

Suggestions for Early Season Golf Turf Maintenance

By O. J. NOER

(Second Installment)

Knotweed is a troublesome weed on some courses in the northern United States and in Canada where it is called "ironweed". Although complaints from golfers about this weed do not start until late summer, early spring is the best time to kill it in fairways and elsewhere.

In early spring, long before other plants show any signs of life, knotweed seeds sprout and commence to grow. Germination occurs right after snow melts and before the soil becomes warm enough for other vegetation—including grass—to start growth. Soon thereafter knotweed provides a green cover on bare spots and in areas where the turf is thin. Knotweed is satisfactory for play until the plants develop long stringy stems, usually in late July or August. That is why complaints are not made until then.

Killing knotweed is a simple matter when it is in the two or three-leaf seedling stage, which is in late April or early May, depending upon the section of the country. Sodium arsenite can be used then without discoloring the turf because it is still brown. The bare spots or the thin areas can be seeded before or right after using sodium arsenite, which is not the case with 2, 4-D. It is best to broadcast the grass seed while the ground is still honeycombed, and roll lightly to insure contact of the seed with the soil. From $\frac{1}{2}$ to 1 ounce of sodium arsenite per one thousand square feet is enough, or $1\frac{1}{4}$ to $2\frac{1}{2}$ pounds per acre. The spray method is preferable because the leaves are too small to collect a lethal dose with the dry method.

Sodium arsenite can be purchased as a powder or as a liquid concentrate. One preparation contains 5 pounds sodium arsenite per gallon. At one quart per acre, the rate is $1\frac{1}{4}$ pounds. The liquid contains no suspended material to clog the nozzles.

Knotweed can be killed very easily in spring and early summer with 2, 4-D, but not after it becomes stemmy. Sodium arsenite, even at light rates, is very effective at any time. When reseeding is contemplated, which is usually the case, 2, 4-D should not be used because at least two to three weeks must elapse between its use and seeding, otherwise the stand of new grass will be disappointing.

To stop seed formation completely is another important reason for killing knot-

weed promptly after it germinates. Seed production starts in June. From then until the first killing frost plants have seeds in every stage of growth from flowers to mature seed. The crop each year comes from seed, so it is important to kill knotweed before it can produce any viable seed. Then there will be less seed in the ground to produce another crop the next spring.

Study Drainage Conditions

Many clubs have given scant attention to drainage conditions on fairways. In some instances excessive wetness, especially in spring, is the reason for poor turf and weed infestation. Spring is the best time to review and study drainage conditions on fairways, and is the only good time to observe hillside slopes for seepage. The ground is at or near saturation so wet areas can be spotted easily and quickly. A preponderance of creeping bent or poa trivialis on unwatered fairways is further evidence of excessively wet soil because both of these grasses are fond of moist locations.

In doubtful cases ground water levels can be studied by digging test holes with a post hole digger at convenient locations. The holes should be 4 to 5 feet deep. On side hills one should be at or near the top, another near the bottom, and one or two should be midway down the slope. When the holes fill with water in 24 to 48 hours, tile lines are needed.

For ordinary drainage, excepting side-hill seepage, two tile lines, lengthwise of the fairway, are enough, but where the soil is an extremely impervious clay, and on hillside slopes, three may be needed. On side hills the lines must cross the direction of the slope to intercept seepage flow. Gravel backfill must be used to within 8 to 12 inches of the surface to collect the water and lead it down to the tile. The trench must be of sufficient depth to effectively cut the flow of seepage water.

In a few instances ledge rock or localized outcropping rock make it impossible or unduly expensive to dig trenches for tile. Then the best alternative is to encourage creeping bent, either by seeding with Seaside or by planting stolons of native bent grass.

The grass in low spots where ponded water stands after snow melts often win-

terkills. Kentucky blue grass and fescue are most liable to be killed. The creeping bent grasses and poa trivialis usually persist. Spring growth may be checked, but recovery starts from surviving nodes when the weather becomes favorable and complete coverage takes place before midsummer. The ugly weed infested bare spots resulting from complete kill of blue grass or fescue can be eliminated in one of two ways. The best procedure is to correct faulty surface drainage with soil fill. The other alternative is to encourage creeping bent grass by seeding with Seaside or by planting stolons of native bent gathered from low-lying wasteland on the property. The shredded stolons should be scattered over the area and cut into the soil by cross-discing. Light rolling should follow to press them into the soil. Some clubs top-dress lightly afterwards.

The green leaves of grass produce extra food in the fall. It is stored in the rhizomes, roots and special storage organs. The grass utilizes these reserves to start and continue growth in the spring until the leaves are of sufficient size to manufacture food. Grass leaves must make enough extra food in early spring to replenish the depleted reserves in the storage organs. Fairway mowing ought not to start too early in the spring. Leaves should attain enough extra growth so they can produce the extra food. Some clubs go a step further. They keep the fairway turf a bit longer for the first few weeks and then gradually lower the bed-knife to the standard height.

