Sodium Arsenite and Organic Mixed for Pearlwort Control

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(Progress report on pearlwort control project at the Western Washington Experiment Station.)

AMONG the many troublesome weeds that are prevalent in golf courses throughout the Pacific Northwest none are more widespread or persistent than pearlwort (Sagina procumbens). For years golf course superintendents have attempted to combat this perennial pest by removing the infested portions of their greens by means of cup-cutters or other similar devices and resodding these areas with pearlwort-free turf, an operation that is both costly and time-consuming and frequently ineffective.

Certainly no aspect of greens management is more deserving of the attentions and facilities of agronomic research than the problem of pearlwort control. With this object in mind, a study, sponsored jointly by the Pacific Northwest Turf Assn. and the State College of Washington, was initiated to discover ways and means whereby an effective control of this weed might be obtained.

In the fall of 1951 a seedbed, built up of equal parts of a well-decomposed peat, sawdust, sand, and the parent soil (an impervious clay) to a depth of 12 in., was constructed. These materials, together with sufficient lime to bring the soil reaction to approximately 5.6, were mixed thoroughly. The green, 4000 sq. ft. in area, was then seeded to a mixture of Colonial bentgrass and creeping red fescue.

In the following spring, four series of plots, each series including eleven 5 ft. by 10 ft. plots, were laid out. Thirty plugs of sod were removed from each plot and these were replaced by plugs of pearlwort which were obtained from golf courses in the area. The turf management, including watering, fertilizing, and mowing, to which this experimental area has been subjected during the course of this study has been similar to the management practices generally employed on golf greens in the western Washington area.

Ten treatments, comprising the most promising of a number of materials tested in a preliminary study conducted in the greenhouse and the recommendations made by weed and turf specialists from the various cooperating agencies, have been studied in replicated plots during the past two years. In addition, check or no treatment plots were also included within the scope of this experiment. The treatments, form, rate, and time of application, and the results obtained are presented in tabular form on the opposite page.

Sodium Arsenite, Organic Works

Bear in mind that in developing a control for pearlwort, the objective was to find a material or combination of materials that would not immediately kill or burn out the weed, causing severe discoloration and disfigurement to the turf, but would weaken it to such an extent that the desirable grasses might gradually "crowd" it out of the turf. The only treatment that satisfied these requirements was a combination of sodium arsenite (½ oz. per 1000 sq. ft.) mixed thoroughly with an organic fertilizer (5-4-0); the mixture was then applied at bi-weekly intervals at the rate of 16 lbs. per 1000 sq. ft.

This treatment not only reduced the infestation of pearlwort, but also largely eliminated annual bluegrass (Poa annua) from the turf. Sodium arsenite, applied in the same manner at the rate of ¼ oz. per 1000 sq. ft., was not nearly so effective in reducing the infestation of pearlwort. Spray applications of 2,4-D checked the growth of pearlwort and broad-leaved weeds alike, however, this effect was accompanied by a severe burning of the bentgrass, particularly at the heavier rate of application.

Chlordane, applied as a spray at two rates, was neither effective as a control for pearlwort nor for other broad-leaved weeds that encroached into the plot area. Chlordane, mixed dry with an organic fertilizer and applied in that manner, was somewhat more effective. Supplemental applications of commercial nitrogen fertilizer

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TREATMENT				RESPONSE OF PEARLWORT	REMARKS
Material	Form	Rate of Application	Time of Application		
No treatment	.....	.....	.....	no change, new infestation	nutrient deficiency, infested with annual bluegrass, plantain, chickweed
2,4-D	spray	0.2% soln. turf wetted thoroughly	June 19	weakened, new infestation	nutrient deficiency, burn injury to grass
2,4-D	spray	0.4% soln. turf wetted thoroughly	June 19	weakened, very little new infestation	nutrient deficiency, severe burn injury to grass
Chlordane	spray	6 oz. actual/ 1000 sq. ft.	June 19	spreading new infestation	nutrient deficiency, infested with chickweed, plantain, annual bluegrass
Chlordane	spray	12 oz. actual/ 1000 sq. ft.	June 19	no change, new infestation	nutrient deficiency, infested with chickweed, plantain, annual bluegrass
Chlordane	spray	6 oz. actual/ 1000 sq. ft. 0.2% soln.	June 19	no change, new infestation	nutrient deficiency, burn injury to grass
Nitrogen	dry ammonium sulphate	⅜ lb. N/1000 sq. ft.	June 19, thereafter bi-weekly intervals	no change, new infestation	good color, dense turf, no visible nutrient deficiency
Nitrogen	dry ammonium sulphate	¾ lb. N/1000 sq. ft.	June 19, thereafter bi-weekly intervals	no change, very little new infestation	good color, dense turf, no visible nutrient deficiency
Sodium arsenite Nitroganic	dry mix	¼ oz./1000 sq. ft. 16 lbs./1000 sq. ft.	June 19, thereafter bi-weekly intervals	weakened, very little new infestation	good color, dense turf, no visible nutrient deficiency
Sodium arsenite Nitroganic	dry mix	½ oz./1000 sq. ft. 16 lbs./1000 sq. ft.	June 19, thereafter bi-weekly intervals	severely weakened, no infestation	good color, dense turf, no visible nutrient deficiency
Chlordane Nitroganic	dry mix	6 oz. actual/1000 sq. ft. 16 lbs./1000 sq. ft.	June 19, thereafter bi-weekly intervals	no change, little new infestation	good color, dense turf, no visible nutrient deficiency

