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Baseball Field Renovation

Limited resources, enrollment force schools to renovate fields rather than build new ones.

By Professor H.L. Portz

Baseball fields located in the transition zone have many problems including severe compaction of unmodified soils and wear and loss of unadapted turfgrass species and cultivars. These problems and others are aggravated by poor usage practices and maintenance. In addition, limited resources and lower enrollments indicate most high schools, universities and recreation facilities will have to renovate rather than undertake new construction.

This article, therefore, is oriented to the renovation and management of current baseball fields in this unhospitable climatic zone across the middle belt of the United States. It also deals primarily with facilities at educational institutions and recreational areas.

Renovation

Upgrading of several sites near and at Southern Illinois University-Carbondale (SIUC) included major drainage correction and leveling and establishing more-adapted turfgrass species.

Recognizing that many older baseball fields were established for student accessibility rather than a desirable baseball site, first consideration should be given to the soil and drainage and their effect on compaction. Whether native clay soil or disturbed soil and rubble, a baseball field needs good drainage, especially since most school usage is in the spring when

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rainfall is greatest in the Midwest and East. The area around home plate, the bases and base paths and the infield present major problems because of the heavy traffic. If no tile was laid at construction time, one can dig and lay a periphery tile on the outside of the skinned area or one must depend primarily on surface drainage. A combination of both is desirable. For tiling to be effective, one must make sure that water reaches the tile by percolation through the compacted soil or by other means. Harper (2) comments that compaction seals the surface and prevents normal movement of air and water into and through the soil. He indicates that tiling of the entire playing area may be of little value because of surface compaction which impedes water movement into the tile lines.

Turf Shaper *was one of three implements tested for overseeding with tall fescue at 7 lbs./1000 sq. ft.*

Using SIUC's Abe Martin Field as a case study, we found that tile had been laid on a 30 ft. grid. About a foot of gravel had been used to cover the tile, silty clay topsoil and subsoil was used to fill the remaining 1½ to 2 feet. In addition, in ten years, a two-inch compacted layer of silt and clay had developed about one-inch below the surface, preventing percolation of water downward and to the tile. The field was unplayable for one to three days after even moderate spring rains.

Also, a ridge had developed in the outfield grass at the edge of the skinned area which prevented water from escaping into the outfield and player positions were easily identifiable by puddles of water. Old, leaky canvases did not help much and could not be left on continuously because of heat, sun exclusion and lack of labor, especially over weekends, holidays and when the team (the canvas crew) was out of town.

After surveying and closely checking the field, several solutions were considered including the following: completely removing infield sod, working in calcined clay to a four inch depth and replacing with new sod and completely reworking the skinned area and incorporating calcined clay; uncovering the tile lines, adding calcined clay or gravel/sand to near surface and resodding and releveling skinned area plus more careful surface raking of skinned area in the future.

Steps finally recommended for use in fall 1975 were:

1. Remove three sod strips (three feet) along inner edge of outfield.
2. Remove additional soil and deposited infield material with sod cutter to a depth of two to four inches.
3. Trench the whole circle from right to left baselines crossing existing tile. Connect short slit trenches and low area behind 1st base to drain tile along east and west edges.
4. Fill the trench to within three to four inches of the top with creek-run gravel, tamp and top with four inches of a sand/soil mixture (approximates a French drain).
5. Grade skinned area to slope toward the trench and fill the low areas.
6. Resod over the trenches being careful to center a strip of sod over the trench and alternate sod ends.
7. Remove two sod strips from along outsides of 1st and 3rd base paths, remove two to three inches of soil and replace with new sod.
8. Work calcined clay (Turface) into the base paths and skinned area to a depth of two to three inches and relevel with a slope from the infield grass to the outer edges of the base paths and to French drain and outfield grass.

The results were good. Rain and irrigation water surface-drained from grass infield to French drain and then to underground tile. In general, as long as it wasn't raining on the day of a game, they were able to play ball. By 1978, there again was a buildup on the outer edge of infield grass and edge of outfield grass due to soil/calcined clay migration, and fielding positions were obvious in the skinned area. Stripping, lowering of stripped area, releveling of infield and resodding were repeated. This process will be repeated in 1983 or 1984 and whenever needed.

Heavy wear and compacted areas around the pitcher's mound and home plate are routinely resodded, usually every other year in the fall.

