

2014 Southeast Hay Convention

Alfalfa Production in the South



Alfalfa in the Southeast Traveling with "Horse Power"

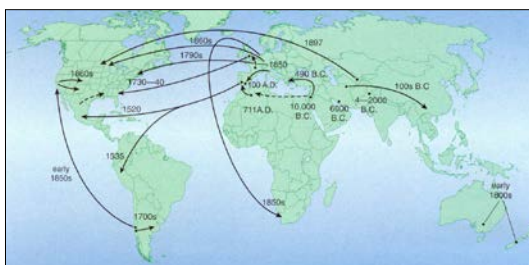
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Where Did Alfalfa Come From?



How Alfalfa Came to the U.S.A.

Nine historical germplasm sources introduced to US
M. falcata, Ladak, *M. varia*, Turkestan, Flemish,
Indian, Chilean, Peruvian, African



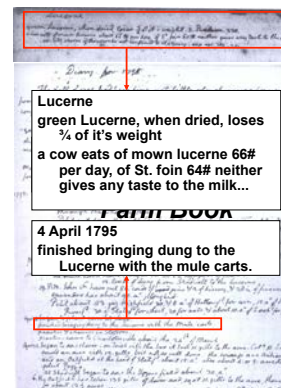
Russelle, 2001, Am. Sci. 89:252

Jefferson and Lucerne



Mid-March, 1770, First mention in Jefferson's records:

"Work to be done at Monticello.
plant raspberries, gooseberries—
currans—strawberries—
asparagus—artichokes—fill up
trees—sow grass—henhouse—
cherry tree—Lucerne..."



Jefferson and Lucerne

9/12/1795, Jefferson to George Washington:

"I sowed at the same time 2. acres of Lucerne, in exactly an equal soil, which in both instances had been originally rich, but was considerably exhausted. I gave the Lucerne this last year a good coat of dung, & due tillage; yet it is such poor dwindling stuff that I have abandoned it,

10/4/1795, George Washington to Jefferson:

"Lucern has not succeeded better with me than with you; but I will give it another, and fairer trial before it is abandoned altogether.



11/20/1801, William Maclure to Jefferson:

"...perhaps the clover, **lucern** & other grasses which grow in the upper parts of Germany might succeed with you where the English and Dutch seeds have failed.... In the country around the Hartz Mountains they use **pulverized Gypsum as a top dressing** for their Lucern & Clover and frequently cut the lucern seven times....."

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Alfalfa Management

Pliny, *Naturalis Historia*, A.D. 50

XLIII. Lucerne is foreign even to Greece, having been imported from Media during the Persian invasions under Darius; but so great a bounty deserves mention even among the first of the grains, since from a single sowing it will last more than thirty years.

Well tilled, weed free seedbed

Lime and fertilize as needed

Plant after danger of frost

Don't grow in wet areas

BOOK XVIII. XLIII. 146-147V. 150

Harvest at early flower

Control weeds

Plow up when stands thin

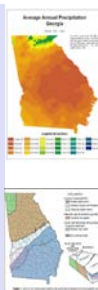
Also it is more useful when green, as it dries into a woolly state and finally thins out into a useless dust. About tree-melick, which itself also is given a very high rank among fodder, we have spoken sufficiently among the shrubs. And now we have to complete our account of the nature of all the cereals, in one part of which we must also speak about diseases.

...not much has changed in ~ 2000 years!

Variety selection



- Variety selection is one of the most important considerations in an alfalfa production program
- Most of the forage breeding in the United States is focused in the upper Midwest, Great Plains, the Intermountain West, and the irrigated regions of the southwest.
- The Georgia environment is substantially different.
- Germplasm from outside the region typically performs poorly within the state and the southeast region
- UGA forage breeding program has historically developed commercially successful cultivars such as Alfagraz, Alfagraz 600RR, Bulldog 505, and Bulldog 805 alfalfas



Variety selection

Table 6. 2013 Dry matter yields for alfalfa varieties in Poplarville

Variety	4/13/13	5/28/13	6/20/13	8/7/13	Total
Alfagraz 600RR	2192	1540	1475	1465	6673
Ameristand 815TRR	2327	1491	1882	1353	7053
Bulldog 505	2363	1532	1504	1747	7147
DKA41-18RR	1393	1414	1740	1442	5989
DKA65-10RR	2479	1549	1760	1478	7266
DKA84-10	2094	1251	1538	1273	6157
Mean	2141	1463	1665	1460	6729
LSD α_{05}	NS	NS	NS	290	NS
CV%	29	19	15	13	12

CV%: Not Significant

Planted: 10/12/12 Soil: Basin loam

Fertilized: 315 lb/ac of 0-0-60 @ mid-season

Lime: 1 ton/ac @ planting

Herbicide: Paraquat after each harvest 1 pint/ac; Pursuit (ammonium salt of imazethapyr) 4 oz/ac after first harvest

Variety selection

Variety	2 yr average (2008-2009)	3 yr average (2008-2010)
	Midville	Athens
Attention II	6430 bc	9468 bode
Bara - 5035	7243 a	9757 bod
Bara/Wet 5011	7108 ab	10592 a
Bulldog 505	7233 a	9861 abc
Bulldog 805	6561 abc	9213 cde
CW 351601	-	8074 f
CW 361061	6223 c	-
CW 500	-	10114 ab
Evermore	-	9788 bc
Hybri Force 600	7117 ab	8550 e
Hybri Force 700	6462 bc	9036 de
PGI 801	6769 abc	-
PGI 909	-	7635 d
Phoenix	-	9940 abc
TS 40101	-	9531 bode
TS 80311	-	8590 bc
CV%	10	9
LSD	710	735

