways and in the rough, they do not cause appreciable damage and are consequently of little concern.

However, these first impressions can soon turn to dismay as extensive fairy ring development can cause significant damage, particularly so when they occur on tees, approaches to greens, aprons or even the greens themselves.

Biological control mechanisms, developed by plant pathologists at the STRI and universities in the USA and Canada, offer an alternative to fungicides for control of fairy rings.

By definition, biological control is the use of natural enemies to control disease. Natural enemies, in the context of turfgrass diseases, can basically be divided into two groups.

Firstly, in turf there are fungi termed hyperparasites, which attack the disease directly. Thus, in the same way that fusarium patch is harmful to turf grasses, these hyperparasites are directly harmful to the disease. Biological control based on hyperparasitism has been well developed for several diseases of agricultural and horticultural crops but, as yet, it has not been thoroughly investigated for turf diseases. Great potential for future turf disease control lies in this area.

Turf infected with fairy rings mixed with the underlying soil by use of a rotivator.

Secondly, biological control based on another phenomenon termed antagonism has been developed for several turf diseases and in particular for fairy rings. Antagonism is a relationship between different organisms where one (the antagonist) partly or completely inhibits the growth of another (the fairy ring).

Observation on the development of Type One fairy rings (Marasmius Oreades) has revealed some very interesting information.

For example, it is rare to find one ring developing inside another larger ring. Also, surveys of M. oreades rings on lawns have indicated that fairy rings are most numerous on lawns six to ten years old, and there is a decline in the number of rings with increasing lawn age. Finally, when two rings collide, in the zone of collision the rings cancel each other out to form a figure of eight arrangement.

This observation can be repeated under laboratory conditions. If cultures of M. oreades are allowed to grow towards each other on a Petri dish then both cultures will stop shortly before they are due to come into contact.

These observations have led to the conclusion that fairy rings are discouraged from spreading by a naturally occurring biological control exerted by antagonistic fungi and bacteria in the soil.

The observation that one ring rarely develops inside another is explained, at least partly, by the build up of antagonists that directly inhibit any subsequent rings. Older lawns, which appear to be less prone to fairy rings, have had time to develop an antagonistic soil microflora.

>>