



**Yield of  
Semidormant and Nondormant  
Alfalfa Varieties  
in Mississippi**

**MAFES**

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# **Yield of Semidormant and Nondormant Alfalfa Varieties in Mississippi**

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Alfalfa is a high-quality forage with the potential to produce a profit for specialty markets, such as horses, dairy cattle, and to a much smaller extent rabbits or guinea pigs.

Interest in alfalfa in south Mississippi is increasing because of profit potential and high nutritional value. Alfalfa is a versatile crop, which can be harvested as greenchop, hay, or silage; some varieties can be grazed. Production is accomplished without the addition of nitrogen fertilizer, thereby reducing production cost and possible groundwater contamination.

Problems associated with producing high-quality alfalfa hay in the South are primarily loss of stand and adverse weather. Loss of stand is normally attributed to weeds, diseases, and insect infestations. Alfalfa breeders have improved disease and insect resistance of new cultivars. Chemical companies have developed and registered herbicides and insecticides that, coupled with proper management, can reduce weed and insect losses.

Alfalfa is a crop that requires high inputs and careful management to produce a high-quality product. Most alfalfa hay coming into south Mississippi is from Oklahoma and other western states that have climates more adapted to alfalfa production. In the Deep South, heat, high humidity, frequent rain showers, and a myriad of disease and insect problems complicate alfalfa production. Many soil sites are also too poorly drained to sustain alfalfa production. Alfalfa should only be grown on sites with good internal and external drainage.

This work was initiated to compare the yield of new alfalfa releases to currently grown standard varieties. It is a cooperative project with the USDA-ARS Regional Plant Introduction Station at Griffin, Georgia. The objective is to find high yielding alfalfa varieties adapted to environmental conditions of the Deep South.

## Materials and Methods

Six nondormant and 16 semidormant alfalfa varieties were planted October 13, 1989 in plots 4.5 feet by 20 feet on a prepared seedbed at a seeding rate of 25 lb/A using a KEM small plot drill. A randomized complete block design with three replications was

used. Statistical analysis was accomplished using the SAS GLM Procedure.

Fertilizer and lime were applied to soil test recommendations. Trifluralin, which is labeled for use in forage legumes for cover crops but not for hay or grazing, was preplant incorporated at 0.5 lb ai/A for weed control in this experimental planting. Four hundred pounds of 0-24-24 and 2 lb/A of boron were applied in April of each year.

Plots were harvested with a rotary lawn mower and "hay" (at 13% moisture) yield was determined at 32-day intervals, when possible, during the growing season. Gramoxone was applied immediately after each harvest for weed control at a rate of 0.75 pt/A in 20 gallons of water.

Production budgets were taken from Agricultural Economics Report 43, Forage 1991 Planning Budgets.

## Results

### *Nondormant Varieties*

In 1990, the nondormant alfalfa varieties were harvested six times starting March 21. The highest yielding of the six varieties were DL 8802, 5,820 lb/A; Florida 77, 5,355 lb/A; and VS-448, 5,306 lb/A (Table 1). There were no differences in total yield among nondormant varieties.

In 1991, the nondormant alfalfa varieties were harvested five times starting March 25. The highest yielding of the six varieties were Florida 77, 7,641 lb/A; WL 516, 7,080 lb/A; and Condor, 7,061 lb/A (Table 2).

In 1992, the nondormant alfalfa varieties were harvested five times starting April 24. The three highest yielding varieties were DL 8802, 12,144 lb/A; Florida 77, 12,134 lb/A; and VS-448, 11,591 lb/A (Table 3). There were no differences in yield attributable to variety.

For the total yield over 3 years, the highest yielding of the six varieties were Florida 77, 25,130 lb/A; DL 8802, 25,018 lb/A; and VS-448, 23,662 lb/A (Table 4). There were significant differences in yield among nondormant alfalfas attributable to variety for 1991 and for the 3-year total. In 1991, Florida 77 outyielded DL 8801 and VS-448. Over the 3 years, Florida 77 outyielded all varieties except DL 8802.