Soil acidity and Aluminum tolerance



- Aluminum (Al) toxicity in acid soils is one of the factors limiting production of forage legumes
- Al tolerance was identified in a diploid *Medicago sativa* subs. *caerulea* accession and has been successfully integrated at the tetraploid level in the Al-tolerant genotype Altet-4
- Identification of acid soil and Al tolerance sources in NPGS collection and incorporation of the traits in adapted germplasm
- Precision phenotyping and development of molecular markers for the Al-tolerance trait to accelerate the development of alfalfa cultivars with improved productivity in acidic and Al-toxic soils

Selection for grazing tolerance

- Response to grazing is a vital criteria for the development of persistent forage cultivars intended for use in the Southeast
- Performance of varieties developed over 3 decades has proven convincingly that exposure to grazing can be exploited in plant selection to improve grazing tolerance
- Extended this strategy to all perennial species



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FD = 1
Dormant

FD = 11
Non-dormant

Dormancy controls autumn growth...

Growth after September harvest

...and regrowth rate during the year

Growth seven days after harvest

FD = 11 FD = 5 FD = 1

Why Grow Alfalfa?

\$\$\$ Economic opportunities

- Warm season grass systems have an abundance of forage from late spring through summer,
- Are not productive in fall and winter.
- The two biggest challenges in assembling a balanced forage system are maintaining supplies of quality forage in Fall and extending the grazing as long as possible into early winter.

Filling in the blanks....

Normal forage availability by month

Species: Alfalfa, Sweetclover, Field Pea, Red Clover, Ladino Clover, etc.

Interseeding Alfalfa in Bermudagrass

Eliminate Your N Cost

Legume	Plant N derived from atmosphere (%)	N Fixed symbiotically (kg ha ⁻¹)
Alfalfa	80	114-300
Sweetclover	90	5-250
Fababean	90	178-300
Field Pea	80	2-200
Lentil	80	10-150

Interseeding Alfalfa in Bermudagrass:

Increase The Value Of Your Hay

Feed and Forage Analysis Report

Client Information: [Name], [Address], [Phone]

Sample: [Sample ID]

Analysis: [Nutrient Data]

Feed and Forage Analysis Report

Client Information: [Name], [Address], [Phone]

Sample: [Sample ID]

Analysis: [Nutrient Data]

Profitable to grow alfalfa

Is it more profitable to grow alfalfa hay or grow corn?

The analysis shows it can be more profitable to grow Alfalfa than the row crops.

	US and National Farm Averages	Example	Alfalfa	Corn	Soybean
Revenue					
Value of Crop ¹	\$225/ton	\$6.70/bu	\$13.65/bu		
Expected Yield	3.0 ²	122.8 ³	35.3 ³		
Value of Harvested Crop per Acre	\$679	\$823	\$482		
Expenses (Avg of 4 states)⁴					
Crop Inputs (fertilizer, pesticides, herbicides, etc)	\$135	\$263	\$113		
Seeding costs per Year per Acre ⁵	\$33	\$109	\$50		
Cost to Harvest	\$138	\$182	\$108		
Total Cost	\$306	\$554	\$271		
Net Profit per Acre	\$372	\$269	\$211		

¹ Alfalfa Upper Midwest average price in 2012 per ton; USDA 2011 for Corn and Soybeans; ² USDA NASS Quick Stats - 2012 US Average; ³ Alfalfa Tons per acre; ⁴ USDA 2012 harvest forecast in bushels per Acre; ⁵ US Midwest States Extension Services; ⁶ Alfalfa seeding costs are averaged over 4 years, includes Tech Fee for Round-up Ready variety

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Alfalfa in Georgia

Moultrie
Mid November, 2006



Moultrie
Mid December, 2006



Interseeded into bermudagrass
Irrigated; Limed; Fertilized (P & K)
Fall dormancy = 8
(if North Georgia, FD = 4-5)

Bulldog Alfalfa in Valdosta, GA, inter-seeded in Tift 85 Bermudagrass
2nd year stand
(picture taken March 24, 2011)



Bulldog 505 Alfalfa interseeded in Alicia Bermudagrass in
Watkinsville, GA Planted: Nov. 2009
Picture taken March, 2011



Alfalfa seeded in Bermuda in Cook County
in the fall of 2004 (picture June 2005)



Bulldog 505 alfalfa sod-seed in Tifton 44
Bermudagrass in Chattooga County



Bulldog 505 Alfalfa Sod-seeded in Bermuda
in N.W. GA



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**Bulldog 805 Alfalfa Inter-seeded in Tift. 44
Bermudagrass in Nov. Picture taken in July**



**Bulldog 805 Alfalfa Inter-seeded in Tift.44
Bermudagrass, Moultrie,GA .1 year old. Picture
taken in Dec.**



Alfalfa-bermudagrass is a viable system....

1. Well-drained site.
2. Soil test for adequate pH (6.5), fertility (100 lbs/acre P and 250-300 lbs/acre K).
3. Before seeding, bermudagrass is mowed or grazed to 1-2", spray contact herbicide (Gramoxone at 1 qt/ac, glyphosate at 9 oz/ac of 5.5-lb ai/gal, glyphosate at 12 oz of 4-lb ai formula).
4. Fire can be used after the chemical burndown.
5. Plant on 7-9" rows no deeper than 1/2".
6. After emergence, apply Mustang or Karate at the highest rates allowed to control field crickets that feed on seedlings at night).
7. Planting dates, Sept. 15 to Oct. 15 in the Mountains and Piedmont area, Oct. 15-Nov. 15 in the Coastal Plains region,.
8. Seeding rate: 22- to 25-lb/acre.

Thank you for your attention !!!!