Comparing Input Costs for Alfalfa and Grass (2006)

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Fertilizer prices have just about doubled across the board. So, one begins to wonder if the production costs of alfalfa and grass are very different and if one should change their cropping program. I have put together three tables to compare the input costs of pure alfalfa, pure grass, and a alfalfa/grass mix. **These tables are a format for you to use to make your own decisions. They are not a definitive answer on which crop is cheaper to grow.** The tables are organized so that you can plug in a cost for each potential application of fertilizer. Then at the bottom, the cumulative input cost is divided by the cumulative yield for up to five years. Plug in your own numbers based on your management practices, yields, and manuring practices, then get out a calculator to determine the cost per ton of dry matter. Of course to select the right crop rotation you will also have to consider what the soil will grow and all the other issues that you can not punch into a calculator.

In the tables, I included numbers for two different management practices. I used Cornell fertilizer recommendations for a soil with medium fertility in phosphorus (P) and potassium (K). And I also determined fertilizer amounts to replace P and K removed by the crop. It is interesting to see the cost difference between these two management practices (ie. $42/ac difference in top-dressing alfalfa). Can you afford not to have a Cornell soil test and compare your fertilizer practices with their recommendations? Cornell fertilizer recommendations are based on years of field research.

I did not include the cost of liming the soil. For both crops you need to maintain soil pH. Alfalfa needs a pH of 6.8 to 7.0, and grass needs a pH of 6.0 to 6.2. No matter the pH level, you will need to add about the same amount of lime to maintain soil pH for either crop.

Fertilizing grass can be costly, especially when you have to "spoon-feed" the N. Grass takes $77 of nitrogen a year in three applications ($21 or so). Fortunately, manure can meet the Cornell recommendation for P and K if you apply 4,000 gallons (two applications of 2,000 gal) - a reasonable amount to topdress. However, that will only give you 44 lbs of N (this includes manure N from the previous year) and you need 175 lbs for the year. So, you still need to topdress N onto grasses. It seems logical to apply N in the early spring and maybe some after first cutting. The manure N will be most available when the weather is warm and moist (summer time).

Applying manure to alfalfa can be risky. Machinery can damage the crowns, especially if the soil is wet and soft. Manure that is incorporated before seeding alfalfa has shown to increase yields. Weeds are also more abundant the first year. Use manure to build soil nutrients to a high but safe level a couple of years before seeding alfalfa. The deep tap root will mine the nutrients that are stored in the soil. Then reduce the risk of manuring alfalfa by topdressing only older stands when the ground is hard. Topdress within two days of harvest. Manure must go onto stubble and not regrowth.

Our most common cropping strategy is probably the best. Plant alfalfa and grass mixes. Treat them like alfalfa for three years, then manage them like a grass after that and supply nutrients with manure. Use manure to build the soil fertility before the seeding year.

The challenge is how to grow grass cheaply on those fields not suited for alfalfa. Three N applications per season is not cheap. Harvesting first cutting while it is still high in quality is also a challenge. You can spend $40/ac for spring N and then never get the grass harvested on time. For poorly drained fields that are at high risk for a timely first cutting, perhaps we should eliminate the April application of N and just topdress with manure after first and second cuttings. It would seem reasonable to spread manure on grass fields during the winter. However, spreading manure on frozen hay fields with much forage remaining creates a high risk for the manure to run off with rain and snow. It is better to spread manure onto the stubble and soil rather than a mat of foliage.

Another option for poorly drained fields is to grow red clover. I am sure many dairymen and women do not like that option, but it is one way to diversify your crops and spread your risk on a few acres. A clover/grass mix will give you the same cost advantage as an alfalfa/grass mix. Red clover matures later than alfalfa to spread your harvest window. Feeding clover to dairy cows is different than alfalfa. I have included an article in this issue of "Ag News" about feeding red clover.

The rules of the game have changed for forage production. I hope that these tables will help you think through your forage management. If you have any questions, please call.

