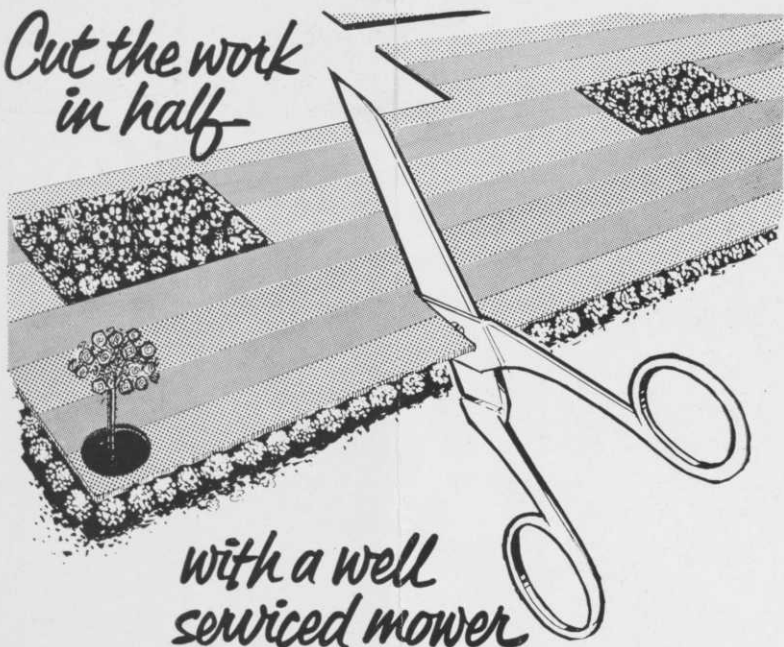


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HON. EDITOR: F. W. HAWTREE.



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No. 206 New Series

MAY 1962

*Conscience is the inner voice
which warns us that someone
may be looking.*

H. L. Mencken.

MAY CONTENTS

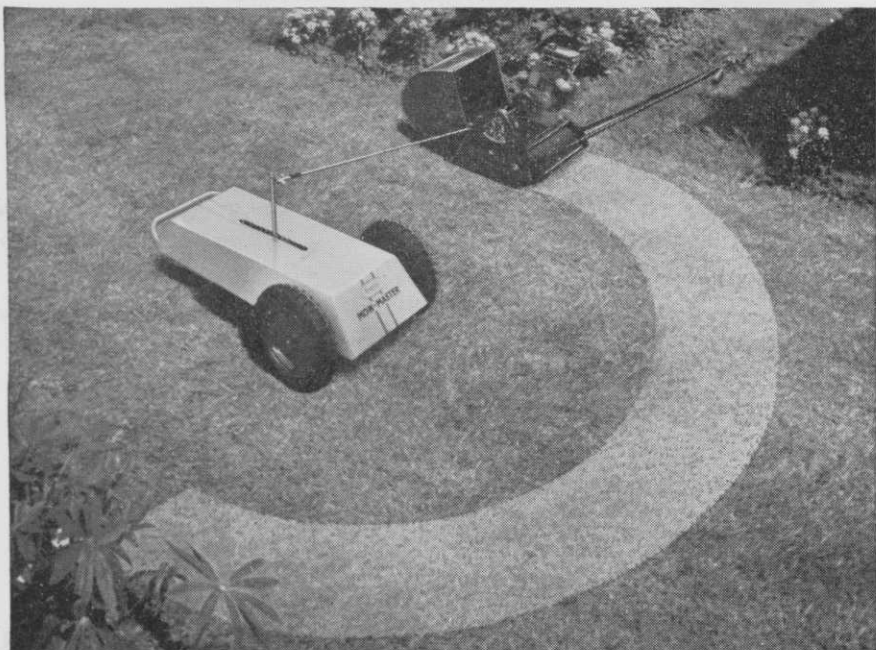
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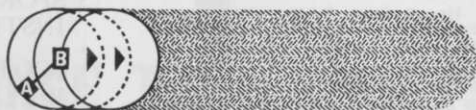
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TEE SHOTS



by the Editor

An Apprenticeship Scheme has now been prepared at the request of the Executive Committee of the Association. The proposals have been sent to each Section Representative and to all golfing organisations likely to be interested in the realisation of such a scheme. There will be a pause of some months before the scheme has been considered, criticised, revised, and, if there is general approval, instituted. Once it has begun, there will be need for the help of individual greenkeepers in many ways and you will be kept informed of progress until that stage is reached.

