# Establishing a Lawn in Oklahoma

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**http://osufacts.okstate.edu**

Establishing your lawn involves turfgrass selection, soil and site preparation, planting, and post-establishment care of the new turf. Proper planning and methods employed for each of these steps helps to ensure a successful and satisfactory lawn establishment. This fact sheet was prepared to describe the necessary steps to properly establish a lawn in Oklahoma.

## Turfgrass Selection

Turfgrass selection involves choosing a turfgrass species and cultivar that is adapted to the environmental conditions of Oklahoma and that fits your personal needs and interests. The grass should also be suited to the physical or environmental limitations of the planting site, such as shade, no supplemental water, or poor soil conditions. Bermudagrass, buffalograss, and zoysiagrass are the warm-season (grows in the summer and dormant in the winter) turfgrass species most commonly planted in Oklahoma. Occasionally, cool-season turfgrass species, such as tall fescue, Kentucky bluegrass, and perennial ryegrass are planted on shaded sites because the warm-season turfgrasses cannot tolerate shade. These grasses also can be utilized in the full sun, but only when a convenient means of irrigation is available. Choosing the right cool-season turfgrass cultivar is essential for its success during the hot, dry summers of Oklahoma.

Table 1 summarizes the commonly planted turfgrasses in Oklahoma and some of their characteristics that should be considered when selecting a turfgrass species. For more detailed information, see Fact Sheet HLA-6418, “Selecting a Lawn Grass for Oklahoma.”

## Soil and Site Preparation

Proper soil and site preparation creates optimal conditions for turfgrass establishment and forms the foundation of the turfgrass area. Try to complete soil and site preparation *just prior* to planting. The seedbed surface should be smooth, without clods, and the soil should be moist but firm, properly fertilized, as well as loose and granular. Uniformity of site preparation is critical in obtaining a uniform turfgrass stand. A firm, weed-free seedbed with just enough loose surface soil for uniform depth of cover is essential. Such seedbeds aid in obtaining a uniform planting depth and improve seed-soil contact. Soil and site preparation is the same regardless of whether you choose to establish your lawn by seeding, or by sodding, plugging, or sprigging.

The following steps describe proper soil and site preparation.

1. Calculate the area, normally in square feet, that will be planted in turf. This is important in purchasing the appropriate quantities of fertilizer, seed, sod, and other materials used in establishing and maintaining your lawn. One method of calculating your lawn area is to divide it into smaller sections (rectangles, triangles, circles, etc.), calculate the area of each smaller section, and then add up the area of the smaller sections to obtain the total lawn area. A second method involves determining the area of your lot and then subtracting the area for spaces devoted to non-lawn use, such as the house, driveway, and ornamental beds.
2. Obtain soil samples for a soil test to determine phosphorus and potassium levels and pH (pH of 7 is neutral, below is acid, and above is alkaline). These should be taken two months prior to your planting date in order to allow sufficient time for you to receive your fertilizer recommendations and purchase the appropriate materials. To soil test, take about 10 to 15 cores, of a consistent depth (3 to 4 inches), over the whole lawn area. Discard plant material, such as stems and leaves. Place all samples in a container and mix thoroughly. Remove a one-pint soil sample and take it to your county Extension office for soil-test analysis. Your county educator will write your fertilizer recommendations, based on your soil-test results. If applications of phosphorus, potassium, lime (to raise pH), or sulfur (to lower pH) are recommended, then incorporate these materials into the upper 4 to 6 inches of soil as discussed in number 9. You will also need to broadcast a “starter” fertilizer on the surface of the finished seedbed, as discussed in number 11.
3. Control noxious, perennial weeds with Roundup, Kleenup, or GLYFOS prior to cultivation. Naturalized bermudagrass is our greatest problem in Oklahoma. The best time to control bermudagrass with Roundup is in September during periods of active plant growth. If you are planting a cool-season turfgrass species, wait at least one week after treatment before cultivation and seedbed preparation. If you are planting a warm-season turfgrass species, you can wait until April or May to begin cultivation and seedbed preparation.
4. Remove debris such as wood, pipe, rock, stumps, and

