

Table A1. Chemical composition of diets used in cow trial.

Component <sup>1</sup>	Diet		
	Alf-TMR	Late grass-TMR	Early grass-TMR <sup>2</sup>
Forage to concentrate ratio	53	44	47
Crude protein	16.7 <sup>a3</sup>	17.0 <sup>a</sup>	20.6 <sup>b</sup>
Acid detergent fiber	22.9 <sup>a</sup>	21.0 <sup>a</sup>	17.4 <sup>b</sup>
Neutral detergent fiber	38.04 <sup>a</sup>	40.33 <sup>a</sup>	33.07 <sup>b</sup>
NEL <sup>4</sup>	1.65	1.61	1.65
Calcium	1.41	0.91	0.80
Phosphorus	0.54	0.50	0.62
Magnesium	0.37	0.33	0.38
Potassium	1.42	1.61	2.23
Sodium	0.338	0.0301	0.286

<sup>1</sup>Reported as % of DM, except for Soluble protein (% of Crude Protein) and NEL, reported as Mcal kg<sup>-1</sup>.

<sup>2</sup>Alf = Alfalfa; Late grass = Late cut orchardgrass; Early grass = early cut orchardgrass.

<sup>3</sup>Statistics are reported for Crude protein, neutral detergent fiber and acid detergent fiber only. n=10.

<sup>4</sup>NEL = net energy for lactation.

Table A2. Chemical composition of alfalfa and grass silages used in cow trial.

Component <sup>1</sup>	Silage		
	Alfalfa	Late orchardgrass	Early orchardgrass
		%	
Crude protein	17.3 <sup>a2</sup>	15.5 <sup>a</sup>	22.8 <sup>b</sup>
Acid detergent fiber	34.3 <sup>a</sup>	35.8 <sup>a</sup>	27.5 <sup>b</sup>
Neutral detergent fiber	53.2 <sup>b</sup>	65.4 <sup>a</sup>	46.2 <sup>c</sup>
NEL <sup>3</sup>	1.50	1.39	1.54
Calcium	0.93	0.55	0.44
Phosphorus	0.29	0.32	0.40
Magnesium	0.28	0.29	0.33
Potassium	1.56	2.44	3.35
Sodium	0.025	0.124	0.029

<sup>1</sup>Reported as % of DM, except for NEL, reported as Mcal kg<sup>-1</sup>.

<sup>2</sup>Statistics are reported for Crude protein, neutral detergent fiber and acid detergent fiber only.  
n=10.

<sup>3</sup>NEL=net energy for lactation.

Table A3. Production parameters as influenced by forage source.

Component <sup>1</sup>	Silage		
	Alfalfa	Late orchardgrass	Early orchardgrass
Dry matter intake, kg d <sup>-1</sup>	22.0	21.3	23.5
Body weight, kg	610	590	613
Body condition score <sup>1</sup>	2.8	3.0	2.9
Milk production, kg d <sup>-1</sup>	34.7	32.9	38.7
Milk fat, %	3.36	3.36	3.39
Milk protein, %	2.93	3.03	3.00
Milk lactose, %	4.75	4.60	4.66
Milk urea nitrogen, mg/dl	13.9 <sup>a2</sup>	15.7 <sup>b</sup>	16.2 <sup>c</sup>

<sup>1</sup>On a scale of 1 to 5.

<sup>2</sup>Means within a row with different superscript are different ( $P < 0.05$ ).

Table A4. Chemical composition of diets used in cow trial.

Component <sup>1</sup>	Diet	
	Late cut orchardgrass-TMR	Earlycut orchardgrass-TMR
Forage to concentrate ratio	41	59
Crude protein	17.78 <sup>a2</sup>	17.72 <sup>a</sup>
Acid detergent fiber	21.78 <sup>a</sup>	20.08 <sup>a</sup>
Neutral detergent fiber	41.23 <sup>a</sup>	38.82 <sup>a</sup>
NEL <sup>3</sup>	1.61	1.58
Calcium	1.10	0.88
Phosphorus	0.51	0.48
Magnesium	0.44	0.34
Potassium	1.34	1.61
Sodium	0.319	0.390

<sup>1</sup>Reported as % of DM, except for NEL, reported as Mcal kg<sup>-1</sup>.

<sup>2</sup>Statistics are reported for crude protein, neutral detergent fiber and acid detergent fiber only.  
n=7.

<sup>3</sup>NEL=net energy for lactation.

Table A5. Chemical composition of alfalfa and grass silages used in cow trial (from Northeast DHIA analyses).

Component <sup>1</sup>	Silage	
	Late cut orchardgrass-TMR	Earlycut orchardgrass-TMR <sup>2</sup>
Crude protein	17.12 <sup>a2</sup>	18.26 <sup>a</sup>
Acid detergent fiber	35.03 <sup>b</sup>	29.71 <sup>b</sup>
Neutral detergent fiber	62.76 <sup>b</sup>	54.68 <sup>b</sup>
NEL <sup>3</sup>	1.36	1.39
Calcium	0.69	0.42
Phosphorus	0.37	0.31
Magnesium	0.50	0.23
Potassium	1.40	1.97
Sodium	0.108	0.204

<sup>1</sup>Reported as % of DM, except for Soluble protein (% of Crude Protein) and NEL, reported as Mcal kg<sup>-1</sup>.

<sup>2</sup>Statistics are reported for crude protein, neutral detergent fiber and acid detergent fiber only. N=7.

<sup>3</sup>NEL=net energy for lactation.

Table A6. Production parameters as influenced by forage source.

Component <sup>1</sup>	Silage	
	Late orchardgrass	Early orchardgrass
Dry matter intake, kg d <sup>-1</sup>	15.6 <sup>a1</sup>	19.2 <sup>b</sup>
Body weight, kg	544 <sup>a</sup>	545 <sup>a</sup>
Body condition score <sup>2</sup>	2.75 <sup>a</sup>	2.93 <sup>a</sup>
Milk production, kg d <sup>-1</sup>	31.4 <sup>a</sup>	35.3 <sup>b</sup>
Milk fat, %	3.94 <sup>a</sup>	3.73 <sup>a</sup>
Milk protein, %	2.71 <sup>a</sup>	2.85 <sup>b</sup>
Milk lactose, %	4.62 <sup>a</sup>	4.79 <sup>b</sup>
Milk urea nitrogen, mg/dl	15.35 <sup>a</sup>	13.64 <sup>b</sup>

<sup>1</sup>Means within a row with different superscript are different ( $P < 0.05$ ).

<sup>2</sup>On a scale of 1 to 5.

Table A7. Nitrogen management and harvest management of perennial grasses: Site characteristics.

	Site		
	Aurora	Ithaca	Mt. Pleasant
Elevation, ft.	830	960	1650
Soil type	Lima loam	Collamer very fine silt loam	Langford channery silt loam
Drainage	Moderately well drained	Moderately well drained	Moderately well drained
Date of grass establishment	5/14/94	5/22/94	5/10/93
Soil status (as of April, 1995) <sup>1</sup>			
pH	7.65	6.97	6.90
Soil P status	Low	High	High
Soil K status	Low	Medium	Very High
OM%	4.10	3.24	6.88
Soil status (as of Nov., 1995) (480 lbs N/A plots only)			
pH	7.66	6.39	6.70
Soil P status	High	High	High
Soil K status	Low	Medium	Medium
OM%	4.36	3.81	7.25
Soil status (as of Nov., 1997) (480 lbs N/A plots only)			
pH	7.50	6.00	6.40
Soil P status	Medium	High	Medium
Soil K status	Medium	High	Medium
OM%	3.10	2.40	5.30

<sup>1</sup> Plots were fertilized for P and K according to soil test recommendations in late April, 1997.

