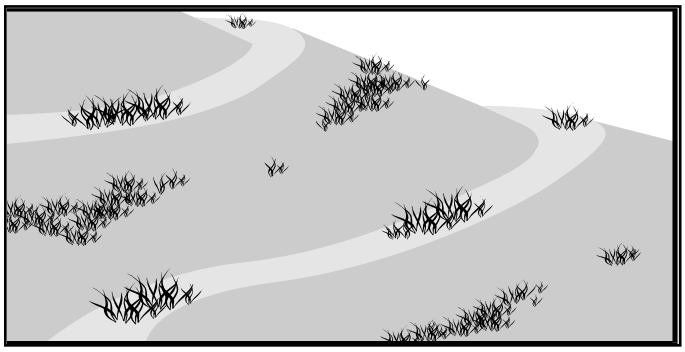
ACTIVITY: Seeding

ES – 08



CITY OF KNOXVILLE

Targeted Constituents				
● Significant Benefit	◗ Partial Benefit	○ Low or Unknown Benefit		
● Sediment	○ Heavy Metals	○ Floatable Materials	○ Oxygen Demanding Substances	
◗ Nutrients	◗ Toxic Materials	○ Oil & Grease	○ Bacteria & Viruses	○ Construction Wastes

Description

Temporary or permanent stabilization of soil, with rapidly growing annual or perennial grasses, is used to prevent erosion on disturbed areas. Temporary seeding is performed for graded areas that are not ready to receive permanent vegetation. Permanent seeding is performed for finished construction areas and for eroded areas that need a permanent vegetation cover.

Suitable Applications

- Apply temporary seeding whenever grading operations are temporarily halted for over 14 days and final grading of exposed surfaces is to be completed within one year. Apply temporary seeding to soil stockpiles.
- Apply permanent seeding whenever grading operations are completed and all construction operations will not impact the disturbed area. Apply permanent seeding to all non-construction areas which show signs of excessive erosion.

Approach

Sheet erosion, caused by the impact of rain on bare soil, is the source of most fine particles in sediment. To reduce this sediment load in runoff, the soil surface itself should be protected. The most efficient and economical means of controlling sheet and rill erosion is to establish vegetative cover.

Proper seedbed preparation and the use of quality seed are important in this practice. Failure to carefully follow sound agronomic recommendations will often result in an inadequate stand of vegetation that provides little or no erosion control.

Temporary seeding is essential to preserve the integrity of earthen structures used to control sediment, such as dikes, diversions, and the banks and dams of sediment basins. Temporary seeding may prevent costly maintenance operations on other erosion control systems. Annual plants which sprout rapidly and survive for only one growing season are suitable for establishing temporary vegetative cover.

Permanent seeding is necessary to prevent long-term erosion of topsoil from the land surface. If performed correctly, permanent seeding will provide many benefits such as increased land value, aesthetics and animal habitats, in addition to reduced erosion and sedimentation.