**Table 1. Hay yield of nondormant alfalfa varieties MAFES South Mississippi Branch, Poplarville, MS, 1990.**

Variety	Cutting Date, 1990						Total
	3/21	4/25	5/29	7/18	8/20	9/19	
	lb/A						
Condor	817	574	496	1,338	705	757	4,687
DL 8801	620	487	354	1,160	555	597	3,773
DL 8802	1,189	877	615	1,367	854	918	5,820
Florida 77	1,024	790	598	1,535	720	688	5,355
VS-448	1,054	714	520	1,466	750	802	5,306
WL 516	858	606	472	1,417	675	849	4,877
Mean	927	675	509	1,381	710	768	4,970
LSD(0.05)	343	232	NS	NS	NS	NS	NS
CV%	20.3	18.9	22.4	13.3	14.5	21.6	13.3

Planting date: 11/89

Seeding rate/A: 25 lb Fertilized annually/A: 0-96-96 + 2 lb Boron

0.75 pt/A Gramoxone after every cutting

**Table 2. Hay yield of nondormant alfalfa varieties, MAFES South Mississippi Branch, Poplarville, MS, 1991.**

Variety	Cutting Date, 1991					Total
	03/25	05/07	06/13	07/15	08/14	
	lb/A					
Condor	1,754	1,160	1,424	1,401	1,322	7,061
DL 8801	1,676	1,097	1,227	1,228	1,209	6,437
DL 8802	2,069	1,242	1,349	1,171	1,223	7,054
Florida 77	1,789	1,278	1,519	1,509	1,546	7,641
VS-448	1,855	1,151	1,237	1,271	1,251	6,765
WL 516	1,799	1,313	1,415	1,358	1,195	7,080
Mean	1,824	1,207	1,362	1,323	1,291	7,006
LSD(0.05)	NS	NS	NS	NS	200	689
CV%	8.5	9.2	9.5	8.3	8.5	5.4

Planting date: 11/89

Seeding rate/A: 25 lb Fertilized annually/A: 0-96-96 + 2 lb Boron

0.75 pt/A Gramoxone after every cutting

**Table 3. Hay yield of nondormant alfalfa varieties, MAFES South Mississippi Branch, Poplarville, MS, 1992.**

Variety	Cutting Date, 1992					Total
	04/24	05/29	06/25	07/22	08/22	
	lb/A					
Condor	2,505	2,375	2,774	1,531	2,133	11,318
DL 8801	2,526	2,283	2,861	1,498	2,145	11,313
DL 8802	2,608	2,769	2,672	1,541	2,554	12,144
Florida 77	2,588	2,794	2,818	1,649	2,285	12,134
VS-448	2,670	2,467	2,789	1,294	2,371	11,591
WL 516	2,526	2,558	2,630	1,444	2,252	11,410
Mean	2,571	2,541	2,757	1,493	2,290	11,652
LSD(0.05)	NS	NS	NS	NS	NS	NS
CV%	7.0	9.8	9.9	10.2	9.6	4.8

Planting date: 11/89

Seeding rate/A: 25 lb

Fertilized annually/A: 0-96-96 + 2 lb Boron

0.75 pt/A Gramoxone after every cutting

### Semidormant Varieties

In 1990, the semidormant alfalfa varieties were harvested seven times starting March 21. The highest yielding of the 16 varieties were WL 320, 8,348 lb/A; WL Southern Special, 7,935 lb/A; and Cimarron, 7,893 lb/A (Table 5).

In 1991, the semidormant alfalfa varieties were harvested five times starting March 25. The three highest yielding varieties were WAMPR, 7,980 lb/A; WL Southern Special, 7,811 lb/A; and Pioneer 5331, 7,774 lb/A (Table 6).

In 1992, the semidormant alfalfa varieties were harvested five times starting April 24. The three highest

**Table 4. Hay yield of nondormant alfalfa varieties, MAFES South Mississippi Branch, Poplarville, MS, 1990-92.**

Variety	Years			Total
	1990	1991	1992	
	-----lb/A-----			
Condor	4,687	7,061	11,318	23,066
DL 8801	3,773	6,437	11,313	21,523
DL 8802	5,820	7,054	12,144	25,018
Florida 77	5,355	7,641	12,134	25,130
VS-448	5,306	6,765	11,591	23,662
WL 516	4,877	7,080	11,410	23,367
Mean*	4,970C	7,006B	11,652A	23,628
LSD(0.05)	NS	689	NS	1,006
CV%	13.3	5.4	4.8	6.1

Planting date: 11/89

Seeding rate/A: 25 lb

Fertilized annually/A: 0-96-96 + 2 lb Boron

0.75 pt/A of Gramoxone was applied after each cutting

\* Means within row followed by the same letter are not different at the P=0.05 level according to DMRT.

