

# Pasture and Hay Planting

## USDA NRCS

### Georgia Job Sheet 512

January 2008



Participant Name	
County	
Tract Number	
Other	

Field No.	Acres	Species	Seeding* (lb/ac) or Sprigging (bu/ac) Rate	Planting Depth (inches)	Planting Date
<b>Total Material Needed for Job:</b>					

\*All seed and planting materials must be labeled and meet or exceed Georgia seed quality law standards for germination, purity and noxious weed seed limitations.

Caution: If pesticides are handled or applied improperly, or if unused portions are not disposed of safely, they may be injurious to humans, domestic animals, desirable plants, and fish or other wildlife; they may also contaminate water supplies.



<b>Additional Recommendations:</b>
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## Management Objectives

This practice may be applied as part of a resource management system to accomplish one or more of the following objectives:

- ❖ Establish adapted and compatible forage species, varieties, or cultivars
- ❖ Improve or maintain livestock nutrition and health
- ❖ Extend the length of the grazing season
- ❖ Provide emergency forage production
- ❖ Reduce soil erosion by wind and/or water

## General Guidelines – Seedbed Preparation

### New Plantings or Renovation

- ❖ Remove rocks, stumps and other obstructions. Smooth land and surface irregularities that prevent surface drainage and/or interfere with safe and efficient operation of equipment.
- ❖ Tillage methods
  - Conventional – Chisel or subsoil to disrupt plowpans and other soil compaction layers. Thoroughly prepare soil to a depth of 6". Mix fertilizer and lime into the soil and smooth and firm the seedbed.
  - Conservation – Prepare the seedbed with a chisel, disk or other implement so as to leave 30% ground cover of existing residue after planting. Tillage or herbicide application should occur sufficiently early to assure a good kill of existing vegetation prior to planting. Mix fertilizer and lime into the soil during seedbed preparation.
  - No-till – Closely graze or mow existing vegetation. Use herbicides to kill existing vegetation and control weeds. Broadcast fertilizer and lime prior to planting.

### Stand Improvement and Addition of Legumes

- ❖ Correct soil pH deficiencies by liming 6 months to 1 year in advance of planned planting date.
- ❖ Graze or mow existing vegetation to a one-inch stubble height.
- ❖ Herbicides may be used to suppress or kill bands of existing vegetation.
- ❖ Prepare seedbed by lightly disking, ripping, or with other mechanical methods to expose sufficient mineral soil to insure adequate germination and space for seeded plants to grow. Do not penetrate the sod more than 2 – 3".
- ❖ Broadcast fertilizer at or just prior to planting.

## General Guidelines – Planting

- ❖ Conventional and Conservation Tillage  
Use high quality seed and plant uniformly. Place seed in contact with mineral soil using a cultipacker seeder, drill, rotary seeder, or other mechanical seeder. Cover lightly and firm the soil with a cultipacker.
- ❖ Sprigging  
Plant freshly dug high quality sprigs free of undesirable plants into moist soil. Plant using a sprig planter or spread uniformly over the soil surface and lightly disk. Sprig tips should extend approximately 1" above the soil surface following planting. Firm the soil with a cultipacker or other suitable equipment.
- ❖ No-till  
Use high quality seed and plant uniformly. Use a no-till drill equipped with coulters to cut through existing vegetation or crop residue, allowing seed to be placed in contact with the soil at the proper planting depth.
- ❖ Inoculation  
Inoculate legume seed with the proper strain of Rhizobium immediately prior to planting. Use fresh inoculum according to manufacturer's instructions.

## General Guidelines – Management

Restrict grazing and/or limit harvest until the area is well established to the desired species. Avoid grazing young plants during wet weather when they are easily pulled from the ground. Do not graze or mow perennial forages closer than 3 - 4" from the soil surface during the first growing season.

Utilize a Pest Management Plan that includes biological, chemical and cultural methods to control weeds and other pests.

## Determining Pure Live Seed (PLS) –

The percentage of pure live seed is an indicator of seed quality. It is often used in connection with seeding rate recommendations for species which typically have relatively low germination rates, or frequently contain a substantial amount of inert material. If not specified on the label, PLS can be calculated if purity and germination are known.

