

22 yrs. Progress

By EB STEINIGER

Aerifying is a subject that is receiving a lot of attention these days. Looking back over my own experience in golf course maintenance, I find that the idea of aerifying is by no means a new one. We greenkeepers thought of it long ago, but it was not extensively practiced simply because the proper tools were not available.

Aerification posed a major problem at Pine Valley for many years. Since our course is located in sandy Southern Jersey, many people take it for granted the soil is ideal so far as drainage and aeration are concerned. But there is a considerable variation in the materials which qualify as sand. Some sand is coarse particled and porous; some isn't. We have the latter kind, and it packs as much as any other fine particled soil material.

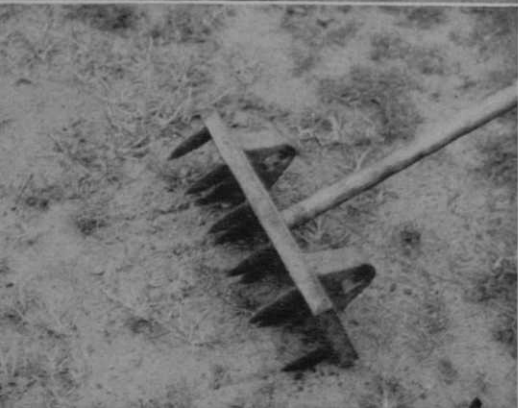
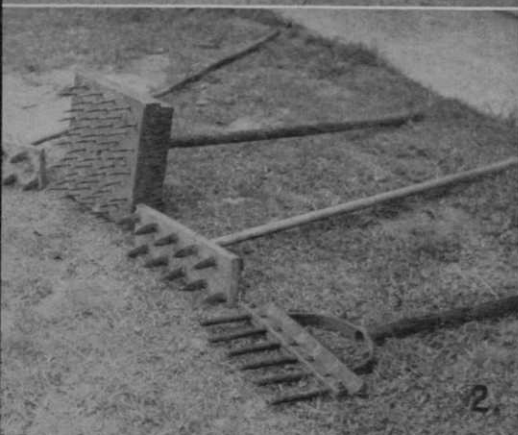
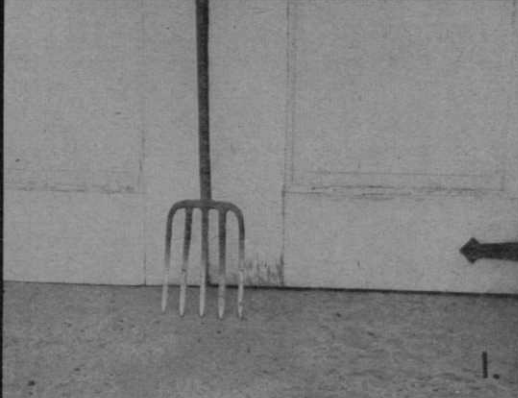
When the course was constructed, some Pennsylvania clay soil was brought in. This was used chiefly in the greens. The mixture of clay and fine sand is not an ideal soil mixture for greens; it compacts very easily.

We have also had a serious problem with thatch on our greens and fairways. Needless to say, the combination of compaction and thatch made us acutely aware of the need for aerification. We've tried just about every aerifying implement that has come on the market during the past twenty years or so. We even devised some tools that the manufacturers did not think of. Fortunately, I cannot recall how much time and money went into the making of gadgets.

Back as far as 1928, I remember we had trouble with hard spots and sedgegrass. We used the only tool we had at hand, the spading fork (see Fig. 1), to break up the hard soil, and then we limed the troublesome areas.

In 1929 we got classy and imported some hollow-tined forks from England. I guess this was our first attempt at what nowadays would be classified as "aerifying". These forks did break through the thatch and loosen the soil, but it wasn't easy.

It was after that that we made up some hand tools in our own shop. These tools were rather crude—just a heavy square board with nails driven through to extend about three inches on the underside. Each greensman had one. It wasn't a very fancy tool, but it helped, or at least we thought it did. (Fig. 2.)



In Aerifying Turf

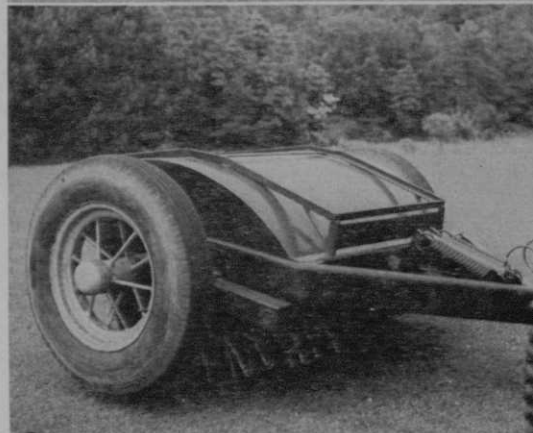
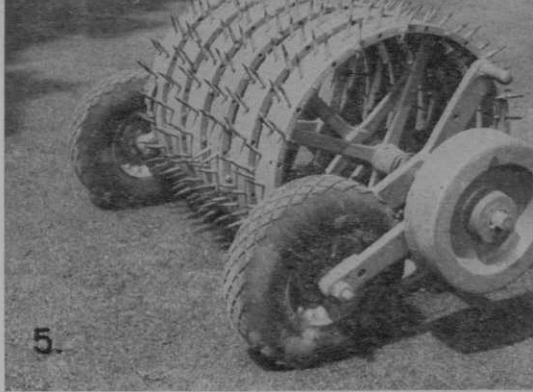
Heavy mowing equipment used on the fairways did not improve conditions there, either. It was also in 1929 that we purchased a meeker harrow for fairway use. This implement had a wooden frame and there were two sets of discs mounted on two axles. The second set of discs was spaced out of register with the first so the discs cut in-between the first row of discs. We went to work and constructed a smaller version of this harrow for use on greens. (Fig. 3.) This method did some good in cutting the near surface rhizomes, but did nothing toward overcoming compaction. The implement could only be used in the spring or fall when the grass was growing very rapidly because yellow streaks of dead grass would show where the grass roots had been cut.

Another trouble with the discs was keeping them sharp enough to cut through the turf. Then, too, when enough weight was added to make them go down, the implement became quite difficult to handle. So, still in 1929, we tried another method of attack. We had purchased a rotary soil tilling machine, and we removed the digging tines and mounted saw blades on the drive shaft. They were spaced so we got four blades on the machine. They cut into the ground to a depth of about 5 inches. That was pretty good depth penetration but we couldn't keep the machine in sawblades, on account of the teeth wearing off so rapidly in soil. There was also the drawback that the turf was not in playable condition when we were finished.

We weren't the only inventors of that period. Others recognized that compaction was a cause of poor turf, and did their bit toward developing implements to overcome it. Charlie Erickson made a spiker with steel spikes that penetrated the soil to a depth of about one and a half inches. We tried one of his machines for awhile, but it was too heavy and cumbersome for even small scale use.

In 1930 O. B. Fitts came up with a two-man spiker—a two handle job, with six sets of flat dagger-like spikes, pivoted on a centre cast iron wheel. This machine was effective in cutting through thatch, but increased, rather than decreased, compaction. It was very unwieldy so we removed the dagger-blades and mounted each set on an individual handle, and each greensman carried one of these to use on trouble spots. (Fig. 4.)

Also in 1930 an American made tubular tine fork appeared on the market. We tried these, too. They are good for spot



work. Whole greens were forked when needed, but this method is slow and expensive.

Around 1932 a spiker came on the market, which was more maneuverable than anything we had had previously. In view of what we had previously, this is not saying much. This maneuverable machine had six cast iron wheels, about 24" diameter, mounted to revolve independently. In each wheel, pointed steel spikes were mounted so they pivoted at the base. Spikes moved in elongated holes to prevent tearing the turf. A tension spring held each spike in position. (Fig. 5.) We used the implement mainly for reseeding and before top-dressing. It punched a good many shallow holes in the surface soil and helped in establishing new seed.

In 1933 another type implement appeared on the market, and we thought it was the answer to the compaction problem. This one was a hollow tine implement. Even then we were aware that making a hole by removing the soil, instead of punching a hole with a solid spike, was a lot more effective toward overcoming compaction. So we liked the idea of a hollow tined implement.

This new implement had a sturdy handle for one or two men. (Fig. 6.) Transport wheels were built into the machine. The hollow tines were threaded into a steel drum about 36" in diameter. Soil passed through the hollow tines into the drum. There was a nice little clean-out door at one end of the drum so the soil could be removed from time to time. The tines were made of tempered steel, and tapered from $\frac{5}{8}$ " at the base to $\frac{1}{2}$ " at the tip that went into the ground.

The implement did not work as well as expected. Marking of the surface of the green was considerable. So we made some alterations on the hollow tine implement before turning it loose again. We put slats of wood between the rows of tines so they would not go in so deep, and this improved the operation sufficiently that we were able to use it on fairways and the collars of greens. We did have trouble, though, on account of the hollow tines blocking up with soil. And as the metal wore thin, the ends of the hollow tines curled in and the tines would no longer remove a soil core.

Tried Air Compressor

Actually, we had made no real progress at all toward overcoming compaction and thatch. One time we decided to try an air compressor with an attachment to make straight, deep holes into the ground. We thought we might even be able to force air into the turf. My only comment on this method is that it's fortunate Pine Valley is in a secluded spot. Otherwise, the neighboring inhabitants surely should

have questioned the sanity of our queer activities.

We tried other tools less spectacular than the air compressor — soil augurs and cup cutters, home made punches and spikers. One manufactured tool that we used quite extensively was a flat bladed spiker. (Fig. 7.) Both a hand-drawn type and a tractor-drawn type were used. The sharp points on the saw-like blades punched through the turf, and for fall renovation of fairways, we would cut figure eights with the implement to tear up the turf as much as possible.

We tried out a drilling machine on greens. This operation was slow and drills wore out quickly so the machine was not suitable for extensive aerifying.

In 1946 we enlarged the collection with a new type aerifying implement — the one with the curved, hollow spoons. We got the first machine produced, a tractor-drawn model and it didn't have any kind of device to keep the turf from being picked up by the spoons. That wasn't satisfactory. But after the manufacturer added an attachment of steel ribs to rest against the turf, we got along better with the machine. (This feature of the machine was improved recently by changing to spring devices attached to each spoon to hold the turf down.)

We found that the open spoon removed a soil core just as well as a full-round hollow tine. And the open spoons never block up. Putting a curve on the spoon, instead of using a straight tine, provides a cultivating effect beneath the surface.

We gave the tractor-drawn model an extensive try out on the fairways, and in 1950, obtained the self-powered version of the tool. (Fig. 8.) So after twenty years of searching, we have at last found tools which make it practical to aerify the entire course, without interrupting play.

I don't think our twenty years of trying were at all wasted effort. In that time, naturally, we formed some definite ideas of what we wished to achieve and how to achieve it. We observed that even though you loosen the soil in an area one time, the soil will become packed again. So we concluded that aerifying is a process which has to be done again and again. Just as the supply of plant foods in the soil must be replenished from time to time, so must the physical condition of the soil be given regular attention. Likewise, a thatch layer at the surface is forming constantly, and raking and aerifying must be repeated regularly in order to overcome it.

When I talk about aerifying repeatedly, I don't mean to aerify once this year and then repeat the operation next year. At Pine Valley, we aerify about once a month as long as soil and weather conditions will

permit it. Sometimes we aerify oftener than that on areas which need special attention. What have been the effects of this intensive aerifying? Well, we are achieving a more uniform mixture of the surface soil. Dry spots have been practically eliminated. We are making real progress toward overcoming thatch. We have reduced heavy fairway watering. In view of what has been accomplished, we are certain that aerifying, just like fertilizing, watering and mowing, is here to stay as a regular part of our maintenance program.

The Combination That Made 25 Miracle Years in Golf

By JOHN ANDERSON

On looking back at course maintenance for 25 years or even for 20 years one marvels at the progress that has been made. Most of it we might say was just natural. It had to be. It was produced by not any one phase or any one of the different angles that go to making progress, but by a combination of management, maintenance, administration, and the demands of each on the other. The teamwork of all has been responsible for all of the improved standards of course upkeep and maintenance during the past 25 years of progress.

To list the points of progress in the development and maintenance of fine turf, and their place of importance:

The greenkeepers' and superintendents' long time and sometimes disheartening effort to get together and form a workable association for the good of themselves and for the clubs and the business of golf as a whole is and has been an outstanding achievement.

Next; the relationship between the professional and the course superintendent which now exists has been one of the high points in the progress toward improving the standard of golf in the last 25 years. Many of the older superintendents have looked forward to the time when experience and education would attain just that.

Third; the close contact between the state agricultural colleges, their staffs, and the local superintendents' associations, have played no small part in the

development and upkeep of the fine turf grasses. Moreover, at the yearly short courses now held at state agricultural colleges the superintendents have had a chance to study, not only turf maintenance but all the different phases and operations such as fertilizers, chemicals, machinery, administration, and so on, generally in the winter when they are not too busy, and get a chance to study while pressure of the golf season is relaxed.

The USGA with its nation-wide influence, its grasp of conditions and information gained thru its Green section, has been and will continue to be a prime factor in the development, maintenance and progress of golf course turf and the playing condition of our golf courses.

The machinery manufacturers have played no small part in the scheme of things to bring about finer golf courses. Often at the urge of the greenkeepers they have gone ahead and taken a gamble with a piece of equipment, manufactured and marketed it with no more guarantee of success than that it had the support of some of the local superintendents.

All those points have accounted for golf's progress. And highly important in the advance has been the cooperation and support of GOLFDOM, which has been a grand contributing factor, in its ability to collect and distribute information, and its support, advice and encouragement to those far-seeing guys who have the good of golf in their hearts.

Short Course Value Is Up to You

By TAYLOR BOYD

The value of any short course or turf conference is entirely up to the individual attending. I have attended all turf meetings at Washington sponsored by the USGA Green section, all the short courses at Purdue, and have never failed to get a valuable idea.

As an example; when Dr. Montieth and Dr. Grau were demonstrating sodium arsenite as a weed control in 1937, I saw their work, and while at the same meeting saw a fairway area that had been treated with Milorganite at rates of 1000, 2000 and 3000 pounds per acre.

What I saw there was outstanding and I took $\frac{1}{4}$ acre of number 13 fairway of the Kendale course at Kenwood CC on August 20, 1938 for a test area. Sodium arsenite was applied at the proper rate, the area reseeded to Seaside bent, and fertilized at the rate of 3000 lbs. per acre.

The results convinced not only Kenwood that the procedure had merit and value but affected the maintenance procedures on other Cincinnati courses. The area is still good turf.

John Anderson, a prime mover in the establishment of greenkeepers' and superintendents' organizations and a vigorous promoter of short courses, has been a strong influence in maintenance progress not only by his own work but in the work of able younger superintendents who are his proteges. — Editor