**Table 5. Hay yield of semidormant alfalfa varieties MAFES South Mississippi Branch Station, Poplarville, MS, 1990.**

Variety	Cutting		Date,					1990 Total
	3/21	4/26	5/25	6/20	7/18	8/20	9/19	
	-----lb/A-----							
Apollo	899	714	676	435	1,027	492	686	4,929
Archer	1,007	1,243	1,046	909	1,298	673	731	6,907
Arrow	1,137	1,366	1,145	742	1,333	655	642	7,020
Cimarron	1,375	1,440	1,206	921	1,393	673	885	7,893
Cimarron VR	1,386	1,477	972	666	1,393	600	642	7,136
GT58	650	812	652	423	910	382	664	4,493
Haymark	1,267	1,292	898	525	1,003	346	620	5,951
Magnum 3	1,181	1,452	1,132	831	1,357	655	819	7,427
NK 84634	1,224	1,390	1,071	908	1,404	728	775	7,500
NK 86637	952	1,082	923	627	1,228	619	752	6,183
Pioneer 5331	1,386	1,476	960	832	1,463	710	775	7,602
Pioneer 5432	1,169	1,280	1,082	832	1,452	746	841	7,402
VS-447	1,008	1,082	837	615	1,168	491	619	5,820
WAMPR	1,169	1,377	1,082	908	1,428	655	797	7,416
WL 320	1,365	1,722	1,193	1,062	1,511	764	731	8,348
WL Southern Special	1,386	1,365	1,169	972	1,476	837	730	7,935
Mean	1,160	1,285	1,003	763	1,303	627	732	6,873
LSD(0.05)	365	289	220	266	258	177	155	1,323
CV%	18.9	13.5	13.2	20.9	11.9	17.0	12.7	11.5

Planting date: 11/89

Seeding rate/A: 25 lb

Fertilized annually/A: 0-96-96 + 2 lb Boron

0.75 pt/A Gramoxone after every cutting

**Table 6. Hay yield of semidormant alfalfa varieties, MAFES South Mississippi Branch, Poplarville, MS, 1991.**

Variety	Cutting Date, 1991					Total
	03/25	05/07	06/13	07/15	08/14	
	lb/A					
Apollo	1,681	1,075	1,349	953	949	6,007
Archer	1,702	1,216	1,703	1,451	1,102	7,174
Arrow	1,805	1,199	1,605	1,324	1,063	6,996
Cimarron	1,846	1,137	1,673	1,271	1,025	6,952
Cimarron VS	2,022	1,251	1,733	1,504	1,038	7,548
GT 58	1,516	1,111	1,388	1,346	886	6,246
Haymark	1,764	1,181	1,762	1,240	759	6,706
Magnum 3	2,032	1,313	1,703	1,525	988	7,561
NK 84634	1,877	1,269	1,949	1,472	1,088	7,655
NK 86637	1,732	1,199	1,437	1,346	937	6,651
Pioneer 5331	2,062	1,251	1,979	1,419	1,063	7,774
Pioneer 5432	1,577	1,199	1,615	1,334	1,063	6,788
VS-447	1,599	1,058	1,605	1,303	1,012	6,577
WAMPR	1,897	1,199	1,999	1,632	1,253	7,980
WL 320	1,877	1,242	1,920	1,494	1,127	7,660
WL Southern Special	1,877	1,260	1,890	1,557	1,227	7,811
Mean	1,804	1,198	1,706	1,386	1,016	7,130
LSD(0.05)	280	NS	412	NS	NS	1,287
CV%	9.3	9.2	14.5	14.5	19.4	10.8

Planting date: 11/89  
 Seeding rate/A: 25 lb  
 Fertilized annually/A: 0-96-96 + 2 lb Boron  
 0.75 pt/A Gramoxone after every cutting