★ ★ ★

The North Eastern Greenkeepers have now formally resolved to restore their link with the B.G.G.A. and we hope that through this magazine they will be able to keep in touch with each other and the Association as a whole. They are fortunate in having Mr. Leslie Jones as President. He has worked tirelessly to get them the support from clubs which they need. Chairman, J. Simpson, and the Hon. Secretary, Tommy Oliver, will already be well known to many readers and we hope to see more of the Section soon at one of the Annual Tournaments. Next year their President will also be President of the English Golf Union, a distinction which all will welcome but this Section with especial pride.

★ ★ ★

Landing at London Airport in a Caravelle from Brussels the other day, we were surprised to be greeted by fire-engines. A tactful steward explained that one engine had caught fire and we had flown on the other one alone for the last half hour. With this information we were able to congratulate ourselves at last on the sangfroid with which we had come through this gruelling ordeal and seeing the ground at the comfortable distance of about 10 ft. below us, we felt able to enquire what happened if the other engine caught fire.

"You still go on flying!" he said.

While anxious to believe this, another question was obviously necessary.

The steward explained patiently that before being put into service, the Caravelle had been flown over Paris at 10,000 feet and both engines had been cut. Even so the aircraft had been able to glide and land at Geneva.

"That's all very well," said our neighbour crossly, "but what about if you're going to London?"

★ ★ ★

Potassium—That Mysterious Macronutrient

By CHARLES E. CROLEY

Agronomist, Southwestern Region, USGA Green Section

OF the various soil minerals known to be essential to plant growth, potassium was among the first to be recognized. One of the first observations of potassium-plant relationships was that potassium is required in relatively large quantities by plants. Yet, since those early observations, progress has been slow in understanding the specific part potassium plays in plant growth and development. Through scientific investigations and practical observations we have learned that plant uptake of potassium is often higher than any other mineral and that a deficiency of potassium will give a very marked decrease in growth and, if the potassium level is low enough, even death of the plant. Since the beginning of the 20th century, emphasis on quality of crop production, especially in turf management, has increased to a prime factor. Here, too, potassium and plant quality are very closely related. It seems only profitable, then, to survey briefly what is known of the potassium-plant relationships.

Function of Potassium in Plants

Voluminous amounts of investigations on potassium-plant relationships have clearly indicated that unlike nitrogen, phosphorus, calcium, and magnesium, potassium is not a permanent component of any organic compound or structural part of plants. Its total apparent existence is in the form of soluble inorganic and organic salts, the greater portion being the inorganic forms.

Recent investigations have indicated that potassium affects the metabolic activities of plants in several ways, most of which appear to be enzymatic. Lawton and Cook report that evidence now available shows that potassium affects the following processes: (1) synthesis of carbohydrates, (2) translocation of carbohydrates, (3) reduction of nitrates and synthesis of proteins, particularly in meristem tissues, and (4) normal cell division. It is also suggested that potassium plays a part in maintaining turgor

in plant cells as well as increasing disease resistance. Research further indicates to some investigators that potassium may affect photosynthesis through its influence on chlorophyll.

Concerning carbohydrate synthesis, it has been reported that a decrease in available potassium is associated with a decrease in carbohydrate content of the plant and that high potassium content is necessary for high carbohydrate synthesis. It has been suggested that potassium may play a major part in the formation of more complex sugars and starches from the simple sugars in plants—a lack of potassium appeared to cause an increase in simple sugars as compared to total carbohydrate.

In the Cell

Practically coupled with potassium-carbohydrate studies has been the investigations of potassium as related to the structure of stems and cell walls. It is generally held that adequate supplies of potassium are necessary for the formation of stiff straw or stalk. Researchers have reported that when carbohydrates are present in high amounts, stem structures are likely to be strongest. Such a report strongly supports the potassium-stiff straw relationship. But if carbohydrates are used up in protein synthesis as when high amounts of available nitrogen are present, stems and plant tissue may not be stiff even though there is an abundant amount of potassium present in the plant.

