

The cost of Chlordane today is insignificant compared to the cost of re-establishing that turf. Controlling the grubs means also that fewer weeds need to be controlled, because weeds come in only when turf is not solid.

Fairway Renovation

Occasionally unsatisfactory fairways need to be renovated so that a new and superior turf grass can be established. The work of the USGA Green Section consistently has shown that sodium arsenite is one of the most effective and yet one of the cheapest chemicals ever produced for this purpose. This information is directly applicable to the nine-hole course, where costs mean so much. The USGA Green Section has been working with sodium arsenite for more than 20 years. Golf-course superintendents from 18-hole courses who regularly have attended the conferences and field days are

the ones who have learned the most about how to use this very useful chemical.

It has been difficult to reach the nine-hole golf course. Too often the superintendent and the green committee chairman feel that the conferences don't meet their problems; therefore, the personnel of the nine-hole course fail to obtain the basic information which would help them to do a better job at lower cost. The personnel of the USGA Green Section staff never has been, and perhaps never will be, adequate to visit all of the nine-hole courses which are members of the USGA. We should like very much to make such visits, because we realize how much we could help the nine-hole golf courses. Yet we depend largely upon our USGA JOURNAL and upon correspondence. The information which the USGA Green Section has is available to all. Everyone who can write a letter or dial the telephone can get the information he wants.

AERATION AND OTHER PRACTICES

The Mid-Atlantic Association of Golf-Course Superintendents heard, at a summer meeting, discussions of various topics which we believe will be of interest to all golf-course superintendents.

Aeration

Charles K. Hallowell, Philadelphia's representative of the Pennsylvania State College, Division of Agricultural Extension, emphasized that we should not throw our present fundamental knowledge in soils out the window now that we are being bombarded with advertisements describing miracles accomplished with the new soil conditioners. The need for lime, organic matter, nutrients and good maintenance and management practices is important today and will always be important in growing good turf. Our present knowledge in soils is the amassed thought and experience of innumerable minds. This knowledge is not passed off lightly by wise turf men.

Mr. Hallowell spoke of Dr. Alderfer's

work at Penn State. Dr. Alderfer regards a good soil as one made up of approximately 25 per cent air, 25 per cent water and 50 per cent solids (sand, soil, organic matter). A good soil takes in approximately one inch of rainfall or more per hour while a poor soil will take in approximately .5 inches per hour or less. It is important not only to get water into soils but also important, in many instances, to get water out of soils. This is also true of air. When air circulation is poor, grass roots, like any other living organisma, are in danger of suffocation. Movement of water and air are the important factors. If water or air become static, then you have a poor or troublesome condition. Aeration aids in water and air movement.

Mr. Hallowell stated that this past spring was unlike any he had previously experienced. As we all know it was one of the wettest seasons on record, and many of the poorly drained golf courses encountered difficulties. The usual heavy

week-end play intensified soil compaction of many putting-green surfaces. Too, grass root systems were shallow as a result of the continuous rains. Usually we encounter moderately dry weather in May which is beneficial to turf as root systems go down. This was not true this year, and when we experienced a few consecutive dry, hot days in June, the shallow-rooted grasses weren't able to take it. Turf areas which were predominantly *Poa Trivialis* and *Poa annua* looked beautiful in May but sad in June. Aerated turfs, where air and water movement were good, came through these adverse conditions in far better shape than unaerated turf.

Mr. Hollowell cited Alex Strachan's recent experience with regard to water utilization. Alex was informed that the water on his course was to be shut off at certain hours each day; therefore, he aerified his greens prior to watering and concluded that the amount of water he formerly applied under normal circumstances was excessive. Aerification allows for more uniform placement of water, decreases run-off, cuts down on water bills and makes possible more judicious use of water.

Mr. Hollowell spoke of a recent Philadelphia meeting of golf course superintendents at which the members discussed at length the subject of getting greens into shape for the hot summer months. The discussion revolved about aeration which points up the fact that when things get tough, regardless of season, the superintendent includes aeration in conjunction with other management practices to help him through. Aeration is as good a practice as any we have when we are in trouble. Aeration is here to stay.

Mr. Hollowell showed several interesting slides of aeration results and practices, with emphasis on the ever-important fundamentals in soils and turf culture. These included slides showing thin root growth resulting from aerating with the hollow-tine fork as compared with the dense root growth resulting from sub-

COMING EVENTS

- September 24:** Field Day. Greater Cincinnati Golfers League and Cincinnati Golf Course Superintendents. Taylor Boyd.
- October 6-7:** Turf Conference, University of California, Los Angeles, Cal. Sam Houston.
- October 9-10:** Turf Conference, University of California, Berkeley, Cal. John J. McElroy.
- October 13-14:** Turf Conference, Washington State College, Pullman, Wash. Alvin G. Law.
- October 20-21:** Turf Conference, Oklahoma A. & M. College, Stillwater, Okla. Jack R. Harlan.
- October 22-24:** Third Turf Conference, Central Plains Turf Foundation and Kansas State College, Manhattan, Kan. William F. Pickett and L. E. Lambert.
- November 17-21:** American Society of Agronomy Meetings, Netherland Plaza Hotel, Cincinnati, Ohio. L. G. Monthly.
- December 1-3:** Texas Turf Conference, Texas A. & M. College, College Station, Texas. James R. Watson.

surface cultivation with the half-tine spoons and several slides showing severe matting conditions on bentgrass turf.

Many superintendents report less disease incidence when the matted condition is relieved. Whether this is due entirely to aeration, they cannot say, but certainly it is a factor. Aerification also makes for more resilient greens, thereby enabling the golfer to pitch to the green with more accuracy and assurance. Shale soils also will compact if layered, and in such cases aeration is needed even on such light soils. A matted condition is dangerous, whether it be on tee, fairway or green. A bad break in weather may cause matted turf to go out. This happened at Wilshire Country Club, Los Angeles. Several golf courses open late in the season, and turf (creeping bents and fescues, especially) mowed infrequently in early season tend to mat excessively. The numerous clippings decompose slowly and result in thatch build-up.

Slides of compacted areas on aprons and fairways showed machinery tracks plainly visible. These worn-out areas were in need of more aerification. Another slide compared the healing ability of dif-

ferent strains of bentgrass after aeration. If the grass is a type which doesn't heal rapidly, timing of aeration is very important from the playability and esthetic viewpoints. Other slides emphasized that aeration fits into the home-lawn picture, too. Aeration equipment which cultivates beneath the surface is especially valuable for seedbed preparation in established turf. Several aerifications, followed by dragging, result in innumerable cavities with loose, friable soil, and this is an ideal seedbed. Some manufacturers make small models to fit the home owner's pocket-book. In some cities also, landscape men are doing custom aerifying for home owners.

Mr. Hallowell presented slides showing some of the results of work done at Penn State by Prof. Musser, Jim Watson and Jack Harper. Penn State statistics show less water run off and 56.9 per cent more phosphorous penetration in aerified areas, compared with non-aerified plots. Also, with regard to root penetration, the weight of roots in the four-inch layer of 5,000 square feet of turf increased 7.7 per cent in aerated plots over non-aerated plots.

In closing, Mr. Hallowell stressed the benefits of aeration: Movement of water and air are extremely important results of aeration; without air movement, there is little or no water movement. Efficient placement of moisture and nutrients, deeper root systems, more resilient turf, reduction in the amount of water necessary and excellent seedbed preparation in fallow or established turf areas are other benefits.

Greens

Sub-surface and surface drainage for every putting green area was recommended. Use improved strains of bentgrass such as the C-1 and C-19 if stolonizing, the polycross creeping bentgrass if seeding. If greens must be built up, slope them gently so that fairway power equipment can be used to the maximum. For the approach aprons, the Dahlgren C-115

strain of creeping bentgrass might well be given serious consideration.

Tees

In the reconstruction of tees, a good point to keep in mind is that large tees maintained with fairway mowing units are preferable to small, abruptly sloping tees requiring hand maintenance. For the open, sunny tees U-3 Bermudagrass is recommended, while for the shady tees a combination turf of Merion (B-27) bluegrass and Meyer (Z-52) zoysia would be preferable. Dahlgren bent should be given a thorough trial on shady tees.

Fairways

In renovating fairways, it is advisable to spray with herbicides prior to overseeding. The one-pound rate of sodium arsenite can be used to good advantage if applied at weekly intervals two to three weeks prior to reseeding. Thorough aeration and dragging prior to seeding would insure uniformity of stand. Give serious consideration to the improved strains of turf grasses in this renovating program. The seed mixture recommended was 35 per cent Merion (B-27) bluegrass; 30 per cent creeping red fescue, such as Illahee, Trinity, or Oregon creeper; 30 per cent Chewing's Penn State Blend and 5 per cent Highland bentgrass. Meyer (Z-52) zoysia plugs or plugs of any of the other zoysias should then be inserted into all fairways as time and the labor situation allow.

Turf Nursery

A good turf nursery is one of the most valuable assets on any golf course. The time and expense involved in setting up a sizable nursery area is negligible when compared with the benefits derived in good turf. Large plots of combination Merion (B-27) bluegrass and Meyer (Z-52) zoysia, U-3 bermudagrass, Dahlgren (C-115) creeping bentgrass, Arlington C-1 and Congressional C-19 creeping bentgrass, and Meyer or any of the other

zoysias would pay handsome turf-insurance dividends. The initial plantings need not be large, but steady increase of each of these selections could be made on a long-range program basis.

The Management of Grass Around Trees With Fuel Oil

By R. WILLIAMS and E. STATEN
BEVERLY COUNTRY CLUB, CHICAGO, ILL.

A method of managing grass around trees was devised to eliminate laborious hand or power cutting. An area approximately 18 inches wide around each tree was sprayed with fuel oil. This left a mat of dead turf.

The fuel oil was applied with a three-gallon sprayer mounted on a caddie cart for ease of movement. Approximately 20 seconds were required to spray around each tree. It took approximately 32 hours of labor and 50 gallons of fuel oil to complete the job for the entire course. It is estimated that we have 3,000 to 4,000 trees.

Two applications were made, the first in May and the second in August. The second application was necessary because of the re-growth of some of the grass and the germination of some annual weeds. The trees and the rough looked well groomed practically all season, and the area around the trees was very suitable for hitting a controlled golf shot. This method saved many hours of labor and the results were considered superior.

TURF MANAGEMENT

Worth-while discussions of the problems confronting Green Committee Chairmen are contained in **TURF MANAGEMENT**, a book sponsored by the United States Golf Association. This volume was edited by H. Burton Musser and published by the McGraw-Hill Book Co., Inc. It is available through the USGA, 40 East 38th Street, New York 16, N. Y.; the USGA Green Section, Room 331, Administration Building, Plant Industry Station, Beltsville, Md., and bookstores generally. The price is \$6.

SOURCES OF MERION SEED

The USGA Green Section cannot furnish a list of all suppliers of Merion bluegrass seed (and other turf seeds), but we wish to invite the attention of USGA JOURNAL readers to our list of Green Section Service Subscribers. This list will be made available to all readers who send a stamped, addressed envelope with their request to the USGA Green Section, Plant Industry Station, Beltsville, Md.

Somewhere in the list of Green Section Service Subscribers there will be a dealer near you who will be in a more favorable position to furnish seeds of improved turf grasses than firms not affiliated with the Green Section. We suggest that our subscribers be given a chance to supply you. Through their subscriptions (\$35 a year) they help to build our Education Fund which enables us to develop and support cooperative turf research over the United States.

Results of the Merion bluegrass survey have been tabulated. Mimeographed copies will be sent upon receipt of requests accompanied by a self-addressed, stamped envelope. Requests should be directed to the USGA Green Section, Plant Industry Station, Beltsville, Md.

QUESTION AND ANSWER

Q. Our putting greens are gone, not a blade of grass left but goosegrass and crabgrass. Our *Poa annua* fairways that were beautiful last spring are now brown and bare. We have no nursery. We have fired the greenkeeper. What should we do now? (New York)

A. Rehire your greenkeeper at a higher salary (if he will come back). Start planting a nursery of improved grasses.

Don't let the golfers tell the greenkeeper to pour on more water. That is probably what ruined the turf.

Have the pro teach the golfers how to play shots to firm greens.

Visit other clubs to see how they handle their problem. Yours is not an isolated case.