Example – Assume a bag of seed has a purity of 97.5% and the germination is 70%. PLS is determined by multiplying the purity by the germination and dividing the product by 100. In this example PLS is calculated as:

$$(97.5 \times 70) \div 100 = 68.25\%$$

In order to calculate the amount of seed needed per acre, the PLS recommended seeding rate should be divided by the calculated PLS percentage and multiplied by 100. If the PLS recommended seeding rate is 10 lbs. of PLS/A, and the calculated PLS percentage is 68.25, the amount of seed that should be planted per acre is:

$$(10 \div 68.25) \times 100 = 14.65 \text{ lb.}$$

**14.64 lb. of the material taken from the bag needs to be planted in order to achieve the 10 lb PLS/A recommended seeding rate.**

### Common Planting Mixtures –

*Arrowleaf or crimson clover* with bahiagrass, bermudagrass, tall fescue

*Red or white clover or birdsfoot trefoil* with orchardgrass, tall fescue

*Subterranean clover or vetches* with bermudagrass

*Small grains* with bermudagrass, bahiagrass, orchardgrass, sericea lespedeza, tall fescue

*Ryegrass* with bermudagrass or bahiagrass

**TABLE 1. FORAGE CROPS COMMONLY GROWN IN GEORGIA**

Forage Crop	Seeding Rate (lb/A)	Seeding Depth (in.)	Planting Date			Remarks
			Mountains	Piedmont	Coastal	
<b>Warm-season Perennial Grasses</b>						
<i>Bahiagrass</i>		¼ - ½	--	Mar – Apr	Mar – Apr	Adapted to sandy soils; tolerates drought and poor drainage; best planting results are achieved using a no-till sod drill on prepared ground
▪ Argentine, Pensacola	25					
▪ Tifton 9	5 – 8					
<i>Bermudagrass – common</i> (hulled)	5 – 10	0 - ½	--	Apr – Jun	Mar – Jun	Adapted to sandy soils; tolerates drought; responds to nitrogen; potassium is important for survival and production
<i>Bermudagrass - hybrid</i>			Mar – May	Feb – Apr	Jan – Apr	Adapted to sandy soils; tolerates drought; responds to nitrogen; potassium is important for survival and production; sprig through July if under irrigation
▪ Sprigged in rows	20 bu/ac	Leave upper 2” exposed				
▪ Sprigs broadcast	25 – 40 bu/ac	Covered				
▪ Sprigs no-tilled	20 – 25 bu/ac	Leave upper 2” exposed				

Forage Crop	Seeding Rate (lb/A)	Seeding Depth (in.)	Planting Date			Remarks
			Mountains	Piedmont	Coastal	
<i>Big bluestem</i> <sup>1</sup>	6 – 10	¼ - ½	Apr – May	--	--	Drought tolerant; requires rotational stocking; slow to establish
<i>Dallisgrass</i>	10 – 15	¼ - ½	--	Mar – Apr	Mar – Apr	Adapted to clay and loam soils with good summer moisture
<i>Eastern gamagrass</i> <sup>1</sup>	15 – 20	½ - ¾	May – Jun	May – Jun	Apr – May	Requires rotational stocking; slow to establish
<i>Johnsongrass</i>		½ - 1	--	Apr	Apr	Adapted to clay soils; drought tolerant; rotational stocking required; can become a serious pest in adjacent cropland
▪ Broadcast	20 – 30					
▪ Drilled	10 – 15					
<i>Switchgrass</i> <sup>1</sup>	4 – 6	¼ - ½	Apr – May	Apr – May	Apr – May	Drought tolerant; tolerates poorly drained soils; requires rotational stocking
<b>Warm-Season Annual Grasses</b>						
<i>Browntop millet</i>		½ - 1	May – Aug	May – Aug	May – Aug	Tolerant of soil acidity; less productive than pearl millet or sorghum-sudan hybrids
▪ Broadcast	25 – 30					
▪ Drilled	15 – 20					
<i>Foxtail millet</i>		¼ - ½	May – Jul	May – Jul	May – Jul	Fairly drought tolerant; less productive than pearl millet or sorghum-sudan hybrids; not recommended for horse hay
▪ Broadcast	20 – 30					
▪ Drilled	15 – 20					

