



Erosion Control for Athletic Fields

By Steve and Suz Trusty

Erosion is seldom an athletic field problem, but it's frequently a problem for the sports turf-manager. Although the prime consideration is the playing field, the area surrounding the field and facility usually are under his or her care. At many universities, city school systems and parks and recreation departments, the athletic fields may be a small portion of the "area" of responsibility.

Analysis is the first step in erosion control. Identify the potential for an erosion problem, decide whether this is a short-term or long-term situation, determine the probable extent of damage from uncontrolled erosion, and weigh the advantages and disadvantages of possible solutions.

Evaluating Site Solutions

That bare strip edging a parking lot may be the planned site of ornamental shrubs once construction is completed. If facility use will be minimal during construction, the exposed area is relatively flat, and anticipated weather conditions are moderate, little or no corrective measures may be necessary. If facility use is at normal or high levels, the bare section is sloped, or seasonal wind or rainfall pose risks, a temporary solution, such as covering with a landscape fabric, will be required.

Such long-term problems as that steep slope behind the stadium call for long-term solutions. Is the degree of

slope too severe to allow mowing? Is there a possibility future construction would eliminate the slope or alter its severity? Would a series of terraces convert the slope to usable space, or make it mowable? Is wind or precipitation erosion the biggest factor? Does irrigation runoff impact parking areas, walkways or other highly used sections of the facility? What is the actual, and the perceived, environmental impact of the erosion?

Well-established turf is the most effective method of erosion control, as well as one of the most aesthetically-pleasing choices. Extensive studies document the effectiveness of turf in filtering water, eliminating runoff, and controlling sediment loss.

However, the safety of the mower operator must be the prime concern. Turf should not be used on a slope so steep it poses a risk to operator safety. Generally, with ride-on equipment, if operators feel a need to shift their weight on the mower seat to compensate for the mower's angle on a slope, or if they feel uncomfortable or apprehensive about mowing a slope, it's too steep for turf.

Consider alternative plantings for such sites. For the stadium hillside, ornamental trees and decorative boulders, interspersed among ground-hugging evergreen shrubs, could be a solution. A combination of native grasses and wildflowers might provide adequate erosion

control along with a seasonal-changing splash of color.

What are the real and perceived consequences of uncontrolled erosion? Is this an actual problem for the integrity of the site or for the surrounding environment? Does a temporary erosion problem create blowing dust and debris that adversely affects facility users or those at neighboring facilities? Does precipitation runoff create wet or muddy conditions that hamper facility use, irritate people, or raise environmental concerns? Do erosion situations create a perception of a lack of environmental concern on the part of the facility? The greater the real or perceived consequences of erosion, the greater the need for immediate and highly effective action.

Explore the possibilities. Consider the immediate and long-term effectiveness of each usable erosion control method. Assess the practical and aesthetic impact of each option. Compare the immediate and long-term costs, including those of follow-up care and extended maintenance.

A Quick and Effective Solution

Sodding is the quickest and most effective method of erosion control. The results of a 1991 study conducted at the University of Maryland and presented by Dr. Mark J. Carroll of the University's Department of Agronomy at the 1992 Midwinter Conference of the American Sod Producers Association



Hydro-applications are a practical solution for large areas of bare ground and for remote or limited access sites.

Photo courtesy: Reinco, Inc.

(now Turfgrass Producers International) offered supporting data for this statement.

Controlled studies of sediment losses from the disturbed soil of an eight to ten percent hillside slope compared four different man-made materials with sodded, straw covered and bare soil areas during natural and simulated rainfall conditions. With a simulated 3.8 inch per hour rainstorm, for a period necessary to cause runoff plus an additional 35 minutes, sediment loss from sodded areas was from eight to 15 times less than that for the man-made materials and ten times less than that of the straw-covered areas. Additionally, the amount of time needed for observable runoff was 28 to 46 times longer for the sodded area than for any of the other erosion control sites.

Obviously, in practical applications, there will be variations in sod erosion control effectiveness based on the pre-installation preparation of the site, the type of turf and the soil profile in which it is grown, the form of the sod (thin cut, thick cut, processed or washed, slabs, standard rolls or big rolls), the method of installation, degree of follow-up care, and the amount of knitting that has occurred.

