

OUR LETTER BOX

The Green Section receives numerous inquiries concerning local turf problems and is always glad to reply to them. With the hope that some of these questions and answers may be helpful to others besides the original correspondent, a few of them will be published. While most of the answers will have a general application, it should be remembered that each recommendation is intended for the locality designated at the end of the question.

Best fertilizer for turf.—We would appreciate your recommendation as to what is generally considered to be the best turf fertilizer. We know that this is difficult to make without a soil analysis for the specific soil in question. I might say that we have a clay loam soil with an underlie of limestone. The turf is 10 years old, and consists of a mixture of Kentucky bluegrass and redbow. (Wisconsin.)

ANSWER.—For turf fertilizing we generally find that best results are obtained by using a fertilizer such as a 12-6-4, 10-5-3 or similar combination containing twice as much nitrogen as phosphorus; and a still smaller amount of potash. The best fertilizer is one which will provide the most plant food in approximately the proportions mentioned above for a given expenditure. Sometimes there are decided variations in soils which make it necessary to resort to certain modifications of the preceding recommendation.

Bagasse cinder in topdressing.—

At a 9-hole golf course here they use ground bagasse cinder for topdressing greens, particularly during the rainy season. The cinder results from the burning of cane refuse (bagasse) in the sugar mills. It is cheap and plentiful. They have Bermuda grass greens and only a few players. However, the cinders seem to have given them good results over several years. I am sending you a sample and should appreciate your comment on it as a material for topdressing. Might it be substituted in part for the peat which we lack? (Cuba.)

ANSWER.—From the standpoint of soil improvement, this material should be entirely satisfactory as a substitute for part of the sand and humus. There is a danger that there may be too much soluble salt in bagasse cinder to warrant repeated large-scale use. However, tests of your sample show that it has been effectively leached of practically all

such harmful material. Therefore, we think you can use this material safely as the heavy rains in your section will undoubtedly take care of any excess of soluble salt. It might be well to set aside a pile somewhere to leach for at least one rainy season before it is used on your turf. The small pieces of charcoal in the bagasse cinder should be effective in improving your soil texture, and we think you could safely use it to the extent of at least one-third of the compost mixture.

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Rates and time of application of lead arsenate for earthworm control. At present I am assisting The Panama Canal employes in the construction of a 9-hole golf course at Gamboa. The ground is badly infested with worms. I should like to know how much arsenate of lead to use for each 1,000 square feet of top surface. Should the first application be 1 or 2 feet below the surface? (Canal Zone.)

ANSWER.—When applying arsenate of lead, we have found that it is not necessary to put it deep into the soil. Earthworms, like grubs, feed most heavily near the surface, and therefore the poison should be at the surface. You can apply the arsenate of lead before you seed, by lightly raking it into the soil during

the last raking process before sowing the seed. On the other hand, it may be applied after the seed has germinated. Usually the before-seeding method is preferable, although there is a likelihood that it may slightly retard the germination of the grass seed. This retarding effect, however, can be overcome by adding an application of sulphate of ammonia, about 5 pounds to 1,000 square feet.

The amount of arsenate of lead needed to control worms varies with different soils and with different species of earthworms. Some tropical and semi-tropical species are hard to poison. The heavier soils generally require more arsenic than do the light, sandy soils. We ordinarily recommend that arsenate of lead be applied at the rate of 5 pounds to 1,000 square feet. If this rate is not sufficient for your soil, repeat the treatment until you build up enough poison to get control. From the standpoint of economy, we feel that it is wiser to try the lighter dosage and be prepared to add more until you get the desired effect rather than to go to the expense of immediately applying the heavy treatment.

It may take three or four weeks for the arsenic to show much of an effect on earthworms. Therefore do not be in a hurry to pass judgment on the effectiveness of the treatment.

Arsenic acid in weed control.—We have been applying arsenic acid (75 per cent) with the power sprayer at the rate of $\frac{1}{2}$ pint in 50 gallons of water to cover 1,000 square feet of turf to control chickweed. It has burned the clover out and injured dandelions and broadleaf plantain. There has been considerable burning of the turf however. Has our rate of application been too heavy? (Massachusetts.)