Table A8. Nitrogen management and harvest management of perennial grasses: Experimental design and treatments.

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Experiment: Split-split plot randomized complete block design with 4 replicates.

Treatments	
Main plot	Grass Species (Timothy and Reed canarygrass)
Split plot	N fertilization (0, 60, 120, 240, and 480 lbs N/year)
	N applied in spring: 0, 60, 80, 120, and 240 lbs.
	N applied after 1st cut: 0, 0, 40, 60, and 120 lbs.
	N applied after 2nd cut: 0, 0, 0, 60, and 120 lbs.
Split-split plot	Harvest management (early and late)
	Early cut: at approx. 55% NDF
	Late cut: at approx. 65% NDF
	1st harvest: Late cut approx. 7-10 days after early cut
	2nd harvest: Late cut approx. 14-20 days after early cut
	3rd harvest: Late cut approx. 21-40 days after early cut (actual harvest date affected by rate of regrowth)
Manure application:	40 tons manure/acre (split applied before and after 1st cut)
	40 tons manure + 480 lbs N/acre (Manure applied to 4 replicates of reed canarygrass at Aurora and Ithaca)
Herbicide application:	1 pt/acre Banvel applied annually to all sites (for control of clover, primarily in low N plots)

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Table A9. Nitrogen management and harvest management of perennial grasses: Harvest Dates.

Harvest	Early/Late cut	Aurora	Ithaca	Mt. Pleasant
<u>1996</u>				
1	E	5/29	5/20	6/3
	L	6/11	5/30	6/12
2	E	6/25	6/24	7/1
	L	7/22	7/16	7/26
3	E	8/12	8/6	8/13
	L	9/27	9/30	10/2
4	E	9/27	9/30	10/2
N applied in spring		4/30	4/27	5/3
Manure applied in spring		5/3	5/2	
<u>1997</u>				
1	E	5/27	5/22	6/4
	L	6/10	6/5	6/16
2	E	6/27	6/25	7/1
	L	7/23	7/16	7/31
3	E	8/14	8/5	8/19
	L	10/7	10/2	10/6
4	E	10/7	10/2	10/6
N applied in spring		4/24	4/16	4/25
Manure applied in spring		5/7	5/5	

Table A10. Reed canarygrass neutral detergent fiber (NDF), % of dry matter, as influenced by N fertilization and harvest management, 1997.

N Fertilization (lbs of N/A)	Cutting Management						
	Early				Late		
	Cut 1	Cut 2	Cut 3	Cut 4	Cut 1	Cut 2	Cut 3
<u>Aurora</u>							
0	60.7	61.0	60.1	-	63.0	57.0	50.6
60	59.8	60.5	60.5	-	57.8	58.1	-
120	59.8	61.3	60.8	-	62.2	61.1	61.6
240	60.5	62.2	60.0	50.3	59.3	62.9	56.3
480	60.1	56.4	55.8	46.8	62.0	59.4	53.7
<u>Ithaca</u>							
0	49.8	65.4	52.6	51.9	61.4	61.9	57.9
60	50.9	64.3	56.0	53.6	64.3	64.6	58.2
120	50.3	64.8	55.1	51.3	65.0	68.0	58.6
240	-	64.6	51.8	52.2	-	67.9	58.2
480	48.1	64.4	50.8	47.8	59.4	64.7	57.7
<u>Mt. Pleasant</u>							
0	54.6	60.2	58.3	47.7	60.6	59.3	53.3
60	58.3	57.7	55.6	45.3	67.5	59.3	55.6
120	58.0	59.0	56.3	47.7	68.5	61.6	55.7
240	-	56.8	57.0	46.8	-	62.4	50.7
480	56.3	54.3	57.9	44.6	62.2	59.6	54.6

<sup>1</sup> means of 4 field replicates.

Table A11. Timothy neutral detergent fiber (NDF), % of dry matter, as influenced by grass N fertilization and harvest management, 1997.

N Fertilization (lbs of N/A)	Cutting Management						
	Early				Late		
	Cut 1	Cut 2	Cut 3	Cut 4	Cut 1	Cut 2	Cut 3
<u>Aurora</u>							
0	57.6 <sup>1</sup>	65.4	52.0	-	60.7	53.5	-
60	61.9	58.6	52.6	-	62.5	57.9	-
120	64.4	60.5	55.3	-	63.2	58.0	-
240	62.0	61.7	53.4	52.2	62.2	59.9	51.1
480	61.4	59.2	53.4	50.9	61.0	56.7	52.1
<u>Ithaca</u>							
0	52.2	64.1	56.4	54.8	61.9	56.2	56.1
60	55.0	62.7	60.7	57.4	67.4	59.0	53.0
120	52.6	65.5	57.9	56.0	65.2	62.2	53.4
240	54.1	64.4	53.6	52.7	64.0	62.8	55.3
480	51.3	62.4	54.5	48.8	60.9	62.1	54.8
<u>Mt. Pleasant</u>							
0	53.9	61.5	55.3	-	62.2	54.3	50.8
60	61.1	58.0	54.5	50.0	70.0	58.4	55.9
120	61.8	59.4	54.3	53.8	67.2	59.4	57.4
240	59.2	58.5	56.0	48.1	64.4	60.9	54.6
480	56.3	56.3	55.0	47.5	62.3	58.7	53.1

<sup>1</sup> means of 4 field replicates.

