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### Research & Editorial

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## Football Fields: Major Repair—Minor Cost

by Jim Puhalla, president, Sportscape International, Inc.



If your football field looks like this one at Indian Creek High School, Wintersville Ohio, it's time for some major repair.



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More than any other sport, football causes a large area of compaction in a

concentrated space—the entire middle of the field. On compacted soil there's no pore space for the roots to grow and consequently the grass dyes. Players line up between the hash marks, along the line of scrimmage, where their cleats rip and tear at the grass as they struggle in competition. That portion of the turf can be reduced to bare dirt by end of the season unless the season begins with a full, thick, stand of grass.

Many cool season fields are seeded every spring in hopes they will be ready for competition in late August. Warm season fields are aerated and fertilized with the same hopes. But if the middle is bare at the end of the season, like the field in Figure 1, there is not enough time for the turf to mature before competition begins. If more than 35 annual events are to be played on the field, the center may show signs of thinning by mid-season.

## **The Solution**

Sod it and the season will begin with a full, thick, stand of grass. At first reaction, this may seem a little extreme and maybe even too costly. But if no other work needs to be done, like under drains, irrigation, or importing topsoil, the total cost should be under \$50,000. What's more, the project can be broken into two separate contracts: one for grading and one for sodding, with both contracts being under \$25,000. The purpose of this article is to provide step-by-step instructions to get the best job at the lowest price.

### **Step 1. Survey and Grade Plan**

To make sure you're not wasting your money, a little planning is necessary. The first step is to perform a topographic survey. In surveying a football field, shoot elevations every 10 yards down the center of the field and 40-foot increments toward the sidelines. Include at least 20 feet outside the field to make sure the grade will carry water off the playing area. In my experience, a crowned field needs the addition of 4 inches of soil (approximately 200 tons) from the center of the field to the hash marks to reestablish the crown.

Many people assume football fields are crowned down the center when in fact many fields are built with a side-to-side slope. This design works well as long as someone doesn't try to recrown the field. Adding soil along the center line of a side-to-side sloped field will cause the upper half of the field to become muddy in rainy conditions because the additional soil leaves the upper half of the field level or with very little slope.

### **Step 2. Grass Removal**

After the design is finished, it's time to start reconstruction. The biggest challenge is to remove the grass so the field can be regraded. This process can be very costly especially if the existing grass is removed and hauled off-site.

The most economical, efficient and beneficial way of getting rid of the existing grass is to plow it under as showed in Figure 2. Plowing the soil under allows for better soil on top for turfgrass roots to establish. This is an old method of farming using an old tractor and plow, but it still works. Usually the top inch or two of soil is so compacted that it has lost its structure. For best results, turn the soil (and the grass) over: The soil that is 4 to 5 inches below the surface is not as compacted as the top couple inches and has better soil structure.



**Plowing the soil under allows for better soil on top for turfgrass roots to establish. This is an old method of farming using an old tractor and plow, but it still works.**

### **Step 3. Scarify**

Scarify the soil to break up the large clumps left behind by the plow to prepare the field for grading. Use a disc (like the one in Figure 3), a rototiller, or a pulverizer to accomplish this step. An old-fashion farmer's disk can be used to break the large clumps of soil that the plow left behind in preparation of grading.

If the sod comes back to the surface, it may take three to four weeks for the sod to decay. During this time, continue to scarify at least once a week to break up the clumps. Eventually there will be very little grass and mostly soil to begin the grading process. If you're using a rototiller, avoid excessive tilling that breaks down the soil

into fine particles and destroys soil structure.



**An old fashion farmer's disk is used to break the large clumps of soil that the plow left behind in preparation of grading.**

#### **Step 4. Grading**

Grade the field by cutting high spots and filling low spots as per your grading plan. Additional soil can be brought in if there's not enough cuts to fill in the low spots. This would be an added expense but could be a separate contract.

For this process, it's best to use equipment that causes the least amount of compaction like the one shown in Figure 4 in which the tracks distribute the weight evenly and cause less compaction than wheeled vehicles.



**It's best to use equipment that causes the least amount of compaction like this CAT whose tracks distribute the weight evenly and cause less compaction than wheeled vehicles.**

### **Step 5. Sodding**

In the warm season zone, bermudagrass is the turf of choice for football fields; in the cool season zone, it's Kentucky bluegrass. The thatch layer of bermudagrass and Kentucky bluegrass provides protection for both the field and the players. For the field, thatch prevents excessive tearing of the root system. For the players, thatch cushions falls. In rainy weather thatch keeps players out of the mud by not allowing their cleats to contact the soil.

Kentucky bluegrass seed takes more than a year to develop a thatch layer and bermudagrass takes several months. For this reason, seeding is not recommended for football fields. However, bermudagrass sprigging is an option as long as you have 10 to 12 weeks before using the field for competition. Allow 6-8 weeks before using a sodded field.

With a newly sodded field, you'll be starting the season with a full, thick, and mature stand of grass that will withstand the pressures of competition.

### **About the author:**

Jim Puhalla is the president of Sportscape International, Inc. of Boardman, Ohio and co-author (with professors Jeff Krans and Mike Goatley) of two books: Sports Fields—a Manual for Design, Construction and Maintenance, and Baseball and Softball Fields – Design, Construction, Renovation, and Maintenance.

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