**Table 1. The turfgrasses commonly planted in Oklahoma and some of their selection characteristics relative to Oklahoma.**

| | *Adaptation* | | *Resistance to*[1] | | | | *Maintenance Requirements*[2] | |
|---|---|---|---|---|---|---|---|---|
| *Turfgrass* | *Location* | *Site* | *Wilting from drought* | *Wear* | *Winter Hardiness* | *Heat Stress* | *Cultural Intensity* | *Irrigation Requirements* |
| **Warm-Season Turfgrasses** | | | | | | | | |
| *Bermudagrass* | | | | | | | | |
| Arizona common | Statewide | Full Sun | Excellent | Good | Fair[3] | Excellent | Medium | Medium-Low |
| Guymon | | | | | Very Good | | | |
| Jackpot | | | | | Very Good | | | |
| Mirage | | | | | Very Good | | | |
| OKS 91-11 | | | | | Very Good | | | |
| U-3 | | | | | Very Good | | | |
| Sunturf | Statewide | Full Sun | Good | Good | Good | Excellent | High | Medium |
| Tifgreen | | | | | Good | | | |
| Tifway | | | | | Good | | | |
| Midiron | | | | | Very Good | | | |
| Midfield | | | | | Very Good | | | |
| Midlawn | | | | | Very Good | | | |
| NuMex Sahara | | | | | Fair[3] | | | |
| *Buffalograss* | Western | Full Sun | Excellent | Marginal | Excellent | Excellent | Low | Low |
| 609 | | | | | | | | |
| Bison | | | | | | | | |
| Cody | | | | | | | | |
| Comanche | | | | | | | | |
| Prairie | | | | | | | | |
| Sharp's Improved | | | | | | | | |
| Tatanka | | | | | | | | |
| Texoka | | | | | | | | |
| Topgun | | | | | | | | |
| *St. Augustinegrass* | Extreme Southeastern | Full Sun to Light Shade | Poor | Favorable | Poor | Excellent | Medium | High |
| Texas Common | | | | | | | | |
| Raleigh | | | | | | | | |
| *Zoysiagrass* | Eastern | Full Sun to | Favorable | Excellent | Excellent | Excellent | Medium-High | Medium-High |
| Meyer | Half | Light Shade | | | | | | |
| **Cool-Season Turfgrasses** | | | | | | | | |
| *Kentucky bluegrass* | Northern | * | Poor | Marginal | Excellent | Poor | Medium-High | High |
| *Perennial ryegrass* | Northern | * | Poor | Marginal | Excellent | Poor | Medium-High | High |
| *Tall fescue* | Statewide | * | Favorable | Favorable | Excellent | Favorable | Medium-High | Medium-High |

*Recommended for sites that are lightly shaded or irrigated. Use in full sun will require more frequent watering.
[1] Tolerance ranking is: Excellent>Very Good>Good>Favorable>Marginal>Poor.
[2] Maintenance requirements: H=High; M=Medium; L=Low.
[3] Some winter-kill frequently occurs during the first season after seeding bermudagrasses.

any other objects that will interfere with turfgrass root growth and water movement through the soil.

