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THE BRITISH GOLF

GREENKEEPER

HON. EDITOR: F. W. HAWTREE.

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No. 238 New Series
JANUARY 1965

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A LONDON NEWSPAPER,
11th December, 1964.

JANUARY CONTENTS

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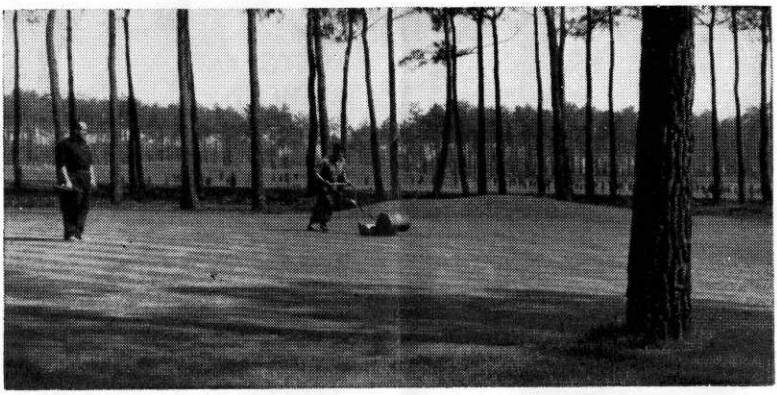

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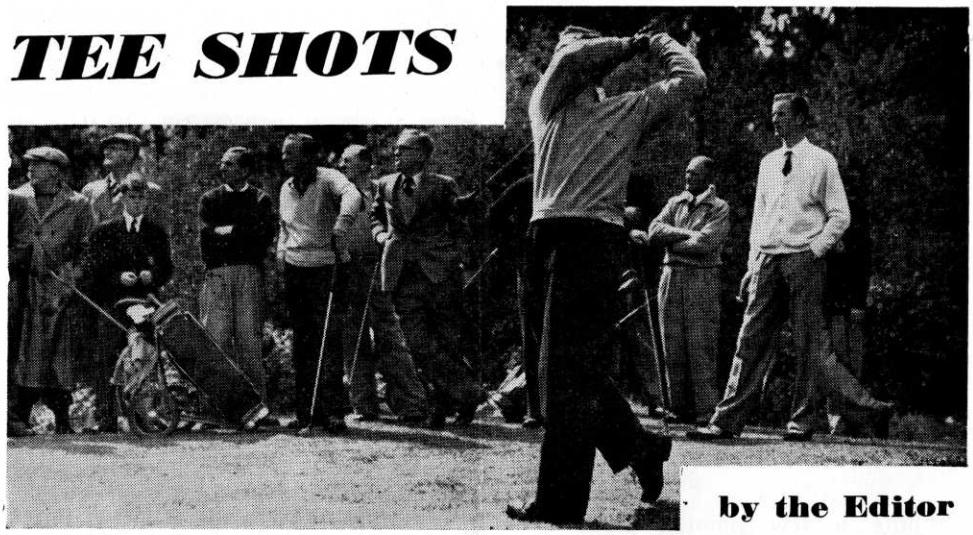

by the Editor

A Swedish contribution to mowing has become popular in the Manchester area. A. Wilson, Head Greenkeeper at Bramall Park, showed us his "Flymo" with some pride last month. This is a rotary mower with 2-stroke engine sitting on a fibre glass body, the whole thing weighing only about 26 lbs. Vanes on a disc above the revolving cutting blades cause the whole machine to float on air when the engine is started. Thus, on banks or round bunker edges, the operator can whisk his mower to and fro with one hand and cut awkward slopes and corners with less effort than it takes to wield a scythe. Bramall Park was certainly looking well cared for, though most of it still went through the traditional routine.

* * *

Mr. S. Frappell, Head Greenkeeper at the Bristol and Clifton Golf Club, Failand, has shaped up a new 11th green very neatly in the past few weeks. The old one suffered from problems of visibility and a strong backward slope. Teasing problems of this sort seem to last just so long (a long time in this case) but not for ever. The greatest problem of golf course design is trying to provide the problems without making them eccentric.

