

TIMELY TURF TOPICS

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UNITED STATES GOLF ASSOCIATION GREEN SECTION

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NEW FERTILIZER ORDER EFFECTIVE JULY 1, 1944: As was true last year, only specialty fertilizers may be bought at this time for use on "lawns, parks, golf courses, cemeteries, roadsides, and the non-commercial production of flowers, bulbs, shrubs, trees or other ornamental plants." However, according to Order WFO5, Amend. I, June 30, 1944, "any fertilizer material eligible for direct sale may also be delivered as a specialty fertilizer." Since sulfate of ammonia is listed in Schedule I of the same order as eligible for direct sale this means that it can be bought by golf clubs as a specialty fertilizer for use on turf provided a manufacturer can be found who is willing to sell a portion of his year's quota of chemical nitrogen in this form. It should be remembered that the manufacturer is still restricted in the amount of nitrogen and potash which he can use for specialty fertilizers. For the year ending June 30, 1945, the manufacturer may not use "quantities of nitrogen and potash in excess of the quantities of such materials used by him for specialty fertilizer purposes in the year ending June 30, 1942, or June 30, 1943, whichever is greater."

So far as organic nitrogen is concerned, there has been little or no change except as relates to oilseed meals, since, according to the above order, no manufacturer shall use in specialty fertilizers a quantity of insoluble organic nitrogen "in excess of the quantity of such material used by him for specialty purposes during the year ending June 30, 1944. According to WFO105, which deals specifically with the use of edible oilseed meals in fertilizer, these may not be acquired for fertilizer purposes from July 1, 1944, to June 30, 1945, unless specific authorization has been granted by the Director of the Office of Materials and Facilities of the War Food Administration.

AMMONIUM NITRATE AS COMPARED WITH SULFATE OF AMMONIA: Since ammonium nitrate may be a more readily available source of nitrogen this year than sulfate of ammonia, a comparison of these two materials may be of timely interest here. The coated ammonium nitrate product referred to on page 2 of the September, 1943, issue of TIMELY TURF TOPICS is now available commercially. It contains approximately 32.5 percent nitrogen as compared with the nitrogen content of 20 percent in sulfate of ammonia. Therefore approximately 60 pounds of ammonium nitrate are equivalent in nitrogen content to 100 pounds of sulfate of ammonia.

Cost prices in the Washington area have been obtained for ton lots of each of these nitrogen carriers and from these prices has been figured the comparative cost of a unit of nitrogen in each. Sulfate of ammonia sells in this area at approximately \$45 a ton, which means a cost of \$2.25 per unit of nitrogen. On the other hand, ammonium nitrate sells in the same area at \$60 a ton, or \$1.85 per unit of nitrogen.

The coated ammonium nitrate product is sold in specially processed bags and should be stored in these unopened bags until it is used, in order to avoid danger of caking. The product is granular in structure and therefore easily distributed unless it is permitted to cake. Ammonium nitrate has the advantage of furnishing the turf directly with both ammonia and nitrate nitrogen. It acidifies the soil at approximately one-third the rate as does sulfate of ammonia, according to tests made by a Department of Agriculture staff.

In humid weather mixtures fortified with more than three units of nitrogen from ammonium nitrate should be applied shortly after they are mixed. In dry weather such mixtures can be stored for longer periods of time.

July, 1944

POSSIBLE FIRE HAZARD OF AMMONIUM NITRATE USED AS A FERTILIZER: According to the Bureau of Mines ammonium nitrate is listed in the Federal Explosives Act of December 26, 1941, amended April 1, 1943, as one of the "explosives" for which a license is necessary both to buy and to use. However, when handled in such a way as to avoid conditions which might make it dangerous no violent reaction need be anticipated from impacts, jars, or friction, which must be avoided with more sensitive explosives.

Ammonium nitrate should be stored in the processed bags in which it is purchased in a preferably fire-resistant building. According to the regulations in the Federal Explosives Act the stock should be kept locked to prevent the material from being taken or used illegally. According to the Division of Soil and Fertility Investigations of the United States Department of Agriculture it should not be stored with combustible material nor should it be stored with organic materials such as cottonseed meal.

EMPTY BAGS WHICH HAVE CONTAINED AMMONIUM NITRATE ARE INFLAMMABLE AND SHOULD NEVER BE PILED EVEN TEMPORARILY IN OR NEAR WOODEN BUILDINGS. Paper bags should be burned promptly after they are emptied. Fabric bags may be saved for subsequent use if they are immediately washed with water and drained repeatedly until no evidence of salt shows on drying.

Commercial fertilizer mixtures containing ammonium nitrate require no special precautions provided free acid is absent and may be handled in the same way as similar mixtures containing sodium nitrate, since, according to the Division of Soil and Fertilizer Investigations "it requires the presence of over 50 percent of ammonium nitrate with ammonium sulfate to make the mixture explosive under violent shock test conditions."