General Seeding Guidelines

- Verify that erosion control devices are functioning. Prepare ground surface using methods in ES-05, Gradient Terraces, and ES-06, Surface Roughening.
- Select desired type of grasses. Consult a horticulturist or the UT Agricultural Extension Office, located on the 5th floor of the City County Building, or the website (http:www.utextension.utk.edu/knox/). This office has a wide variety of brochures and pamphlets for selecting all types of vegetation such as lawns, parks, or field crops.
- Analyze topsoil for fertilizer and lime requirements. Fertilizer and lime shall be uniformly incorporated into soil at a minimum depth of 1 inch, typically by rakes.
- A typical fertilizer application rate is anywhere from 5 to 20 pounds per 1000 square feet with commercial grades 6-12-12 and 10-10-10 being commonly used. Fertilizer should be free-flowing and uniform in composition. Fertilizer packaging should indicate weight, chemical analysis and date of production.
- Lime requirements are listed in Table ES-06-1 for soils with a pH less than 5.5. Requirements for crushed agricultural limestone are generally a minimum of 85% by weight calcium carbonate and magnesium carbonate.
- Purchase seed from a reputable dealer in original packaging that indicates percentage of seed mix, date of production, net weight, seed purity and germination rates.
- Apply selected seed at rate recommended for temporary or permanent seeding, using seeding package instructions or as directed by local experts (such as a horticulturist or agricultural extension agent). Seed should be sown uniformly by means of a rotary seed spreader, hydraulic equipment, or hand broadcasting.
- Apply straw mulch with tackifier, especially to seedlings in the fall for winter cover or on slopes that exceed 3:1 (H:V). See ES-07, Mulch, for additional description and methods.
- A tackifier should generally be used in conjunction with mulch for steep slopes. A tackifier is an inflammable, non-toxic, non-asphaltic, organically-formulated product which is capable of holding mulch and soil in place. Tackifier compound may contain a color additive to assist in the uniform application of product after mixing with water.
- Tackifier and water shall be blended and applied at a rate that is in accordance with the manufacturer's written instructions. Written instructions may give different application rates for revegetation (mulch tackifying) and for erosion control (soil stabilization). Application shall be performed with a fine spray immediately after each area is mulched.
- Do not seed during rainfall events or when heavy rain is predicted. No seeding shall be done during windy weather or when the ground surface is frozen, wet or otherwise unsuitable. Permanent seeding shall not be performed during December and January. Temporary seeding may be performed during the winter months with expectations that additional seeding is required in the spring.
- For slopes steeper than 3:1 or where surface water cannot be diverted from flowing over the face of slopes, install erosion control matting such as jute nets or excelsior mats (see ES-11, Erosion Control Matting). Mulch and tackifier are not required for areas that receive erosion control matting.
- Do not allow any equipment or material placed on any seeded areas. Erect suitable barricades and guards to prevent equipment, vehicles or labor from traveling onto or

over any seeded areas.

- Maintain newly seeded areas until final acceptance of the construction project or until erosion problems have stopped. Restore areas which are washed out or which have settled. Reseed as necessary until an acceptable grass stand has been achieved.

Temporary Seeding

- All areas receiving temporary grass mixture shall receive an application of fertilizer and be protected with mulch or erosion control matting. Apply fertilizer at a minimum rate of 5 pounds per 1000 square feet. Uniformly incorporate into soil for a depth of 1 inch. Lightly water to aid dissipation of fertilizer.
- Apply seed mixture at recommended application rate evenly in two intersecting directions by the use of a mechanical spreader. Do not seed an area in excess of that which can be mulched on the same day. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- Straw mulch shall be applied at a minimum rate of 100 pounds per 1000 ft^2 and traversed with mechanical roller or other device specially manufactured for crimping. Mulch shall be applied immediately after seeding. All mulched areas shall receive an application of tackifier.
- Roadside: Temporary mixtures for TDOT projects are listed in Table ES-08-1; these seed mixtures grow rapidly and are low-maintenance. Seeding rate is typically 1 pound per 1000 square feet.
- Lawns and parks: Apply the desired permanent grass mixture at reduced rates. Use straw mulch liberally, and use additional slope stabilization methods for steep grades. Typical seeding rate is 2 to 3 pounds per 1000 square feet.
- Fields and open spaces: Consult local agricultural extension office for recommended types of crops or grasses, and follow suggested seeding dates.

Permanent Seeding

- All areas receiving permanent grass mixture shall receive an application of fertilize and be protected with mulch or erosion control matting. Apply fertilizer at a rate of not less than 10 pounds per 1000 square feet. Apply lime at rate based on pH of soil. For dry seeding, uniformly incorporate into soil for a depth of 1 inch and lightly water to aid the dissipation of fertilizer.
- Apply seed mixture at recommended rates evenly in two intersecting directions by the use of a mechanical spreader or hydroseeder. Do not seed area in excess of that which can be mulched on same day. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- Combined hydraulic application of seed, fertilizer, and mulch may be performed. Tackifier application may be within the combined mixture if allowed by manufacturer's recommendations. Hydraulic spraying equipment and mixture shall be designed so that when the grass mixture is sprayed over the area, the mixture components shall be equal in quantity to the specified rates.
- Wood fiber mulch shall be applied at a minimum rate of 35 pounds per 1000 square feet. As an option, straw mulch can be utilized at a rate of 100 pounds per 1000 square feet. Mulch shall be applied immediately after seeding or during seeding. All mulched areas shall receive an application of tackifier.
- Roadside: Permanent mixtures for TDOT projects are listed in Table ES-08-2; these