Forage Crop	Seeding Rate (lb/A)	Seeding Depth (in.)	Planting Date			Remarks
			Mountains	Piedmont	Coastal	
<i>Pearl millet</i>		0 – ½	Apr – Jun	Apr – Jun	Apr – Jun	Best adapted on sandy soils, tolerant of drought and soil acidity; nitrate accumulation can cause toxicity; requires high stocking rate, preferably with rotational stocking
▪ Broadcast	25 – 30					
▪ Drilled	12 – 15					
<i>Sorghum</i>		1 – 2	May – Jun	May – Jun	May – Jun	Very drought tolerant; not tolerant of highly acid soils; nitrate accumulation or prussic acid can cause toxicity
▪ Broadcast	15 – 20					
▪ Drilled in wide rows	4 – 6					
<i>Sorghum-sudan hybrids &amp; Sudangrass</i>		½ - 1	May – Jun	May – Jun	May – Jun	Very drought tolerant; not tolerant of highly acid soils; requires high stocking rate, preferably with rotational stocking
▪ Broadcast	30 – 35					
▪ Drilled	20 – 25					
<b>Cool-season Perennial Grasses</b>						
<i>Orchardgrass</i>		½ - 1 ½	Sep	Sep	--	Less tolerant of drought and poor drainage than tall fescue; requires moderate stocking
▪ Broadcast	20 – 30					
▪ Drilled	15 – 20					

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			Mountains	Piedmont	Coastal	
<i>Tall fescue</i>		¼ - ½	Sep – Oct or Mar – Apr	Sep – Oct	Oct – Nov	Adapted to clay and loam soils; Endophyte-infected varieties tolerate drought; endophyte-free varieties result in superior gain but require higher level of management; novel endophyte fescue has good survival without toxic effects; to establish in the Coastal Plain plant endophyte-infected ‘Georgia 5’, use low stocking rates, and do not allow summer grazing; causes reproduction problems with mares
<ul style="list-style-type: none"> <li>▪ Broadcast</li> <li>▪ Drilled</li> </ul>	20 – 25 15 – 20					
<b>Cool-Season Annual Grasses</b>						
<i>Prairiegrass (Matua bromegrass)</i>	25 – 30	0 – ¼	Sep	Sep	--	Short-lived perennial or reseeding annual; establishes quickly; drought tolerant; high fertility required; rotational stocking required
<i>Ryegrass</i>		0 – ½	Sep – Oct	Sep – Oct	Sep – Nov	Tolerates wet, poorly drained soil; usually seeded with a small grain; tolerates close continuous grazing
<ul style="list-style-type: none"> <li>▪ Planted alone</li> <li>▪ Planted in mixtures</li> </ul>	20 – 30 10 – 15					

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<i>Small grains (rye, oats, wheat, barley, triticale)</i>		1 – 2	Sep – Oct	Sep – Oct	Sep – Nov	Rye is more tolerant of soil acidity than wheat or oats; Oats is cold sensitive and subject to winterkill; responsive to N and require adequate P & K; overseed into warm- or cool-season perennial grass pastures
▪ Planted alone	90 – 120					
▪ Planted in mixtures	60 – 90					
<b>Warm-Season Perennial Legume</b>						
<i>Perennial peanut</i>	60 – 80 bu/ac rhizomes	2 – 4	--	--	Dec - Mar	Adapted to well-drained, sandy soils in lower half of Coastal Plain (Tift County and south); high nutritive quality; very slow to establish; do not graze during first establishment year; will not tolerate poor drainage; low fertility requirement; calcium applications are necessary; do not cut for hay within 5 – 6 weeks of killing frost
<i>Sericea lespedeza</i>	30 – 40	¼ - ½	Mar – May	Mar – May	Mar – Apr	Drought tolerant; best on clay or loam soils; tolerant of soil acidity and low fertility; tannin content reduces digestibility; select low-tannin varieties; slow to establish

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<b>Warm-season Annual Legume</b>						
<i>Annual lespedeza</i>						High nutritive quality; tolerant of soil acidity and low soil phosphorus; competes poorly under high fertility
▪ Korean	25 – 30	¼ - ½	Feb – Mar	Feb – Mar	--	
▪ Striate	30 – 35	¼ - ½	Feb – Mar	Feb – Mar	Feb – Mar	
<i>Cowpea</i>		1 – 3	May – Jun	May – Jun	May – Jun	Needs good drainage; tolerant of Drought; low fertility and soil acidity
▪ Planted in rows	30 – 40					
▪ Broadcast	100 – 120					
<i>Soybean</i>	60 – 100	1 – 3	May	May	May	Adapted to well-drained soils; drought tolerant; short grazing season
<i>Velvetbean</i>	30	1 – 2	--	--	Apr – May	Adapted to sandy soils; tolerant of soil acidity and low fertility