Height of Cut

Opinions differ about height of cut on fairways. The golfer wants short turf and would prefer bare ground to long grass. The agronomist objects to short cutting of blue grass and fescue. He knows from experience that they will not survive when cut at or below a half-inch. The good golfer cannot control the shot if the turf is long, or so fluffy that there is grass between the club head and the ball. The golfer has a right to expect turf which makes it fun to play golf. So both are correct. Up to now bent in the North and Bermuda in the South are the only grasses which will stand close cutting. Some day the efforts of plant breeders to produce a fescue and a blue grass which can be cut at half an inch or less may be crowned with success. Until then fairways of blue grass and fescue should not be cut much below an inch in spring and fall, and from late June until early September the grass should be a trifle longer than an inch. It means more frequent cutting during periods of rapid growth. Fairways are not too bad for play after half an inch of growth if cut originally at half an inch. But lies become unplayable and complaints are bitter after that much growth if the

original height was one to one and a quarter inches.

Inch Cut With Dense Grass

Blue grass and fescue fairways cut at an inch are satisfactory for play, provided the turf is a pure stand of dense grass. In fact better lies are obtained on some of the good unwatered blue grass and fescue fairways than on nearby watered ones where the turf has degenerated and consists mostly of poa annua in spring and fall and clover during the summer season.

Trouble arises on blue grass or fescue fairways when either or both clover and creeping bent are present in patches. A little clover mixed with the grass has little effect upon the playability of the ball, but lies are always unsatisfactory in patches of solid clover and the ball is hard to find. The golf ball may rest on top of the creeping bent and make the lie look satisfactory. This is not true if the turf is fluffy. There is sure to be grass between the club face and the ball upon impact of the two in playing the shot. Divots are long and ugly. Clover can be controlled, but there is no easy way to eliminate bent grass from fairways once it becomes well established. The best plan is to cut close enough to provide satisfactory lies and let the bent predominate. Astoria or Highland bent will persist in unwatered fairways, even in the belt from Philadelphia to Kansas City. Highland has one bad feature, which is most noticeable when the grass is cut above one-half inch. An above ground crown of tufted grass develops at a height of $\frac{3}{4}$ to 1 inch. The lower leaves turn brown and impart an over-all brownish color to the turf. Highland has a dull grayish cast, which is less pleasing in appearance than the deeper green of Seaside and Astoria.

Bent on Unwatered Fairways

Colonial bent has done well on unwatered as well as on watered fairways. Astoria bent has stayed in the fairways on an unwatered course in Cincinnati for more than ten years. Highland bent might have done as well. Kentucky blue grass alone was used first during a fairway renovation program at this club. After that the seed mixture included 10 per cent Astoria bent. The pure blue grass fairways have never been as good as the ones containing Astoria. The fairways with the bent turn brown in dry weather, but turf recovers promptly when the fall rains commence. Clover is not a problem on these fairways. There is some crab grass each year, but never enough to reduce turf density. These fairways are fertilized generously each fall. The turf is cut at one-half to three-quarters of an inch in the cooler spring and fall seasons and a trifle higher in summer.

Fairway mowers are operated at excessive speeds on many courses. Fast mowing results in an over-all ragged appearance. It produces corrugations on watered



EMERGENCY FAIRWAY WATERING

Basil Brooks of Temple Terrace GC, Tampa, Fla., has been using a 1942 auxiliary fire truck, a pump powered by a six-cylinder engine, and a citrus grove irrigation sprinkler as a portable outfit which has proved effective emergency equipment for fairway watering.

Temple Terrace is in a Tampa suburb. Fairways are rather rolling and soil is sandy. Although the Hillsborough river winds around the course only a few holes can be watered by pumping from the river.

The portable equipment is connected by fire hose, up to a 2000 ft. length, to fire hydrants in watering fairways that can't be irrigated by water pumped from the river. During the hot dry summer the fairways of the 18-hole, 6300 yd. Temple Terrace course get about three heavy waterings a month.

Pipe scarcity and high cost prevented installation of the fairway watering the club wanted so Basil Brooks adapted the portable idea from an orange grove outfit he saw at work during a drought when he was visiting his brother Victor Brook, pro at Winter Haven. —Byron Hollingsworth

courses and in moist locations, or during wet seasons on unwatered ones. Surfaces may become so bad that walking becomes arduous and fatiguing. Sometimes clover or crab grass becomes dominant in the trough between the ridges. Reducing the speed of mowing is the first step in eliminating corrugations. Operational speed ought not exceed 4 to 6 miles per hour. Anyone walking at a comfortable gait should have no trouble following the tractor and mowers. Cross-mowing or cutting on the diagonal is necessary also. It should be done every other time, or once in the middle of the week where the fairways are cut three times a week. Cross-mowing every other time gives the turf a neat, trim appearance.