seed mixtures (primarily fescue) grow rapidly and are low-maintenance. Seeding rate is typically 2 pounds per 1000 square feet.

- Lawns and parks: Tall fescue grasses (such as Kentucky 31) have good resistance to high temperatures, drought, and soil acidity. Bermudagrass is commonly used for lawns and for athletic fields; it does not fare well in shady areas. Shady lawns and parks may require a more specialized seed mixture. Plant in the late summer or early spring to take advantage of mild climate conditions in spring and autumn. Typical seeding rate is 5 to 8 pounds per 1000 square feet.
- Fields and open spaces: Consult the local UT Agricultural Extension Office, located on the 5th floor of the City County Building. This office has a wide variety of brochures and pamphlets for selecting field crops and planting dates.

Hydroseeding

Hydroseeding is the wet hydraulic spraying of seed, fertilizer, tackifier and usually mulch in a one-step process. Materials are mixed with water in a slurry tank to form a homogeneous slurry, which is then sprayed on the soil surface at a uniform rate in two intersecting directions by a hydraulic seeder.

Ordinary mulch is not suitable for hydroseeding. Mulch for hydroseeding is generally virgin wood fiber mulch at a rate of 35 pounds per 1000 square feet, manufactured to be uniformly suspended as a slurry. Alternatively, straw mulch can be applied after hydroseeding at a rate of 100 pounds per 1000 square feet.

Maintenance

- Inspect frequently within the first six weeks of planting to see if grass stands are uniform and dense and to assure that appropriate moisture levels are maintained. Make provisions to water as needed to penetrate to a depth of 6 inches.
- Check for damage caused by equipment or heavy rains. Damaged areas should be repaired, fertilized, seeded, and mulched. Tack or tie down mulch as necessary.

Limitations

- Annual rye grass and a few other types of annual grass may reseed the following year without assistance. This may make it difficult to establish a different type of grass as permanent vegetation.
- Uneven application of fertilizer, lime, seed or other materials may cause patchy growth and erosion. Overapplication of fertilizer or lime causes stormwater runoff pollution.

References **33, 34, 35, 115, 139, 172, 179** (see BMP Manual Chapter 10 for list)

Table ES-08-1
Temporary Seed Mixtures (TDOT)

Groups	Seeding Dates	Grass Seeds	Percentages
D	January 1 to May 1	Italian Rye	33 %
		Korean Lespedeza	33 %
		Summer Oats	34 %
E	May 1 to July 15	Sudan-Sorghum	100 %
E	May 1 to July 15	Starr Millet	100 %
F	July 15 to January 1	Balboa Rye	67 %
		Italian Rye	33 %

Table ES-08-2
Permanent Seed Mixtures (TDOT)

Groups	Seeding Dates	Grass Seeds	Percentages
A	February 1 to July 1	Kentucky 31 Fescue	80 %
		Korean Lespedeza	15 %
		English Rye	5 %
B	June 1 to August 15	Kentucky 31 Fescue	55 %
		English Rye	20 %
		Korean Lespedeza	15 %
		German Millet	10%
B1	April 15 to August 15	Bermudagrass (hulled)	70%
		Annual Lespedeza	30%
C	August 1 to December 1	Kentucky 31 Fescue	70 %
		English Rye	20 %
		White Clover	10 %
C1	February 1 to December 1	Kentucky 31 Fescue	70 %
		Crown Vetch	25 %
		English Rye	5 %