

NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS URBAN MANUAL
PRACTICE STANDARD

PERMANENT VEGETATION

(acre or sq.ft.)
CODE 880



(Source: USDA - Natural Resources Conservation Service - Illinois)

DEFINITION

Establishing permanent vegetative cover to stabilize disturbed or exposed areas.

PURPOSE

The purposes of this practice are to:

1. Permanently stabilize disturbed or exposed areas in a manner that adapts to site conditions and allows selection of the most appropriate plant materials.
2. Reduce erosion and sedimentation from such areas.
3. Create a landscape that enhances soil permeability and the filtering of runoff pollutants, while improving wildlife habitat.

CONDITIONS WHERE PRACTICE APPLIES

1. Disturbed areas where long-lived vegetative cover is needed to stabilize the soil.

2. Rough graded areas that will not be brought to final grade for a year or more.
3. Other areas where permanent cover is desired.

CRITERIA

Selection of plant materials

Selection of plant materials shall be based on climate, topography, soils, moisture conditions, land use, available light (shade tolerance), aesthetics, planned use of the area, and the degree of maintenance desired. All seed shall be of high quality and comply with Illinois Seed and Weed Laws.

See Tables A, B and C for selection of grasses, forbs, ground covers, and vines under different moisture and light conditions. These tables provide information for selected species that are generally commercially available and suitable for use in urban and agricultural settings. The native species presented represent those that are more tolerant of disturbed urban situations where this

practice would be applied. See the references given with the tables for information on additional species. The tables in this standard are not meant to be all-inclusive and the information in this standard can be applied to other species that may be desired or suitable for a given application. For trees and shrubs see practice standard [TREE AND SHRUB PLANTING 985](#). For manicured turf grass sod, see practice standard [SODDING 925](#).

Site Preparation

The site shall not be worked when frozen or saturated. Install necessary erosion and sediment control practices before seeding, and complete grading according to the approved plan. The grading plan shall utilize techniques and equipment that minimize soil compaction. If the final graded site consists of subsoil that may have been compacted by heavy equipment during grading activities, the subgrade shall be scarified to a depth of at least four inches by chisel plowing, disking or harrowing. This practice will create at least limited pore space for water and root penetration and bonding of the topsoil and the subsoil.

After the grading operation, spread topsoil where needed following practice standard [TOPSOILING 981](#). Topsoil shall meet criteria in material specification [804 MATERIAL FOR TOPSOILING](#).

Seedbed preparation

If needed based upon soil conditions and desired vegetation type, incorporate the lime and fertilizer into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of at least 3

inches. On sloping areas the final operation shall be on the contour.

Prior to seeding or planting, the seedbed shall be relatively free of all weeds ($\geq 80\%$ weed free), stones, roots, sticks, rivulets, gullies, crusting and caking, or other debris which may interfere with seeding or planting operations or plant establishment.

The seedbed shall not be worked when frozen or saturated. Prior to seeding or planting the surface shall be disked or raked to a depth of 2-3 inches either by hand or mechanical means to create a smooth uniform seedbed. This operation should result in a seedbed comprised of soil aggregates ranging from fine to coarse, with none larger than two inches in diameter.

In areas that have not been regraded, which have grown up in weeds, or to be no-till seeded, a herbicide application may be necessary to reduce competition with the desired vegetation. An approved herbicide may be used to treat such areas to kill all existing vegetation. Herbicide application shall be done at least 15 days prior to seeding or planting.

Fertilization

Fertilizer or lime is generally not recommended for native vegetation establishment unless soil tests indicate $\text{pH} < 5.5$, $\text{P} < 15 \text{ lb./ac.}$, or $\text{K} < 150 \text{ lb./ac.}$ If levels are below this, apply lime and fertilizer according to a soil test and the needs of the vegetation selected.

Seed

All legumes shall be inoculated with the

proper inoculant prior to seeding. Seeding rates given in Tables A and B are based upon Pure Live Seed (PLS).

Seed mixtures shall be selected according to site conditions and desired use and appearance. Other considerations include soil moisture condition, shade tolerance, mowing tolerance, winter hardiness, flooding tolerance, mature height, emergence time, and salt tolerance.

All seeds shall have the proper stratification and/or scarification to break seed dormancy for spring or early summer plantings. No treatments are needed for late summer, early fall, or dormant seeding.