5. Cultivate the upper 8 to 10 inches of soil by means of a field cultivator, disk, or similar cultivating equipment. Deep cultivation may not be feasible in all situations, but at least cultivate or roto-till the upper 4 to 6 inches of soil. Loosening the soil surface by cultivation is critical for alleviating compacted, hard, tight soils; for incorporating fertilizer and soil amendment materials throughout the entire root-zone soil; and for creating a proper soil, air, and water relationship in the seedbed for optimum turfgrass establishment.
6. Tight clay soils can be improved by incorporating either topsoil or sand to increase soil aeration and water drainage. At least 4 to 6 inches of a loamy topsoil or coarse sand must be uniformly incorporated into the upper 2 to 4 inches of underlying soil to achieve soil improvement. Sandy soils are modified with topsoil to increase water and nutrient retention. Incorporate 6 to 8 inches of a loamy topsoil into the upper 4 to 6 inches of underlying soil. If the soil being modified lacks organic matter, add 10 to 15 percent by volume of a well decomposed peat or other organic material. It is also important that soil amendments be uniformly incorporated into the existing soil and not layered on top of the surface.
7. Installation of subsurface drain tile and underground irrigation systems should be completed prior to final seedbed preparation. Drainage lines should be 6 to 18 inches deep, depending on the weight of anticipated traffic. Irrigation main lines should be placed below the frost line while lateral lines in ornamental beds should be 18 inches deep and lateral lines in turf areas should be 12 inches deep.
8. If improvement of soil pH is indicated by a soil test, incorporate the recommended amount of lime or sulfur into the upper 4 to 6 inches of soil.
9. If indicated by a soil test, incorporate the recommended amount of phosphorus, potassium, and other fertilizer elements, except nitrogen, into the upper 4 to 6 inches of soil.
10. Complete final grading and smoothing. There should be at least a one percent slope away from buildings to prevent water from settling around them. Small areas can be sufficiently smoothed by hand raking. At planting, the seedbed should be firm enough to walk on, with the upper 0.5 inch of soil loose. If footprints are deeper than 0.5 inch when the soil is walked on, the seedbed is too loose and will require firming by rolling and/or watering. Seed planted in soil that is too loose is usually planted too deeply and will die before seedlings can emerge. Conversely, if the soil surface becomes too hard before planting, then lightly till the seedbed so the upper soil surface is loose. Never sod, plug, or sprig into dry soil. Several days prior to these operations, water the seedbed to a 5- to 6-inch depth.
11. Just before or after planting, apply a "starter" fertilizer (containing nitrogen, phosphorus, and potassium) on the seedbed surface at a rate of 1 to 2 pounds N per 1000 $ft^2$. This fertilization will ensure that ample amounts of fertilizer elements are in the location of roots of germinated seedlings or new plants, thus ensuring rapid establishment.

## Planting

The critical factors in planting turfgrasses are listed below and discussed in this fact sheet.

1. Plant a recommended turfgrass species and cultivar that is well adapted to the environmental conditions of Oklahoma and one that is also suited to your planting site and interests. See Fact Sheet HLA-6418, "Selecting a Lawn Grass for Oklahoma," for detailed information.
2. Plant the recommended amount of seeds or vegetative material (sod, sprigs, and plugs) to ensure rapid coverage (Table 2).
3. The amount of actual or percentage of pure live seed (PLS) in a bag varies from variety to variety. It is best to seed based on the amount of pure live seeding rates than simply using a general rate recommendation that does not take into account variation in seed purity and germination viability between sources. To calculate the actual amount of your specific variety to plant, look at the seed label (usually on the back of the bag) and note the percent of seed purity and percent germination. The amount of this seed to plant per 1,000 $ft^2$ =

$$\frac{\text{suggested PLS rate from Table 2, column 4,}}{\text{(percent pure seed listed on your label) x (percent germination on label)}}$$

4. Uniformly distribute seed, sprigs, or plugs over the lawn area to prevent bare spots or areas that are likely to be invaded by weeds and slowly covered by turf.
5. Plant when environmental conditions favor rapid turfgrass establishment. In the case of warm-season turfgrasses this means that there is enough time for good plant development before frost. In the case of cool-season turfgrasses there should be adequate time for growth before hot, dry summer conditions come about.

Table 2 summarizes the commonly planted turfgrasses in Oklahoma and their planting characteristics.

### Seeding

Small lawns can be broadcast seeded with a 2- to 3-foot wide drop spreader. Divide the recommended amount of seed (Table 2) into two equal portions and spread each portion in a different direction to ensure proper distribution (Figure 1). It may be necessary to dilute small amounts of seed with sand, Milorganite, or similar material to increase the amount of bulk material being spread.

