

Establishing a Lawn From Sod

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Warm-season grasses popular in Arkansas, such as bermudagrass (*Cynodon* spp.), zoysiagrass (*Zoysia* spp.), St. Augustinegrass (*Stenotaphrum secundatum*) and centipedegrass (*Eremochloa ophiuroides*), are usually established from sprigs, plugs or sod. Tall fescue (*Festuca arundinacea*), a cool-season grass, is also available by sod. Sodding is fast and reliable compared to the additional time and inputs needed to establish a lawn from seed. Table 1 lists species and cultivars of sod available in Arkansas. For more information about choosing the best adapted species and cultivars for your lawn, see FSA2112, *Choosing a Grass for Arkansas Lawns*.

The easiest way to install sod is to hire a landscaper. Should you decide to save money and do your own

sodding, follow the steps outlined in this publication. It may not be practical to do everything listed here, but successful sodding should always include detailed attention to soil preparation, site grading and watering, as they are integral steps in the installation process.

General Sod Specifications

The sod should be:

1. Guaranteed as to type and cultivar of turfgrass requested and of uniform height, color and texture. Blue-tag certified sod is available from some producers in Arkansas through a program administered by the Arkansas State Plant Board. This blue-tag certification guarantees consumers they are, in

Table 1. Turfgrass species and cultivars available by sod and suitable for Arkansas lawns.

Species	Cultivars With Sod Availability for Arkansas Lawns	Cost/yard ² †
Bermudagrass	'Celebration', Common, 'Midlawn', 'Patriot', 'Quickstand', 'Tifsport', 'Tifway' and others	\$1.25 - \$1.50
Centipedegrass	'TennTurf' and others	\$3.00 - \$3.50
Tall fescue‡	'Apache', 'Avenger', 'Barvado', 'Bonanza', 'Cayenne', 'Cochise III', 'Durana', 'Dynasty', 'Finelawn Elite', 'Firebird', 'Greenkeeper', 'Guardian', 'Inferno', 'Jaguar', 'Justice', 'Masterpiece', 'Millennium', '2nd Millennium', 'Plantation', 'Rebel', 'Rebel II', 'Rebel Exeda', 'Red Coat', 'Rembrandt', 'Scorpio', 'Shenandoah', 'Solara', 'Turbo', 'Watchdog' and others	\$3.00 - \$4.50
St. Augustinegrass	'Raleigh', 'Palmetto' and others	\$3.00 - \$4.00
Zoysiagrass	'Cavalier', 'Crowne', 'El Toro', 'Emerald', 'Meyer', 'Palisades', 'Zorro' and others	\$2.00 - \$4.00

†Costs vary by cultivar and sod producer. Approximate costs listed.

‡Tall fescue sod often contains 10% bluegrass or netting to help the sod hold together since tall fescue lacks rhizomes and stolons.

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fact, purchasing the species and cultivar they have requested.

2. Relatively free of weeds, insects and diseases.
3. Thin cut (1/2 to 3/4 inch of soil) of uniform thickness. Soil texture of the sod should closely match the soil texture of the existing lawn soil.
4. Moist, freshly cut sod delivered within 24 hours of harvest and protected from sun and wind during transport.

1. Soil test.

A soil test provides key information including pH, potassium and phosphorus levels of soil. Soil testing is free through county Cooperative Extension Service offices. Collect soil samples in a plastic bucket from the upper 4 to 6 inches of soil from ten or more locations around the yard. Remove any vegetative material such as stems and leaves. Air-dry and mix the samples thoroughly. Take about 1 pint of the mixture to the county Extension office for analysis. Make sure to test your soil at least two months prior to establishing your lawn. This will allow ample time to receive the results of your soil test as well as provide time to apply and incorporate recommended nutrients prior to laying sod. If topsoil is needed from off-site, it is necessary to have this soil tested as well.

2. Determine area.

A key step in establishing a lawn by sod is to determine the size of the lawn. This will aid in calculating how much sod, lime and fertilizer you will need to order to establish the lawn. The best way to do this is to divide your lawn into several squares, rectangles or circles. Calculate the area of these smaller shapes and then add them together to determine the total size of the

lawn. Sod is typically sold as square yards. Therefore, the total square feet of the area should be divided by nine in order to determine how many square yards of sod you need to order. Typically, one pallet of sod will contain about 50 yd² of sod or about 450 ft². Order about 10 percent more sod than you anticipate needing to account for calculation errors and waste that occurs when cutting sod around corners and edges.

3. Control perennial weeds.

If perennial weeds or undesirable grasses exist on the site, the first step is weed control (Figure 1). A typical example is a common bermudagrass yard renovation to zoysiagrass. In this case, it is important to control the bermudagrass before planting. Roundup (glyphosate) is the most commonly used herbicide for preplant weed control. Make the spray solution by adding 2 2/3 ounces of 41 percent Roundup per gallon of water. Glyphosate is sold under many trade names other than Roundup.

Concentrations of these other formulations vary from 1 to 41 percent. Always read the label before using. Do not expect complete control of bermudagrass after applying Roundup once. Research indicates it takes three applications of Roundup over the growing season (waiting 3 to 4 weeks for regrowth before making the next application) to achieve greater than 90 percent control.

4. Remove trash.

Remove all wood, concrete, pipe, rock and construction scrap to prevent interference with turfgrass root growth and water movement. Insist the builder not use the site as a dumping ground for paint, concrete, etc. Stumps not removed will eventually decay, leaving depressions in the lawn.

5. Rough grade.

If extensive grading is necessary, stockpile existing topsoil and replace it after the rough grade is set. The rough grade should slope gradually away from the house at least 15 feet in all directions. A 1-foot drop in 50 feet will usually supply adequate surface drainage. Mowing and erosion problems may arise when slopes steeper than 4:1 (1 foot drop every 4 feet) are established. Alternatives to a steep grade include terraces, retaining walls or planting a ground cover.

6. Replace topsoil.

Redistribute or add topsoil. This is necessary on sites with poor soil fertility. Approximately 19 cubic yards of topsoil create a layer 6 inches deep over 1,000 square feet. If suitable topsoil is not available, modify the existing soil. If the topsoil lacks organic matter, incorporate peat, decomposed manure, composted chicken litter or composted rice hulls at 1 to 3 cubic yards per 1,000 square feet. Mix these materials with the native soil at least 6 to 8 inches deep.



Figure 1. Bare soil clean of weeds prior to sod installation.

7. Apply amendments.

Uniformly apply nitrogen, phosphorous, potassium and lime according to soil test recommendations (Tables 2 and 3). Thoroughly mix lime, fertilizer and organic amendments into the upper 6 to 8 inches of soil. Avoid tilling when

Table 2. Arkansas phosphorus and potassium recommendations for established and newly planted lawns.

Phosphorus Fertilizer Recommendations		Potassium Fertilizer Recommendations	
Soil Test P Level and Concentration Range (ppm)		Soil Test K Level and Concentration Range (ppm)	
Below Optimum	Above Optimum	Below Optimum	Above Optimum
≤ 25	> 25	≤ 100	> 100
----- P Fertilizer Rate, lbs P ₂ O ₅ /1,000 ft ² /yr -----		----- K Fertilizer Rate, lbs K ₂ O/1,000 ft ² /yr -----	
2	0	2	0

Table 3. Arkansas lime recommendations for newly planted lawns.

Soil Texture	Soil Water pH Level Interpretation					
	Below Optimum			Medium	Optimum	High
Soil Test Ca	< 5.0	5.0 - 5.4	5.5 - 5.7	5.8 - 6.2	6.3 - 6.9	> 6.9
ppm	----- lbs CaCO ₃ lime/1,000 ft ² -----					
< 500	80*	57	46	0	0	0
500 - 1,500	115	92	69	0	0	0
1,501 - 2,250	138	115	92	0	0	0
> 2,250	138	138	115	0	0	0

*Lime rates are for CaCO₃ (Ag lime) sources that contain a 90% Calcium Carbonate Equivalent. Adjust the lime rate for other sources of lime.

the soil is too wet to avoid damaging the soil structure. For more information on liming, see FSA6134, *Liming Your Lawn*.

8. Install drainage and irrigation.

Install subsurface drainage and irrigation before final grading and smoothing. Drainage lines are usually placed 6 to 18 inches deep. Place irrigation pipe below the frost line and normal tillage depth (12 to 18 inches). Work to complete the grading before digging irrigation trenches and installing heads, because it will be difficult to use large grading equipment without damaging the installed irrigation components.

9. Final grading.

Final grading should leave the soil surface ready for planting. Use hand rake for small areas (Figure 2). Larger areas require a

heavy steel drag mat, soil blade, plank drag or tiller. Allow one week for the soil to settle before final grading. Irrigation or significant rainfall will aid in settling the soil. A properly prepared planting bed should be firm enough to walk on with the top 1/2 inch of soil loosened. The soil will require further watering or rolling if footprints are deeper than 1/2 inch. During final soil preparation, examine height and slope of soil in



Figure 2. Loosening the soil to a depth of 0.5 inches prior to sod installation helps with rooting.

relation to walks and driveways. Driveways and walks should be about 1/2 inch above the soil surface to allow for the soil that comes on the sod. Fill any low spots that collect and hold water after irrigation or rainfall.

Take care not to destroy or damage existing trees. Tilling around trees will cut a large percentage of a tree's surface roots, which can weaken or kill the tree. Trees can also be killed by placing large amounts of soil over the roots because this practice deprives the roots of oxygen. If significant grade changes are needed, it is recommended that a root-aerating tree well be constructed by an experienced professional.

When to Lay Sod

Many landscapers lay sod successfully year-round. Sodding in spring or early summer while

grasses are actively growing allows rapid rooting. Giving warm-season grasses time to develop an extensive root system before cold weather arrives enhances their ability to resist winter injury. Also, planting during May and June coincides with the time when the chances of rainfall are greatest, thus reducing dependence on irrigation. Sodding bermudagrass any time there are three to four weeks of good growing weather remaining is generally successful. Zoysiagrass is somewhat slower to root than bermudagrass and needs more time to become well established. Allow approximately six to eight weeks for zoysiagrass to become well rooted.

Due to construction deadlines, it is sometimes necessary to lay sod during winter months when warm-season grasses are dormant. Dormant sodding can be successful but is more risky than sodding in the spring and early summer due to increased risk of winter desiccation and injury. The same site preparations discussed previously also apply to dormant sodding turf.

First Watering

Prior to planting, water to moisten the soil. It is important to schedule this watering in advance to avoid a muddy site when sod installation begins. **Do not lay sod on dry soil.** Even if sod is watered immediately after being laid on dry soil, root growth will be retarded.

Delivery

Prepare the site before scheduling delivery of the sod. Make sure the sod is moist, freshly cut, delivered within 24 hours of harvest and protected from sun and wind during transport. It is difficult to determine whether dormant sod is healthy at the time of delivery. If the soil on the sod is

moist, then it is likely healthy and you can go ahead and install the sod. To ensure its health, a small piece of sod can be brought indoors (> 70°F) and kept moist. The sod should green-up and begin growing within 10 days if it is healthy.

Sod arrives on wooden pallets, each stacked with 50 square yards of grass. Sod weighs about 35 to 40 pounds per square yard. Pieces are typically 18 inches wide and 24 inches long, but vary depending on the particular cutting machine. The charge for the sod will likely include a \$4 to \$8 deposit on each pallet. Try to be there when the sod arrives so the pallets are positioned strategically to minimize the distance pieces are carried for installation. Documentation should be provided during delivery that guarantees the species and cultivar of turfgrass requested. Inspect the sod before acceptance of the shipment to make sure its quality is adequate.

Installation

Lay sod soon after it is delivered. The longer the sod sits on the pallet, the more it will deteriorate. This is especially important when dormant sodding. Laying dormant sod quickly after delivery will help protect the sod from freeze injury because of the latent heat in the soil. Lay the first strip of sod along a straight edge, such as a driveway or sidewalk, with subsequent strips placed parallel and tightly against the first strip. If there are only curves, lay at right angles to the curve. In irregular areas, use a string to establish a straight line (Figure 3). Butt joints tightly to prevent root drying, but do not overlap (Figure 4). On the second row, stagger the joints as when laying bricks (Figure 4). Use a sharp knife or sod knife to cut sod to fit curves, edges and sprinkler heads. Try to avoid short or narrow strips because they tend to



Figure 3. Install the first piece along a straight edge.



Figure 4. On each row of sod, stagger the joints as when laying bricks.



Figure 5. Rolling eliminates irregularities and establishes good contact between the sod and soil.



Figure 6. Begin to water the lawn thoroughly after the sod is installed and rolled.

dry rapidly. As a rule of thumb, don't use pieces less than 9 inches wide or 18 inches long. Always place trimmed pieces on the inside. Mound soil against exposed edges to protect it from drying if the entire area is not sodded. When sodding slopes, start at the bottom. On steep slopes, peg both ends of the sod strip with wooden pegs on the high side of each piece. To avoid starting erosion, carefully monitor the amount of water applied to slopes.

Do not lay the whole lawn before watering. When a conveniently large area is sodded, water lightly to prevent drying. Continue to lay sod and water until installation is complete.

Rolling

Roll the lawn after laying all the sod (Figure 5). Rolling eliminates irregularities and establishes good contact between the sod and soil. Fill the roller partially with water to provide the necessary weight.

Second Watering

As soon as the sod is installed and rolled, begin to water the lawn thoroughly (Figure 6). Moisten the soil to a depth of 6 inches. Irrigate daily at midday until the sod becomes well rooted, usually about 10 days. After the sod is established, decrease the frequency and increase the amount of water per application. Most grasses are fairly well rooted within 10 to 14 days if watered properly. Nevertheless, it is a good idea to keep people off the lawn for three to four weeks until the grass has become well anchored. Irrigate dormant sodded turf similarly despite the fact it is not actively growing. Lack of irrigation is the number one reason dormant sodding is unsuccessful. Additionally, warm-season grasses do not have the ability to produce new roots during winter.

Monitor soil moisture throughout the winter until new roots develop in late spring.

Mowing

After the sod is well rooted, cut with a sharp mower to avoid tearing and pulling the grass. Start off at a slightly higher mowing height than what is ultimately desired. Despite all efforts to create a smooth surface with good site preparation and planting, some undulations will still remain. Mowing slightly higher initially will prevent scalping of the newly sodded lawn.

Fertilization

Apply fertilizer four weeks after installation. One pound of nitrogen per 1,000 ft² is a good target rate. Delay nitrogen fertilizer applications until April or May (after full green-up) if sod is installed in the off-season while dormant. For more information on fertilizing, see FSA2114, *Fertilizing Your Lawn*.

Herbicides

Some preemergence herbicides applied prior to sod installation in spring or summer can reduce rooting and establishment. Avoid applying any herbicide except glyphosate within two months prior to sod installation. After sod installation in spring or summer, most preemergence and postemergence herbicides can be used on newly sodded turf 30 days after sod installation.

Research indicates pre-emergence and postemergence herbicides applied to dormant sodded bermudagrass and tall fescue 45 days after sod installation do not reduce establishment. Similarly, we recommend waiting about 60 days after sod installation before applying herbicides, according to label recommendations, to dormant sodded

centipede grass, St. Augustine grass and zoysiagrass.

Common Mistakes

Although many mistakes are made when establishing a lawn using sod, a few mistakes occur more frequently. These mistakes include:

- Lack of irrigation or inadequate irrigation during summer, especially to sod edges (Figures 7-9)



Figure 7. Inadequate irrigation distribution on a newly sodded bermudagrass lawn.



Figure 8. Inadequate irrigation of a newly sodded zoysiagrass lawn.



Figure 9. Sod edges drying out on this newly sodded bermudagrass lawn.



Figure 10. Winterkill of bermudagrass sod laid in early winter due to insufficient irrigation during winter (left and right). Some areas were resodded in late winter and survived (center).



Figure 13. Do not purchase sod more than 24 hours after harvesting. Plant fresh material.



Figure 11. Overlapping sod seams during installation will cause desiccation.



Figure 14. Do not purchase sod more than 24 hours after harvesting. Plant fresh material.



Figure 12. Too much space between sod seams during installation will cause drying.

- Lack of irrigation of dormant sodded areas (Figure 10)
- Poor spacing of sod seams (Figures 11 and 12)
- Purchasing/installing sod more than 24 hours after harvesting (Figures 13 and 14)

Additional fact sheets available at <http://publications.uaex.uada.edu/>.

Additional information about turf management available at <http://turf.uark.edu/>.

References

- Ferrell, J.A., T.R. Murphy and W.K. Vencill. 2003. Tolerance of winter-installed tall fescue (*Festuca arundinacea*) and hybrid bermudagrass (*Cynodon transvaalensis* x *C. dactylon*) sod to herbicides. *Weed Tech.* 17(3):521-525.
- Fishel, F.M., and G.E. Coats. 1994. Bermudagrass (*Cynodon dactylon*) sod rooting as influenced by preemergence herbicides. *Weed Tech.* 8(1):46-49.