



# Kansas LTAP Fact Sheet

## Seeding: An Effective Erosion Control Measure

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**T**his factsheet will present information on seeding, including types of seed, machinery used, common practices, and its maintenance practices that comply with Kansas state regulations.

### Seeding helps prevent erosion

Seeding is the process of planting seeds of annual grasses, legumes, or small grains to establish perennial vegetation cover on disturbed areas, helping to reduce erosion. It is one of the less costly and most effective erosion prevention practices. When done successfully, seeding counteracts the erosive influences of rain, snowmelt runoff, and wind on exposed soil. Planted vegetation holds soil particles in place and reduces sediment and runoff to downstream areas. It also filters sediments, helps the soil absorb water, and improves and enhances the aesthetics of the land area.

Seeding can be an easy and efficient erosion prevention practice on all local projects, from large construction projects to routine maintenance work. For many years, seeding practices were left up to the jurisdiction, and effectiveness varied from place to place. With more stringent rules regarding erosion control and water quality for construction and maintenance projects, it is more important than ever that local agencies proactively establish good ground cover for their local projects.

### Types of seeding - temporary and permanent

Temporary seeding is used when a disturbed area is inactive or will not be brought to the final grade for an extended period. This practice controls runoff and erosion until permanent vegetation or other erosion control measures can be established. It also reduces problems associated with mud and dust from exposed soil surfaces during construction. Permanent seeding is appropriate for large areas of exposed soil or for any final graded and exposed area of land that has not been otherwise stabilized. Different practices are recommended for temporary vs permanent seeding.

### Seeding in Kansas

In the state of Kansas, all temporary and permanent

seeding procedures must be carried out in accordance with the Kansas Department of Transportation's (KDOT) Temporary Erosion and Pollution Control Manual (Division 900) and Materials for Roadside Improvements Manual (Division 2100). According to KDOT's Division 900 manual, temporary seeding is to be used only if the project has less than 1 acre of erodible or exposed surface; otherwise, permanent seeding is preferred. Typically, local governments and agencies have seed mixes corresponding with the seasons in their respective jurisdictions. It is recommended to check with your local government requirements for seeding and other erosion control measures for any given project. This factsheet includes limited information on seed mix, soil preparation, and seeding and mulching recommendations by KDOT that comply with Kansas State regulations. The KDOT's Division 900 manual contains detailed seeding methods, construction, and preparation requirements, while the Division 2100 manual provides detailed material requirements for fertilizers, seeding, and mulching.

### Process of seeding

A well-established seeded area requires proper preparation and fertilization of the seedbed, appropriate selection of the seed mixture and seeding equipment, and protection with mulch. Unless shown otherwise in contract documents (the documents that confirm the agreement to a particular seeding process, materials, requirements and any extra specifications between the local agency and the seeding contractor), the following steps for seeding are carried out within the right-of-way and construction easements.

### Preparation of seedbed

Before seeding, the disturbed areas should be repaired by leveling the grade to the elevations of any abutting sidewalks and removing rocks and other debris. In developed urban and residential areas, the seedbed is commonly prepared by using rotary tillers or similar equipment; however, tractor-mounted equipment is permitted if the area is large enough to accommodate it. To prepare a firm, friable, and weed-free seedbed, tillage implements like disks and harrows

that drill 2 to 3 inches of the seedbed should be used. If impractical, then hand methods will suffice.

The following are a few things to remember when preparing the seedbed:

- No damage should be done to the trees and native grasses if planning to keep intact.
- If encountered, areas of annual grasses like cheat, crabgrass, or triple-awn should be eradicated by disking
- If existing or temporary grasses provide stability with no erosion, those areas do not need to be graded.

#### Application of Fertilizers

Fertilizers should be applied to the prepared seedbed by using a fertilizer attachment on the seed drill or a broadcast spreader. Hand methods can be used to spread fertilizer uniformly where it is impractical to use a seed drill. Fertilizers that can be used on KDOT and local projects must comply with the applicable sections of the 'Kansas Commercial Fertilizer Law' as administered by the Kansas State Board of Agriculture. The commercial fertilizers that are used on KDOT projects/ local projects have a varied composition of Nitrogen (N), Phosphoric acid (P2O5), and Soluble Potash (K2O), and are packaged individually, in bulk, or liquid form.

#### Materials Requirements for Seed Mix

The seeds used for seeding must comply with the seed and noxious weed laws of the State of Kansas and applicable Kansas Department of Agriculture Rules and Regulations, except when specifically mentioned. Sericea Lespedeza and Multiflora Rose should not be provided or mixed with any seed.

- Before seed drilling, seed analyses must be conducted by the rules and regulations prescribed by the Association of Official Seed Analysts (AOSA) and Kansas Seed Law. The Kansas Seed Law specifies the following: the type and amount of weed seed permitted; the requirement for a current analysis report; labeling of all seed to show its purity, germination, date of last germination test, and weed seed content (Division 2100, Section 2103.2). (Note: Local agencies purchase the seed mix which has been already analyzed and in some cases KDOT conducts test before its use on KDOT projects)
- The seed should be cleaned and conditioned, resulting in a product that meets or exceeds minimum standards, which can then be planted without further cleaning and processing.
- Minimum Pure Live Seed (PLS) requirements, as shown in the table 2103.1 and 2103.2 (found in Division 2100), should be met. Seed PLS (%) can be computed by using the following formula:

