NEWS LETTER

FEBRUARY MEETING

RHODE ISLAND SHORT COURSE

CONTROL OF WEEDS IN TURF

SOIL ACIDITY

FEBRUARY

1933

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FEBRUARY MEETING

The February meeting was held at the Statler Hotel, Boston, on Feb. 6th, Mr. Henri D. Haskins, Fertilizer Control Chemist at the Massachusetts Experiment Station spoke on "Fertilizers for Golf Courses". Mr. Haskins pointed out that in any study of fertilizer for any vegetation, a study of the soil types was first necessary, as a soil well suited to the growing habit of a plant lessens the problem. The greatest problems are cases where the soils are unfitted mechanically, and certain soil constituents such as silt or clay may be wanting, and must be replaced, or organic matter substituted.

A soil to be desired should possess good water holding properties, with available plant food, and enough organic matter. There is often the problem of too much water, or the lack of drainage. After suitable tile has been installed, capillary attraction will usually supply these areas with sufficient water. The use of lime should receive more attention on the golf course.

Soluble iron and aluminum compounds have been found to be toxic to clover roots. These compounds may become toxic even to bent and fescues if concentrated enough.

Altho the tolerance for soil acidity of certain grasses has been stressed, the fact that most plants are more or less tolerant of a wide range of soil reaction should not be forgotten.

Many of the plants of the Grass family are very susceptible to soluble iron and aluminum compounds. Soluble phosphoric acid compounds will render such toxic compounds insoluble, and they are then unable to exert their toxic effect.

The soil of any green with a pH between 4 and 5 should be limed, preferably with limestone of a dolomitic nature. A soil too acid is not best for the bacteria which are so important in the establishment and maintenance of soil fertility, and does not respond to treatment so well. Ammonium sulphate acts best as a source of nitrogen when used on soils containing a liberal amount of carbonate of lime.

A soil is very much handicapped if it does not contain a liberal amount of organic matter with which to feed its bacteria.

In considering fertilizer, it may be best to review some of the functions of the various plant food elements. Nitrogen stimulates leaf and stem development. An excessive amount is apt to delay fruit and seed formation. It is quite possible that too much nitrogen with too little of the other plant food elements will produce a plant weakened in its ability to withstand disease organisms and the various unfavorable changes that are common to our seasons.

Phosphoric acid promotes maturity and is essential to seeds. Potash is essential to the formation of sugar and starches in wood development. The leaves and stems of plants contain much potash. Calcium is necessary in normal leaf development, and it neutralizes acids in plant juices. Magnesium promotes the formation of chorophyl in plants.

The recent trend in fertilizer grades has been toward fertilizer grades of much higher analysis than formerly, often with forty to sixty per cent of available plant food. These concentrated fertilizers have given good results when used intelligently.

The rare plant food elements are of importance, and the continual use of concentrated fertilizers might cause a deficiency of these elements. Many of the fertilizers and manures used in the past have contributed these elements.

Recent investigations have shown that certain of these rare plant food elements have had a decided influence in plant growth. It may be necessary in time to use in our fertilizer mixtures those of the rare elements which we find are necessary and depleted from our soil.

As every soil is a problem, no one fertilizer or grade of mixed fertilizer can give the same results under all cases. The fertilizer should be selected with the aim of securing a uniform and vigorous growth to keep the plants healthy and also to discourage weeds.

A complete fertilizer will probably be desired at least once during the year. There are many mixtures which would

Cash Cost Per Ton of Several Unmixed Fertilizing Materials at Centers of Distribution in New England and New York.
(Quotations + 20% for Overhead)