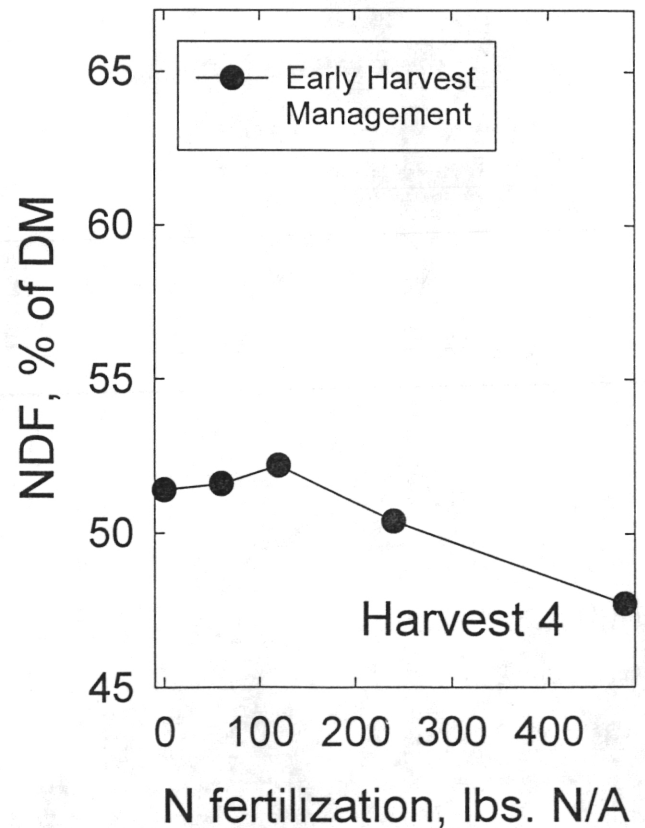
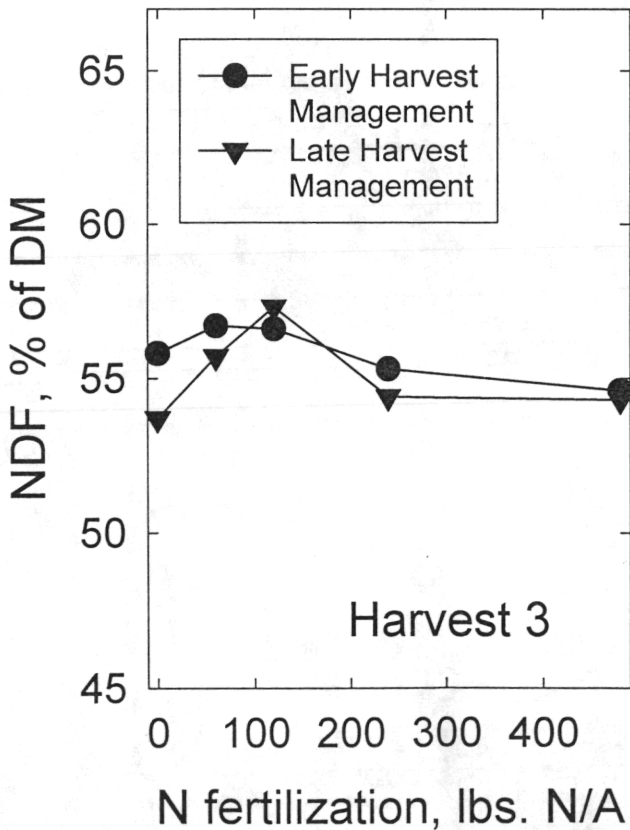
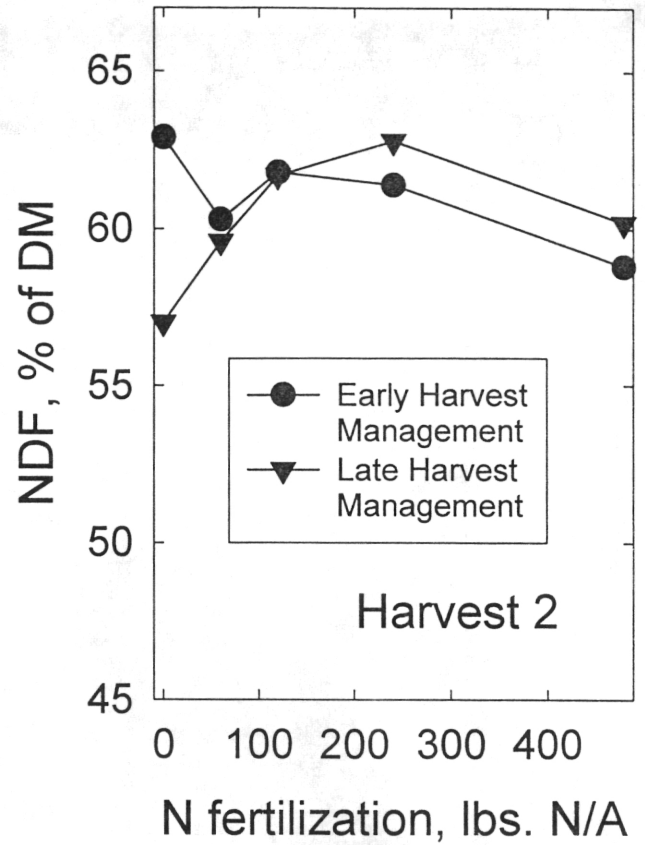
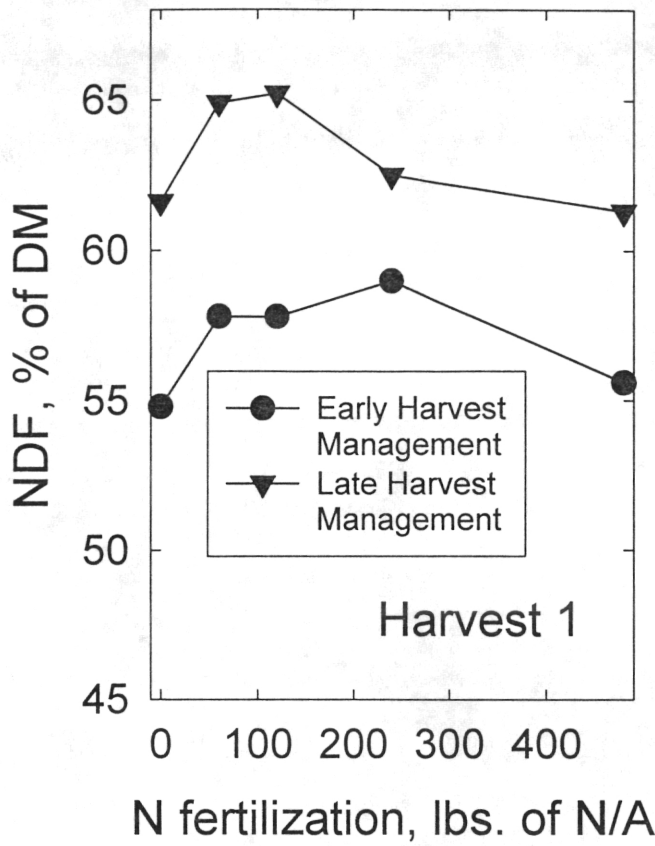


Figure 1. Neutral detergent fiber (NDF) concentrations, averaged over species, 1997.