#### What is pure live seed?

The amount of living seed in the total quantity of seed when non-viable seed or non-seed material is excluded. (Division II, Section 2400 KC Metro Chapter of APWA)

$$\% \text{ PLS} = \frac{(\% \text{ Germ} + \% \text{ Firm or Hard Seed})}{\% \text{ Purity}} \times 100$$

- There are two types of seeds used: Grass seeds and wildflower seeds. Grass seeds are used most often as they cost less than wildflower seeds. Wildflower seeds are planted at designated locations for the beautification of the surrounding areas. All the grass and wildflower seeds that can be used in the State of Kansas are listed in Tables 2103-1 and 2103-2 of DIVISION 2100.
- If seeds fail to comply with PLS requirements, it is permitted to use them under the following conditions:
- The Contractor can provide suitable evidence to the Engineer that seeds that comply with Table 2103-1 and 2103-2 (Division 2100) are not readily available.
- The Contractor is willing to increase the number of seeds, at no additional cost to KDOT or the Local Public Authority (LPA), to provide the minimum quantity of PLS required.
- It is permissible to use seed from native stands if the seed is harvested within range of its planting location. This is not to exceed 300 miles south, 150 miles north or west, and 1500 feet in elevation. To certify location and elevation, native seed sources are identified by state and county where the seed was harvested. Local agencies are responsible for gathering the native seeds (or the contractor as agreed in the contract documents).

#### Seed Drilling Equipment

In rural areas, a seed drill is the most commonly used machinery for seeding. A broadcast seeder is used when it is impractical to operate a seed drill. On steep slopes or other areas inaccessible with a seed drill or broadcast seeder, a hydroseeder may be used. In developed urban areas, suitable equipment for the size of the lawn and small areas should be used. When appropriate, manually operated equipment like drop-seeders, cyclone spreaders, or other similar equipment can be used. The drill used for seeding can accommodate the seed sizes and weight of seed using as many compartments as required. Seeds of compatible size and weight may be mixed and placed in the same compartment.

#### Drilling Procedure

The maximum depth for drilling grass seeds and wildflower seeds is 1/2

inch and 1/8 inch, respectively. If both the seeds are used in the same area, grasses are drilled first. Once the disturbed area is fertilized and seeded, the soil should be firmed using a cultipacker or smooth roller. The seeds should be drilled at the rate and in the locations as mentioned in the project contract documents.

#### Seeding Seasons

It is important to seed the project during the proper seeding season to protect the finished grading. There are two types of seasons based on different grass and wildflower seeds – Cool-season (February 15 through April 20 and August 15 through September 15) and Warm-season (November 15 through June 1). When the seeding area is less than 1 acre, the seeding is done during the seeding seasons specified for either cool or warm-season grasses. Seeding mix is based on the season type, cool and warm seasons. If wrong seeds are planted in a wrong season, then the rate of germination decreases resulting in the lower chances of survival of the vegetation.

#### Mulch

To promote the effective establishment of vegetation, the seeded areas should be covered with mulch immediately after fertilizing and seeding operations. The mulch should be applied uniformly over the area at the rates mentioned in the contract documents. Mulch is punched into the ground by approximately 2 inches, using a mulch puncher. If needed, weights can be used on the mulch puncher to punch the mulching material into the soil. When the sloped area is too steep to use a mulch puncher, the mulch should be patted with the forks as it is placed on the slope. On the lawn and small areas in urban areas, mulch is applied using hand methods. It is recommended to hand spread a light application of soil or sand over the mulched area to reduce any wind loss. Other types of mulches like wood cellulose fiber and hydro-mulching are also preferred depending on the budget, size, and location of the seeded area. To ensure that no bare spots are left, mulch tacking slurry can be applied over the mulched area.

#### Maintenance Tips

The following are some of the recommended steps that are practiced for the maintenance of the seeded area:

- Seeded areas should be monitored and observed to identify poor growth or areas that fail to germinate. In those identified areas, reseeded and mulching should be done, as needed.
- Repairing eroded areas and irrigating seeded areas, particularly during extended dry periods, may also be necessary.
- Mowing is not required until 4 inches of growth occurs. It should not remove more than 1/3 of the grass height during the first 4 months.
- For a successful establishment of permanent seeding, the seeded areas should be repaired and

reseeded for the complete first year.

- Inspection should be done at regular intervals and within 48 hours after every rain event that causes stormwater runoff to occur on-site.
- Though mulching is expensive and optional, it is highly recommended for well-established vegetation.

#### Conclusion

Seeding is a cost-effective and immediate measure to prevent and reduce soil erosion caused by disturbed areas due to on-site construction activities. Seeding is the application of temporary or perennial vegetative cover on disturbed areas by planting seeds or plants with appropriate rapidly growing annual or perennial plant types. The type of seed mixtures used for seeding must comply with the rules and regulations of Kansas weed law and Kansas Department of Agriculture. A well-established seeded area requires proper preparation and fertilization of the seedbed, appropriate selection of the seed mixture and seeding equipment, and protection with mulch within the right-of-way and construction easements. Some of the best procedures for the maintenance of established seeding include regular inspection, repairing and reseeded damaged areas, and mowing the grass only when necessary. Though it is not required for local agencies to follow the KDOT seeding requirements, it is highly recommended to follow KDOT manuals and procedures for the long term and good yield of vegetation which requires less maintenance over the period of time and saves money.

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#### References

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