Product	Chemical Analysis: Nitrogen	Chemical Analysis: Available Phosphoric Acid	Chemical Analysis: Potash	Ton Cost Average Sept. 1932 to Feb. 1, 1933.	Pound Cost of Plant Food (Cents)	Form of Plant Food	Quality of Plant Food
Nitrogen Products							
Ammonia Sulfate	20.50			$27.00	6.59	Mineral	Good, does best on limed soils.
Synthetic Urea	46.00			90.60	9.85	Organic, but water soluble	Good, quicker than most organics.
Nitrate of Potash	13.00		44.00	53.80	11.60N 2.69K20	Soluble mineral	Good. N. much like nitrate of soda.
Nitrate of Soda	15.50			36.34	11.6	Mineral	Good, quickest form.
Hoof Meal	14.15			17.316	5.7	Organic, insoluble in water	Good, availability like fish and tankage.
Tankage (10-15 grade)	8.22	6.86*		20.53	11.56N 1.00P205	Mostly water insoluble organic	Good, highly available.
Dried Blood	9.87			25.20	12.8	Ditto	Ditto.
Cottonseed Meal (36 prot.)	5.76	2.49*	1.91†	20.43	17.7N	Organic vegetable	Ditto.
Castor Pomace	5.00	1.56*	1.09†	14.76	16.33	Ditto	Ditto.
Dry Ground Fish	9.05	6.86*		36.60	19.4N 1.00P205	Mostly water insoluble organic	Ditto.
Processed Org.	8.00			15.20	9.5	Largely water insoluble organic	Ditto.
Phosphoric Acid Products							
16% Superphosphate		16.00		17.27	5.4	Available 2/3 water soluble	Good, standard source.
Ground Bone	2.47	22.80		20.51		Water insoluble	N. availability good. P205 slow, about 2/3 available.
Potash Products							
Muriate of Potash			50.54	44.58	4.41	As chloride	Good for most crops.
High Grade Sulfate of Potash			48.65	57.00	5.88	As sulfate	Good.
Sulphate of Potash-Magnesia			26.00	33.36	6.43	Ditto	Good, recommended when deficiency of MgO is suspected.

*Total phosphoric acid. †Total potash.

give general satisfaction. An effective and economical mixture with an analysis of 7-5.7-2.5 would consist of 880 pounds of cottonseed meal, 400 pounds of ammonium sulphate, 640 pounds of 16% superphosphate and 80 pounds of muriate of potash. Cottonseed meal is low, but some urea, tankage, fish, castor pomace, processed ammoniates or milorganite could be substituted.

In mixing fertilizers it should be remembered that nitrate of soda, nitrate of lime, nitrate of potash, basic slag phosphate, wood ashes, cotton hull ashes, and carbonate of potash all contribute to an alkaline soil, while sulphate and chloride of ammonia and urea tend to make a soil more acid.

Remember that good drainage, maintenance of a proper soil reaction, the use of enough organic matter, are as essential in a successful system of soil management as is the selection of proper fertilizers.

A list of unmixed fertilizer materials that are best suited for golf greens with some data is appended.

RHODE ISLAND SHORT COURSE

Probably one of the most enthusiastic groups that ever was on the campus of the Rhode Island State College was the group of greenkeepers that attended the first Short Course for Greenkeepers held from January 30 to February 3 inclusive. Held largely as an experiment, the Course proved conclusively that the College and Experiment Station had information of great value to the greenkeepers attending, and this first Course should be only the start of many more annual courses to come.

Much of the value of this Course was due to the informality, in that there was much discussion along all of the lines presented. A visit to the turf plots proved of interest. We were also pleased to have Professor Dickinson of Mass. State College and some thirty of his classes with us on Thursday. We were pleased to note the very fine spirit of fellowship and the very earnest desire to help which characterized all of the faculty who lectured.

As the program was printed in the December NEWSLETTER, we will not take the space to reprint it, but will give you in this issue and future issues some of the interesting lectures which were presented.

Director Gilbert spoke on Monday morning on "The State Survey of Golf Courses", and pointed out that the number of courses had increased in the last five years from 22 to 40. There are less of the rougher grasses used now than in 1927. More clubs have nurseries. Practically all courses now have water at the greens, but in 1927 only 13 out of 22 had water. There have been very little changes in the fertilizer practices used in the last five years, but the use of lime is more prominent now. It is possible to use too much sulphate of ammonia and get the soil too acid. New materials are used for the control of brown-patch now. We have learned more in the last few years in disease resistance.