PURE ALFALFA INPUT COSTS					
	Cornell Management[1]			Nutrient Replacement[2]	
	Seeding Year				
INPUT	Amount	Cost		Amount	Tot. Cost
Seed	15# @ 4.50/#	$67.50		15# @ $4.50/#	$67.50
Starter fert.[3]	60# P 30# K	24.60 7.80		60# P 30# K	24.60 7.80
July Topdress	20# P 30# K	8.20 7.80		20# P 80# K	8.20 20.80
Appl. Cost		7.00			7.00
	Cost/yr	$122.90		Cost/yr	$128.90
Years 2 - 5					
Summer Topdress	20# P 30# K	8.20 7.80		40# P 160# K	16.40 41.60
Appl. Cost		7.00			7.00
	Total Cost/yr	$23.00		Cost/yr	65.00
Yield and Cumulative Input Cost per Ton Dry Matter					
	tons DM\yr	Cum. $/ton		tons DM\yr	Cum. $/ton
Year One	2	$61.45		2	$64.45
Year Two	4	$24.32		4	$32.32
Year Three	4	$16.89		4	$25.89
Year Four	4	$13.71		4	$23.14
Year Five	4	$11.94		4	$21.61

1) Cornell fertilizer recommendations for a gravelly loam soil with medium levels of soil phosphorus and potassium.
2) Fertilization based on replacing 10# phosphorus and 40# potassium for each dry matter ton of alfalfa or grass harvested.
3) Fertilizer is priced at $0.44/# for nitrogen, $0.41/# for phosphorus, and $0.26/# for potassium.

PURE GRASS INPUT COSTS					
	Cornell Management[1]			Nutrient Replacement[2]	
	Seeding Year				
INPUT	Amount	Cost		Amount	Tot. Cost
Seed	10# @ $3/#	$30.00		10# @ $3/#	$30.00
Starter fert. [3]	40# N 10# P 30# K	17.60 4.10 7.80		40# N 10# P 30# K	17.60 4.10 7.80
July Topdress	50# N 10# P 50# K	22.00 4.10 13.00		50# N 20# P 80# K	22.00 8.20 20.80
Appl. Cost		7.00			7.00
	Cost/yr	$105.60		Cost/yr	117.50
Years 2 - 5					
April Topdress	75# N	33.00		75# N 20# P 80# K	33.00 8.20 20.80
Appl. Cost		7.00			7.00
June Topdress	50# N 10# P 60# K	22.00 4.10 15.60		50# N 10# P 40# K	22.00 4.10 10.40
Appl. Cost		7.00			7.00
July Topdress	50# K	22.00		50# N 10# P 40# K	22.00 4.10 10.40
Appl. Cost		7.00			7.00
	Cost/yr	$117.70		Cost/yr	156.00
Yield and Cumulative Input Cost per Ton Dry Matter					
	tons DM\yr	Cum. $/ton		tons DM\yr	Cum. $/ton
Year One	2	$52.80		2	$58.75
Year Two	4	$37.22		4	$45.58
Year Three	4	$34.10		4	$42.95
Year Four	4	$32.76		4	$41.82
Year Five	4	$32.02		4	$41.14

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ALFALFA / GRASS MIX INPUT COSTS					
	Cornell Management[1]			Nutrient Replacement[2]	
	Seeding Year				
INPUT	Amount	Cost		Amount	Tot. Cost
Seed	12# @ $4.50 5#@ $3	$69.00		Same seed	$69.00
Starter fert. [3]	60# P 30# K	24.60 7.80		60# P 30# K	24.60 7.80
July Topdress	20# P 30# K	8.20 7.80		20# P 80# K	8.20 20.80
Appl. Cost		7.00			7.00
	Cost/yr	$124.40		Cost/yr	$137.40
Years 2 - 3					
Topdress	20# P 30# K	8.20 7.80		40# P 160# K	16.40 41.60
Appl. Cost		7.00			7.00
	Cost/yr	$23.00		Cost/yr	65.00
Years 4 - 5					
April Topdress	75# N	33.00		75# N 20# P 80# K	33.00 8.20 20.80
Appl. Cost		7.00			7.00
June Topdress	50# N 10# P 60# K	22.00 4.10 15.60		50# N 10# P 40# K	22.00 4.10 10.40
Appl. Cost		7.00			7.00
July Topdress	50# K	22.00		50# N 10# P 40# K	22.00 4.10 10.40
Appl. Cost		7.00			7.00
	Cost/yr	$117.70		Cost/yr	156.00
Yield and Cumulative Input Cost per Ton Dry Matter					
	Tons DM\yr	Cum. $/ton		Tons DM/yr	Cum. $/ton
Year One	2	$62.20		2	$68.70
Year Two	4	$24.57		4	$37.73
Year Three	4	$17.04		4	$26.74
Year Four	4	$20.58		4	$30.24
Year Five	4	$22.54		4	$32.19

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