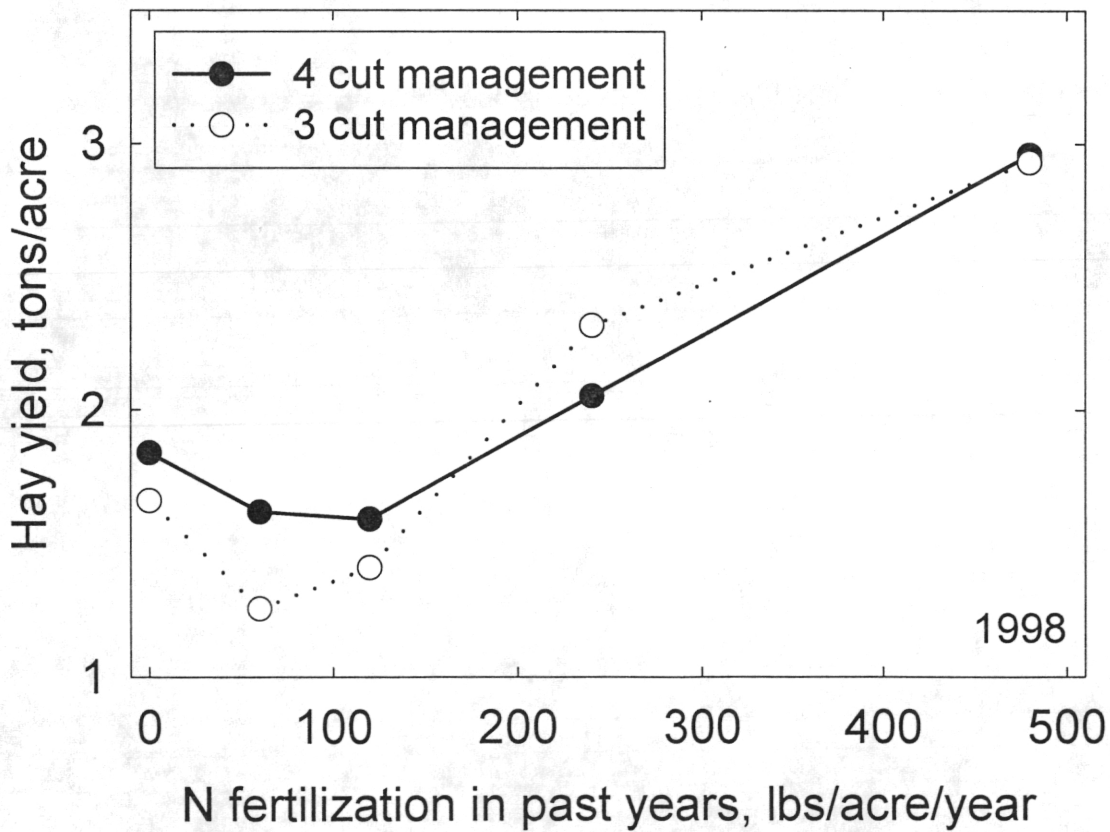
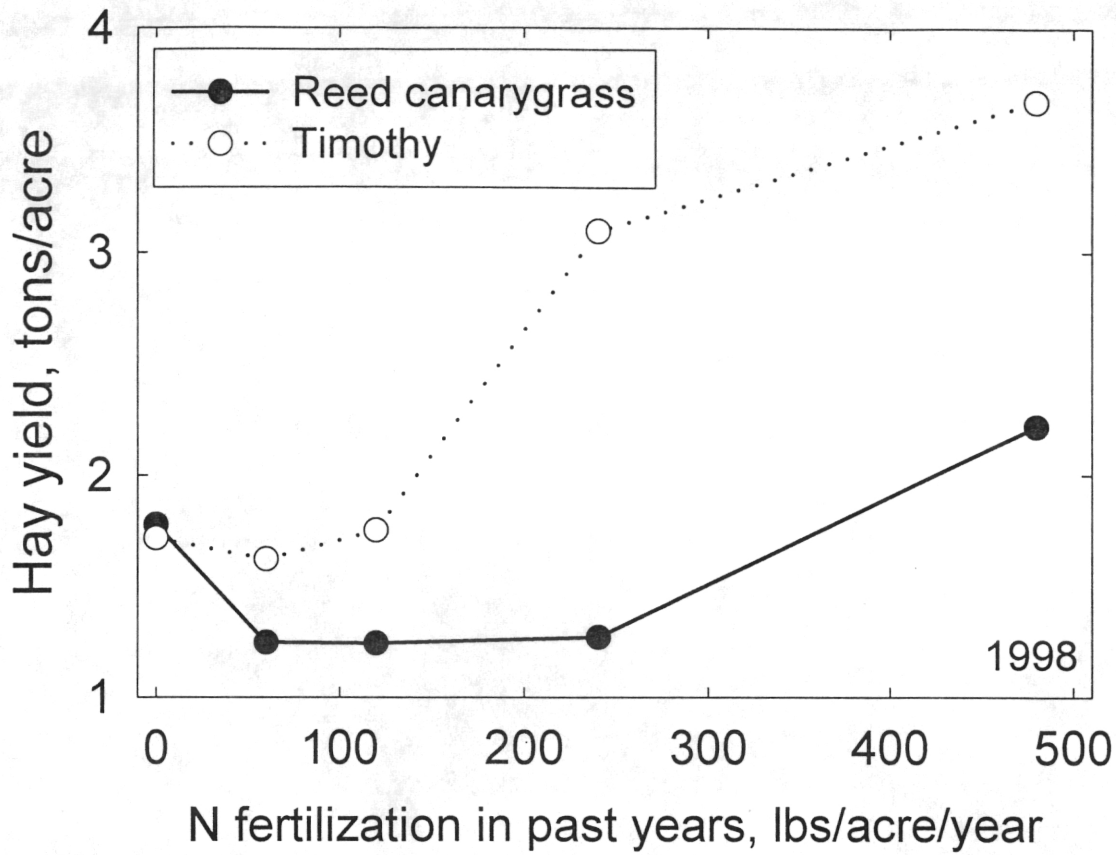


Figure 2. Significant interactions for residual hay yield in 1998.

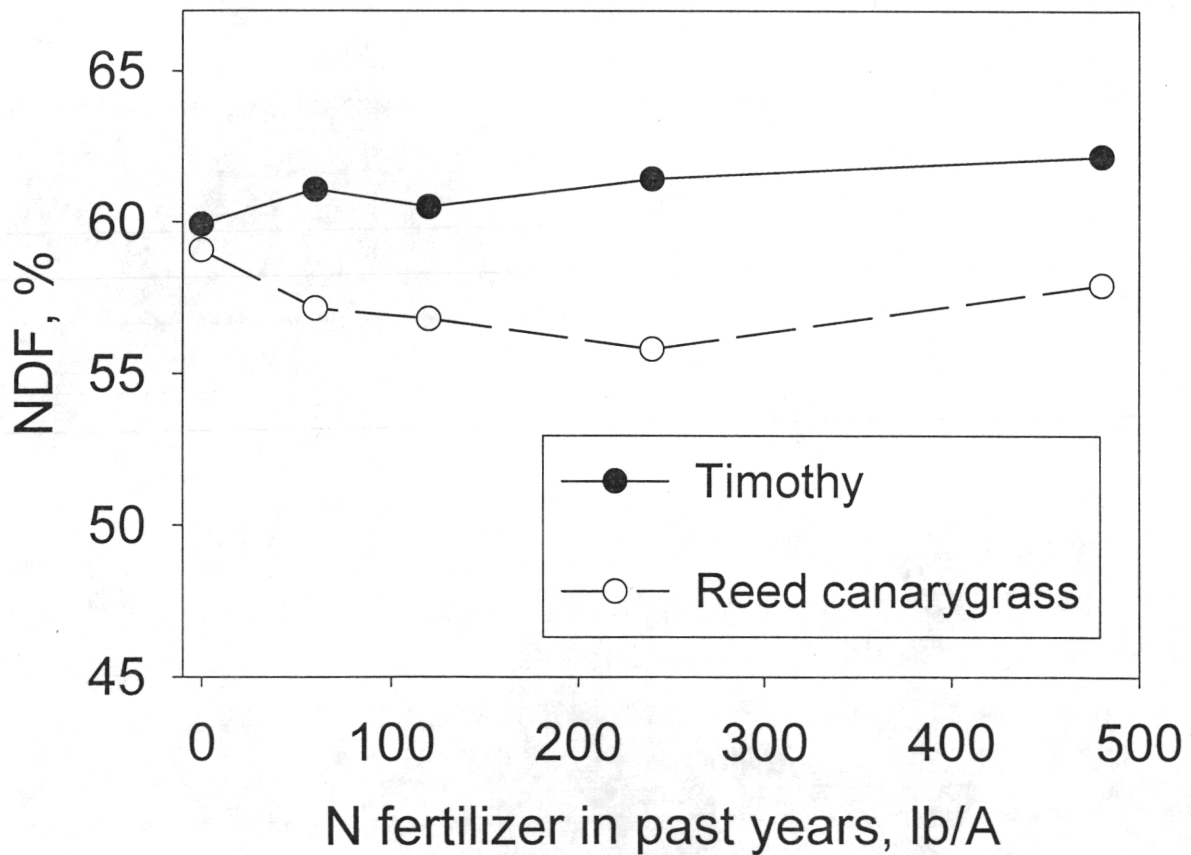
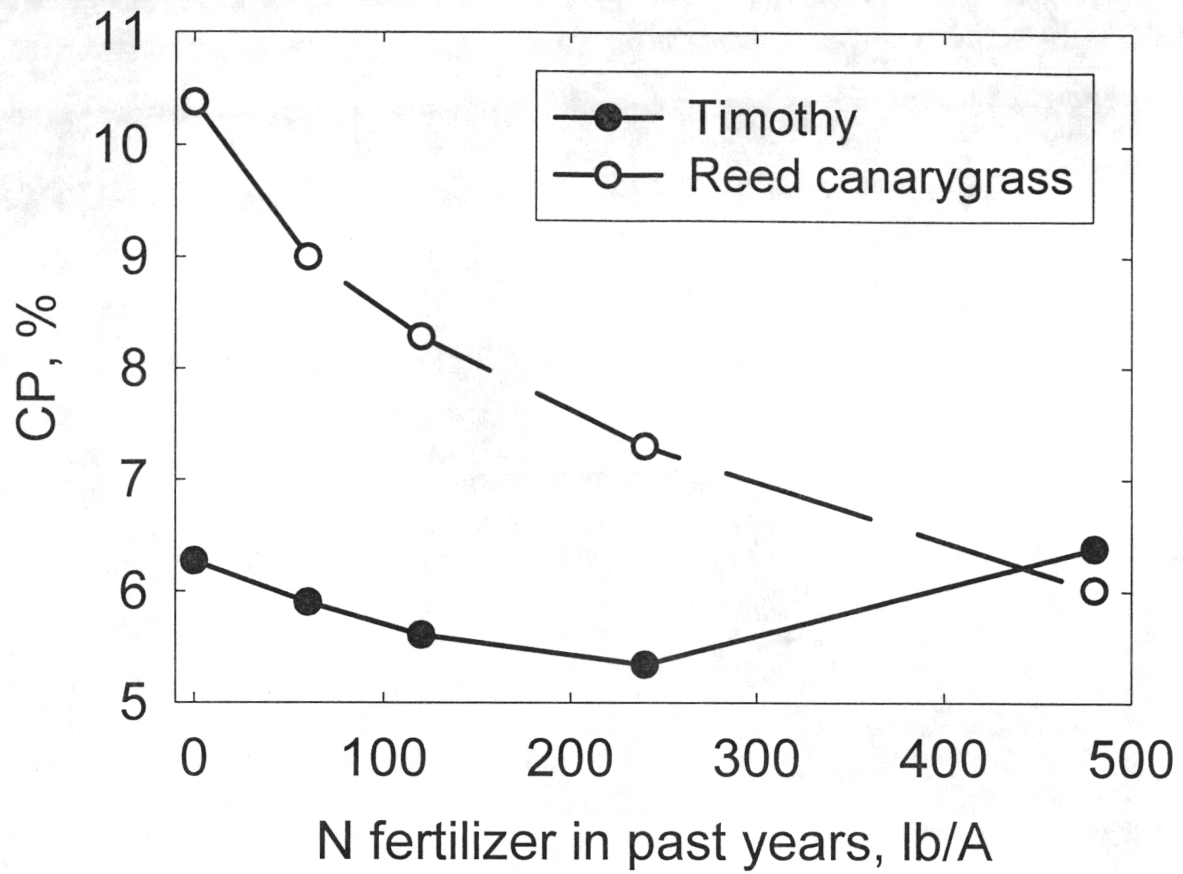