Should ammonium nitrate be involved in a burning building or in a fire with other combustible material, ordinary fire-fighting methods should be used for extinguishing it. Water is ordinarily the most convenient and effective method.

Reference has been made earlier to the necessity of obtaining licenses in order to purchase or use ammonium nitrate as a fertilizer. Farmers as a group have been exempted from the necessity of obtaining licenses for this purpose. Unfortunately, however, according to authorities in Washington, the golf clubs are not included in this blanket exemption and it will be necessary according to the law for a club to obtain a "purchaser's license" in order to purchase or possess ammonium nitrate for fertilizer purposes. In addition a "foreman's license" in the name of the greenkeeper will be necessary if he wishes his help to apply the fertilizer. This second license is not necessary if the person whose name appears on the "purchaser's license" is to apply the fertilizer himself. Licenses cost only 25¢ plus the notary fee and can usually be obtained in the office of the County Clerk. If the county clerk is unable to furnish the licenses or the information as to where they may be obtained, additional information can be obtained by addressing inquiries to the Bureau of Mines, Department of Interior, Washington, D. C.

AMMONIUM SULFAMATE FOR POISON IVY: In the June, 1943, issue of **TIMELY TURF TOPICS** ammonium sulfamate was recommended for use in the eradication of poison ivy, ragweed, Canada thistle, and other noxious weeds. Any areas which were treated last year for the control of poison ivy should be checked now to make certain that no new shoots have come up from deep-seated roots which were not completely killed. If new shoots are appearing a repeat treatment is recommended now. Ammonium sulfamate is readily soluble in water and should be used at the rate of between 1/2 and 1 pound in 1 gallon of water. The foliage should be well wetted with such a solution. There are indications according to its manufacturers that woody perennials such as poison ivy or annuals are most effectively treated just after rain or during periods of high humidity. On the other hand it is recommended by the manufacturers that for perennial weeds other than the woody ones the most effective treatments are those made just before a rain or those which are followed by watering. Ammonium sulfamate is still available commercially. This year it is sold by its manufacturers under the trade name Ammate.

FORMULA FOR FORTIFYING LOW-NITROGEN FERTILIZER MIXTURES: Many of those who have stocks of low-nitrogen fertilizer mixtures on hand will be interested in increasing the nitrogen content of these mixtures before making fall applications to turf.

In this connection the question frequently is raised as to how much of the nitrogen carrier must be added to a ton of the low nitrogen mixture to raise its nitrogen content to a desired level - say, 10 or 12 percent. This is easily accomplished by use of the following formula:

$$N + Px = N'(100 + x)$$

where N equals the amount of nitrogen in 100 pounds of the low nitrogen mixture, P equals the percentage of nitrogen in the carrier, N' equals the desired percentage of nitrogen in the final mixture, and x equals the required amount of nitrogen carrier to be added to 100 pounds of the original low-nitrogen mixture.

Let us say for example that you have a ton of last year's Victory Garden fertilizer, which was of 3-8-7 grade, and that you want to fortify it with sufficient ammonium nitrate to increase the nitrogen content to 10 percent. Ammonium nitrate contains approximately 32.5 percent nitrogen. Therefore in the above formula $N=3$, $P=32.5\%$ or .325, and $N'=10\%$ or .10. Substituting these values in the above formula, we have

$$3 + .325x = .10(100 + x) \text{ or}$$

$$3 + .325x = 10 + .1x$$

Solving the equation for x,

$$.325x - .1x = 10 - 3 \text{ or}$$

$$.225x = 7 \text{ and}$$

$$x = 7 \div .225 = 31.1 \text{ lbs.}$$

Therefore, every 100 pounds of 3-8-7 will require 31.1 pounds of ammonium nitrate to raise the nitrogen content of the mixture to 10 percent. A ton of 3-8-7 would therefore require 20×31.1 or 622 pounds of ammonium nitrate to raise the nitrogen content to 10 percent.

The P 0 content of this mixture would then be $\frac{100}{131.1} \times 8$ or $\frac{800}{131.1}$ or 6.1 percent and the potash content would be $\frac{100}{131.1} \times 7$ or $\frac{300}{131.1}$ or 5.3 percent; and the grade of the final mixture expressed in round numbers would be 10-6-5.

SERIOUS CHINCH BUG INJURY IMMINENT IN DRY SEASONS: Chinch bug injury to turf usually first becomes evident on high, dry or sandy locations exposed to direct sunlight. The first symptom is a browning of the grass in spots. Since chinch bugs are most active in dry seasons the early symptoms are easily mistaken for drought injury or sun scald on the turf. It is unfortunate, however, if their presence is not detected in these early stages since the bugs reproduce extremely rapidly and it is not uncommon for heavy infestations to completely kill the grass, leaving behind only clover and weeds on which they do not feed. Chinch bugs are apparently very specific in the types of grass they elect to feed upon. In the northern and middle Atlantic states, for instance, seaside creeping bent, redtop, and certain strains of velvet bent are much more susceptible to injury than are the fescues and Kentucky bluegrass. In Florida, St. Augustine grass is outstandingly susceptible to their injury. In Panama apparently it is Java grass on which they are most interested in feeding.