There are a few workers who have suggested that the presence of potassium and calcium in the plant sap increases the uptake of nitrate nitrogen. These same investigators state further that such activity does not seem to hold true with all species of plants.

There is considerable belief, however, that potassium definitely influences the synthesis of proteins in plants. Some investigators believe there is a direct relationship between potassium and protein synthesis while others hold that the



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relationship is an indirect one. The overall effect agreed upon is that potassium-deficient plants are generally lower than normal in protein content. Along this same line it is suggested that with high nitrogen supply and deficiency of potassium there may result a toxic condition to plants from a too high accumulation of ammonia in the plant.

A number of reports have been made that potassium is in some way associated with cell division and actively growing plant tissues. Often it has been found that in potassium deficient plants the potassium is moved from older tissues to the actively dividing cells of the meristematic tissues. The effects of this phenomenon are observed in grasses by a yellowing of the margins and tips of grass blades. In such a case the potassium, being deficient in the plant, has migrated to the base of the leaves where intercalary meristematic tissues exist. There is still a great deal of doubt as to the function of potassium in cell division but the feeling is that it is associated with protein synthesis.

Combats Disease?

Adequate levels of potassium in the plant have been reported to maintain and in some cases increase disease resistance in the plant. Here again just how potassium causes this effect is not known. A general belief is that it is brought about by the ability of potassium to regulate chemical reactions in the cells of the plant. When potassium is deficient, there usually exists excess nitrate and phosphorus, thinner cell walls in epidermal tissues, reduced production of amino acids because nitrate reduction is suppressed, a marked decrease or halt in the accumulation of carbohydrates, a failure to produce new cells for want of essential amino acids for the protoplasm, and slower growth of meristematic tissues that would permit replacement of diseased tissues. Under such conditions caused by potassium deficiency, disease organisms can more easily enter the thin cell walls, obtain the abundantly available nitrogen necessary for their growth, and more easily damage plant tissues which the plant is unable to replace at a competitive rate.

Potassium is also given partial credit for the maintenance of proper turgor in plant cells. Turgor is the state of living cells being plump and swollen as a result of internal water pressure. In this respect it is reported that potassium affects the cell sap and helps to regulate the degree of swelling and the water economy of cells.

Concerning potassium and photosynthesis, some workers suggest that potassium has an indirect effect. It is known that photosynthesis takes place in the chlorophyll molecule, and that CO₂ as well as water and light are needed for the process. Some scientists feel that potassium enables the chlorophyll molecule to accept CO₂ more readily, which in turn affects the photosynthesis process—the process from which plant food is derived. It is also thought that potassium, perhaps by way of activating enzymes, plays a definite role in the manufacture of the chlorophyll molecule.

A. G. Kennelley has been quoted as summarising the role of potassium in plants as follows: "Potassium is important in the general health of the plant, particularly in developing sturdiness and disease resistance. It helps to promote the growth of woody tissues and usually improves textures, colour, and quality".

Supply of Potassium to the Plant

The plant receives its potassium from the soil. It is generally known that heavy soils or soils high in clay content have the ability to hold more available potassium than light soils or those high in sand content. The available potassium is supplied to the soil from the weathering of potassium minerals, which contain unavailable potassium. Generally the unavailable potassium makes up approximately 99% of the total potassium in the soil. In many cases the amount of such minerals in the soil and the rate of weathering of these minerals is great enough to supply adequate amounts of available potassium to the plant. However, when the weathering of enough minerals is too slow or the available potassium is lost at too rapid a rate by plant removal, leaching, and erosion, potassium must be added to the soil in the form of fertiliser.

The available potassium is taken into the plant by the root. There is widespread belief that the root cells immediately associated with the uptake of potassium and other minerals as well must exert a considerable amount of energy in order to absorb the potassium.

