



## Establishing and Grazing Alfalfa in Mississippi

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Alfalfa (*Medicago sativa*) is a productive and vigorous forage crop that has not been widely grown in the Mississippi because information on adapted varieties is lacking. It is the fourth largest crop (acreage base) grown in the United States following corn, soybeans, and wheat. Alfalfa is high quality forage commonly fed to beef cattle, sheep, and horses and it can be also used for green chop and silage. Alfalfa is a cool-season perennial legume with up to 36 inches of growth and a deep taproot. Most tillers arise from the crown. Leaves are trifoliate with serrated leaflets at the tip.

When planting alfalfa always select a variety that will fit your area. New varieties with greater yield potential, better persistence, winter hardiness and disease resistance, and improved forage quality have been developed in the last years. Varieties will perform differently in various growing regions; look for varieties grown in similar soil type and climate to your farm as possible to determine yield potential. Persistence depends on management. Expected persistence in Mississippi should be 3 to 4 years with good management practices. Fall dormancy determines how tall alfalfa will grow in the month following the last cutting. Three areas of adaptation have to be considered in Mississippi (Figure 1). Dormant alfalfas (dormancy 4 to 5) will fit in the northern part of the state. Dormant and semi-dormant alfalfas (dormancy 5 to 7) will fit in the central part. Semi-dormant and non-dormant alfalfas (dormancy 7 to 10) will fit the southern part of Mississippi. Semi-dormant and non-dormant varieties typically might recover faster after cuttings, yield more in the fall and might green up earlier in the spring.

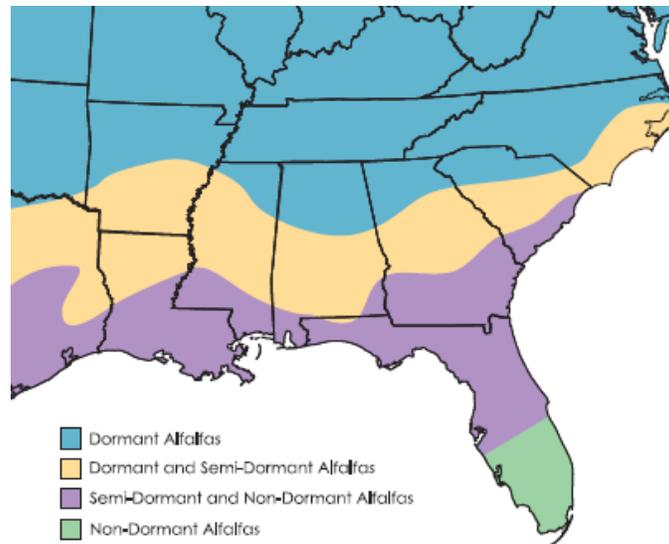


Photo Courtesy: Cal-West/Producer's Choice Seed.

**Figure 1.** Alfalfa adaptation map for Mississippi.

Alfalfa requires a well-drained soil for optimum and production and establishment. Always soil test before planting. Liming is the most important part in establishing, maintaining high yielding and quality alfalfa stands. Alfalfa is sensitive to soil acidity and soil pH of 6.2 or above is required for optimum yield production. Apply lime at least 6 months (preferably 12 months) prior to seedling since lime reacts



very slowly with soil acids. Alfalfa is a legume that should fix most of its own N requirement. Applying 20 to 55 pounds of fertilizer N per acre at establishment will aid seedling growth while root nodules are forming. Phosphorous, potassium, boron and sulfur are important nutrients for a good establishment. Manure is a good source of macro- and micronutrients that could be used to satisfy alfalfa nutrient requirements. Testing the manure prior to application is recommended for application rates that will satisfy alfalfa nutrient needs. Avoid direct manure/seed contact. Manure application prior to seeding should be incorporated into the soil. On soils with a relatively high leaching potential (sandy and sandy loam) apply manure within 3 to 4 weeks of seeding. On less leachable soils, manure may be applied in the fall before alfalfa seeding.

Fall seeding is preferred since adequate soil moisture and cool temperatures enhance germination and establishment. Alfalfa should be plated from mid-September to mid-October in a well-prepared seed bed at a seeding rate of 15 to 20 lb/acre. No-till is better recommended for Round-up Ready (RR) varieties. Plant seeds  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch deep in medium to heavy soils and  $\frac{1}{2}$  to 1-inch deep on sandy soils. Alfalfa usually needs about 6 weeks growth after germination to store the necessary carbohydrates and survive the winter. To ensure a proper nitrogen fixation, it is better to purchase pre-inoculated seed or treat the seeds using commercial inoculums. Nodules are the result of an infection by an effective strain of bacteria (*Rhizobium meliloti*). The inoculum should be from the current year and should have been stored in a cool place in the store away from sunlight. Contact your local County Extension Office for the proper inoculating procedure.