* * *

Harry Roberts, West Lancashire Golf Club Head Greenkeeper, produced a new 10th green at West Lancs. in something under a fortnight in December. Green Committee decisions are not always speedy—Harry decided to translate thought into action between one meeting and the next—and succeeded.

* * *

A Happy New Year to all our members.

CHEMICALS or COMPOST

by

John Stobbs

Quite a few pointers have been showing up in greenkeeping articles in various American publications which rather suggest that they are realising anew, over there, that there are ways in which slicker methods of treating turf, for immediate results, may have considerable long-term disadvantages.

This is a point of view which has always held its ground over here, of course: the more so since members of the British greenkeeping profession have a certain traditional suspicion against "too much science"—especially when combined with high-pressure salesmanship (as all new products, good or bad, inevitably are in America). It's still interesting, though, to see an old cry of British Greenkeepers and Turf Advisers taken up with something of the air of a new and interesting rediscovery over there.

Ice Coating!

Maybe it was triggered off by the vast damage suffered by many Northern American courses in the winter of '61 and '62, when big snowfalls thawed slightly, then froze solid: to cover many greens with a solid coating of ice (much the same problem which we had ourselves here).

There was a great deal of to-ing and fro-ing and comparing of notes, apparently, amongst "Course Superintendents" in areas most seriously affected. All manner of theories were put forward to account for why some courses had suffered so much more catastrophically than others. On some courses, whole greens emerged from the ice-sheet, rotting and stinking, or emerged green, only to die off soon afterwards; whereas in others, where conditions had been much the same, the turf suffered little permanent damage.

Theory plus Facts

In the end, it seems, the theory which most closely seemed to fit the facts (including the examination of plugs from different greens) was the one many a Briton might have suggested in the first place! Where the soil-structure of greens had least successfully been looked after, so that aeration was poor, and there was compaction of the soil (often at more than one level), the effects of the ice-sheet were disastrous. Where the turf had best been kept aerated and healthy in structure, damage seemed to be least. "If compacted turf is overlaid by a thick sheet of ice, life-giving oxygen can't penetrate to the roots . . . . Air drainage is a must" just about summed it all up, as the magazine *Golfdom* put it.

Autumn Dressing

Since then, there's been quite a bit of attention paid, too, to the functions of autumn dressing of greens: with the idea that above all it mustn't aim to stimulate growth above ground, but rather to strengthen the turf reserves for winter, and to help it to store up food for itself during the cold season. No one, they reckon, yet knows exactly how turf stores food reserves. But it does, and it must be helped to do so.

With the focus on long-term health of greens, not entirely surprisingly, there seems to have been something of a re-emphasis on composts, as against fertilisers. *Golfdom,* which usually has its nose very close to the ground indeed, came out with a short but dogmatic article (admittedly by a Vice-President of an Organic Compost Company, a Frank T. Sprogell), with a heading reading like one of our old clichés of tradition in this country: "Organic Material Helps to Rebuild Depleted Soil"!

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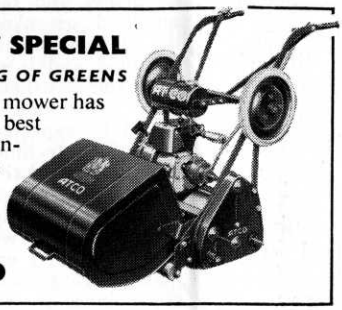

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He's worth quoting at some length, for the gist of his message to the modern American Greenkeeper :—

"Some of us who, for many years, have been responsible for golf course maintenance have wondered how we once managed to keep greens in such excellent condition despite the somewhat primitive stage of turf management technology compared with today's advanced methods, materials and machinery."

The troubles they used to have then, he remarks, don't seem to have been any worse than the troubles they now get "in this modern, highly scientific turf management era".

Use Compost?

Why? Because, he suggests, "the old fashioned value of soil building in compost" has gone rather out of fashion. "A good living organic compost is much more than just a fertiliser . . . . It is a means of continuing life". And this old well-tried idea, he thinks, more and more American greenkeepers are reverting to.