**Table 7. Hay yield of semidormant alfalfa varieties, MAFES South Mississippi Branch, Poplarville, MS, 1992.**

Variety	Cutting Date, 1992					Total
	04/24	05/29	06/25	07/22	08/20	
	lb/A					
Apollo	2,463	1,434	1,957	1,207	1,687	8,748
Archer	3,014	1,715	2,758	1,542	2,182	11,211
Arrow	3,329	1,762	2,527	1,304	2,215	11,137
Cimarron	2,969	1,874	2,609	1,336	2,271	11,059
Cimarron VS	3,351	1,874	2,609	1,595	2,362	11,791
GT 58	2,946	1,602	2,324	1,336	2,047	10,255
Haymark	2,845	1,640	2,419	1,282	2,035	10,221
Magnum 3	3,138	1,790	2,731	1,444	1,957	11,060
NK 84634	3,644	1,752	2,731	1,466	2,474	12,067
NK 86637	3,003	1,706	2,677	1,412	2,114	10,912
Pioneer 5331	3,329	1,949	2,718	1,509	2,362	11,867
Pioneer 5432	3,318	1,786	2,690	1,509	2,249	11,552
VS-447	3,048	1,706	2,568	1,380	2,238	10,940
WAMPR	3,284	1,987	2,786	1,692	2,114	11,863
WL 320	3,497	1,902	2,690	1,487	2,305	11,881
WL Southern Special	3,239	1,977	2,745	1,692	2,249	11,902
Mean	3,151	1,779	2,596	1,450	2,179	11,154
LSD(0.05)	NS	NS	NS	NS	NS	NS
CV%	13.8	14.0	12.8	18.1	13.6	10.4

Planting date: 11/89  
 Seeding rate: 25 lb/A  
 Fertilized annually: 0-96-96 +2 lb Boron  
 0.75 pt/A Gramoxone after every cutting

**Table 8. Hay yield of semidormant alfalfa varieties, MAFES South Mississippi Branch, Poplarville, MS, 1990-92.**

Variety	Years			Total
	1990	1991	1992	
	lb/A			
Apollo	4,929	6,007	8,748	19,684
Archer	6,907	7,174	11,211	25,292
Arrow	7,020	6,996	11,137	25,153
Cimarron	7,893	6,952	11,059	25,904
Cimarron VS	7,136	7,548	11,791	26,475
GT 58	4,493	6,247	10,255	20,995
Haymark	5,951	6,706	10,221	22,878
Magnum 3	7,427	7,561	11,060	26,048
NK 84634	7,500	7,655	12,067	27,222
NK 86637	6,183	6,651	10,912	23,746
Pioneer 5331	7,602	7,774	11,867	27,243
Pioneer 5432	7,402	6,788	11,752	25,742
VS-447	5,820	6,577	10,940	23,337
WAMPR	7,416	7,980	11,863	27,259
WL 320	8,348	7,660	11,881	27,889
WL Southern Special	7,935	7,811	11,902	27,648
Mean	6,873C	7,130B	11,154A	25,158
LSD(0.05)	1,323	1,287	NS	1,483
CV%	11.5	10.8	10.4	6.1

Planting date: 11/89

Seeding rate/A: 25 lb

Fertilized annually/A: 0-96-96 + 2 lb Boron

0.75 pt/A Gramoxone after every cutting

yielding varieties were NK 84634, 12,067 lb/A; WL Southern Special, 11,902 lb/A; and WL 320, 11,881 lb/A (Table 7).

There were significant differences in yield in 1990, 1991, and the 3-year total. Over 3 years, the three highest yielding varieties and their respective yields (lb/A) were WL 320, 27,889 lb/A; WL Southern Special, 27,648 lb/A; and WAMPR, 27,259 lb/A (Table 8).

## Discussion

For the 3-year period there was little difference between the average yield of semidormant and nondormant alfalfa varieties. Over 3 years, the semidormant varieties had a total average yield of 25,170 lb/A and the nondormant 23,635 lb/A, which is a difference of 1,535 lb/A.

The direct cost to establish an acre of alfalfa was \$154.60, or \$51.53 per year prorated over 3 years, (Table 9). The estimated annual cost of maintaining and harvesting an acre of alfalfa five times per year plus establishment costs prorated over 3 years was \$347.69 (Table 10) (Enterprise Budget Committee, 1991). Maintenance costs were lower than those projected by Mississippi State University because lower fertility levels were required. It is imperative to soil test annually and follow recommendations that ensure adequate nutrients are available for plant growth.