Prof. Lawrence Dickinson brought out several reasons why the greenkeeper should keep costs:

1. Because he is maintaining a factory.
2. To maintain a balance between budget and maintaining standard.
3. To know definitely if management operations are apparently or truthfully efficient.
4. To understand and anticipate hidden costs.
5. To know distribution of total cost.
6. For estimating cost of course alterations and new construction.
7. Cost records will keep you on the budget; budgets are fine if commonsense is used.
8. Cost keeping is the first step towards an independent grounds' account.
9. It is a defensive power for the greenkeeper.
10. It can be used as a ward against efficiency experts. Time is not saved unless used.
11. To make greenkeeper more valuable to club.
12. We can use cost accounting as an offensive force as advancement

Professor Dickinson showed that the average 18 hole golf course divided their labor dollar as follows: 6 cents for tees, 37 cents for greens, 12 cents for fairways, 24 cents for miscellaneous work, 7 cents for new construction, 8 cents for traps, and 6 cents for rough.

On Friday morning, Mr. Lester E. Erwin gave an interesting talk on the "Causes or Plant Diseases". Mr. Erwin spoke of the history of Plant Pathology. Some people still believe that disease is caused by the weather; it is rather a specific organism. Plant Pathology is young, only a little over fifty years. Plants are as susceptible to disease as

animals, even more so possibly.

Diseases are classified according to cause:

Parasitic, (most diseases are caused by micro-organisms, these are unable to make their own food, therefore are parasitic).

Various kinds, such as animal, insect, true parasitic, slime molds, bacteria diseases, true fungi, water molds, sac fungi, stalk fungi, imperfects.

Non-parasitic, caused by some physical agent, or cultural practice, (malnutrition), environmental conditions, poisons, plants living on trees as mistletoe.

Factors which influence plant diseases are Temperature, soil and air; moisture; humidity; soil acidity; and soil fertility. Control of plant disease is through cultural methods, chemicals, and resistant varieties.

ANNOUNCEMENT OF THE GOLF SHOW

Mass. State College, Amherst, Mass.

By the Class of '33 Greenskeepers Winter School to be held at Stockbridge Hall March 11th and 12th.

The exhibit will be strictly educational in character. Modern appliances including three types of power gang greens mowers will be displayed.

The usual popular Forum will be included every evening. A strong program of speakers, including many from outside the College, is being arranged, details of which will be announced later.

Every person in the golf field will find many things of interest.

The members of the Class of '33 feel it a privilege to invite all the members of the organization and their friends who may be interested.

Greenkeeper with seven years' experience, thirty years working on turf, would appreciate hearing of club needing experienced man. Address XYZ, % Newsletter.

IMPORTANT NOTICE

We take pleasure in announcing the appointment of Mr. Howard Farrant as Business Manager of the NEWSLETTER. Mr. Burnett who has carried on in this position so faithfully for over three years has been forced to resign, due to his distance from Boston. We feel that the club owes Mr. Burnett a great debt for his fine work. We ask for Mr. Farrant the same cooperation which our members and advertisers gave Mr. Burnett.

Every member should plan to be present with his green chairman at the combined meeting of the Massachusetts Golf Association and the Greenkeepers Club at Braeburn on Feb. 27th.

CONTROL OF WEEDS IN TURF

by Dr. T. E. Odland

The weed problem is one of the most important ones with which the greenkeeper has to contend. We may divide the recommendations for control into two classes—prevention and cure.

Weed Prevention

Needless to say we should try to keep from introducing weed seeds when building greens or in applying fertilizer or compost later on. The use of fresh manure is one of the chief sources of weed infestation on lawns and other turf. Many weed seeds will pass through an animal without having its germination lessened in the least.

The use of soil for composts which has been taken from weed infested land is another source of weeds in fine turf.

Where it is possible to build a soil sterilizer this will usually prove a good investment on the golf course.

Getting Rid of Weeds on the Golf Course

Hand weeding is the final resort when everything else has been tried.

Certain special fertilizer mixtures may be used. The use of sulphate of ammonia as a nitrogen carrier has in most cases proved a better weed control method than the use of nitrate of soda. Tests at this station as well as at a number of other stations, especially in England, indicate that this ability to control weeds is due as much to something in the material itself as it is to the effect it has in making the soil more acid. Sulphate of iron has also been found effective against different weeds especially by English workers. The mixture chiefly used has been 3 pounds of sulphate of ammonia and 1 pound of sulphate of iron to 1000 square feet of turf.

Call at Greenkeepers Club booth at Amherst Show.

Lead arsenate has been found effective against chickweed in a number of experiments. Used at the rate of 30 pounds per 1000 square feet at this station when the land was plowed it has kept earthworms out of the plats almost free of chickweed. As a top dressing about 5 pounds per 1,000 square feet should be used.

The Ohio Station Bi-monthly Bulletin, December, 1929, reports that 1 to 2 ounces of sodium chlorate in a gallon of water has controlled ground ivy and speedwell. Chlorates usually kill all plants unless very carefully applied.

Other commercial weed killers such as Herbicide, Atlaside, Weedex, etc. are often very useful when it is desired to kill all plant growth including grass and weeds.

Classification of Weeds

Annuals: Weeds that start from seed, produce a crop of seed and then die the same year. Examples are—crabgrass, chickweed, poa annua.

Biennials: Weeds that require two years to complete the life cycle. Examples are—burdock, some plantains, and thistles.

Perrennials: Weeds that spread both by seeds and roots. They live over from year to year. Examples—dandelion, some plantains, and quack grass.

Most Troublesome Weeds

The Green Section under date of January 17, 1933, sent out a summary of a survey made of the worst turf weeds in the United States. In returns from 39 states the following list of worst weeds was made up:

Lawns—Dandelion, Crabgrass, Plantains, Chickweeds, Rumex spp.

Pastures—Thistles, Plantains, Dandelion, Plantains, White Clover.

Putting greens—Crabgrass, Chickweeds, Dandelion, Plantains, White Clover.

Fairways—Dandelion, Crabgrass, Plantains, Chickweeds, Rumex spp.

Roughs—Dandelion, Thistles, Plantains, Ragweeds, Rumex spp.

For Rhode Island conditions, we might add on lawns, Yarrow, Heal-All; for putting greens, Pearlwort, Knotweed; Yarrow, and Poa annua; for fairways, Heal-All; and for Rough, Yarrow and Heal-All.

SOIL ACIDITY

By L. A. Keegan

There is no simple explanation of what soil acidity is. It is a very complex problem varying with all sorts of conditions. In this humid section of the country nearly all soils are sour or acid unless they have had some sort of treatment. The heavy annual percipitation which we have in the East, from 40 to 45 inches of rain per year, washes out the materials which make a soil sweet. This means then that they must be constantly replenished in the form of limes, seaweed, poultry manure or other calcium containing mixtures.

Soil acidity keeps some plants from growing at all, others are not affected by the acidity so much but all may be effected when the acidity becomes so great that it keeps plant food from becoming available to the plants. When a soil gets to be very sour it holds back and retards the plant from getting full value from fertilizers.

What is the difference between very acid, acid and sweet? Acidity is measured in pH which may be compared to degrees F. on a thermometer. The zero point may be taken as pH. 7.0. At this point a soil is neither acid nor alkaline, it is neutral. Points above pH. 7.0 such as 7.1 or 8.0 are alkaline. Points below pH 7.0, and this is where we find most soils, are acid or sour. There is one difference between this scale and the thermometer scale. Starting at 7.0 and going either way the divisions to each point below (or above) go in multiples of 10. That is if there are 10 divisions from 7.0 to 6.0 there are 100 divisions from 6.0 to 5.0 and 1000 from 5.0 to 4.0.

This shows quite clearly why a soil may still be sour but much more strongly sour in one case than in another. Also why it takes a lot of lime to raise a soil from 5 to 6, but very little to keep it there. This pH is measured in a variety of ways, the most accurate being by means of a delicate electrical apparatus. For field and general use indicators are used. These are delicate dyes which change color for different degrees of acidity and when used properly will give a value close enough for field use.

For instance, one indicater readily purchased by any one has color changes as follows:—As it comes it is a greenish liquid. Applied to a soil it changes to a wine red for a pH of 4, to orange for a pH of 5.0, yellow for pH 6.0, green for a pH of 7.0, and blue for pH 8.0. With use fractions between can be distinguished as for instance yellowish green or greenish yellow.