It has been well recognised that soil aeration is necessary for normal root growth and nutrient absorption by roots. And it has been observed that poor aeration apparently has more pronounced inhibitory effects on potassium than on any other elements. The effects of aeration on potassium absorption are primarily on the plant roots and not on the status of potassium in the soil. The effects of a lack or adequate aeration are due to either a lack of oxygen to the roots, or a toxic effect of too much carbon dioxide on the roots, or both. This point still remains a mystery. Excess soil moisture and soil compaction affect the absorption of potassium in that they limit soil aeration. Unless a soil can be adequately drained and relieved of compaction, aeration will be limited.

A number of investigators have found

that very low soil moisture considerably reduces the absorption of potassium by the plant. This effect is a result of both the dehydration of the plant and a reduced availability of the soil potassium.

Most workers have concluded that mineral nutrient absorption is reduced under low environmental temperatures. It has been found that within the range of 50° F. and 77° F. potassium absorption changed directly as the temperature changed.

Potassium Fertilisation of Turfgrass Areas

There are a number of potassium fertiliser materials. The most widely used material, however, is potassium chloride, commonly called muriate of potash, which contains from 50 to 60 per cent K₂O. This fertiliser can be applied alone or in a fertiliser mixture with phosphorus and/or nitrogen materials.

The amount of potassium fertiliser to apply and the time to apply it will depend on several factors. These factors are: (1) The amount of available potassium in the soil. If, at any time during

continued on page 16



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MY SYSTEM WITH COMPOST

George Herrington, Lindrick's popular Head Greenkeeper, gives some useful pointers on a seasonal task.

THE first and obvious thing is to decide on the composition of the compost. Soil, sand, peat, leaf-mould, sewage sludge and deep litter if made from peat, may all be used.

For soil, the top spit of your own course may be used. This should always be kept in stock whenever you have any space available as it will improve for riddling after being stacked.

Leaf mould can very often be found within ten miles of your own course. It may be possible for members to pull a few strings in order to get your own constant supply.

10/- per Ton

Peat can be bought in 1 cwt. bags but it is rather expensive. We are very fortunate in this respect as we can buy very good peat soil at 10/- per ton, plus the cost of transport.

Sewage sludge may also be bought ready for use, but we get our own from our local sewage works for 1/- per tractor load. This I like to keep for two years, keeping it well turned over. It then breaks up far better.

Deep litter can also be useful if got from someone who beds down with peat, not shavings. We bought some from a poultry farmer who had kept it in deep litter houses for three years. We gave him the price he paid for the baled peat, so we got the peat plus three years' poultry manure as well for the original price. This we stacked with alternate layers of soil and kept for one year before using.

I once tried slaughter house refuse just after the war when things were scarce. We built a wall with old turf, then got a load of refuse from the

slaughter house, put it in the centre and covered it with a layer of soil. This process was repeated using alternate layers of refuse and soil. Laying it was rich but messy.

Riddling

Once the compost is mixed, the process is completed by a shredder to break it down. It is then put through a $\frac{1}{4}$ in. riddle and finally through a $\frac{1}{8}$ in. riddle by hand. The fine dressing is then used for greens and the rest for semi-greens and tees.

One of the chief reasons why many greenkeepers do not make their own compost is lack of a suitable, warm, dry shed in which to make it during the bad weather. Clubs should provide suitable facilities for compost making as the original outlay will soon be amply repaid by the consequent saving on bought compost.

When and How to Compost

I like to spike my greens as soon as they start to grow, that is, late March or early April. The method I use is one man a green in front spiking and the rest of us following on with compost using 30 cwt. per green. We wheel this on the greens with balloon tyred barrows and spread with shovels. The compost is then brushed and drag-matted about six times. Then we rod well and iron roll. For the next few days we brush, drag and rod the greens which we think gives them their very fast pace.

Personally I cannot see the value of spiking and composting in the Autumn. I like to leave the greens as firm as possible in Winter as they are played on throughout the Winter months.

News



from the Sections

NORTHERN

By J. Parker

Chairman:
G. W. MASON
(Halifax West End)

Hon. Secretary:
8 Goit Stock Terr., Harden,
Bingley, Yorks.

MEMBERS ARE REMINDED THAT subscriptions for the year 1962-3 are now due. Early payment will be much appreciated.