Seed when temperature and moisture conditions favor rapid germination and establishment. Warm-season turfgrasses should be seeded when daily mean temperatures of the upper soil surface range from 68° to 95° F. In Oklahoma, this usually means not seeding (or sodding, plugging, or sprigging) warm-season turfgrasses before May 1. On the other hand, warm-season turfgrasses should be seeded early enough in the growing season to allow enough time for them to become established before winter. Most seeded bermudagrasses should be planted by July 1. Cool-season turfgrasses germinate optimally when daily mean temperatures of the upper soil surface range from 68° to 86° F. Thus, the ideal time to seed Kentucky bluegrass, perennial ryegrass, or tall fescue is in late September and October. Temperatures become too cold in November and December for optimal

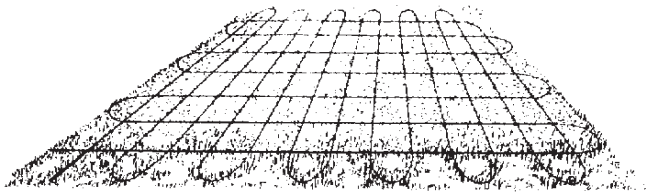

**Figure 1. When seeding a lawn, divide the recommended amount of seed into two equal portions and spread each portion in a different direction to ensure uniform distribution.**

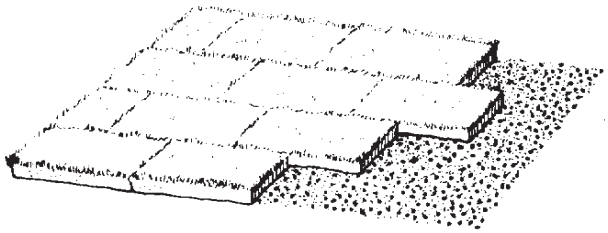

**Figure 2. Sod transplanting involves the manual placement of individual slabs or rolls of sod in a staggered, checker board pattern. It is helpful to place the first sod pieces along a straight edge, such as a driveway or sidewalk, and then work toward the middle. Snugly fit sod pieces against each other to prevent exposure and drying of the edges. Do not tuck the edges or ends of sod underneath adjacent pieces of sod.**

germination and establishment. The second best time to seed cool-season turfgrasses is in March. Fall plantings of cool-season turfgrasses are superior over spring plantings because there is more time for plant development prior to heat and drought conditions of summer.

After seeding, cover the seed with soil to a depth of approximately 1/8 inch by lightly hand raking with a garden rake or dragging a flexible steel door mat over the area. To ensure proper seed-soil moisture contact for rapid germination, firm the soil around the seed by rolling with a weighted lawn roller or by some other means of packing the seedbed. The chances of establishment from broadcast is high only if the newly emerging root is able to penetrate the soil surface easily and if the surface is kept moist.

Mulching the seedbed following seeding helps to ensure favorable temperature and moisture conditions for rapid seed germination and seedling growth. It also helps to stabilize loose soil and seed during rain and high winds. This is particularly true on slopes. Distributing clean wheat straw at approximately 100 pounds per 1000 $ft.^2$ is one of the preferred methods of mulching. Placing string over the mulch every 3 feet will help prevent it from being blown by wind.

Keep the upper 1-inch surface of the seedbed moist by daily, light waterings for at least 10 to 14 days. When a majority of the seed has germinated and bermudagrass seedlings are about 3/4 inch tall or tall fescue seedlings are about 2 inches tall, remove the straw mulch. After the seed germinates and becomes established, practice deeper, less frequent waterings.

*Hydroseeding* involves spraying seed suspended in water on the area to be established. Fertilizer and mulch are commonly added to the suspension. Hydroseeding is very effective for hard-to-plant areas, such as slopes. Since the seed is placed on the soil surface, frequent, light irrigations are critical for keeping the seed moist. Hydroseeding is normally accomplished on a contract basis.

## Sodding

Sodding provides an almost instant lawn. It is important to have the seedbed moist (but not waterlogged) prior to the arrival of fresh sod. Therefore, moisten the upper 5 to 6 inches of seedbed soil several days before sodding, plugging, or sprigging.

