MISSISSIPPI STATE UNIVERSITY EXTENSION

Forage Establishment in Mississippi

Recommended Seeding Rates, Planting Depths, and Planting Dates for Common Forage Species

Forage production, stand persistence, and economic returns depend on proper forage establishment of pasture and hay fields. Successful forage establishment depends on proper seeding rate, planting depth, and planting date. A seeding rate that is too low can allow for more weed competition. A seeding rate that is too high will cost more than necessary and waste seed. If seed is placed too deeply, seedlings may not emerge. Shallow seeding allows the seed to dry out too soon, be moved out of place by rain, or be consumed by birds, all resulting in stand loss. Planting depth also depends on soil preparation; a seedbed that is too soft can result in deeper seed placement. In addition, the smaller the diameter of the seed, the shallower that seed should be planted.

This guide provides seeding rates, planting depths, and planting dates for common grass and legume species grown in Mississippi. Table 1 provides ranges for seeding rates and planting depths for pure stands. Lower seeding rates in the range are for species established in a prepared seedbed using a drill, while the higher seeding rates are recommended when planting in grass sod with a no-till drill or when broadcasting the seed (prepared seedbed or sod).

Information provided in **Table 1** is broken down by perennial and annual cool- and warm-season species for grasses and legumes. The dates represent an acceptable range of environmental conditions across Mississippi. For northern Mississippi, early-fall and late-spring planting dates are recommended. For southern Mississippi, late-fall and early-spring planting is possible.

Recommended seeding rates for native warm-season grasses are based on pure live seed (PLS) rates. PLS is determined by multiplying the percent seed purity by the percent germination. This information is found on the seed tag if using certified seed.

Proper Seeding

Always use certified seed to make sure that purity and germination is optimal for establishment. When selecting a legume, make sure that it is inoculated with the proper Rhizobia species and that the inoculum is live or fresh before planting. Check the seed tag for the inoculation date; if it was more than 6 months ago, re-inoculate.

Fertilization

Fertilizer application should be based on soil test recommendations. Collect soil samples at least 6 months before planting so you will have time to make lime applications if recommended. Phosphorous (P) and potassium (K) can be applied at the time of seeding. Do not apply nitrogen at planting. It might take 7–21 days for seed to germinate (depending on species) and to develop a root system capable of nutrient uptake. During this period of time, N can be lost depending on N source and environmental conditions. Nitrogen should be applied to grasses when they have reached 1–2 inches of growth. Remember that properly inoculated legumes in ideal soil conditions will make their own N.

Establishment Methods

The two common establishment methods implemented across the state are conventional (prepared seedbed) and no-till (sod seeding). When using conventional seeding, the seedbed should be firm with uniform soil particles and no weeds. Generally, a well-prepared seedbed is firm when an adult's heel footprint is no more than ¼-inch deep. A seedbed with excessive tillage can cause the soil to crust after planting and impede seed emergence. Sod seeding can impact seed establishment if not done properly. Clipping or chemically suppressing the existing forage is recommended to avoid competition. Sod seeding is recommended for planting annual cool-season grasses or clovers into dormant warm-season perennial pastures.

Seeding Methods

Use calibrated equipment to ensure correct seeding rates and depths. Follow equipment manufacturer calculations to determine the proper seeding rate calibration procedure. If you are using rented equipment through your co-op, Natural Resources Conservation Service, or Water Conservation Commission, always check the equipment thoroughly. When plating in a conventional tillage system, a grassland drill or grain drill will be the best option depending on slope and conditions of the field. If the drill does not have a packer wheel system, consider using a cultipacker or roller to press the seed below

the soil surface. Do not mix grass and legume seed in the same hopper box because legume seed will gravitate to the bottom of the drill, which will not allow for homogeneous seed distribution and planting.

Broadcasting seed onto a prepared seedbed can be achieved by using a whirlwind or end gate seeder, but this will require higher seeding rates. Broadcasting will also require rolling and cultipacking before and after broadcasting the seed. The seed should be covered with at least ¼ inch of soil.

Another seeding method is no-till planting. This method is commonly used in warm-season perennial grasses when adding clovers or planting winter annual forages. This method works well when planting into land that is subject to erosion or when no-till practices are being used. Planting into grass sod can help to conserve soil moisture and organic matter. To avoid competition, achieve mechanical or chemical control of the sod before planting. Refer to Extension Publication 1532 Mississippi Weed Control Guidelines for products that could be used to suppress existing vegetation.

Seeding rates, planting depths, and dates provided in this publication are only guidelines for establishing common pure stands of pasture and hay systems in Mississippi. Specific variety information can be found in the annual Forage Variety Trial bulletins at https://www.mafes.msstate.edu/variety-trials/includes/forage/about.asp.

Table 1. Mississippi forage crop establishment guidelines.

Forages	Scientific name	Season	Lb/bushel	Approx. seed/lb	Seeding rate (lb/ac)	Planting depth (in)	Planting date
Perennial Grasses							
Tall fescue	*Schedonorus arundinaceus*	Cool	25	280,000	20–25	¼–½	Sep 15–Oct 30
Bahiagrass	*Paspalum notatum*	Warm	46	273,000	15–20	½–1	Apr 15–Jul 15
Bermudagrass, seed	*Cynodon dactylon*	Warm	40	2,071,000	8–10	¼–½	Apr 15–Jun 30
Bermudagrass, sprigs	*Cynodon dactylon*	Warm	–	–	30–40 bu	1–3	Apr 15–Jun 15
Dallisgrass	*Paspalum dilatatum*	Warm	14	281,000	15–20	¼–½	Mar 15–Jun 15
Johnsongrass	*Sorghum halepense*	Warm	28	119,000	20–25	½–1	Apr 15–Jun 30
Native Grasses**							
Bluestem, big	*Andropogon gerardii*	Warm	22	165,000	9–11	¼–½	Apr 15–Jun 30
Bluestem, little	*Schizachyrium scoparium*	Warm	20	260,000	5–10	0–¼	Apr 15–Jul 30
Eastern gamagrass	*Tripsacum dactyloides*	Warm	5	5,900	6–10	½–1	Apr 15–Jun 15
Indiangrass	*Sorghastrum nutans*	Warm	10	200,000	8–12	¼–½	Apr 15–Jun 30
Switchgrass	*Panicum virgatum*	Warm	55	280,000	5–8	¼–½	May 1–Aug 30
Annual Grasses							
Crabgrass	*Digitaria sanduinalis*	Warm	25	825,000	6–8	½–1	Apr 15–Jun 15
Millet, browntop	*Echinochloa esculenta*	Warm	14	142,000	20–25	½–1	May 1–Jul 30
Millet, foxtail	*Seratica italica*	Warm	50	213,000	15–25	½–¾	May 1–Jul 30
Millet, pearl	*Penisetum glucum*	Warm	48	82,000	15–25	¼–½	May 1–Jul 30
Sorghum, forage	*Sorghum bicolor*	Warm	56	17,000	15–20	1–2	May 1–Jul 30
Sorghum x sudan	*Sorghum bicolor*	Warm	48	35,000	20–25	½–1	May 1–Jul 30
Sudangrass	*Sorghum bicolor*	Warm	40	60,000	30–40	½–1	May 1–Jul 30
Teffgrass	*Eragrostis tef*	Warm	40	1,300,000	8–10	0–¼	May 1–Jun 15
Oat	*Avena sativa*	Cool	32	16,000	90–120	1–2	Sep 15–Oct 30
Rye, cereal	*Secale cereale*	Cool	56	18,000	90–120	1–2	Sep 15–Oct 15
Ryegrass, annual	*Lolium multiflorum*	Cool	24	224,000	20–30	0–½	Sep 15–Oct 30
Triticale	*Triticum x Secale*	Cool	48	15,000	90–120	1–2	Sep 15–Oct 30
Wheat	*Triticum aestivium*	Cool	60	11,000	90–120	1–2	

Forages	Scientific name	Season	Lb/bushel	Approx. seed/lb	Seeding rate (lb/ac)	Planting depth (in)	Planting date
Perennial Legumes							
Alfalfa	*Medicago sativa*	Cool	60	227,000	15–20	¼–½	Sep 15–Nov 15
Red clover	*Trifolium preatense*	Cool	60	272,000	8–12	¼–½	Sep 15–Oct 30
White clover	*Trifolium repens*	Cool	60	768,00	2–3	0–¼	Sep 15–Oct 30
Serecea lespedeza	*Lespedeza cuneata*	Warm	60	372,000	12–15	¼–½	Apr 15–May 30
Annual Legumes							
Arrowleaf clover	*Trifolium vesiculosum*	Cool	60	400,000	5–10	0–½	Sep 15–Oct 30
Ball clover	*Trifolium nigrescens*	Cool	60	1,000,000	2–3	0–¼	Sep 15–Oct 30
Balansa clover	*Trifolium michelianum*	Cool	60	500,000	8–10	¼–½	Sep 15–Oct 30
Berseem clover	*Trifolium alexandrium*	Cool	60	207,000	15–20	¼–½	Sep 15–Oct 30
Crimson clover	*Trifoluim incarnatum*	Cool	60	150,000	20–25	¼–½	Sep 15–Oct 30
Persian clover	*Trifoluim resupinatum*	Cool	60	642,000	3–5	¼–½	Sep 15–Oct 30
Rose clover	*Trifolium hirtum*	Cool	60	164,000	15–20	¼–½	Sep 15–Oct 30
Vetch, hairy	*Vicia villosa*	Cool	60	16,000	20 -25	1–2	Sep 15–Oct 30
Winter pea, Australian	*Pisum sativum*	Cool	60	3,900	30–40	1–2	Sep 15–Oct 30
Annual lespedeza	*Kummerowia stipulacea or K. striata*	Warm	60	240,000	25–30	¼–½	Apr 15–Jun 30
Alyce clover	*Alysicarpus vaginalis*	Warm	60	301,000	15–20	¼–½	May 1–Jun 15
Cowpea	*Vigna unguiculata*	Warm	60	3,600	60–90	1–3	May 1–Jun 30
Lablab	*Lablab purpureus*	Warm	60	3,800	15–20	½–1	Apr 15–Jun 15
Soybean, forage	*Glycine max*	Warm	60	4,500	60–90	1–2	May 1–Jun 30
Forbs							
Chicory	*Cichirium intybus*	Warm	60	426,000	3–4	¼–½	Apr 15–June 1
Kale	*Brassica oleracea*	Warm	50	104,000	3–4	¼–½	Aug 15–Oct 1
Radish	*Raphanus sativus*	Warm	55	50,000	3–4	¼–½	Aug 15–Oct 1
Rape	*Brassica napus*	Warm	50	156,000	3–4	¼–½	Aug 15–Oct 1
Turnip	*Brassica rapa*	Warm	55	220,000	3–6	¼–½	Aug 15–Oct 1

*Lower seeding rates in the range are for species established in a prepared seedbed using a drill, while the higher seeding rates are recommended when planting in grass sod with a no-till drill or when broadcasting the seed (prepared seedbed or sod).

**Pure live seed

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