Initial costs of sod can be high in comparison to the initial costs of other alternatives. Proper site preparation is necessary. Manual installation is labor-intensive. Machine installation of big roll sod is faster and requires less labor, but costs more. Irrigation must be monitored closely until the sod is firmly established. However, except under extreme circumstances, erosion control begins as soon as the sod is in place.

Hydroseeding and Hydromulching

Hydroseeding and hydromulching both refer to a method of planting which uses a "wet slurry" of material, generally issued from a tank with internal agitation through a hose and nozzle or a "spray canon" to the planting site. In hydroseeding, the seed and nutrients and/or other appropriate materials are applied. In hydromulching, a suitable mulching material is included in the "slurry" mixture to provide protective coverage for the seed.

Because of the added element of protection, hydromulching is preferred for slopes and areas subject to runoff

from precipitation or irrigation, as well as spots where post-planting maintenance may be less than desired. Hydroseeding or hydromulching also may be chosen for level areas with irregular, rocky or wet soils that make drill seeding impractical.

The seed used may be turfgrasses, groundcover materials such as crown vetch, a combination of native grasses and wildflowers, or any other plants that can be successfully started by seed with minimal follow-up care.

Ideally, the deterioration of the selected mulching material will coincide properly with the seed's germination and establishment. Hydroseeding may be followed by an application of straw mulch, perhaps enhanced with a tackifier.

Hydro-applications are a practical solution for large areas of bare ground and for remote or limited-access sites. Because the seed is placed on top of, rather than into, the soil, follow-up irrigation is required, especially during the most critical stages of germination and seedling development. Timing hydro-applications to coincide with traditional spring or fall rainfall and moderate temperatures may reduce post-application irrigation needs.

Because hydro-applications frequently are used on highly exposed sites with great erosion potential, such weather extremes as high winds or heavy rains can remove the seed or reduce the percentage of coverage, forcing additional applications. Some degree of erosion control is achieved by the mulch-covered seed. As in all seeding situations, best control is achieved only after the plants become well established and surface coverage is complete.

Plugging Away

Another acceptable form of cover establishment is plugging. Because there is minimal root loss within the plugs, they take hold quickly. Any type turf and many forms of groundcover can be established from plugs. Zoysiagrass and bermudagrass are two turf varieties frequently started as plugs.

Obviously, the closer together the plugs are placed, the faster the establishment of cover capable of erosion control. The speed of coverage also depends on the rooting and spreading characteristics of the plants chosen and the compatibility of the plants with the site and weather conditions.

For faster control, the plugs may be planted through holes cut in a degradable mulching fabric or some form of mulching material may be spread around the plugs once they are in place.

Because plugging is labor-intensive, this method is generally used for small areas where quick results are desired, but sodding costs are deemed prohibitive. Post-planting irrigation is required, at least until the plugs are established. Costs will vary with the plant materials chosen, site preparation requirements, mulching materials used and degree of follow-up care required.

Landscaping Alternatives

Long-term erosion control can be achieved with a combination of woody, long-lived plants, including evergreen and deciduous trees and shrubs. These plants can provide deep, extensive root systems for years of soil-holding power. Plant types and varieties can be selected for year-round uniformity or for seasonally-changing color and appearance. Spreading, needled evergreens can be mixed with small, upright, deciduous trees and shrubs, or with 'pockets' of colorful herbaceous perennials, wildflowers or ornamental grasses.

Plants should be chosen for their growth characteristics, hardiness, minimal maintenance requirements, and site compatibility, as well as aesthetic appeal. For faster, more complete, erosion control, these plantings can be surrounded by mulch or inserted through slits in an overall covering of landscape fabric that has been anchored with spikes or held in place by boulders.

Initial costs will be high and will vary depending on the types and sizes of the plant materials chosen, the support materials used and the degree of difficulty involved in installation. Irrigation will be required until the plants are well established. Long-term results should be factored in when considering this alternative. If these plantings are well-planned and planted properly, they can provide effective erosion control for decades. The best erosion control methods match site needs, provide the desired aesthetic appeal, fall within budgeting parameters, and have minimal and easily managed maintenance requirements. □