Spraying With 2, 4-D

Broad-leaf weeds can be killed by spraying with 2, 4-D. Weeds should be in active growth and temperatures should be in the range of 65° F or above. Plantain and buckhorn start growth in the spring after dandelion. Where they are present it is wise to wait for their appearance before starting to spray.

Spring or fall are the two best seasons to use 2, 4-D. Weeds may not be in active growth during midsummer, due to a limited supply of moisture in the soil. Spraying in late spring stops dandelion and clover bloom and kills the old established plants. By fall there is apt to be a new crop of weeds from seeds. That is why some advocate fall as the best time to spray. By waiting until then the old and the new plants are killed. Where weeds are especially bad, it may be necessary to spray in spring for the first time and do it in the fall after that, provided blue grass or fescue are the main grasses in the turf.

Bent grasses are less tolerant of 2, 4-D than most others. The creeping bents are more easily damaged than the colonial types. Injury is less apt to occur in spring or early summer than in the fall. Before July seems to be the safest time to spray fairways containing a high percentage of bent grass. The amount of 2, 4-D used per acre should not exceed one-half to three-quarter pounds of actual 2, 4-D. The amine and salt formulations seem to cause less discoloration than the ester types. There

is more danger of drift damage to nearby ornamentals with the ester forms.

The broad-leaf weeds are forced into an erect type of growth when the bent turf is dense. Then these weeds are more unsightly than they are bad for play. The number developing from seed in a single season is small so there is little to be gained by waiting until fall to spray. By checking growth of bent, the use of 2, 4-D at that time might pave the way for the invasion of *poa annua*, chickweed, etc.

Use of Lime

The use of lime is justified on fairways where the soil is more acid than pH 6.0. At least a ton to the acre of ground limestone should be applied where the reaction is between pH 5 and 6. Double that amount is not too much where the reaction is below pH 5. The quantities can be reduced somewhat for sandy soil, and increased on heavy soil. On soils where available magnesium is low, a dolomitic type of ground limestone should be used to eliminate any possibility of a plant food deficiency in this element. The dolomite should contain not less than 20 per cent of magnesium reported as the oxide. The analysis is generally printed on the bags, or it can be obtained from the producer.

Although nitrogen fertilizer is the key to dense fairway turf, soils should be

checked for reaction and possible deficiencies of phosphorus and potash. Lime should be applied first as suggested above. Phosphate and potash come next. One good application will last for several years because clippings are not removed. After that it is a matter of providing enough nitrogen. Generous rates are justified where the grass is thin until a good turf is developed. Then quantities can be reduced somewhat, to an amount which will provide enough to maintain a dense turf and keep clover in check.

On unwatered fairways it is customary practice to apply most of the fertilizer in early fall. Grass grows best then and in the following spring. There is a trend in some districts toward summertime feeding on watered fairways. Light to moderate rates are used in late June and again in late July or August.

The trend on courses with watered fairways seems to be to use the water to keep the grass alive rather than to keep it lush and green at all times. Clubs faced with labor shortages are questioning heavy watering of fairways. To stop altogether may not be wise where the turf is mostly *poa annua* or creeping bent. It can be done if the grass population is blue grass or colonial bent.

U. of Mass. Turf Conference Program To Be Different

The 34th annual turf conference to be held at the University of Massachusetts will open its first session at 10:30 A.M., Thursday, March 8, in Bowker Auditorium in Stockbridge Hall. The program will continue through the day until 5:00 P.M. with moving pictures during the hour-and-one-half luncheon period. At 6:30 the annual conference dinner will be held at Hotel Northampton.

Friday, March 9, the program will start at 10:00 A.M., have movies during the lunch hour and close at 3:30 with the presentation of certificates to the members of the twenty-first class of professional turf growers who have been attending an intensive and specialized ten-week course which started January 3.

Following the conference program the annual meeting of the Massachusetts Section of the New England Turf Association will be held.

Professor Lawrence S. Dickinson, agronomist at the University, who started the turf conferences and is founder of the first school of turf culture ever held, urges all persons interested in the growing of fine turf grasses to attend the conference. He said, "Last year we promised something different, and we are not going to let the

turfmen down." One thing is certain, there will be much information and many ideas to be absorbed painlessly.

Purdue Turf Conference March 5-8

Purdue's Annual Turf Conference for 1951 will be held in the Memorial Union building, Lafayette, Ind., March 5-8.

The extension turf specialist at Purdue, Dr. Wm. Daniel, announces lectures will be on Dutch elm disease; establishment, maintenance and renovation of turf; chemical control of turf weeds and insects; recommended varieties of fairway and tee grasses; the planting, pruning and maintenance of shrubs; labor and its management, and water conservation and water management.

Over 400 attended the Purdue turf sessions in 1950, coming mostly from the states of Illinois, Michigan, Wisconsin, Missouri, Ohio, Kentucky, and Indiana. Those who plan to attend the Purdue conference this year should arrange for rooms early in advance, Dr. Daniel advises.

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