Fairway Soil Aerification — A Cultural Practice or Renovative Process?

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Aeration and aerification are the words used to describe turfgrass cultivation. In turf, unlike other crops, we must selectively till the soil in a manner that will not destroy the sod characteristics. The words aeration and aerification are perhaps misleading because often times the improved water movement is just as important as the improved aeration. In turfgrass culture aeration and aerification can further be broken down into turf aeration and soil aeration. Turf aeration is basically the slicing or grooving of the sod layer and will be covered in the verticutting presentation. This presentation will focus on soil aeration. The use of a machine with either tines or spoons that penetrate the sod and soil layers and brings a core containing a portion of the sod layer and soil to the surface. This is called coring. Other forms of soil aeration may be the new schafter core method, spiking or forking. In the past we have been led to believe that soil aeration should not be used as a routine cultural practice, but only as needed to correct problems associated with soil compaction. Today we are finding more and more golf course superintendents using soil aerfication as a cultural practice and it is proving to be a tremendous aid to them in maintaining quality turf.

Let's look at what actually happens in the coring process of soil aerification. First we have the cutting of a hole through the sod layer. This action also cuts the stolons or rhizomes of our desirable grasses and promotes new shoot and root growth. Also this opening into the sod layer provides an avenue for air, water, and nutrient movement into the rootzone. Next, we have the penetration into 3 to 4 inches of soil. This action breaks up any layering of soils that may exist and relieves partical compaction before it has caused a visual problem. Finally we have the removal of a core to the surface containing a portion of the sod layer and a few inches of soil. This hole increases infiltration of water and improves surface drainage. It gives an opening to incorporate an improved soil mix should we so desire, here one would remove the surface cores before adding a top dressing mix. The soil brought to the surface itself provides many benefits. It is an economic source of topdressing for large turfgrass areas, just think of how difficult it would be otherwise to topdress 30 acres of fairways. This topdressing effect aids in the decomposition of thatch. The loose soil when worked back into the aerifier holes provides an unrestricted area ideal for new root growth. This filled aerifier hold also provides an excellent home for a desirable grass seed, overseeding should be a part of our aerification program. The increased infiltration of air and water helps dry the surface and lessens the likelihood of disease development. The effects of soil aerification are positive and do tend to enhance turfgrass quality.

Today many golf course superintendents are looking at fairway soil aerification in terms of a preventative cultural practice rather than a curative renovation process in fairway maintenance. For years we have treated greens, tees and collars in this manner and it has proven beneficial. We have all removed plugs from greens in August and found our healthiest roots are in those spring aerification holes. Those who are aerifying fairways as a cultural practice are finding the same thing in their fairway turf.

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I doubt that there is one of us who has not had ill experiences with fairway soil aerification. If we look back our worst experiences can be associated with the approach we have taken with soil aerification. We have often used it as a last resort, a curative treatment, after we have had a compaction problem and our turf has developed a restricted root system. As a result we did receive excessive turf tearing, poor spoon or tine penetration, plugging of tines or spoons and of course, a period of prolonged recovery. This has provoked the wrath of the golfer because of the brutalness of the operation and the resulting unplayable conditions. We have had our reasons for waiting, many times heavy event scheduling in spring would not allow time for aerification and we were forced to omit it. In the spring when preventative aerification would be most beneficial our fairway turf is at its peak and many golfers feel, why disturb it. But today with increased play, fewer caddies, more golf cart traffic and a greater than ever demand for quality turf throughout the golfing season we should review our use of fairway aerification. One approach is more communication with our Grounds & Greens and Golf Committees and perhaps suggest setting aside a couple of weeks in late spring with fewer events so that we can use fairway aerification as a cultural practice.

Today we have over twenty companies manufacturing various types of machines for the purpose of soil aerification. In my short twenty years in this profession we have seen great advances in aerification equipment. I can remember when it was a struggle to aerify six greens in one day, today with the improved equipment many of us are aerifying twenty greens with ease. There is still much room for improvement. Many of us would like to see a machine designed for large area use, fairways, that punches as many holes as a machine designed for small areas or green use. We should look at all the machines, ask for demonstrations at our own golf courses and then make our judgements on what works best for us.