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<b>Cool-season Perennial Legume</b>						
<i>Alfalfa</i>	12 – 25	¼ - ½	Aug – Sep or Feb - Apr	Sep – Oct or Feb - Apr	Oct – Nov	Requires well-drained soil with pH 6.5+; drought tolerant; supply potassium, phosphorus, sulfur & boron; rotationally graze hay type varieties; control alfalfa weevils
<i>Birdsfoot trefoil</i>	4 – 6	0 – ¼	Sep	--	--	Non-bloating; adapted to well-drained soils; tolerates drought and moderate soil acidity; in mixtures with tall fescue & orchardgrass; allow natural reseeding
<i>Red clover</i>		¼ - ½	Sep – Oct or Feb – Mar	Sep – Oct or Feb – Mar	Oct – Nov	Short-lived; long growing season; fairly tolerant of drought; overseed into cool-season perennial grass sods in Oct – Nov or Feb – Mar; acts as an annual in the Coastal Plain
▪ Broadcast	12 – 15					
▪ Drilled	6 – 8					

Forage Crop	Seeding Rate (lb/A)	Seeding Depth (in.)	Planting Date			Remarks
			Mountains	Piedmont	Coastal	
<i>White or Ladino clover</i>	2 – 3	0 – ¼	Sep – Oct	Sep – Oct	Oct – Dec	High quality grazing; bloat can be a problem; tolerant of moderate soil acidity and wet soils; survives under drought conditions; in mixtures with cool-season perennial grasses; overseed into cool-season perennial grass sods in Oct – Nov or Feb – Mar
<b>Cool-season Annual Legume</b>						
<i>Arrowleaf clover</i>	5 – 10	0 – ½	--	Sep – Nov	Oct - Nov	Plant only scarified seed; can be planted earlier than crimson clover; reseeds well; not tolerant of soil acidity or low fertility; in mixtures with perennial grasses
<i>Ball clover</i>	2 – 3	0 – ¼	--	Sep – Oct	Oct - Nov	Good natural reseeder; adapted to loam & clay soils; tolerant of poor drainage; bloat can be a problem; tolerates heavy grazing
<i>Caleypea</i>	50 – 55	½ - 1	--	Sep – Oct	Oct - Nov	Plant scarified seed; good natural reseeder; adapted to clay & loam soils; does well on wet, acid soils; seed are mildly toxic to livestock

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<i>Crimson clover</i>	20 – 30	¼ - ½	--	Aug – Oct	Oct - Nov	Not tolerant of poorly drained soils; tolerant of soil acidity; more productive under low temperatures than most clovers; in mixtures with perennial grasses at 10 lb. seed/A
<i>Rose clover</i>	15 – 20	¼ - ½	--	Sep – Oct	Oct - Nov	Good natural reseeder if livestock removed by mid-April; tolerant of drought & low soil fertility; adapted to soil pH 6 – 7
<i>Subterranean clover</i>	10 – 20	¼ - ½	--	Sep – Oct	Oct - Nov	Adapted to well-drained soils; lower yielding than crimson or arrowleaf clover; supply adequate phosphorus & potassium; tolerant of soil acidity, close continuous stocking, & shade; overseed into bermudagrass

Forage Crop	Seeding Rate (lb/A)	Seeding Depth (in.)	Planting Date			Remarks
			Mountains	Piedmont	Coastal	
<b><i>Vetch</i></b>		1 – 2				Requires well-drained soil; high phosphorus requirement; tolerant of soil acidity; do not graze until plants are at least 6” tall; plant small grain at 60 lb/A as companion crop; overseed into bermudagrass
▪ Common	30 – 40		--	Sep – Oct	Oct – Nov	
▪ Hairy & bigflower	20 – 25		Sep – Oct	Sep – Oct	Oct – Nov	
<b><i>Winter Pea</i></b>	30 – 40	1 – 2	Sep – Oct	Sep – Oct	Sep – Oct	Adapted to well-drained loam or sandy loam soils; seed at 20 – 30 lb/A if planted with a small grain; does not tolerate highly acid soils; suited for use as silage or green manure
<sup>1</sup> Native warm-season grasses such as big bluestem, eastern gamagrass and switchgrass should be established on a well prepared seedbed; no-till planting of these grasses is not recommended.						