Sod transplanting involves the manual placement of individual slabs or rolls of sod in a staggered, checker board pattern (Figure 2). It is helpful to place the first sod pieces along a straight edge, such as a driveway or sidewalk and then work toward the middle. Snugly fit sod pieces against each other to prevent exposure and drying of the edges. After laying the sod, tamp or roll the area to ensure proper contact between sod and underlying soil. Water should be immediately applied. On large areas it is best to plant and water smaller sections at a time. Sod warm-season turfgrasses at least one month before the first fall frost in order to allow enough time for adequate rooting.

## Plugging

Plugging involves the transplanting of small pieces of sod into holes the same size. The advantage of plugging over sprigging is that plugs have a greater chance of becoming established than sprigs. This is because individual sprigs have little if any roots with adhering soil and are smaller with less plant storage material to help them get started. The disadvantage of plugging is that it normally takes more time to obtain total lawn coverage than with sprigging and it is a more labor intensive project than sprigging. Plugging can be accomplished mechanically or manually. Plugs can be either circular (1 to 2 inches diameter) or square (1 to 2 inches square) or irregular in shape but approximately the same size as round or square plugs. Plugs are planted on 6- to 12-inch centers (Figure 3). That is, there are 6 to 12 inches between rows of plugs and there are 6 to 12 inches between

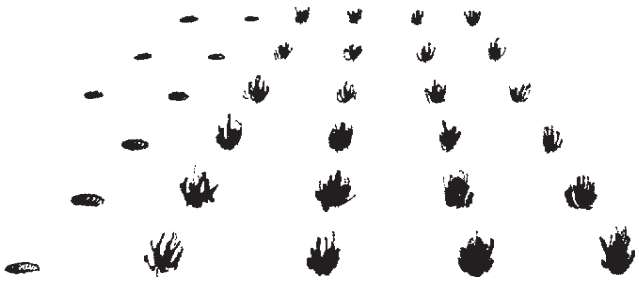

**Figure 3. Plugs are planted on 6- to 12-inch centers. That is, there are 6 to 12 inches between rows of plugs and there are 6 to 12 inches between individual plugs within each row.**

individual plugs within each row. Always plug zoysiagrass on 6-inch centers, due to its slow establishment rate. Roll or tamp soil around each plug after planting and keep the upper surface (1 to 2 inches) moist until the grass is well rooted and spreading. In large areas, it is best to plant and water smaller sections at a time. Plug warm-season turfgrasses at least two months before the first fall frost in order to allow enough time for adequate spread and rooting.

### Sprigging

Sprigging rates are shown in Table 2. Sprigging can be accomplished mechanically or manually. It normally involves planting sprigs (stems or runners with two to four nodes, "joints") in furrows that are 1 to 2 inches deep and 10 to 18 inches apart (Figure 4). inches apart (Figure 4). Sprigs should be placed at 4- to 6-inch intervals within furrows. Shallower planting results in a more rapid establishment. The ideal placement is leaving one-quarter of each sprig above ground after planting (Figure 5). Roll or tamp soil around sprigs after planting and keep the upper surface (1 to 2 inches) moist by daily, light irrigations until the grass is well rooted and spreading. In large areas, it is best to sprig and water smaller sections at a time.

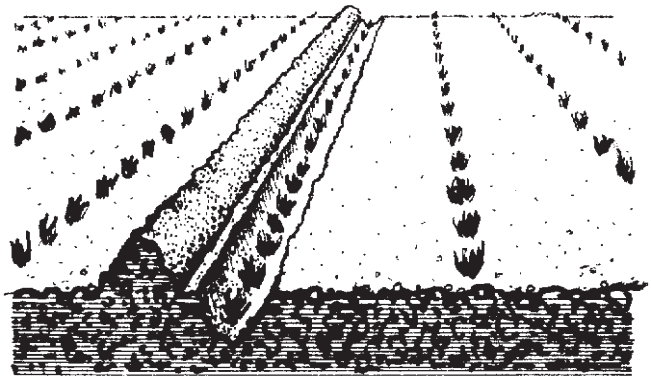

**Figure 4. Sprigging normally involves planting sprigs in furrows that are 1 to 2 inches deep and 10 to 18 inches apart. Sprigs should be placed at 4- to 6-inch intervals within furrows.**