Seeding

Seeding may be done by any of the following methods:

1. Conventional Drill

- a. Apply seed uniformly at a depth of 1/4 to 1/2 inch with a drill (band seed) or cultipacker seeder. On sloping land, seeding operations should be on the contour wherever possible.
- b. Apply mulch or erosion blanket following seeding as required.

2. Broadcast Seeding

- a. Cultipack or roll seedbed, then apply seed uniformly and cover to 1/4 to 1/2 inch depth with a cultipacker, or similar tool. Spinning disc type broadcasters equipped with an agitator are effective with native seed mixes. Often broadcasters require the use of a carrying agent such as oats or vermiculite. Attention

should be given to seed mixes with seeds of varying size and weight so that the seed remains effectively mixed during seeding operations.

- b. On sloping land, dragging, harrowing or cultipacking should be done on the contour to ensure seed-soil contact and reduce erosion.
- c. Apply mulch or erosion blanket following seeding as required.

3. Hydroseeding

- a. For areas to be hydroseeded, final seedbed preparation shall leave the soil surface in a slightly roughened condition.
- b. Lime and fertilizer shall be incorporated prior to seeding unless they are to be applied at the same time as the seed (applying lime with a hydroseeder may be abrasive to the equipment). Do not use hydrated lime in a slurry mix.
- c. A minimum of 1000 gallons of water per acre shall be used. The hydraulic seeding equipment shall include a pump rated and operated at no less than 100 gallons per minute and at no less than 100 pounds per square inch pressure. The tank shall have a mechanical agitator powerful enough to keep all materials in a uniform suspension in the water. Calibration of the hydraulic equipment shall be accurate.
- d. When seeding legumes, increase the recommended rate for inoculant four times for hydroseeding. If legume inoculant is added to a fertilizer and/or lime, seeding should be applied within 30 minutes.

- e. If seed and fertilizer are mixed together they should be seeded within 2 hours of mixing.

4. Dormant Seeding

Dormant seeding may be done between November 15 and March 15 by using conventional drill or broadcast methods.

If soil conditions are suitable during the dormant seeding period, prepare the seedbed and seed as indicated in this specification. Apply mulch or erosion blanket following seeding.

5. No-till

In some instances it may be desirable to sow seed into existing sod, a temporary cover crop, or natural vegetation. Drilling may be done after herbicide application to non-native sod or undesirable weeds such as Canada thistle. A rangeland type grass drill with a no-till attachment shall be used. Seeds should be drilled to the depth appropriate for the species, according to the supplier's recommendations.

The seeds of some plants require light to stimulate germination and growth. In situations with some of these species, particularly some native forbs, a combination of broadcasting and no-till drilling may be used. Grasses should be drilled first, followed by broadcasting of the desired forbs.

Plugs and Rootstock

Some plants cannot be grown readily from seed and must be planted vegetatively (see Table A). Plugs are young plants that are grown in a nursery or greenhouse for transplant. Rootstock may consist of fragments of horizontal

stems or roots that include at least one node (joint).

1. Plugs

Plugs shall be planted in designated areas according to site plans and the recommendations of the supplier for that species. Attention should be given to soil moisture, anticipated flooding, shade, and other factors.

- a. Plugs shall be planted in a hole dug with a trowel, spade, planting bar, or suitable instrument such that the hole is of a minimum diameter and depth to accommodate the plug, with its roots, without damage.
- b. The soil excavated from the planting hole should be used to backfill around the plant and lightly packed to secure the roots in the soil.
- c. Plugs shall be watered upon completion of planting enough to keep soil moist but not saturated.
- d. If planting is delayed more than six hours after delivery, store plugs in the shade, protect from the weather and mechanical damage, and keep them moist and cool. All plugs should be planted within 24 hours of delivery.
- e. Plugs shall be obtained from a reputable nursery or grown from seed. Plugs shall not be collected from wild populations of plants.

2. Rootstock

Plant tubers and other rootstock into a properly prepared area according to the following and in accordance with the

suppliers recommendations for that species.

- a. Tubers and rootstock should be freshly dug before planting. If planting is delayed, protect material from weather and mechanical damage, and keep moist and cool. Do not use materials that have been in cold storage more than 45 days.
- b. Holes for planting rootstock shall be dug in locations shown on plans or as adjusted in the field.
- c. Holes shall be dug with a trowel, spade, planting bar or other suitable instrument, such that holes are of a minimum depth and diameter to accommodate the tuber or rootstock without damage.
- d. Rootstock shall be obtained from a reputable nursery or grown from seed. Rootstock shall not be collected from wild populations of plants.

Ground Covers

Most shrub and vine type ground covers are available as bare root stock, balled and burlapped, or in containers or pots. Many ground covers and vines perform best when planted in the spring. Container-grown plants can be planted throughout the growing season if adequate water is provided.

Ground covers and vines are plants that naturally grow very close together and close to the ground or climbing over other plants. This can cause severe competition for space, nutrients and water. Soil for ground covers should be well-prepared. A well-drained soil high in organic matter is best. If the area to be planted is so large or difficult to

prepare due to steepness or rockiness that adding amendments to the soil as a whole would be impractical, organic matter and fertilizer may be added to each planting hole.

Lime and fertilize according to soil test, if needed. If no soil test is available and the soil is believed to be deficient, add 30 lbs. of 10-10-10 fertilizer and 100 lbs. of ground agricultural limestone per 1000 square feet. Incorporate into the top 4 to 6 inches of the soil.

When planting individual plants, prepare a hole slightly larger than the container or ball and deep enough that the roots can extend to the bottom. Most ground covers should be planted ½" to 1" deeper than they have grown in the pot or container.

Mulching/Erosion Blanket

All permanent seedings shall be mulched upon completion of seed application or planting. Refer to practice standard [MULCHING 875](#). Erosion blanket should be substituted for mulch on steep slopes (10% slope or greater) or wherever highly erosive conditions exist (e.g. in drainage swales or waterbody shorelines). Refer to practice standard [EROSION BLANKET 830](#). When planting plugs and tubers, particularly in wetland plantings, mulch or erosion blanket should NOT be used except in specific areas with erosive conditions. When planting ground covers it may be advantageous to apply mulch or erosion blanket prior to planting. Plants should then be tucked into the soil through slits or holes. In all cases, planting should be done in a staggered pattern to minimize erosion.

CONSIDERATIONS

Where feasible, deep-rooted native species are preferred because of their abilities to enhance soil permeability and pollutant filtering and their reduced needs for fertilizer, herbicides, irrigation, and mowing. Care also should be taken to avoid non-native aggressive species that could spread beyond the site boundaries.

The best time for seeding depends upon the species; there is no single best time to seed. There are certain groups of species which do best fall planted and are compromised by spring seeding. There are other groups of species that do best spring planted and are compromised by fall seeding. Some species are not tolerant of nurse or temporary cover crops while others benefit by them. Some species are difficult to establish in the field from seed and are far more practical to install as plugs.

Some species require light for germination and are thus less successful if drilled into the soil, while others require burial to have successful germination. Broadcasting is generally favored for native species for this reason, and so the plants do not become established in unnatural looking rows. A temporary cover crop may be necessary to hold soil until permanent vegetation becomes established. See practice standard [TEMPORARY SEEDING 965](#).

Using an intact native soil is the most desirable situation, but in most cases stabilization is needed because of earthwork activities. In many instances, the topsoil may have been removed

and/or stockpiled during earthwork activities.

Evaluate the capabilities and limitations of the soil to be seeded or planted and the desired use and appearance of the area. Special attention needs to be given to soil pH, texture, internal water movement, moisture regime, steepness, and stability in order to plan the appropriate treatment.

PLANS AND SPECIFICATIONS

The plans and specifications for seeding or planting and mulching shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items:

1. Seed mixtures and rates or plant species and density.
2. Site preparation methods.
3. Fertilization rates and methods of application.
4. Seeding or planting methods.
5. Seeding or planting periods.
6. Mulching or erosion blanket materials and application rates.

All plans shall include the installation, inspection and maintenance schedules with the responsible party identified.

OPERATION AND MAINTENANCE

High-maintenance areas are mowed frequently, fertilized and pesticide treated regularly, and either (1) receive intensive use (e.g., athletic fields or golf courses) or (2) require maintenance to a particular aesthetic standard (e.g., home lawns). Grasses or ground covers used for these situations are long-lived perennials that form a tight sod and are

fine-leaved in appearance. They must be well adapted to the geographic area where they are planted and able to endure the stress of frequent mowing. Sites where high-maintenance vegetative cover is commonly utilized include homes, industrial parks, schools, churches, and active recreational areas.

High-maintenance seedings should be fertilized one year after planting to strengthen the plants and insure proper stand density. The following recommendations may be used:

1. For grass only stands, apply 200 lbs./acre (5 lbs/1000 sq. ft.) of 27-3-3, or equivalent.
2. For grass-legume or pure legume stands, apply 500 lbs/ac. (12 lbs./1000 sq. ft.) of 10-20-20, or equivalent.
3. The best time to apply fertilizer is between March 1 and May 30 or August 1 and September 30.

Do not mow high-maintenance turf seedings until the stand is at least 6 inches tall. Do not mow closer than 3 inches during the year of establishment.

In areas adjacent to waterbodies and wetlands, fertilizer should be used sparingly to minimize runoff of nutrients causing undesired growth of aquatic plants (eutrophication).

Low-maintenance areas are mowed infrequently or not at all, and do not receive lime, pesticide or fertilizer on a regular basis. Plants must persist with little maintenance over long periods of time. Native grass, forb, and legume mixtures are favored for these sites because they are deep-rooted and can add nutrients to the soil. Legumes in particular are a source of soil nitrogen.

Mixed stands are more resistant to adverse conditions. Sites suitable for low-maintenance vegetation include steep slopes, stream or channel banks, lake shorelines, stormwater drainage and detention facilities, office campuses, low-density residential properties, some commercial properties and areas adjacent to roadways.

Native plants typically do not require fertilization to become established. Experience in prairie restoration suggests that fertilizing adds to weed problems and promotes undesirable species. For this reason, conventional fertilizing is not recommended for native plantings.

Low-maintenance stands should be mowed only as needed to control weeds. Native plantings should be mowed to control weeds prior to August 15 during the establishment period (2-3 years). Mowing should be done before undesirable weeds set seed. Keep mowing height above the height of the seeded plants (6-12 inches).

Prescribed burning is the preferred maintenance technique for native prairie vegetation. Burns should be performed after the establishment period (2-3 years) on a 2-3 year rotational basis to control invasive weeds and to encourage a balance between grass and forb species. Less-frequent burning may be appropriate once the prairie is well established.

Goose or other nuisance wildlife control may be needed on some plantings. For example, plantings (plants, rootstock or seed) of native wetland plants must be protected from depredation by Canada geese. Goose exclosures constructed of fence posts and "chicken wire" netting

is usually recommended during the first year of establishment.

Vine and shrub type ground covers may need hand weeding until the area is well covered.

For ground covers and vines, prune old growth in the spring as needed to improve appearance and promote growth. If pruning is desired, it should be done every year rather than when the plants have developed into an overgrown state.

High and low maintenance areas

Vegetation cannot be expected to provide erosion control cover and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.

The operation of equipment is restricted and may be unsafe on slopes steeper than 3:1. Where steepness prohibits the use of farm machinery, seedbed preparation, fertilization, and seeding or planting may need to be done by hand.

Moisture is essential for seed germination and seedling establishment. Supplemental irrigation can be very helpful in assuring adequate stands in dry seasons or to speed development of full cover.

Protect the planted area from human, animal and vehicular traffic until the stand is adequately established.

Inspect all planted areas for failures and make necessary repairs, replacements, reseeding, and mulching within the planting season, if possible. If a stand has less than 70% ground cover, re-evaluate the choice of plant materials, quantities of lime and fertilizer, seeding

or planting methods, time of seeding or planting and available light and moisture. Re-establish the stand with modifications based on the evaluation.

After initial planting and/or seeding, irrigate to keep the seedbed moist (not wet) for at least 7 to 10 days after seeding depending on conditions. This may require watering daily the first week, especially during hot weather, and less frequently thereafter. Water application rates and delivery must be carefully controlled to prevent runoff and erosion. Inadequate or excessive amounts of water can be more harmful than no supplemental water. Irrigation is seldom needed for low-maintenance seedings made at the appropriate time of the year.

Herbicides may also be used for weed control. Apply all herbicides according to rates specified on the label.

REFERENCES

U.S Department of Agriculture - Natural Resources Conservation Service, U.S. Environmental Protection Agency - Region 5, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers - Chicago District, 1997. [Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois.](#) IL

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