Film Show

The last get together of the winter session was held on Tuesday, 20th March at the White Swan, Leeds. This was in the form of a film show and 45 members were present. The films of Penfold/Swallow Tournaments played at Barnton and Prestwick were of excellent quality and much enjoyed by all. An additional one of the Bing Crosby Tam-O-Shanter Tournament was shown at the end of the evening. A vote of thanks to Mr. Teddy Foulds who kindly projected the films, was proposed by our chairman, Mr. G. Mason, and seconded by Mr. W. Mountain, President. Our thanks are due to Swallow Rainwear of Birmingham who kindly loaned us the films of the Penfold/Swallow Tournaments.

Autumn Course S.T.R.I.

Two places have been reserved for the Autumn Course of Instruction at the Sports Turf Research Institute, Bingley, to be held from the 22nd to 26th October, 1962. Any member of this Section wishing to attend is asked to forward his name to me as soon as possible. The Section will pay the registra-

tion fee, but members attending will be responsible for their own travelling expenses and meals.

Grand National Sweep

May I take this opportunity of thanking all members who supported the Sweep by selling tickets, and especially Mr. Bob Newbould who once again sold one hundred books. Who is going to challenge him next year?

SOUTHERN

By W. Mason

Chairman:
J. K. GLASS
(Thorpe Hall)

Hon. Secretary:
18 Albert Road, Hendon, N.W.4.
Tel.: SUNnyhill 0245

OUR ANNUAL GENERAL MEETING will be held at the Stirling Castle on Wednesday, 30th May at 6-30 p.m. Will members please make a special note of this date and every effort to attend.

March Meeting

In the absence of our President, Mr. F. Chambers, who, unfortunately had a previous engagement, Mr. J. Glass acted as Quiz-Master and Chairman at our last Meeting.

We had a most enjoyable evening, and typical of the many questions asked were, "How many members spiked their greens" and "How often greens should be dressed".

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SOUTHERN SECTION—cont.

A debate followed on the best method of ridding greens of thatch. The general opinion appeared to be the use of Chlordane either in liquid or granulated form as this also acts as a worm killer.

Mr. J. Glass had a very busy evening and I would like to congratulate him on the way in which he conducted the meeting.

Subscriptions

May I draw the attention of members to the fact that subscriptions for the year 1962/63 are due on 1st May. An early return of these will be greatly appreciated.

Association Ties

I still have a few Association ties and will be pleased to post one to members on receipt of 10/6d.

Spring Tournament

The draw for the Spring Tournament will take place on Tuesday, 1st May. All competitors will be notified at a later date when they will receive a copy of the draw sheet.

New Member

We welcome to our Section Mr. A. Littlewood of Burnham Beeches Golf Club, Burnham, Bucks.

MIDLAND

By F. Cashmore

Chairman:
G. HART
(Gay Hill)

Hon. Secretary:
76 Four Oaks Common Road
Sutton Coldfield, Warwickshire.

MEMBERS WILL BE SORRY TO HEAR that Albert Oakley, Greenkeeper at Moor Hall Golf Club is in hospital recovering from an operation. We wish him good luck and a speedy recovery back to health.

New Member

We welcome a new member at the commencement of the new year. From the Shirley Park Golf Club, W. Handy, 251 Golden Hillock Road, Sparkbrook, Birmingham, 11,—no relation to Bill Handy from Olton.

NORTH-WEST

By B. Ellis

Chairman
O. P. JONES,
(Bramhall G.C.)

Hon. Secretary:
Romiley G.C.

OUR SECTION ANNUAL MEETING will be held at the Garrick Hotel, Fountain Street, Manchester, on Thursday, 7th June at 7-0 p.m. Will members please note that no other notice will be given.



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WORKING HEAD GREENKEEPER—two kept—required mid-May for Swindon Golf Club (18 holes). Swindon 7 miles, Marlborough 5 miles. Wages by arrangement. New bungalow (1961) available. Apply with full particulars, Honorary Secretary, Club House, Ogbourne St. George, Marlborough, Wilts.

WORKING HEAD GREENKEEPER required end of May. Three assistants kept. Apply, stating age, experience and wage required to The Whitley Bay Golf Club, Briar Dene, Whitley Bay, Northumberland.

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