Figure 3. Crude protein (CP) and neutral detergent fiber (NDF) concentrations, averaged over two harvest managements, 1998

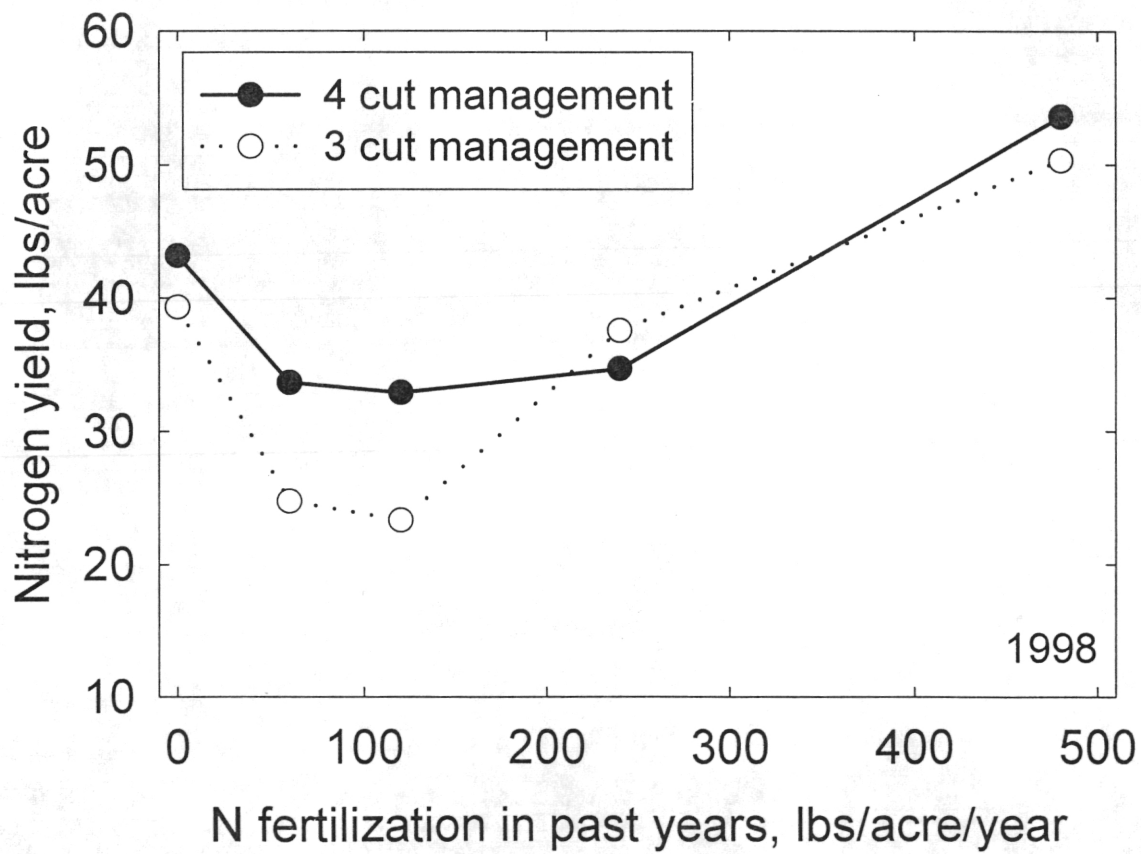
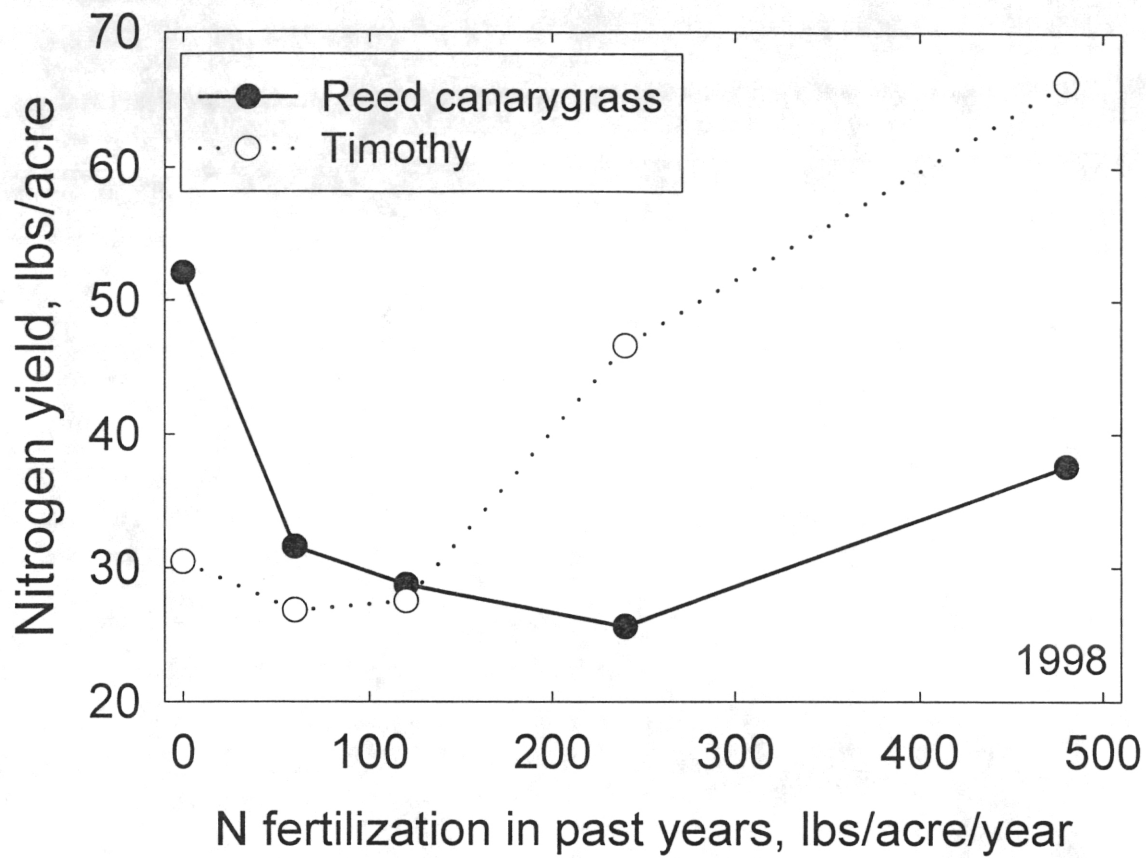


Figure 4. Significant interactions for residual nitrogen yield in 1998.

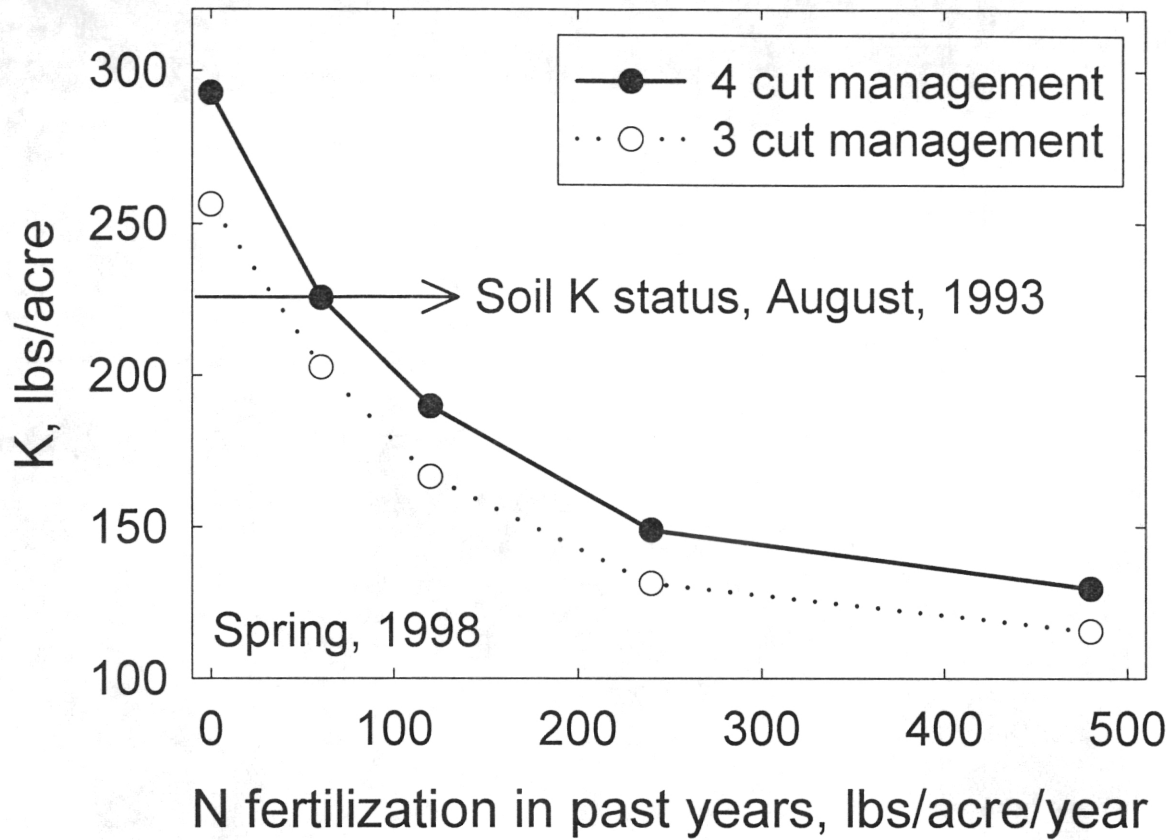


Figure 5. Soil K status in the spring, 1988, after four years of N fertilization at five rates. Fertilizer K was applied in all four years at the rate recommended for the treatments with 480 lbs N/acre/year.



Table B1.

Index of Prices Paid by NY farmers*			
(1977 = 100)			
Item	1992	1998	Chg
Fuel & energy	221	182	82.4%
Fertilizer	139	124	89.2%
Seed	186	179	96.2%
Machinery	237	224	94.5%
Bldg, fencing, supplies	150	106	70.7%
Farm svcs & rent (other)	171	229	133.9%
Agricultural chemicals	159	161	101.3%
Interest rates	101	115	113.9%
Farm wages	246	260	105.7%
Property taxes	194	160	82.5%

\* Update as needed from most recent NY Economic Handbook, Agricultural Situation and Outlook, Dairy Section, published in December each year by Dept. of Agricultural Economics, Cornell University, Ithaca, NY 14853.

Table B 2.

		1992 BASELINE COSTS PER ACRE *					
		GRASS HAY CROPS					
Factor	Mgmt level:	Early			Late		
	Hay Crop:	0	120	240	0	120	240
		\$	\$	\$	\$	\$	\$
1992 Baseline costs per acre for:							
Hay Crop - Growing Equipment - Fuel, oil		2.65	2.65	2.65	2.63	2.63	2.63
(& corn)	- Repair	2.30	2.30	2.30	2.10	2.10	2.10
	- Other growing costs (overhead)	2.00	2.00	2.00	2.00	2.00	2.00
Dry Hay - Harvesting Equipment - Fuel, oil		13.01	13.01	13.01	13.01	13.01	13.01
(& corn)	- Repairs	14.56	14.56	14.56	14.56	14.56	14.56
	- Supplies (twine)	9.25	9.25	9.25	5.75	5.75	5.75
	- Interest	4.85	4.85	4.85	3.94	3.94	3.94
	- Labor	52.54	52.54	52.54	51.26	51.26	51.26
Hay Crop Silage - Hvstg Equip - Fuel, oil		23.72	23.72	23.72	23.72	23.72	23.72
	- Repairs	26.70	26.70	26.70	26.72	26.72	26.72
	- Interest	5.53	5.53	5.53	4.80	4.80	4.80
	- Labor	50.00	50.00	50.00	48.72	48.72	48.72
Hay Crop - Other harvesting costs (overhead)		3.00	3.00	3.00	3.00	3.00	3.00
(& corn)							
Fixed Costs - Equipment (depr, int, ins,hsg)		80.00	80.00	80.00	80.00	80.00	80.00
	- Land (avg rent/ac)	35.00	35.00	35.00	35.00	35.00	35.00

Baseline costs for equipment, overhead, interest and labor are from budgets prepared for a 100 cow dairy farm with field crop equipment complement adequate for 300 crop acres harvested as 50 acres of dry hay, 100 acres of hay crop silage, 100 acres of corn silage and 50 acres of high moisture ear corn.

\* Used as the basis for updating expenses for years after 1992. These expenses are indexed according to changes in the Index of prices paid by NY farmers as published annually in the Dairy section of the "New York Economic Handbook", Department of Agricultural Economics, Cornell University, Ithaca, NY 14853-7801. These expenses are generally applicable to dairy farms somewhat larger than average in New York. Data for a specific application should be used if available.

Table B3.

## BUDGET ASSUMPTIONS FOR REED CANARYGRASS HAY CROP, 1997, MT. PLEASANT, NY.

Factor	Mgmt level: Lb N/ac	Early			Late		
		0	120	240	0	120	240
Stand life, y <sub>1</sub> (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4.0	4.0	4.0	3.0	3.0	3.0
Yield, tns/ac	Established	0.9	2.3	3.1	1.1	3.9	5.5
	Seeding year	0.45	1.14	1.55	0.57	1.93	2.75
	Average*	0.83	2.12	2.88	1.06	3.59	5.10
Feed value per ton							
	Dry Hay Equivalent, (estimated)	111.18	120.34	129.82	103.84	102.31	110.22
	(Cost /unit)						
Seed, lb/ac or cost/ac	3.15						
(w/o companion crop) Reed canary	4	10	10	10	10	10	10
Lime, tn/ac (seeding year or annual)	28.91	0	0	0	0	0	0
Fertilizer							
Seeding year or plant	N lb/ac	0.24	50	50	50	50	50
	P lb/ac	0.23	10	10	10	10	10
	K lb/ac	0.13	20	20	20	20	20
Top or side dressing	N lb/ac	0	120	240	0	120	240
(maint)	P lb/ac		10	10	10	20	10
	K lb/ac	0.13	20	20	20	20	20

Note: All budgets are for crops produced on the same land resource and with the same equipment complement.

\* Calculated average of seeding year and established yields over stand life for hay crops.

c 1993 Agrecord Mgmt Services, RD 1, Box 290A, Union Springs, NY 13160-9766, (315) 364-7637

Table B4. Economic Comparison of Reed Canarygrass Hay Crops Harvested as Dry Hay as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, NY, 1997.

Factor	Mgmt level:	Early			Late		
	Hay Crop:	0	120	240	0	120	240
Stand life, yr (excluding the seeding yr)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, tons/acre*		0.83	2.12	2.88	1.06	3.59	5.10
Feed value per ton of dry HE, \$		111.18	120.34	129.82	103.84	102.31	110.22
Returns		\$	\$	\$	\$	\$	\$
Crop value per acre		92.19	255.34	373.46	109.92	367.56	562.60
Variable Growing Costs							
Seed	(includes prorated seeding cost)	5.71	5.71	5.71	5.71	5.71	5.71
Fertility							
- Fertilizer		7.31	33.51	62.31	7.31	35.81	62.31
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Cc (overhead, scouting, soil tests)		20.06	46.26	75.06	19.86	48.36	74.86
Variable Harvesting Costs							
Equipment		10.71	10.71	10.71	10.71	10.71	10.71
- Fuel, oil		13.76	13.76	13.76	13.76	13.76	13.76
Twine - Repair		6.54	6.54	6.54	4.06	4.06	4.06
Other		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		35.03	35.03	35.03	32.56	32.56	32.56
Interest - Operating		5.52	5.52	5.52	4.49	4.49	4.49
Labor		55.53	55.53	55.53	54.18	54.18	54.18
(seeding & harvest)							
Total Variable Production Costs		116.15	142.35	171.15	111.08	139.58	166.08
Net Returns over Variable Costs		-23.95	112.99	202.31	-1.16	227.99	396.52
less estimated Fixed Costs for:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs**		-144.96	-8.01	81.31	-122.16	106.98	275.52

\* Calculated average of seeding year and established yields over stand life.

\*\* Production costs only - does not include costs to store or sell the crop.

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Table B5. Economic Comparison of Reed Canarygrass Hay Crops Harvested as Hay Crop Silage as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, 1997.

Factor	Mgmt level: Hay Crop:	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, in dry Hay Equiv, tons/acre*		0.83	2.12	2.88	1.06	3.59	5.10
Feed value per ton of dry Hay Eq, \$		111.18	120.34	129.82	103.84	102.31	110.22
		\$	\$	\$	\$	\$	\$
Returns							
Crop value per acre		92.19	255.34	373.46	109.92	367.56	562.60
Variable Growing Costs							
Seed (includes prorated seeding cost)		5.71	5.71	5.71	5.71	5.71	5.71
Fertility							
- Fertilizer		7.31	33.51	62.31	7.31	35.81	62.31
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Co (overhead, scouting, soil tests)		20.06	46.26	75.06	19.86	48.36	74.86
Variable Harvesting Costs							
Equipment		19.53	19.53	19.53	19.53	19.53	19.53
- Fuel, oil		25.24	25.24	25.24	25.25	25.25	25.25
Other - Repair		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		48.79	48.79	48.79	48.81	48.81	48.81
Interest - Operating		6.30	6.30	6.30	5.47	5.47	5.47
Labor		52.85	52.85	52.85	51.49	51.49	51.49
Total Variable Production Costs		127.99	154.19	182.99	125.62	154.12	180.62
Net Returns over Variable Costs		-35.80	101.14	190.46	-15.70	213.44	381.98
less estimated Fixed Costs:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs**		-156.81	-19.86	69.46	-136.70	92.44	260.98

\* Calculated average of seeding year and established yields over stand life.

\*\* Production costs only - does not include costs to store or sell the crop.

c 1993 Agrecord Mgmt Services, RD 1, Box 290A, Union Springs, NY 13160-9766, (315) 364-7637

Table B6.

BUDGET ASSUMPTIONS FOR REED CANARYGRASS HAY CROP, 1997, MT. PLEASANT, NY,  
WITH 88 LB OF N ADDED AS MANURE.

Factor	Mgmt level: Lb N/ac	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4.0	4.0	4.0	3.0	3.0	3.0
Yield, tns/ac	Established	0.9	2.3	3.1	1.1	3.9	5.5
	Seeding year	0.45	1.14	1.55	0.57	1.93	2.75
	Average*	0.83	2.12	2.88	1.06	3.59	5.10
Feed value per ton							
	Dry Hay Equivalent, (estimated)	111.18	120.34	129.82	103.84	102.31	110.22
	(Cost /unit)						
Seed, lb/ac or cost/ac	3.15						
(w/o companion crop) Reed canary	4	10	10	10	10	10	10
Lime, tn/ac (seeding year or annual)	28.91	0	0	0	0	0	0
Fertilizer							
Seeding year or plant N lb/ac	0.24	50	50	50	50	50	50
P lb/ac	0.23	10	10	10	10	10	10
K lb/ac	0.13	20	20	20	20	20	20
Top or side dressing (maint)							
N lb/ac		0	32	152	0	32	152
P lb/ac		10	0	0	10	0	0
K lb/ac	0.13	20	0	0	20	0	0

Note: All budgets are for crops produced on the same land resource and with the same equipment complement.

\* Calculated average of seeding year and established yields over stand life for hay crops.

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Table B7. Economic Comparison of Reed Canarygrass Hay Crops Harvested as Dry Hay as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, NY, 1997.\*

Factor	Mgmt level: Hay Crop:	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding yr)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, tons/acre**		0.83	2.12	2.88	1.06	3.59	5.10
Feed value per ton of dry HE, \$		111.18	120.34	129.82	103.84	102.31	110.22
Returns		\$	\$	\$	\$	\$	\$
Crop value per acre		92.19	255.34	373.46	109.92	367.56	562.60
Variable Growing Costs							
Seed	(includes prorated seeding cost)	5.71	5.71	5.71	5.71	5.71	5.71
Fertility							
- Fertilizer		7.31	10.09	38.89	7.31	10.09	38.89
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Cc (overhead, scouting, soil tests)		20.06	22.84	51.64	19.86	22.64	51.44
Variable Harvesting Costs							
Equipment		10.71	10.71	10.71	10.71	10.71	10.71
- Fuel, oil		13.76	13.76	13.76	13.76	13.76	13.76
Twine - Repair		6.54	6.54	6.54	4.06	4.06	4.06
Other		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		35.03	35.03	35.03	32.56	32.56	32.56
Interest - Operating		5.52	5.52	5.52	4.49	4.49	4.49
Labor		55.53	55.53	55.53	54.18	54.18	54.18
(seeding & harvest)							
Total Variable Production Costs		116.15	118.93	147.73	111.08	113.86	142.66
Net Returns over Variable Costs		-23.95	136.41	225.73	-1.16	253.71	419.94
less estimated Fixed Costs for:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs***		-144.96	15.41	104.73	-122.16	132.70	298.94

\* Assumes 88 lb N/yr are added as manure.

\*\* Calculated average of seeding year and established yields over stand life.

\*\*\* Production costs only - does not include costs to store or sell the crop.

c 1993 Agrecord Mgmt Services, RD 1, Box 290A, Union Springs, NY 13160-9766, (315) 364-7637

Table B8. Economic Comparison of Reed Canarygrass Hay Crops Harvested as Hay Crop Silage as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, 1997.\*

Factor	Mgmt level: Hay Crop:	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, in dry Hay Equiv, tons/acre**		0.83	2.12	2.88	1.06	3.59	5.10
Feed value per ton of dry Hay Eq, \$		111.18	120.34	129.82	103.84	102.31	110.22
		\$	\$	\$	\$	\$	\$
Returns							
Crop value per acre		92.19	255.34	373.46	109.92	367.56	562.60
Variable Growing Costs							
Seed (includes prorated seeding cost)		5.71	5.71	5.71	5.71	5.71	5.71
Fertility							
- Fertilizer		7.31	10.09	38.89	7.31	10.09	38.89
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Co (overhead, scouting, soil tests)		20.06	22.84	51.64	19.86	22.64	51.44
Variable Harvesting Costs							
Equipment		19.53	19.53	19.53	19.53	19.53	19.53
- Fuel, oil		25.24	25.24	25.24	25.25	25.25	25.25
Other - Repair		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		48.79	48.79	48.79	48.81	48.81	48.81
Interest - Operating		6.30	6.30	6.30	5.47	5.47	5.47
Labor		52.85	52.85	52.85	51.49	51.49	51.49
Total Variable Production Costs		127.99	130.77	159.57	125.62	128.40	157.20
Net Returns over Variable Costs		-35.80	124.56	213.88	-15.70	239.16	405.40
less estimated Fixed Costs:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs***		-156.81	3.56	92.88	-136.70	118.16	284.40

\* Assumes 88 lb N/yr are added as manure.

\*\* Calculated average of seeding year and established yields over stand life.

\*\*\* Production costs only - does not include costs to store or sell the crop.

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Table B9.

## BUDGET ASSUMPTIONS FOR TIMOTHY HAY CROP, 1997, MT. PLEASANT, NY.

Factor	Mgmt level: Lb N/ac	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4.0	4.0	4.0	3.0	3.0	3.0
Yield, tns/ac Established		0.8	2.8	3.9	1.0	4.2	5.5
Seeding year		0.38	1.38	1.97	0.51	2.10	2.76
Average*		0.70	2.56	3.66	0.95	3.90	5.12
Feed value per ton							
Dry Hay Equivalent, (estimated)		101.40	110.25	116.53	96.15	100.61	108.84
	(Cost /unit)						
Seed, lb/ac or cost/ac	3.15						
(w/o companion crop) timothy	0.78	10	10	10	10	10	10
Lime, tn/ac (seeding year or annual)	28.91	0	0	0	0	0	0
Fertilizer							
Seeding year or plant N lb/ac	0.24	50	50	50	50	50	50
P lb/ac	0.23	10	10	10	10	10	10
K lb/ac	0.13	20	20	20	20	20	20
Top or side dressing (maint)							
N lb/ac		0	120	240	0	120	240
P lb/ac		10	10	10	10	20	10
K lb/ac	0.13	20	20	20	20	20	20

Note: All budgets are for crops produced on the same land resource and with the same equipment complement.

\* Calculated average of seeding year and established yields over stand life for hay crops.

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Table B10. Economic Comparison of Timothy Hay Crops Harvested as Dry Hay as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, NY, 1997.

Factor	Mgmt level:	Early			Late		
	Hay Crop:	0	120	240	0	120	240
Stand life, yr (excluding the seeding yr)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, tons/acre*		0.70	2.56	3.66	0.95	3.90	5.12
Feed value per ton of dry HE, \$		101.40	110.25	116.53	96.15	100.61	108.84
Returns		\$	\$	\$	\$	\$	\$
Crop value per acre		71.47	281.84	426.66	91.60	392.10	556.87
Variable Growing Costs							
Seed	(includes prorated seeding cost)	1.11	1.11	1.11	1.11	1.11	1.11
Fertility							
- Fertilizer		7.31	33.51	62.31	7.31	35.81	62.31
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing C <sub>t</sub> (overhead, scouting, soil tests)		15.46	41.66	70.46	15.26	43.76	70.26
Variable Harvesting Costs							
Equipment		10.71	10.71	10.71	10.71	10.71	10.71
- Fuel, oil		13.76	13.76	13.76	13.76	13.76	13.76
Twine - Repair		6.54	6.54	6.54	4.06	4.06	4.06
Other		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		35.03	35.03	35.03	32.56	32.56	32.56
Interest - Operating		5.52	5.52	5.52	4.49	4.49	4.49
Labor		55.53	55.53	55.53	54.18	54.18	54.18
(seeding & harvest)							
Total Variable Production Costs		111.55	137.75	166.55	106.48	134.98	161.48
Net Returns over Variable Costs		-40.08	144.09	260.11	-14.87	257.12	395.39
less estimated Fixed Costs for:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs**		-161.08	23.09	139.11	-135.88	136.12	274.39

\* Calculated average of seeding year and established yields over stand life.

\*\* Production costs only - does not include costs to store or sell the crop.

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Table B11. Economic Comparison of Timothy Hay Crops Harvested as Hay Crop Silage as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, 1997.

Factor	Mgmt level: Hay Crop:	Early			Late		
		0	120	240	0	120	240
Stand life, y <sub>1</sub> (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, in dry Hay Equiv, tons/acre*		0.70	2.56	3.66	0.95	3.90	5.12
Feed value per ton of dry Hay Eq, \$		101.40	110.25	116.53	96.15	100.61	108.84
		\$	\$	\$	\$	\$	\$
Returns							
Crop value per acre		71.47	281.84	426.66	91.60	392.10	556.87
Variable Growing Costs							
Seed (includes prorated seeding cost)		1.11	1.11	1.11	1.11	1.11	1.11
Fertility							
- Fertilizer		7.31	33.51	62.31	7.31	35.81	62.31
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Co (overhead, scouting, soil tests)		15.46	41.66	70.46	15.26	43.76	70.26
Variable Harvesting Costs							
Equipment		19.53	19.53	19.53	19.53	19.53	19.53
- