

Establishing Lawns From Seed

Turfgrass areas are most commonly established with seed, though sodding is another method used in some situations. Sod produces an almost instant turf whereas seed takes much longer to produce a usable turf. Establishment with seed is less expensive and in some ways less complicated than with sod. Regardless of the method chosen, taking time and effort to properly prepare the site will pay dividends for many, many years in a healthy turf that will require minimum inputs. Conversely, taking shortcuts in establishment will produce a problematic, short-lived turf.

There are only a few species of grasses that will perform well in Nebraska and the Northern Great Plains. Turf-type tall fescue performs well in eastern Nebraska while Kentucky bluegrass is the best choice farther west and north of eastern Nebraska. These two are cool-season grasses while buffalograss is a warm-season grass and will perform well throughout the Northern Great Plains. Refer to "Choosing grasses and buying seed for lawns in Nebraska and Northern Great Plains" at <http://turf.unl.edu/pdfcaextpub/Grassesforlawns2012k.pdf> for grass selection.



Figure 1. Remove all construction debris, pea gravel, concrete spoils, etc., prior to establishment to minimize future turf problems.

Timing of seeding:

The optimum time to seed cool-season turfgrasses in Nebraska is between Aug. 15 and Sept. 15, a week or two earlier as you move north to the Dakotas and a week or two later as you move south. It is critical to seed as early as possible within these windows. Even when seeding within these windows, waiting one week later to seed may mean the stand will take two to four additional weeks to mature.

Though the best time to seed is in late summer, sometimes circumstances dictate seeding at other times. If spring-seeding of cool-season turf is necessary, consider seeding before the ground thaws from winter. This is defined as "dormant seeding" because the seed will lie dormant until the soil temperatures warm in April or May. Dormant seeding can be done as early as Thanksgiving and as late as March in most locations. The benefit of dormant seeding is that as the soil heaves and cracks during the winter, crevices are created providing ideal germination conditions in the spring. Additionally, dormant-seeding is easier to schedule than spring seeding, because spring rains make it difficult to seed after March in much of the Great Plains states. Dormant seeding is more effective when

weather remains cold enough to delay germination until spring. Occasionally, extended warm periods in the winter could allow for germination and seedling death with ensuing cold weather. Thus a fast-germinating species like perennial ryegrass is rarely used for dormant seeding.

If late summer or dormant-seeding are not possible, seed cool-season grasses as early in the spring as possible to take advantage of spring rains and cool temperatures. Summer seeding of cool-season grasses

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should be avoided unless done by a skilled professional. Weed and disease pressure plus heat and drought stress make seeding cool-season grasses in the summer extremely difficult.

Warm-season grasses like buffalograss are best established as dormant or spring seedings. Though buffalograss will not germinate until soils warm, early spring seeding will allow the warm-season grass seedlings to take advantage of spring and early summer rainfall and relatively weed-free period. However, like seeding cool-season grasses in winter, spring or summer, irrigation and weed control are critical for successful establishment of buffalograss. More information is found at “Establishing Buffalograss Turf in Nebraska” at <http://www.ianrpubs.unl.edu/epublic/live/g1946/build/g1946.pdf>.

Preparing the Seedbed

On a new site, start with removing all construction debris, branches, rocks, etc. from the area (Fig. 1). If there are weeds growing on the site, assess if there are any perennial grasses like nimblewill, quackgrass, bermudagrass, or windmill grass present. Controlling perennial grassy weeds will require multiple applications of glyphosate over multiple weeks prior to starting soil preparation. Perennial grassy weeds cannot be effectively controlled in the winter or early spring with glyphosate, so if these weeds are found before a planned dormant or spring seeding, delay seeding until after these weeds can be controlled in the summer. More information can be found in “Perennial Grassy Weed Control” at <http://turf.unl.edu/pdfcaextpub/Properenniagrassyweedcontrol2012b.pdf>.



Figure 2. Stockpile topsoil prior to establishing rough grade and then return topsoil to the site, preferably establishing four inches of topsoil over subsoil.

The next step is establishing the rough grade to ensure proper surface drainage away from buildings and eliminating low spots where water can collect. If significant grade changes are required, it may be necessary to stockpile the topsoil, grade the subsoil, rototill the subsoil to relieve compaction and spread the topsoil back out to a minimum depth of 4 inches (Fig. 2).

Once the rough grade is achieved, a soil sample should be taken from the site. The test will determine fertilizer recommendations for the area. Correct any deficiencies in nutrients or pH by following the recommendations in “Soil Testing for Turf Areas” at <http://turf.unl.edu/pdfcaextpub/SoilTesting2012g.pdf>.

Use a rotary tiller or other cultivation equipment to work the soil to a depth of 4-6 inches, incorporating the fertilizer or other soil amendments. To help improve a clay soil, till in one inch of good quality compost and then repeat with another inch of compost tilling in a different direction. Do not attempt to amend a heavy soil by tilling in sand because it will likely become even more compacted in the future than if left unamended. Do not till wet soil because clodding will result, and avoid over-tilling any soil because it will destroy soil

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structure. Slightly compact the soil with a utility tractor or similar weight implement after grading or preferably allow the soil to settle after tilling. Heavy rains and/or irrigation will hasten settling. Allowing time for the soil to settle now will prevent undulations and difficult mowing in the future. Just prior to seeding, rake the area to the finish grade.

After the area is at finish grade, apply a "starter fertilizer" to enhance seed germination and seedling development. Starter fertilizer is high in phosphorus which is listed as the second number in the analysis on the fertilizer bag. For instance, a 16-22-8 fertilizer contains 22% P_2O_5 . Apply the fertilizer according to the label at 1.0 to 1.5 lb. P_2O_5 /1000 sq ft depending on your soil test results. Refer to Table 1 for the proper amount of starter fertilizer to apply.

Seeding

Seed should be applied using a drop spreader because rotary spreaders do not disperse the seed uniformly. However, spreaders typically do have calibration information on seeding turfgrasses. The easiest way to apply seed uniformly to a small area is to calculate and weigh out the amount of seed needed for the area. Then set the spreader adjustment very low, sow one half of the seed in one direction, and then sow the other half at right angles to the first direction. It might take three or more passes over the area in a single direction, but will result in the most uniform seeding. For larger areas, calibrate a drop seeder to apply the proper rate and then seed the area in two or three passes in multiple directions for the most uniformity (Fig 3). Seeding rate recommendations are presented in Table 2.

After the starter fertilizer and seed have been applied, the area should be lightly



Figure 3. Seeding in multiple directions assures most accurate application and quickens establishment of turf cover.

raked and/or lightly rolled with an empty roller to insure good seed-soil contact. A roller designed to be filled with water, but left empty, is perfect for this job. Others will use the "knobby" tires of an all terrain vehicle (ATV) (Figure 4). It is critical to maximize the seed-soil contact for quick germination and establishment.

Mulching

Mulching the area will prevent erosion and conserve water. Therefore, mulching is most important when it is impossible to adequately irrigate newly-seeded areas. One bale of clean (weed-free) straw/1000 sq ft will give a light covering that will not have to be removed after germination. Most will apply too much mulch, which will shade seedlings and have to be raked off later. Apply the mulch lightly so you can still see approximately 50% of the soil through the mulch layer. Mulching is most important in dormant- or spring-seedings, or unirrigated late-summer seedings. Mulching with straw often introduces weed seed, which usually can be controlled with frequent mowing after irrigation. To eliminate weed introduction, professionals use hydromulch which is a paper-based mulch blown on the soil by a specialized sprayer.

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Watering

Seedlings are susceptible to desiccation, and the seedbed should not be allowed to dry. A newly-seeded area will need to be irrigated two to four times daily depending on the weather. Water frequently enough to keep the top 0.5 to 1.0 inch moist, but avoid over-watering and saturating the area. Once the seedlings approach the final mowing height, gradually reduce the frequency of irrigation and water more deeply. After the turf has been mowed two or three times, deep and infrequent irrigation is most effective. However, turf areas less than one year old will require more frequent irrigation throughout the first summer after seeding.

Mowing

Mowing a new lawn will not only encourage the turf to fill in quickly, it will also control most weeds in a new seeding. Mowing should begin when the first few seedlings are tall enough to mow. You may only mow 10% of the plants in the first mowing, 20-30% of the plants in the second mowing, and so on. Most wait too long to mow a newly-seeded turf, but it is better to mow early and often after germination. For lawn-height turf, initially mow at 1.5 to 2.0 inches. After three to four mowings, adjust the mower to the permanent mowing height of 3.0 - 3.5 inches.



Figure 4. Increasing seed-soil contact with rolling or “dimpling” with ATV tires enhances germination and fill-in of turf.

Fertility

New seedlings have poorly developed root systems and thus they cannot effectively absorb nutrients from the soil. Therefore, it is important to fertilize frequently after seeding, with the same starter fertilizer used prior to seeding, to encourage establishment. Apply the starter fertilizer at 1.0 lbs P_2O_5 /1000 sq ft at four to six weeks after germination and again eight to ten weeks after germination. Assuming seeding in mid-August, these applications would be mid- to late September and again mid- to late October. A more common high nitrogen fertilizer applied at 1.0 lb N/1000 sq ft can be substituted for the starter fertilizer at ten weeks after germination if the stand is developing adequately. For dormant and spring seedings, apply the starter fertilizer every four to six weeks throughout the summer as needed to prevent nitrogen deficiency which usually manifests itself as thinning and older leaves turning yellow.

Weed Control

Fall seedings. There is little weed pressure in the fall so weed control may not be needed. Broadleaf weeds may become a problem in the fall, but these can be easily controlled with a broadleaf herbicide application in October or November, after the third or fourth mowing. Annual grasses such as crabgrass can be easily controlled with preemergence herbicides applied in the spring. In seedings made very late in fall where the lawn is not fully established by winter, avoid applying a preemergence herbicide in early spring because it may damage late-developing seedlings. In this case, consider using a postemergence crabgrass herbicide later in summer to control crabgrass. Always apply according to label instructions.

Dormant and Spring Seedings. Always check label instructions when using herbicides, especially over seedling turf. Avoid using broadleaf herbicides in newly-



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seeded areas until seedlings have been mowed at least three times. Herbicides containing mesotrione, quinclorac, or carfentrazone are broadleaf herbicides that are safe to use on seedling turf. Do not use preemergence crabgrass controls (except those containing siduron or mesotrione) at the same time as a spring seeding. As a general recommendation, delay the use of these materials until the new seedlings have been mowed at least twice, depending on the herbicide. Check the herbicide label for exact recommendations. As mentioned earlier, siduron or mesotrione are exceptions to this rule and can be used in the seedbed. Quinclorac or mesotrione can be used for postemergence control of summer annual grassy weeds in seedling turf with little risk to the desired seedlings.

Table 1. Amount of starter fertilizer needed to apply 1.0 lb P₂O₅/1000 sq ft given the % P₂O₅ in the analysis.

% phosphorus in fertilizer	lbs fertilizer needed per 1000 sq ft to deliver 1.0 lb P ₂ O ₅	lbs fertilizer needed per Acre
10	10.0	436
12	8.3	363
14	7.1	311
15	6.7	290
20	5.0	218
22	4.5	198
24	4.2	182
26	3.8	168
28	3.6	156
30	3.3	145
32	3.1	136
34	2.9	128
36	2.8	121
46	2.2	95
60	1.7	73

Table 2. Amount of seed required for 1000 sq ft or one acre given the species composition chosen.

Percentage of species in seed lot				lbs seed/1000 sq ft	lbs seed/Acre
Kentucky bluegrass	Tall fescue	Perennial ryegrass	Buffalo-grass		
100				2-3	87-130
90		10		3	130
80		20		4	175
	100			6-8	260-350
10	90			5-7	217-305
	90	10		6-8	260-350
			100	3	130

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