ANSWER.—Arsenic acid is a heavy liquid and therefore 1 pint of it weighs almost 2 pounds. You can roughly figure it on a 2-pound basis. Therefore, you were applying the material at the rate of 1 pound to 1,000 square feet. This is a very heavy application as a spray and would be expected to cause some injury to the grass. It has been our experience that the best results are obtained when arsenic acid is applied in the form of a spray at the rate of $\frac{1}{4}$ to $\frac{1}{2}$ pound to 1,000 square feet. The $\frac{1}{4}$ -pound rate is usually ample to give fairly good control and does not cause a great deal of damage to grass. In the case of the bent grasses, the rates have been reduced to 1 or 2 ounces to 1,000 square feet. However, when these light rates are used, it is necessary to repeat the treatment at least two or three times to get a reasonably

good control of the weeds. Even though you have considerable burning of the grass, you no doubt will find that most of it will recover. The amount of water which you used is much more than we ordinarily find necessary for complete coverage.

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Sulphuric acid in weed control.—It is my understanding that many thousands of acres of wheat fields were sprayed with sulphuric acid to kill the weeds. Is this method of weed control applicable to weeds in turf? (Michigan.)

ANSWER.—We have tested sulphuric acid for the control of weeds in turf, but our results have not been as promising as those obtained from the use of arsenic acid. In addition, sulphuric acid is a difficult material to handle unless one has proper equipment and experience.

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Earthworm control in lawns.—We have several lawns which are badly infested with earthworms. These Bermuda grass lawns are now almost dormant, and we shall not put in winter ryegrass until about the first of November. Therefore it seems as though there should be little danger of burning by using chemicals during this season. Will you please recommend the best and most eco-

nomical measures to rid the grass of these pests? (Georgia.)

ANSWER.—You no doubt would find that arsenate of lead would be the most effective chemical to use for the control of earthworms under your conditions. It should serve also to protect the sod against certain insects, including white grubs and mole crickets. For ordinary purposes we recommend 5 pounds of arsenate of lead to 1,000 square feet for the first application. On sandy soils the 3-pound rate is often sufficient, but on heavier soils it is sometimes necessary to increase the dosage to 10 or even 15 pounds before an effective control of earthworms is accomplished. We suggest, therefore, that you try using it on your lawns at the rate of 3 to 5 pounds to 1,000 square feet. If this is not sufficient you can repeat the dosage. However, you should allow at least two or three weeks for the arsenate of lead to control the worms before making the second treatment. Frequently the earthworms do not appear to be affected by the lighter applications for several days after the treatment.

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A good fairway mixture.—Will you kindly inform us what proportion of Kentucky bluegrass, redtop and bent would be best for our fairways? (Delaware.)

ANSWER.—For your fairways, we think a good mixture would consist of 80 per cent Kentucky bluegrass, 15 per cent redtop, and 5 per cent colonial bent.

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Improving sand fairways.—We have an 18-hole golf course, the fairways of which are of Bermuda grass. The last three years our fairways have been getting poorer and poorer. We are anxious to obtain the best information available on the subject of growing and maintaining over the years a satisfactory grass surface in the sand. Our practice in past years has been to rely largely, if not entirely, on fertilizer. Now our committee is wondering if we should not perhaps add clay or humus to the sand, or perhaps grow and plow in a cover crop of clover or cowpeas. (Florida.)

ANSWER.—If your soil is primarily sand, you no doubt would find it beneficial to work a little clay into the top few inches. This would help to retain both the fertilizer and the moisture and thereby increase grass growth. I doubt that a cover crop would be practical, since it would necessitate putting the course out of play for a considerable period. No doubt the addition of clay plus fertilizer would be the most effective procedure.

Improving turf on athletic fields. We have been having considerable difficulty in maintaining a stand of grass on our high school athletic field. I am forwarding under separate cover a sample of the soil on the field. We should like to know whether the soil is in proper condition to grow grass or whether it should be cut with sand. Also, I suppose you can let us know by testing the soil what types of fertilizer would be required to get the best catch of grass. As you can imagine, the turf is abused chiefly during the two seasons which are best for growing grass. I should like to know at what time of year we could do a reseeding job, if that is what you recommend. (New York.)

ANSWER.—You may find that an ample feeding program may enable you to thicken up your grass satisfactorily without seed. Tests made on the sample which you sent indicate that the soil contained a good supply of phosphoric acid. Undoubtedly a liberal application of fertilizer containing a high percentage of nitrogen should be effective in increasing the growth of grass. We therefore suggest that in early spring you apply sulphate of ammonia at the rate of about 200 pounds to the acre. This should be applied when the grass is dry.

If the turf is very thin and obviously needs some seed, you probably can get best results by seeding in the spring during the period of late freezing and thawing. At that time some of the grass may be able to germinate and become established before the ground is sufficiently dry to be suitable for play. If neither of these programs gives you satisfactory results, it would be well during late August next year to cut in a little sand and seed and keep the field out of play as long as possible in September to enable the seedlings to become established.

