

# Brynwood Adopts Chemical Weed Control Program

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★ Many weed and clover control programs will start on golf courses when labor and materials become available. Interest in their eradication is widespread. Here is a major concern of golf officials and greenkeepers everywhere. Even club members are keenly interested in ridding fairways of weeds and clover, but their elimination from the roughs is still more important. Weedy roughs are the potential source of infestations in the fairways.

The experience of Lester Verhalen at Brynwood CC in Milwaukee should be of especial interest to those contemplating a weed control program. At one time the fairways and roughs were heavily infested with weeds and clover. Dandelion was the principal weed, but plantain and buckhorn were numerous also. White clover was so bad that fairways were mowed three times a week during the blooming period, otherwise players complained that golf balls were hard to find. The turf was uniformly thin. It consisted of Kentucky blue grass.

Weed and clover control experiments were conducted prior to 1940 on small sized plats. Arsenic acid and sodium arsenite were tried. The latter was applied dry and as a liquid spray. The first plats were located in the rough, but subsequent ones were established along the edge of a fairway. The trials proved that weeds and clover could be eliminated without damaging the grass.

The ninth fairway was selected for a large scale trial. It was treated in the fall of 1940. The dry method was used because discoloration was less severe, and



Hose from boom on the sprayer connects with shut-off valve on tractor.



Sprayer in operation on rough. Boom on Hardie sprayer is home-made. Nozzles are cone-shaped type, spaced 18 inches apart, at 45 degree angle. The two end ones have separate shut-off and are on swivel so boom can be shortened. Upright mounting standards have holes 3 inches apart so height of boom from ground can be changed.

serious damage to the grass less likely than with the spray method. Milorganite was the carrier. The rates of application per 1,000 square feet were 4 to 5 ounces of sodium arsenite (11 to 13½ pounds per acre) and 10 pounds Milorganite (435 pounds per acre). The fairway was treated three times that fall and twice more the next spring. Treatments began after Labor Day. The interval between applications was two to three weeks. The reduction in weeds and clover was amazing. There were almost no blooms visible during the next spring when dandelions and clover were in flower. All the other fairways and the roughs were ablaze with yellow when dandelions were in bloom, and a mass of white during the clover season. During both times this fairway was cut twice when all the others were being cut three times because of the profusion of dandelions and clover blooms.

The results were so striking that the club officials decided to start a weed control on all fairways. The treatment of both roughs and fairways was not feasible because of the labor shortage, so it



Rough between 10 and 18 in fall of 1944 before spraying with arsenic acid.



Rough between 10 and 18, early summer 1945, after spraying five times.

seemed best to forget about the roughs temporarily.

All the fairways received two applications of sodium arsenite in the fall of 1941. Milarsenite (a mixture of Milorganite and sodium arsenite) was used both times at 400 pounds per acre with an interval of three weeks between the applications. The Milarsenite provided 50 pounds nitrogen and 25 pounds phosphoric acid. Additional fertilizer was applied at 600 to 800 pounds per acre (about 40 pounds of nitrogen and 20 pounds phosphoric acid per acre). The folly of killing weeds without supplemental fertilization to encourage grass to spread and take possession of the bare spots was recognized. Although the turf was thin, no seed was used because grass coverage was uniform. The improvement was gratifying. There was no plantain or buckhorn the following year. The reduction in the number of dandelions was appreciable, but not complete.

Additional treatments have been made every fall since then. An excellent stand of Kentucky blue grass has been obtained, and by 1943 turf became almost perfect.

The sodium arsenite also rid fairways of worm casts, and no grub damage occurred in 1944, although there was considerable injury in the adjoining roughs,

and on untreated fairways at other courses in the district.

Roughs were not sprayed until the fourth year after weed control was started on the fairways. Treatments should have commenced simultaneously on both. Then the number of new weeds in the fairways would have been reduced very materially. They come from seeds produced by weeds in the nearby roughs.

A boom was made for the power sprayer used to apply fungicides for disease control. The sprayer tank had a capacity of 100 gallons. The six cone type nozzles, equipped with No. 2 discs, were spaced 18 inches apart on  $\frac{3}{4}$  inch pipe fittings. The two end ones were mounted on swing joints with separate stop cocks so the boom could be shortened to four nozzles to enable spraying among trees. The boom was mounted on upright standards with nozzles tilted backwards at a 45 degree angle. The height of the boom was adjusted so the outside edge of adjacent cones would meet exactly at the surface of the ground with the pump operating at 150 to 175 pounds pressure. Holes on the standards were spaced three inches apart for this purpose. The connecting hose extended from the boom to the tractor and back to the tank outlet. A shut-off valve was inserted beside the tractor seat to permit the driver to start



No. 18 fairway in 1941 before sodium arsenite treatments.