"Many experienced superintendents realise that life (soil bacteria) is being depleted in the soil. This is caused by the constant use of sterile materials and the necessary application of various chemicals needed to correct weed and turf diseases. Detergents and chlorine in city water used on many courses also deplete soil life. Seldom are materials, containing living soil organisms, added to turf programmes to help remedy the deficiency. Lack of active, living organics in the soil creates a condition difficult to cope with. Unhealthy turf, shorter roots and compaction result. The soil becomes less friable, preventing adequate water and air circulation.

"To correct this condition Superintendents are beginning to revert to the old custom of using substantial amounts of live and active organics. Humus is a necessary and active organic portion of the soil. It creates a loamy textured structure by producing granulation, thereby improving aeration and drainage. It also improves the soil's exchange capacity, which is the soil's ability to retain plant nutrients and moisture. Active organic matter is needed by soil micro-organisms as a source of food . . Sufficient living organic matter in the root zone assures the full and complete productive value of all types of inorganic or sterile fertilisers."

Repetitive

It's all been said before, of course (and is continually being explained to Club Committees here in Europe by most of the well-known turf advisers). It is arresting, though, to observe the Americans—well-launched for decades on all the ambitious short-cuts of greenkeeping—rediscovering the fundamental importance of the traditional British base for the whole perennial operation!

A Course Superintendent (Paul Voykin, Briarwood, Illinois), writing elsewhere on another subject in the same issue of *Golfdom*, perhaps sums up, incidentally, what it is all about :

"In the 12 years I have been in the turf business, the most successful superintendents I have run across are those who not only have wide technical knowledge and practical sense, but understand how to work with nature and its elements. They never fight nature or try to rush it. They learn to live with it and that, I think, is the secret of their success."

CORRESPONDENCE

Hon. Secretary,
British Greenkeepers' Association.

Dear Mr. Secretary,

1. The Spangdahlem Air Base is in the process of building a nine-hole golf course. The activity is presently suspended, of course, due to the inclement winter weather. I am sure that you are aware of the fact that there are very few golf courses located in Germany, and our problem is a competent qualified greenkeeper. We are wondering if you have someone available that would be qualified and interested in the position, and since this is a new activity to us perhaps you could offer some ideas as to the salary that would be expected.

2. The technicians that are building the golf course feel that it is most important that the greenkeeper be involved in the initial ground contouring and general layout. If you feel there would be any advantage in our doing so, I or a member of my staff can make arrangements to visit you at your convenience for further discussion.

Very truly Yours,
HARRY B. DAVIS,
Chief Civilian Personnel Officer.

ST. ANDREWS LINKS SUPERVISOR VISITS RANSOMES

When a schoolboy sets his heart on the profession of a greenkeeper one pinnacle of that career would be of Links Supervisor at the Royal and Ancient Golf Club of St. Andrews.

After thirty years of greenkeeping, which had taken him as far south as Devon, and as far north as East Lothian, John K. Campbell was appointed to this top job in 1962, when he was 42.

Few people realise that John Campbell's responsibilities cover an area of 450 acres, a monumental task which, in the season, needs all the attention of twenty-eight men, and an array of machinery which has to earn its keep from dawn to dusk.

With the responsibility of providing top playing conditions for the members of the four courses under his supervision, as well as the world's top players at tournament times, John Campbell has insisted on standardising on Ransomes mowers for all his cutting work and has recently been down to Ipswich to see production at first hand. His equipment ranges from the huge "Quintuple" gang mowers to the hand propelled "Certes" greens mowers with, in between, a large variety of machinery for other specialised cutting work.

Television viewers are probably more familiar with the Old Course than with the others, the course which claims to have the largest greens in the world, one alone covering one acre. As a point of interest, one could be faced with a putt of 225 feet on one of these double greens! With the critical T.V. cameras ready to pick up any fault, John Campbell has to have mowers which provide consistently perfect cutting, and, with such vast areas, there must be no chance of mechanical breakdown.

When next we switch on the set to watch the world's premier golfers and note the perfection of the "two-toned" cutting, spare a thought for John Campbell, the man responsible for providing absolutely perfect playing conditions for near perfect players.

John K. Campbell, Links Supervisor, takes a Ransomes "Auto-Certes" greens mower over the 18th green of the Old Course, in front of the Royal and Ancient Clubhouse, St. Andrews.

