

RENOVATION OF FOOTBALL FIELDS

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When a football field is in poor condition one needs to determine the cause for the failure of the turf before deciding on a solution. The basic difficulties on football fields in Michigan are usually associated with either 1) improper soil selection and construction practices at the time of the original establishment, including selection of an inappropriate grass, 2) intensive and/or untimely use of the field, or 3) improper or limited maintenance practices (Beard, Harper).

A frequent difficulty is the selection of a poor soil and sloppy construction techniques. Once the turf is established it is very costly and often highly embarrassing to tear up the field and reestablish the turf. The old adage - DO IT RIGHT THE FIRST TIME - applies especially well to construction of athletic fields. Not only is cost a limiting factor but the field will be out of use for a period of time during reestablishment.

The desired topsoil for football fields is a sandy loam to a light loam with a reasonably dark color (indicating a fairly high organic matter content). Soils higher in silt and clay drain more slowly and are more subject to compaction. On the other end of the extreme, high sand soils may drain too readily providing a drouth problem unless sufficient irrigation can be provided. In most cases in Michigan the soil limitation is that of excessive clay content.

Another very common problem on athletic fields is inadequate drainage. Careful construction techniques, including the use of a level, are necessary to insure construction of the crown through the middle of the field and to prevent small depressional pockets where water could stand. The crown on a properly constructed football field should be 18 inches above the sidelines. For heavier soils with low internal drainage (such as clays) a 24-inch crown might be better. This surface drainage is of special significance during a rainy football season as was experienced during 1972. Drainage is particularly important between the hashmarks where the bulk of the game is played.

Football fields must be able to withstand heavy use. Football games are not cancelled because of wet grounds. Because the game must go on and because there are often liberal rainfalls and poor drying conditions during the fall season, many games are played on wet fields. Soil compaction is greatest when the soil is moist and high in clay.

Because of demands on space, a football field normally serves many purposes. It serves as an athletic field for one or more games per week as well as a practice field, an intramural field and a practice area for the marching band. Such persistent and concentrated traffic will cause compaction. On such sites where heavy traffic is anticipated, the example of golf courses can be followed where sandier soils are commonly used for greens where the traffic is heaviest. Because the soil is sandy, an intensive irrigation system is required.

Quite frequently the failure of turf on an athletic field is the result of poor maintenance practices. Inattention from mid-June (or perhaps even from November) to early August is common. Infrequent mowing, lack of weed control treatment, no attention given to injury suffered the fall or spring before, and lack of sufficient nitrogen and water are all contributing factors. Crabgrass and knotweed are common in heavily trafficked areas. They compete aggressively with the turf during the summer, but when killed by chemicals or frost they leave open areas and a poor playing surface.

Improving the turf depends on the cause of the problem. When surface drainage is very poor and soil texture is too high in clay flooding will be a problem until it is corrected by alternate drainage techniques, soil modification, or reshaping the field. The use of slit trenches described by Daniel (2) can help relieve some of the drainage problem.

If sufficient money is available, it may be wise to modify the soil and reshape the field. A uniform soil depth of 12 inches or more of the desired soil is preferred. Many budgets will not permit complete replacement of the soil, however. In such instances some soil modification may be practical. If the topsoil is too high in clay, 2 or 3 inches of medium to coarse sand should be mixed in to a depth of 6 inches or more. Sufficient sand should be used to increase the amount of non-capillary pores in the soil so drainage can take place. The amount of sand needed will vary with each soil type. Some soils high in clay may require as high as 50-60% sand by volume to change their properties. Sand which is very coarse or very fine should be avoided. Calcined clays may also be used but they are quite expensive for such extensive use.

If the topsoil is particularly low in organic matter, it would be advantageous if 1-2 inches of peat could also be mixed into the soil. Soil modification with sand cannot be expected to perform miracles, but it can improve marginal soils so they can be used with fewer problems and yet keep the cost of soil modification down somewhat.

In cases where the topsoil is too sandy, a 2-inch layer of a good clay loam topsoil can be mixed in to a depth of 6 or 8 inches. Careful mixing of soil materials is always required.

If the entire field cannot be modified because of expense or if only the area between the hash marks is causing the problem, one might consider modifying the soil between the hash marks only.

Soil modification means reestablishment of the turf so reshaping the field with an adequate crown is then possible as well. Be sure to pack the soil firmly so uneven settling does not result. The uneven settling of soil has likely caused many of the surface drainage problems existing on football fields today.

Tile drainage can also be used for water removal, but special care in placement and backfilling of the trenches is necessary to insure their effectiveness and a smooth playing surface.

When reestablishing a field, a soil test should be used to determine lime, phosphate, and potash needs. These materials should then be worked into the soil for best results.

Assuming the soil texture is acceptable, surface drainage is adequate, and that the use pattern on the field cannot be changed, the turf manager should examine his maintenance program for the field. Many football fields could be improved markedly with increased budgets and good maintenance practices. In these cases renovation of the field need not be considered.

If renovation is needed and weather permits after the last game a late fall renovation may be possible. Heavy coring (sometimes called aerification) followed by dethatching which reaches down into the soil will open up the soil so seed can germinate. If thatch is very deep several passes with these cultivation units may be needed. The thatch debris should be removed for best results. If thatch is extremely heavy sod removal may be the most practical approach to soil preparation.

After cultivation has exposed the soil an overseeding with a mixture of about 75% Kentucky bluegrass (2 or 3 cultivars) and 25% Creeping red fescue at the rate of 1 to 2 pounds per 1000 square feet should be made. A light raking or a drag mat will help the seed make contact with the soil. The seed may very well be on the surface until spring before germinating. Traffic should be withheld in the spring to give the grass a chance to get established.

There is equipment available on the market to accomplish both the dethatching and seeding operations at one time. Several passes may be needed for proper soil preparation with this equipment. If special equipment, such as coring units or seeders are needed, it may be possible to rent these units instead of purchasing them. Local rental companies or turf equipment dealers may be able to make rental units available.

One practice which has been used somewhat effectively is to overseed (with the mixture mentioned above) at the rate of 1 pound per 1000 square feet before the last game. The cleats work the seed down into contact with the soil in open turf areas so it can germinate when weather conditions permit.

Most athletic field renovations, however, are done in the spring. Usually this cannot be started before mid-April, but should be done as early as is practical to take advantage of the good establishment weather and to allow as much time as possible for development of an adequate turf for play the next fall.

Sodding with sod grown on soil with a texture similar to the soil on the field is a quick way to get the turf established. Sod should be laid as early as possible because of better rooting conditions in the spring. Spot sodding or seeding in small, localized problem areas may be sufficient.

In order to encourage development of the playing surface on renovated fields and to maintain the desired quality of turf, good cultural practices should be followed. This means regular mowing at the proper height and frequency for the grass, adequate fertilization, weed control and cultivation as needed, thatch control and irrigation. In some cases, insect or disease control may also be

needed during the summer. Regular maintenance practices should definitely be followed. The investment in the football field and the associated equipment are such that good management of the turf can surely be justified.

LITERATURE CITED

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