No. 18 fairway, summer 1943, after two years of weed control treatments and fertilization.

or stop spraying at will. Details of construction are shown in the accompanying picture.

A tankful of water was sprayed over part of the rough with the tractor traveling at normal speed and the pump operating at 150 to 175 pounds pressure. The area covered was measured. It was found that 100 gallons would spray two acres. Subsequent operations were based on using 50 gallons of water per acre, or about half the quantity normally used in the Chicago area. Arsenic acid was the weedkiller employed on the roughs.

Crude arsenic acid is a heavy liquid, almost twice as heavy as water (specific gravity 1.7 to 1.8). The ordinary grade contains 70 percent arsenic acid. It comes in 12 gallon glass carboys, which are used for sulphuric and other acids. An acid siphon is best for transferring arsenic acid into smaller bottles or jugs. Siphons can be obtained from most chemical supply houses, and from many automobile accessory jobbers. Arsenic acid is a poison and will produce serious flesh burns. It must be handled carefully.

One-half gallon of crude arsenic acid was used per acre, or about 7½ pounds (2¾ ounces per 1,000 square feet). It was less than the 11 pound rate per acre (4 ounces per 1,000 square feet) used by some greenkeepers in Chicago. The contents of a 1-gallon jug were added while the tank was being filled with water and the 100 gallons were sprayed on two acres. The cost per acre for material was less than \$1.00 for each treatment.

Blue grass can withstand a relatively heavy dose of arsenic acid, especially when cut longer, as is the case in the rough. Turf discolors badly, but the grass will recover, provided the soil is not too dry at the time of spraying.

The roughs have been sprayed five times, twice in the fall of 1944 and three times in the spring of this year. Spraying started last fall in late September, and ended in late October. The interval was approximately three weeks. The spring of 1945 was an unusually early one. Midsummer temperatures prevailed in March. Weeds started off with a rush. Plantain and buckhorn plants of the year before were killed completely by the two fall treatments. The reduction in dandelions was marked, but a considerable number still remained. Spraying was resumed in late April but flower buds were far advanced on many dandelion plants, so some seedheads formed despite the spraying.

In the future, spraying in the spring will start when the first flower buds appear in the crown of the plant.

By mid-June there were few weeds left. Players had no trouble this year finding golf balls, even though the roughs were

not cut short, because the weed foliage and seedheads were gone.

Verhalen is so enthusiastic about the improvement in the roughs that he intends to do some spraying every year. He realizes weed control is not a one year proposition, because new weeds keep coming each year from seed in the soil. Besides reducing the weeds, he says spraying at the proper time eliminates all the seedheads which reel-time mowers do not cut. The mowing problem is simplified too, because the arsenic acid checks the growth of blue grass temporarily. When the roughs grow too fast to be kept in check with the mowers, spraying burns the weeds and slows the growth of grass.

Arsenicals help control grubs also. Serious damage does not occur after a program of spraying for a year or two. Arsenic acid and sodium arsenite give control at far lower concentrations than lead arsenate. Grubs are responsible for bad weed infestations on many roughs. They kill the blue grass and then weeds develop from seeds already present in the soil. To kill the existing crop of weeds is only the first step in any weed control program. Unless a cover of grass is obtained and maintained, there will be another crop of weeds in a year or two. The battle to curb weeds is a continuous one. The time may come when a little fertilizer will be used occasionally on the roughs to maintain the grass cover.

Announcement of a new weedkiller, called 2,4-D for simplicity, was made in 1944. It received wide publicity. Results being obtained with it are very promising. When used correctly, it appears to be far better for dandelion, chickory and several other weeds than the arsenicals. Apparently it has a definite place in the weed control program, but may not entirely supplant the arsenicals on golf course turf. Spraying with a combination of 2,4-D and arsenic acid or sodium arsenite might give a better and quicker kill of the weeds, besides grubproofing the roughs and curbing growth of the blue grass during the spring and fall. Whether the idea is a good one and workable is a matter for time to tell. In any event, it is apparent that big things are in the offing for weed control, but herbicides alone will not supplant the necessity for employing other practices which are essential in the maintenance of dense turf capable of resisting the invasion of weeds.

**WESTCHESTER TOPS MILLION INCOME**—Westchester CC, Rye, N. Y., had gross income from operating departments of \$1,163,950.75, and net operating profit of \$118,093.69 for year ending Dec. 1944, according to president's report and audit recently issued.