of the Wilson Sporting Goods Co. told how pros operate in ways that develop more golf play and greater interest and satisfaction at clubs.

Dave Bonella, who has handled course maintenance and house management as well as the pro dept. during his 45 years at Ottumwa detailed how department and committee heads and club officials could work together to give members largest returns for their membership and dues money. Herb Graffis, GOLFDOM's editor, presented the over-all picture of golf club operation as an exacting, important business.

Mayor Pat Touche of Waterloo, a golf enthusiast, spoke on what businesslike golf operation means to a community.

Golf was played in the afternoon and the clinic participants and wives of some of them enjoyed dinner together in the evening. Mgr. Leo Cafferty of Sunnyside gave the party entertainment and instruction by setting up a long table on which were ingredients of a Caesar salad and asking the diners to mix their own. Results were wonderful to behold.

Pro John Brooks and Supt. Joe Sanders of Sunnyside presented, along with Cafferty, a fine demonstration of cooperation in country club operation.

The Iowa group is planning a fall meeting along the lines of the first session. Many who wanted to attend the first meeting were kept away by urgent spring work at their clubs.

SODIUM ARSENITE

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improved the general appearance of the turf, but at the same time stimulated markedly the growth of pearlwort.

In view of the effectiveness of sodium arsenite when used in combination with a supplemental fertilizer, treatments, employing five different rates of this material, were applied at bi-weekly intervals on a pitching green located at the Rainier G&CC in Seattle. These treatments, initiated in late summer of this year, should give a more comprehensive picture of the effectiveness of this material under actual golf-use conditions.

Another herbicide, namely a sodium salt of 2,4-D, has also shown exceptional promise as a control of pearlwort. In a series of treatments conducted in 1952 at the Tacoma G&CC, this material, when applied in a dry mix with an organic fertilizer, checked completely the growth of pearlwort. However, the dry or powder preparations of 2,4-D that were so very effective in these early tests are no longer available on the market. Recently, a small quantity of a similar 2,4-D material was obtained for experimental purposes. A series of test plots which will include the application of this material at several rates will be sent out in 1954.

The information that has been obtained thus far strongly recommends the use of sodium arsenite (½ oz./1000 sq. ft.) applied in a dry mix with a supplemental fertilizer. The importance of the supplemental fertilizer cannot be over-emphasized. The desirable grasses in a golf green must be strengthened and invigorated to resist any new infestation of pearlwort and to crowd out existing clumps of this weed that have been weakened by the application of the herbicide.

Sodium arsenite, when applied in dry form at regular two-week intervals, has weakened the pearlwort thereby contributing to its gradual disappearance without burning or otherwise disfiguring the green.

Supts. 1956 National Meet at Long Beach, Calif.

Golf Course Superintendents' Assn. of America will hold its 1956 turf conference and equipment and supply exhibition at Long Beach, Calif., Feb. 5-10.

Award of the convention was made to Long Beach at a GCSA Executive Board meeting held late in April at St. Louis, Mo.

REMINDS PLAYERS

Sundown Ranch CC, at Scottsdale, Ariz., has its members cooperating in course care now that it's using unique reminder signs. The above "replace divots" sign shows the club pro's wife, Betty Mackey showing "Fan Fare" cartoonist Walt Ditzen a display of a divot somebody didn't replace.