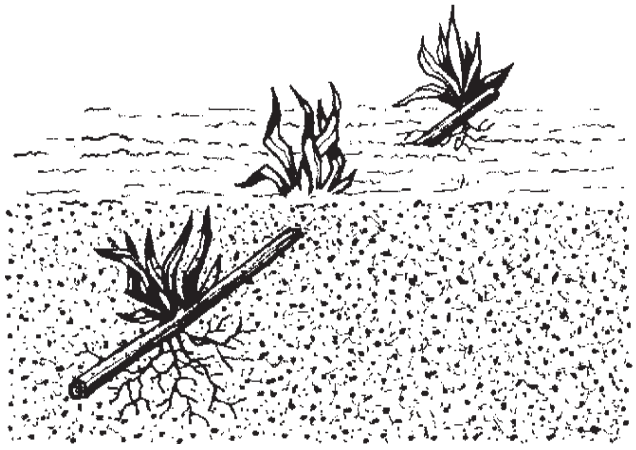

**Figure 5. The ideal placement of sprigs leaves one-quarter of each sprig above ground after planting.**

Sprig warm-season turfgrasses at least two months before the first fall frost in order to allow enough time for spread and rooting.

*Broadcast sprigging* involves uniformly spreading the recommended amount of sprigs over the seedbed surface. Spread a 0.25- to 0.5-inch layer of topsoil or sand over the sprigs and/or lightly press sprigs partially into the surface by a disk or roto-tiller, set 2 to 3 inches deep. Roll or tamp soil around sprigs after planting and keep the upper surface (1 to 2 inches) moist by daily, light irrigations.

## Post-Establishment Care

Watering should be done on a daily basis for several weeks after planting. Only the upper 1 to 2 inches of soil need to be moistened until the turf is rooted and spreading. As the turf becomes more established, begin deeper, less frequent irrigations to promote deeper rooting and a hardier turf. However, never allow newly established turf to experience moisture stress.

A fertilizer application three to four weeks after planting with a nitrogen fertilizer will enhance establishment. Fertilize at a rate of approximately 0.5 pound N per 1000 ft.$^2$

Begin mowing when the turf foliage reaches the intended cutting height. Mowing as soon as it is needed will promote lateral spread and rooting.

In small areas, weed control can be accomplished by hand-pulling. Herbicides should be avoided for at least the first three to four weeks following planting. Only when weed competition is hindering turfgrass coverage should herbicides be considered during establishment. The organic arsenicals (DSMA, MSMA, AMA) are reasonably safe on newly sodded, plugged, or sprigged bermudagrass for the control of emerged summer annual grassy seeds, such as crabgrass and sandbur. Ronstar and Barricade, preemergent herbicides (crabgrass preventers), are safe on newly sodded, plugged or sprigged common-type bermudagrass. Ronstar cannot be used by home consumers on home/residential lawns. The herbicide 2,4-D and related compounds are not safe when applied at rates that are normally used on established bermudagrass.

For detailed information on caring for an established lawn, see Fact Sheet HLA-6420, "Lawn Management in Oklahoma."

## OSU Turfgrass

*Extension Facts (HLA, EPP), Current Reports (CR), and Leaflet (L)*

### Management

| | |
|---|---|
| HLA-6418 | Selecting a Lawn Grass for Oklahoma |
| HLA-6419 | Establishing a Lawn in Oklahoma |
| HLA-6420 | Lawn Management in Oklahoma |
| HLA-6600 | Turfgrass Management of Bermudagrass Football Fields |
| CR-6602 | Performance of Tall Fescues at Stillwater, OK |
| HLA-6604 | Thatch Management in Lawns |
| CR-6605 | Directory of Turfgrass Sod Sources in Oklahoma |
| L-249 | Soil Testing: The Right First Step Toward Proper Care of Your Lawn and Garden |
| L-253 | Don't Bag It Lawn Care Plan |