One of the major challenges for alfalfa producers is a successful weed control using conventional herbicides. The most critical time for weed management in alfalfa is during establishment. Weed infestation and competition during establishment will reduce seedling vigor and affect persistence and longevity of the perennial crop. Yield reduction in thinning stands results in loss of  $\frac{1}{2}$  to 1 lb of yield for each pound of weeds produced. Roundup Ready (RR) technology has been successfully incorporated into alfalfa and is scheduled for commercial release in the near future. Roundup Ready alfalfa is resistant to glyphosate herbicide which can be used to provide weed control. Roundup Ready alfalfa can provide high quality, weed-free forage with excellent crop safety and minimal harvest restrictions. Yields advantages have been reported at Mississippi State University (Table 1). Roundup Ready alfalfa may also help in the establishment of no-till alfalfa stands, but it may not be appropriate for all situations.

With adequate soil moisture, alfalfa can produce good quantity of grazeable forage for five to seven months. Alfalfa productivity in the southern part of Mississippi can occur from March to November while in the northern part could be April to October. It could be used for pasture, hay, or silage. Spring grazing is usually help to avoid weather delays and quality loss which it typical during the first cutting. Summer grazing of alfalfa could benefit livestock during the "summer slump" (late July and August) when quality of warm-season grasses and tall fescue declines substantially. Grazing in the fall could help avoid problems with slow curing of hay due cooler temperatures and high humidity and when most warm-season pastures have completely utilized. Alfalfa also makes excellent forage alternative for weaning calves. I can add weight to yearling cattle or increase cow condition prior to winter.

Even though alfalfa can be grazing tolerant, it still can cause bloat. Currently none of the new varieties have the reduced bloat potential. Grazing pure alfalfa stands through the growing season does not have much appeal to many livestock producers. This problem can be reduced combining grass with alfalfa in fields to be grazed. A 50/50 (alfalfa/grass) mixture is recommended. This mixture percentage or even a lower alfalfa percentage will not guarantee that it will be bloat free, but sharply reduce the risk potential. Provide an anti-bloating agent such as poloxalene several days prior to and while grazing alfalfa. It is also important to provide mineral high in sodium and avoid excessive calcium, magnesium, and potassium.



Continuous grazing of alfalfa is not recommended because it will result in lower grazing efficiency and rapid stand decline. When rotational grazing alfalfa divide the pasture that each paddock will have approximately 25 to 35 days rest period, which means six to eight grazing days. Flexibility can occur in this grazing scheme but it is not recommended grazing for no more than 10 to 12 days. Stocking rates that can be used on alfalfa depend on grazing management and production. When grazing alfalfa in the spring, wait until the plants has reached 6 to 8 inches of growth. Avoid reducing stubble height to less than 3 inches. It is important to monitor livestock during spring grazing because rapidly growing young alfalfa might present a higher bloat potential. After the spring grazing has ended, allow alfalfa to grow for about 25 to 40 days before cutting it for hay. In fall, bloating potential still remains a concern, especially three to five days after a hard freeze. It is recommended to leave a 6 to 8 inches stubble height after fall grazing. To help alfalfa to survive through the winter, allow the plants to grow with cutting or grazing for four to six weeks prior to the expected hard freeze (usually October 15 to November 15). This rest period will allow plants to store carbohydrates to maintain plants alive throughout the winter and develop new shoots in the spring.

**Table 1.** Alfalfa Production in Mississippi in 2006 and 2007.

Variety	2006 <sup>2</sup>			2007		
	Alfalfa	Weed	Total	Alfalfa	Weed	Total
	----- Yield (lb/ac) -----					
Alfagraze	6951	671	7622	13071	795	13866
Alfagraze 300 RR <sup>1</sup>	8400	0	8400	15598	0	15598
Alfagraze 600 RR <sup>1</sup>	10078	0	10078	14832	0	14832
Amerigraze 702	8717	472	9189	15728	565	16293
NFABI	6715	565	7281	13177	600	13777
NFOK	8293	448	8742	14850	848	15698
R84BD31 <sup>1</sup>	8376	0	8376	14090	0	14090
<b>Average</b>	<b>8219</b>	<b>308</b>	<b>8527</b>	<b>14478</b>	<b>401</b>	<b>14879</b>

<sup>1</sup>RR = Round-ready varieties.

<sup>2</sup>Planting rate = 20 lb/ac Pure Live Seed in a Marietta sandy loam soil in Starkville, MS.  
Source: J.R. Parish et al., 2008. American Forage and Grassland Council Annual Meeting.