Chinch bugs are sucking insects, feeding on the juice from the base of grass blades right at the crown of the plants. They are decidedly gregarious in their feeding habits, many adult and young bugs feeding on a single plant until all the available juice has been extracted, whereupon they may move on as a group to the next plant. The injury which they cause on turf, therefore (in the words of one of our correspondents) advances like a marching army.

Chinch bugs are very small in size. The bodies, which are not more than a fifth-inch long, are black, and the wings, which are folded on the back, are white with a black spot on the margin. There are two forms in one of which the wings reach to the end of the body whereas the others have very short wings. The eggs are extremely small, long and oval, whitish at first but gradually turning to amber. The newly-hatched bugs are similar to the adults in form but are yellow, soon turning to bright red with a pale band across the body. A few days before becoming adults they change to a brown-black color but retain the pale band, which is partially covered by the wings.

Chinch bugs cannot usually be found in the brown, dead areas of turf because as soon as the grass is dead they move on as a group to better pastures. Their presence may generally be detected on the margin of such areas by close examination of the crowns of the grass plants. The bugs are usually most actively feeding and most easily found on hot sunshiny days but are likely to hide in periods of cloudy weather. If old dry grass or other debris is present it may be necessary to flood a small area with warm water and to cover it with a cloth or canvas to find the bugs. Since the bugs abhor water they will crawl up the grass blades within 10 or 15 minutes and will be found on the surface of the cloth.

The average life cycle of the chinch bug from egg to egg is approximately 50 days. In the South therefore there may be five or more broods in a single season. In the North there may not be more than two broods, the bugs overwintering in the adult stage in the dry grass and debris of turf, provided sufficient undamaged vegetation remains to furnish food and shelter. They have also been known to overwinter in tall grass near the edges of lawns or putting greens. It requires on the average 11 days for the eggs to hatch and approximately 30 days for the bugs to reach maturity. Adults when approximately eight or nine days old begin to lay eggs.

Heavy rains are perhaps their greatest natural enemy. Adult bugs are little affected by water even when submerged for several hours or days but the newly-hatched bugs are readily killed by rains. Heavy rains may also prevent the females from laying their full quota of eggs and if the eggs are covered with mud as a result of heavy rains they may be prevented from hatching. Therefore the conditions which are most favorable for the development of chinch bugs are dry weather in late spring and early summer since heavy rains at the time of egg laying and hatching may readily dispose of a potentially severe infestation.

Since derris, Cube, and other rotenone products, as well as pyrethrum are not available because of wartime restrictions, reliance must be placed this year on tobacco dust or a solution of nicotine sulfate. The tobacco dust may be applied dry but if so great care must be exercised that the dust be brushed down into the crown of the plant and even into the organic debris at the base of the plant where the bugs may hide. Frequently it is advisable to cut the grass and rake out all dead debris, clippings, etc. away from the crowns before applying the contact poison in order to make it easier to get the poison down into the crowns where the bugs feed, as well as to remove so far as possible their hiding place. It would be well to burn this infested debris in order to dispose of this possible source of future infestations. Tobacco dust containing $\frac{3}{4}$ to 1% of nicotine (or derris or Cube dust containing $\frac{1}{2}$ % rotenone, if either of these is available) may be applied dry at the rate of approximately 25 pounds to 1,000 square feet. In making the applications it should be remembered that no good will result from treating grass which is already yellowed or brown because the bugs will have left it for better feeding grounds. Therefore the application should be made along a strip from three to five weed wide crossing the edge of the infested area since this is where the majority of the chinch bugs will be feeding.

If it is desirable to make the applications by means of a spray it would be well to apply the nicotine sulfate (available under the trade name Black Leaf 40) in a soap solution. Such a solution may be made up with 1 pound of soap to 25 gallons of nicotine solution. The nicotine solution should consist of approximately one part of 40% nicotine sulfate to 800 parts of water. This solution should be applied almost as a deluge on the plants because the bugs quickly escape into the loose debris and soil at the base of the plants and thus avoid contact with the spray. The young bugs or nymphs are more susceptible to the poison than are the mature bugs. Eggs are not injured by it. Therefore it is most essential to repeat the treatment from ten days to two weeks after the first application or as soon thereafter as a new crop of adults appears.

Regardless of the method of treatment, thoroughness is perhaps the most important factor in effecting a control.

Close cutting, watering, and ample fertilization are the maintenance practices most important in the prevention of serious chinch bug attacks.