**Table 2. Commonly used turfgrasses in Oklahoma and their planting characteristics.**

| *Turfgrass* | *Planting Method* | *Planting Date* | *Planting Rate (amount per 1000 ft.²)* |
|---|---|---|---|
| **Warm-Season Turfgrasses** | | | |
| *Bermudagrass (seeded types)* | | seed most bermudagrasses by July 1 | 1 to 2 pounds PLS[1] |
| Arizona common | seed | | |
| Cheyenne | | | |
| Guymon | | seed Guymon by July 15 | |
| Jackpot | | | |
| Mirage | | | |
| NuMex Sahara | | | |
| OKS 91-11 | | | |
| Sundevil | | | |
| seed from U-3 | | | |
| *Bermudagrass (vegetative types)* | | | |
| Sunturf | sod, sprigs, plugs | May-July | 30-50 ft.² of sod for plugging 2-inch plugs on 6- to 12-inch centers |
| Tifgreen | | | 3-10 bushels of sprigs for sprigging[2] |
| Tifway | | | |
| Midfield | | | |
| Midlawn | | | |
| Midiron | | | |
| U-3 | | | |
| *Buffalograss (seeded types)* | | | |
| Bison | seed | seed buffalograss by July 1 | 2 pounds of pure live burrs (treated) |
| Cody | | | |
| Comanche | | | |
| Sharp's Improved | | | |
| Tatonka | | | |
| Texoka | | | |
| Topgun | | | |
| *Buffalograss (vegetative types)* | | | |
| 609 | sod or plugs | May-July | 60 to 100 ft² of sod for plugging 2- to 4-inch plugs on 6-inch centers |
| Prairie | | | |
| *St. Augustinegrass (vegetative types)* | | | |
| Texas Common | sod, sprigs, plugs | May | 30-50 ft.² of sod for plugging 2-inch plugs on 6- to 12-inch centers |
| Raleigh | | | 3-10 bushels of sprigs for sprigging |
| *Zoysiagrass (vegetative types)* | | | |
| Meyer | sod, plugs | May-July | 50 ft.² of sod for plugging 2-inch plugs on 6-inch centers |
| El Toro | | | |
| Matrella | | | |
| *Zoysiagrass (seeded types)* | | | |
| Sunrise brand | seed | seed by July 1 | 1 pound PLS |
| **Cool-Season Turfgrasses** | | | |
| *Kentucky bluegrass* | seed | Sept.-Oct[3] | 2 pounds PLS |
| | sod | Sept.-May | solid sod only |
| *Perennial ryegrass* | seed | Sept.-Oct. | 4 to 8 pounds PLS; 10-12 pounds PLS for winter overseeding of bermudagrass |
| *Tall fescue* | seed | Sept.-Oct.[3] | 4 to 6 pounds PLS |
| Many varieties are adapted. See Current Report 6602: Performance of Tall Fescues at Stillwater, OK | sod | Sept.-May | solid sod only |

[1] PLS=Pure Live Seed = (percent pure seed) x (percent germination). Use the same calculation for determining Pure Live burrs for buffalograss establishment.
Amount of actual seed to plant per 1,000 ft. = $\frac{\text{(suggested PLS rate from Table 2)}}{\text{(percent pure seed listed on label) x (percent germination on label)}}$

[2] Generally, 1 square yard of bermudagrass sod (9 ft.²) equals 1,000 1-inch plugs or 300 2-inch plugs, or 1,000 to 2,000 sprigs, or approximately 1 bushel of sprigs.
[3] March is the second-best time to seed cool-season turfgrasses.

### Weed Control

| | |
|---|---|
| HLA-6421 | Controlling Weeds in Home Lawns |
| HLA-6423 | Controlling Grassy Weeds in Home Lawns |
| HLA-6601 | Broadleaf Weed Control for Lawns in Oklahoma |

### Disease Control

| | |
|---|---|
| CR-6606 | Managing Large Patch of Zoysiagrass |
| EPP-7658 | Dollar Spot of Turfgrass |
| EPP-7665 | Managing Spring Dead Spot Disease of Bermudagrass |

### Insect Control

| | |
|---|---|
| EPP-7306 | Ornamental and Lawn Pest Control |

# The Oklahoma Cooperative Extension Service
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The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

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