Renovation of the SIUC woman's softball field was accomplished in 1980. This field was almost devoid of perennial turfgrasses but had numerous grassy and broadleaf weeds. The renovation steps were:

1. Elimination of weedy species with 2,4-D/dicamba on areas with some desirable perennial grasses and glyphosate (Roundup) on the remaining area including the infield.
2. Use of several implements for research purposes including a roto-tiller/seeder combination (Turf Shaper), a flex-harrow

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(Fuerst) and a large verticutter (modified Grounds Groomer). For both latter implements seed was broadcast before flex-harrowing or verticutting. 'Ky 31' tall fescue was used at a 7 lbs/1000 sq. ft. rate.

3. The entire area (except infield and base paths) was then seeded with a ½ lb/1000 sq. ft. blend of Kentucky bluegrass ('Baron' and 'Parade') and rolled with a Brillion seeder/roller.

Results were excellent with two passes of the Grounds Groomer giving the best results.

A third baseball field at an outlying city park and recreation area was renovated in 1976. The major problems were a very uneven outfield and almost no grass except a few spots of common bermudagrass. A large roadgrader with front spikes was used to work and level the field, plus additional soil was added to a low corner. The field was limed and fertilized according to soil tests. 'Ky 31' tall fescue at 7 lbs/1000 sq. ft. was cyclone seeded and raked in. One-third lb/1000 sq. ft. of Kentucky bluegrass was Brillion-seeded. Results were most acceptable except that the areas of bermudagrass have increased. However, since play on this field is primarily in the summer, the bermudagrass is green and very wear-tolerant so it is not objectionable. Since the infield is not sodded in either the woman's softball or the park's field, good surface drainage is sufficient.

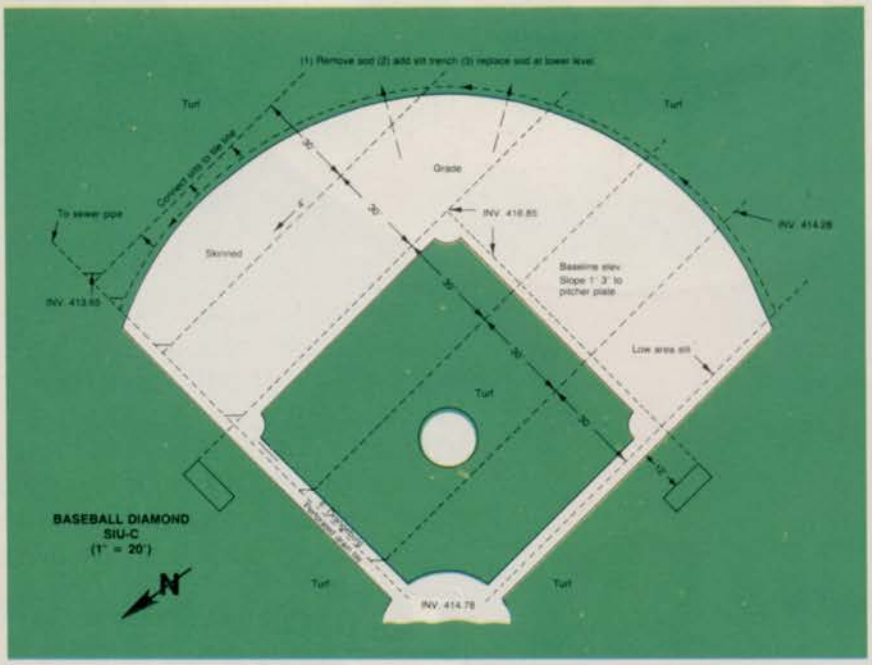
Reseeding or resodding of worn areas is an almost continual renovation practice. If species or cultivar changes are wanted, one can completely kill with glyphosate, aerify, seed, and verticut or just seed and verticut several times. This same procedure, but without killing existing turfgrass, and generally using the same species or cultivar is best for small worn areas. Or, as noted earlier, resodding is often practiced with quicker establishment and almost immediate play.

Only soil surface modification will be discussed here since full soil modification entails complete reestablishment rather than just renovation. The use of calcined clay has already been noted for the skinned areas. Other commercial products are also available for water absorption and conditioning of skinned areas. Pulverized brick is another good surfacing material. Sand is not as desirable because if it is fairly fine, it tends to blow when dry and if coarser-textured it is often too sharp or loose for players and the ball. Sand also has no water-absorbing capacity.

One increasing practice is the installation of an irrigation system. Most often it only occupies the infield and perhaps one line of sprinkler heads is located around the short outfield, although some total irrigation systems are used. This provides better quality turfgrass, especially in the summer but is a fairly costly renovation and does increase the maintenance. Two precautions with an irrigation system: 1) there should be adequate surface drainage and tiling and, 2) one or two lines of heads should be installed to syringe only the skinned area. This area needs much less water than the grassed infield or outfield. Alternatively, variable-speed heads can be used with setting of fast for skinned area and slow for infield/outfield.