Average total yield for all varieties over the life of the stand was 349 bales (70 lb/bale) per acre or an average annual yield of 116 bales per acre.

According to local feed dealers, current alfalfa prices range from \$4.00 to \$6.00 per bale depending on qual-

**Table 9. Direct cost of establishing an acre of alfalfa in south Mississippi, 1991.**

Item	Size or unit	Times over	Quantity	Total* cost
<b>Equipment &amp; Tractor</b>				
Chisel	9-ft	1		6.36
Disk	14-ft	2		8.95
Cultipack	12-ft	1		2.11
Grain drill	12-ft	1		5.91
				23.33
<b>Fertilizer</b>				
Lime	ton		1.0	30.00
0-24-24	cwt		3.0	27.27
Solubor	lb		5.0	3.25
Spreading	acre		1.0	3.00
				63.52
<b>Seed</b>				
Alfalfa	lb		25	67.75
				67.75
			<b>Total</b>	<b>\$154.60</b>

\*Includes labor where applicable.

**Table 10. Direct cost of maintaining and harvesting one acre of alfalfa hay with establishment cost prorated over 3 years in south Mississippi.**

Item	Maintenance Cost			Total* cost
	Size or unit	Times over	Quantity	
<b>Equipment &amp; Tractor</b>				
Cut and Condition	9.0-foot	1		11.64
Rake	8.5-foot	1		4.86
Hay baler	small bales	1		9.74
Twine	bundle		0.08	1.75
Trailer, hay	20-foot	1		1.28
Haul hay	ton	1		15.00
Sprayer, 3-point	21-foot	1		2.74
<b>Herbicide</b>				
Gramoxone	pints		0.75	4.30
				51.31
<b>Cuttings</b>				
				x 5
	Subtotal			256.55
<b>Fertilizer</b>				
Solubor	pounds		5.0	3.25
0-24-24	cwt		4.0	36.36
	Subtotal			39.61
	Prorated Establishment Cost			51.53
	Total			347.69

\* Does not include fixed costs for land or buildings.

ity. This would result in gross income ranging from \$464.00 to \$696.00 per acre based on an average annual yield of 116 bales per acre. The annual net income over direct costs would range from \$116.31 to \$348.31 per acre assuming five cuttings per acre per year and excellent management.

To produce high-quality hay, alfalfa must be cut on a rigid schedule. Also, Deep South weather is notoriously volatile and severe thundershowers occur without warning. Hay should be cut at the 1/10 bloom growth stage and remain on the ground for the minimum amount of time. It is beneficial for producers to own their hay equipment if they have enough acre-

age to justify the expense. Custom harvesters are another option, but selection of a dependable operator is essential. Because of the cost of harvesting, baling, and hauling, it is important that the yield of each cutting be as high as possible to justify trips across the field.

## Conclusions

These data show that alfalfa can be a viable crop for south Mississippi. Over the 3 years, average annual yield of nondormant and semidormant alfalfa varieties was approximately 8,100 lb/A. There were only small differences in yield among the nondormant and semidormant varieties. Most varieties tested have the potential to produce profitable yields, which agrees with results obtained by Hovermale (1987 and 1991), and Blaine et al. (1988). It appears that the break-even point for alfalfa production at \$4.00 per bale over 3 years is 16,168 lb/A, or 87 70-lb bales/A, annually.

## References

1. Blaine, M.A., D.B. Reginelli, and W.E. Stevens. 1988. Alfalfa Trials in North Mississippi. Mississippi Agricultural and Forestry Experiment Station Research Report 13:7.
2. Enterprise Budget Committee. 1991. Forage, 1991 Planning Budgets. Mississippi Agricultural and Forestry Experiment Station and Mississippi Cooperative Extension Service, Agric. Econ. Rep. 43.
3. Hovermale, Carl H. 1991. Alfalfa Variety Trials in South Mississippi. Mississippi Agricultural and Forestry Experiment Station Information Bulletin 208.
4. Hovermale, Carl H. 1987. Alfalfa Variety Trials in South Mississippi. Mississippi Agricultural and Forestry Experiment Station Research Report 12:5.



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