THE ECOLOGY OF NITROGEN ACTIVITY IN TURF SOILS

by

Dr. R. E. Blaser and R. E. Schmidt

This paper was presented at the American Golf Course Superintendents' International Turf-Grass Conference and Show at Philadelphia, last year. We reprint the first instalment here with grateful acknowledgments to the "Golf Course Reporter" because so much of it will be of interest to readers over here.

Nitrogen is a major constituent of all living things; it is an important part of protoplasm which is essential for biochemical processes in all living plant and animal cells. After entering plant cells, nitrogen combines with organic acids (breakdown products of sugars) to form amino acids, the building blocks of proteins. Some of these amino acids then combine to form proteins and protoplasm. The growth rate of plants is dependent on the production of new protein, which in turn is related to the amount of nitrogen taken into plants by the roots. A cell cannot divide nor increase in size until new proteins are produced.

Nitrogen is the key mineral nutrient in growth and quality control of turf. Having nitrogen available a little before growth conditions are favourable for a given grass, stimulates growth competition to crowd out weeds, and is the best way to keep the sod pure. For example, applying nitrogen liberally to bluegrass lawns during the cool late summer and/or spring stimulates growth and sod thickness. Dense sods then shade out crabgrass seedlings which germinate in late spring and early summer. Liberal fertilisation with nitrogen during the summer months would favour crabgrass encroachment, as crabgrass grows better under high summer temperatures than bluegrass. On the other hand, for summer growing grasses such as zoysia, bermuda, and centipede, most of the nitrogen should be available in late spring to mid-summer, the favourable growing period of these grasses. If nitrogen for summer grasses is applied in the autumn, it will simply encourage growth of weeds and grasses that grow at lower temperatures in autumn when summer grasses stop growing with bentgrass greens. Where *Poa annua* (annual bluegrass) is invading, it is best to use most of the nitrogen in early autumn and early spring, the time when bentgrass grows better than *Poa*. *Poa annua* grows better at lower winter temperatures than bentgrass; thus, it is wise for the available nitrogen to be low in the late fall and late winter in areas where *Poa annua* invades bentgrass.

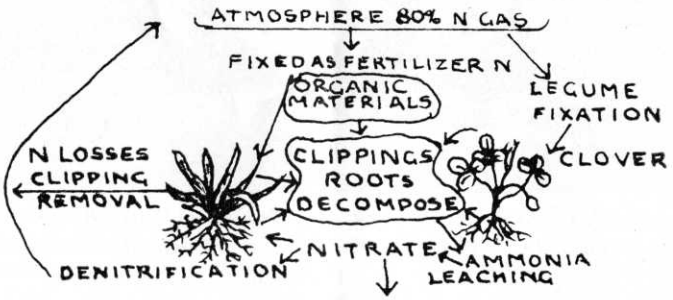

FIGURE 1- THE NITROGEN CYCLE

The Nitrogen Cycle

Nitrogen is needed in greater amounts than any other fertiliser element, yet the

soil is a poor nitrogen storehouse. Turf-grasses absorb nitrogen from soils as ammonia or nitrate, but these nitrogen salts are usually very low in soils. Most of the soil nitrogen is bound in organic matter in various protein stages of decomposition, in plant residues or micro-organisms. The protein nitrogen in organic matter must be oxidised by micro-organisms which release ammonia. Such released ammonia is then absorbed by plant roots or further oxidised and absorbed as nitrate nitrogen.

A simplified chart showing nitrogen "breakdown" as it applies to turf-grasses is shown in Figure 1. It is interesting to note that about 80 per cent of the atmosphere is made up of free nitrogen gas (mostly N_2), but nitrogen gases cannot be used by grasses, except through nodule bacteria on legume roots which can reduce the free nitrogen to ammonia. The change of nitrogen from one form to another, its utilisation by the plant, and its later return to the soil as plant and animal residues is called the nitrogen cycle. Animal and plant residues in various stages of decomposition are also used as sources of nitrogen fertiliser.

Dead roots and shoots, without clipping removal, make much organic matter available for decomposition; the protein nitrogen in plants is released and reuitilised. However, this scheme does not make nitrogen available when plants need it. Decomposition is slow during cool temperatures. Micro-organisms grow fastest when grass growth is also rapid; thus soil microbes "tie up" nitrogen causing a shortage of nitrogen for grasses. Nitrogen is also lost from the nitrogen decomposition cycle in two ways : (1) some nitrogen goes back to the atmosphere as nitrogenous gases, and (2) nitrate is leached out of soils.

The return of clippings is usually not a good source of available nitrogen because of laying on the soil surface where the organic nitrogen compounds are not decomposed into mineral nitrogen. When clippings are removed, more nitrogen fertiliser is needed than when they are returned to the soil.

Form of Nitrogen Fertiliser

The three major forms of fertiliser nitrogen are : (1) Soluble nitrogen fer-

tiliser salts that are immediately available for root absorption, such as ammonium nitrate, sodium nitrate, urea, sulphate of ammonia, and others; (2) Organic nitrogen (plant and/or animal residues), such as sewage sludge, tankage, protein meals, tobacco stems, etc. which must be decomposed by micro-organisms to become available; and (3) Urea-formaldehyde (U-F) nitrogen fertilisers, consisting of urea combined with organic materials to form plastic-like compounds. A little of the nitrogen in U-F is readily available; but most of the nitrogen is made available by decomposition of microbes. In addition to these three forms, quickly available nitrogen, such as urea, is being compounded within long-chain hydrocarbons in pellets to bring about slow nitrogen release.

We have found all of these forms of nitrogen satisfactory for different grasses used on golf course greens and lawns when properly used. Soluble nitrogens ought to be applied every two weeks during the spring and autumn cool season to supply one pound of nitrogen per month or more during the cool season. These soluble sources are utilised quickly so they must be "rationed" to avoid overstimulated growth. Soluble nitrogen should be withheld or used sparingly during the summer months for cool season grasses. With cool season grasses, urea-formaldehydes have given excellent results when applied twice yearly, in late winter and in mid-to-late August. During the first year when U-F nitrogen is used, growth may be a little slow at times; thus, a very light rate of soluble nitrogen (one-fourth to one-half lb./1,000 sq. ft.) may be applied to "perk up" growth.

Organic nitrogens should be applied at monthly intervals for best growth control with little nitrogen used during the summer months. Even though organic nitrogens must be decomposed to release ammonia, they should be rationed to supply enough for 30 to 60 days growth per application.

Soluble nitrogens should be applied when the grass is dry and watered in immediately to avoid burning. The burning effects of quickly available nitrogen may be minimised by using hard pellets; pulverised soluble fertilisers cause more burning than pellets. All nitrogen fertilisers must be thoroughly and evenly distributed; spreaders without deflecting boards cause serious burning in such "row" applications.

When buying nitrogen fertilisers don't look only at the price per sack, consider other factors too; the potential useful nitrogen per sack, how you are going to use it, and what you want it to do for the grass.

Nitrogen and Thatch

Nitrogen must be used to stimulate grass growth to cover injured turf areas, produce dense sods to exclude weedy growth, and to maintain a pleasing uniform foliage colour. It is necessary to manage turf areas much more carefully with liberal nitrogen as compared to low nitrogen fertilisation. Very liberal nitrogen fertilisation stimulates thatchiness.

Nitrogen stimulates top growth (leaves and shoots) that makes beautiful dense turf. Some of the older shoots, leaves, and roots keep dying and are replaced quickly by new growth. The more nitrogen that is available, the greater the amount of growth which results in more dead and decaying plant material. The larger the accumulation of such decaying material, the quicker buildup of thatch (dead to slightly decomposed plant materials). Such accumulating thatch restricts water and air movement into soils; thus, with low soil air (oxygen) and water, the roots get shallow. Thatchiness and shallow rootedness also occur with liberal nitrogen fertilisation because of less oxygen in soils. Nitrogen stimulates formation of many roots with high respiration rates. This causes an accumulation of carbon dioxide and a reduction of soil oxygen ideal for thatch and shallow roots.

Such undesirable thatch occurs on all turf areas; diseases of grasses are also apt to be serious where surface organic matter accumulates. Through judicious and frequent vertical mowing; aerifying; soil top-dressing; light liming; a balanced and controlled fertiliser programme; and proper watering, thatch can be controlled.

(To be continued in February)