Maintenance

Maintenance of baseball fields usually includes fertilization, mowing, cultivation, pest control, almost daily leveling of skinned areas, dust control, and traffic/usage control. Maintenance practices may vary considerably according to turfgrass species and season of peak use. For example, the most usage for educational institutions is spring and sometimes fall, whereas recreational usage is greatest in the summer. The problem is to be able to "get in" the cultivation, reseeding, or other maintenance or renovation operation while practice and games are "in season." Also, species selection in the transition zone varies depending on the heavy use period; universities and high schools with early to late spring play should use cool season grasses such as tall fescue (outfield) Kentucky bluegrass (infield) and occasionally perennial ryegrass as a temporary filler in the Midwest and sometimes as a major component in the mixture in the East. For recreational ball fields, Bermudagrass or zoysiagrass will stand the summer use best. I will briefly refer to recommendations for the transition zone



Slit trenches *spaced 30 ft. apart move water to the perforated drain tile along the third base line.*

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for cool season turfgrasses.

1. Fertilization

In late summer (August, September) apply a complete fertilizer such as 6-24-24 or 12-12-12 (around 2 lbs/1000 sq. ft. of P_2O_5 and K_2)); in late fall (Nov.-after last mowing), apply nitrogen such as NH_4NO_3 at a rate of 1½ lbs N/1000 sq. ft; in spring apply a slow release nitrogen such as IBDU at a rate of 1½ to 2 lbs of N/1000 sq. ft. in early May; smaller amounts of nitrogen and iron to keep color and growth in summer, especially if heavily used and irrigated. Lime is applied according to the soil test, however, if thatch is a problem, 20 - 30 lbs. of lime/1000 sq. ft. should be used annually.

2. Mowing

In spring, mowing should be at least two times a week (remove only ⅓ to ¼ of leaf area) at about one and one-half inches for Kentucky bluegrass and perennial ryegrass and two to two and one-half inches for tall fescue. During summer if not heavily used, mowing heights can be raised one-half inch and mowing can be less frequent.

3. Cultivation

This includes coring (aerifying) to relieve compaction and allow better water infiltration, verticutting, especially if reseeding or removing thatch, and todressing to smooth surface and help in thatch decomposition. Reseeding is a renovation and cultivation operation and coring prior to seeding followed by verticutting or just verticutting helps to move seed into the soil.

4. Pest Control

The major pests are probably weeds. Preemergence herbicides such as DCPA (Dacthal) or bensulide (Betasan) are used for crabgrass and goosegrass control and must be put down in March. A second application is recommended in about five to six weeks. Broadleaf weeds such as dandelion, plantain and even the narrow-leaved wild garlic can be controlled with 2,4-D/dicamba or Trimec in spring or fall. A considerable increase in yellow nutsedge will probably occur with frequent watering of the infield. Although MSMA or DSMA has been used in the past (also for postemergence crabgrass control), the herbicide bentazon (Basagran) is now recommended for nutsedge.

5. Infield Maintenance and Traffic Control.

Even if partial or totally automatic irrigation is not available, one must wet down the skinned area shortly before a game. This light watering to keep down dust does not suffice for maintaining a good infield grass. Either a hose-end sprinkler or crawler can be used for infield grass. After play, the skinned area should be dragged and leveled towards the infield to avoid buildup of material along the inner edge of the outfield which prevents water from running off the skinned area and also makes the ball take unexpected bounces.

Controlling traffic or using the field when too wet are difficult to prevent. A second practice field and batting cages are very helpful. Practicing in the outfield helps save the infield. Obviously agreement between coach and maintenance men is most helpful. The other problem is getting in the cultivation, reseeding or renovation when needed since play is from early March to November. Reseeding is best done in late August or September, but players are still practicing. Since sodding can be later in the fall or even in mid-summer, it often wins out over reseeding. Cultivation of cool season turfgrasses should be in April or May—one must get it in between home games, and even then, those players not on the traveling squad stay home and practice. A calendar with home games coordinated with maintenance or renovation practices should be prepared.

This article is obviously written from the perspective of a turfgrass instructor and researcher, but its intention is to provide the players and coaches with the best playing conditions possible. Please check on the many university and trade journal publications available for more information, especially as it relates to your particular climate and playing needs. **WTT**