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Horse-tails as a lawn pest.—I have a colonial bent lawn that is infested with a weed, a sample of which is enclosed. I think it might be one of the sedge family, and I wonder if you have any control methods for this particular type of weed? (Ohio.)

ANSWER.—The specimen of weed you sent to us is one of the common horse-tails. These plants are common in poor soil but are seldom serious pests in turf. They can ordinarily be controlled simply by the liberal use of fertilizers such as sulphate of ammonia, to give a quick growth of grass and force a rank growth of horse-tails which will be injured by the mowers.

"Turfing Daisy" as a substitute for grass.—We have had inquiries concerning the use of the "Turfing Daisy" as a grass substitute. This apparently is a low-growing plant which only needs to be cut once or twice during the growing season. As we have no knowledge of its identity, I would be glad if you could furnish me with any information you have on the subject. (Ontario.)

ANSWER.—The plant referred to is *Matricaria tchibatchewi*. It is one of several plants that may be useful for lawn purposes under favorable conditions. However, it does not overwinter any too well and requires excessive moisture. Although under very limited conditions it may produce good turf, it can in no way be considered as a satisfactory substitute for grass.

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Effect of height of cut of grass on incidence of weeds.—The grass on our fairways has been cut to $1\frac{1}{4}$ inches, which is $\frac{3}{8}$ inch longer than in previous years. The question arose as to the likelihood of an increase in weeds because of this practice. Your opinion on this question is requested. (New York.)

ANSWER.—According to tests that we have conducted in different districts, clover and other turf weeds are likely to be less troublesome in

grass that is cut to $1\frac{1}{4}$ inches than they are in grass that is cut very short.

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Yellow hawkweed as a lawn pest. During the past three years we have noticed a weed in our lawn which we have been told is yellow hawkweed. It has a deep root and seems to choke out the grass, but it has not spread to any extent. What is the best method of getting rid of this weed? (Pennsylvania.)

ANSWER.—Weeds of this type can often be controlled in small areas by scattering a little sulphate of ammonia on them and burning the crowns. This operation usually has to be repeated two or three times as the plants recover. Sulphate of ammonia not only burns the weed, but also stimulates the grass around it, tends to force a rank growth and crowd up the leaves of the hawkweed so that they are cut by the mower.

Various weed killers may be used with success, but as this is a deep-rooted weed, repeated applications of most of these chemicals may be required. Sodium chlorate or sodium arsenite may be used to advantage, but we think that sulphate of ammonia should serve the purpose, since you say the weed is limited to a small lawn area.

Powdery mildew on bluegrass.— I am sending you a small piece of Kentucky bluegrass sod which appears to have a mildew which gives off a fine dust when the grass is perfectly dry. I should appreciate your advising me what is affecting the bluegrass, if there is any danger from it, and, if so, how it can be treated. (Virginia.)

ANSWER.—The sample you sent was affected by powdery mildew. This commonly occurs on Kentucky bluegrass in the spring, but we have never seen it do any serious harm. This fungus can be controlled by dusting it with finely powdered sulphur. This is the treatment we use in the greenhouse, where the disease is troublesome in propagating stock material. We do not know of any place where the disease has been troublesome enough to justify treatment out-of-doors.

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Effect of arsenate of lead on grass. Is there any grass so fine in texture that it will not survive arsenate of lead treatment? Would arsenate of lead that is applied to greens have any effect on the grass? (New York.)

ANSWER.—Under some circumstances arsenate of lead, when used

in excess, may retard the germination of grass seedlings and may check the growth of some of the more delicate grasses. However, when applied at normal rates, it is perfectly safe to use it on any of the common turf grasses—even the delicate bent grasses used on putting greens.

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Tobacco as a fertilizer for bluegrass.—We are in the midst of the tobacco section, and it frequently happens that we can get damaged tobacco at a small cost to put on our bluegrass. I have the opinion that tobacco affords too much potash and would therefore not be desirable for turfs. Have you had any experience with tobacco as a fertilizer on bluegrass? (Kentucky.)

ANSWER.—Tobacco analyzes from 1 to 5 per cent nitrogen and from .5 to 10 per cent potash. Therefore, its value for the fertilizing of bluegrass is variable, depending entirely on the analysis. If your particular lot happens to be one which runs low in nitrogen and high in potash, it should not be so good for grass fertilizing. On the other hand, if it is the reverse, being high in nitrogen and low in potash, it should be entirely satisfactory.