Today we have a growing number of golf course superintendents using aerifiers which were designed for greens or small area aerification on fairway turf. This is perhaps the ultimate in fairway aerification. It is a slow process, but it is providing results. Many are using two machines and tackle a fairway a day in spring and fall as weather and play permits. The basic aerification technique goes as follows: Start first off in morning with two or more machines, send in relief operators to keep machines going during coffee and lunch breaks. It takes a full working day for the average par 4. Next they may overseed with a desirable grass seed. Then in late afternoon when the aerifying is finished they will dragmat the cores in two or more directions and then mow to further break up the cores and work it into the turf. The final step is blowing the turf tuffs into the rough with a large tractor mounted blower. Some may prefer to wind row the debris into the center of the fairway and pickup. In this manner the finished job is more complete and one is not spreading bentgrass stolons into bluegrass rough. When finished the fairway appears as if nothing has happened. There golfers are accepting it, they merely push the cores aside, play their shot and continue on. They have been shown that the next day after cleanup that that fairway will be back to normal again. They feel that their golf course superintendent is performing a cultural practice that will help provide a quality turf throughout the golfing season.

Yes, we have all been burnt by aerification experiences, many things can go wrong. We should constantly monitor our aerification procedure and look for ways to improve the technique. Sometimes just a simple change can mean so much. This fall while aerifying fairways as a means of renovation, we were correcting a compaction problem and overseeding, we were getting a lot of turf tearing. The dragging operation was making it much worse. After aerifying, we broadcast seed, then were dragging in the same direction the aerifier had traveled. The dragmat was pulling many of the pieces of sod, up to one square foot, completely out. After a close observation of how the weak, shallow rooted **Poa annua** turf was being lifted by the aerifier, the problem with the dragmat operation was found. The aerifier was pulling the pieces forward and the dragging in the same direction would pull the pieces completely out. We started dragging in the opposite direction and found that 90 percent of the pieces would flop right back into place. This simple change in procedure saved many man hours of replacing the turf and made for more playable conditions the next day.

We have all had problems with plugged spoons or tines and poor penetration. We should experiment with different spoon or tine sizes, irrigate the night before or in some cases wait for a rain for better results. We have all had problems because of unforeseen changes in the weather. This past August 1, I had had some turf failure and decided to spot aerify and overseed a few fairway areas, the weather was in the 70's, partly cloudy and everything worked well. The membership was pleased to see us making an attempt to bring things back. Well, the next Monday we continued on, the forecast was for near 80, but a cool front moving in by noon and cooler, especially near the lake. By noon we had 1½ acres aerified and overseeded, but no cool front, the temperature reached 98, sunny and windy. The end result was a 60 percent loss of the turf we had left. I was forgiven because it was realized that we were attempting to make improvements, but such an experience tends to make one leery of summer aerification. With soil aerification we are working with three variables, the turf growth condition, soil moisture and weather. Ideally, we want the turf actively growing for rapid recovery. The soil should be moist for better tine or spoon penetration and less plugging. The weather is most ideal in the mid 60's or 70's, a light breeze and sunny skies are helpful especially when we want to work up the cores. We generally find these conditions in mid to late spring and late summer and early fall. Those are the times we should plan preventative fairway aerification, we have done this with our greens, tees, and collars for years.

Today, the demand for quality fairway turf throughout the golfing season is greater than ever before. We are seeing more and more changes in fairway maintenance practices to make this possible. Three years ago most of us felt that the few who were triplex mowing fairways and removing clippings were going a bit overboard. After 1983, many of us are proposing the use of lighter equipment and clippings removal because we are realizing its merit. Many of the same golf course superintendents who have gone to lighter equipment and clipping removal have also made preventative fairway aerification a part of their overall fairway management program. Preventative aerification has much merit, why wait and use aerification as a last resort, aren't we in effect closing the door after the horse has gone?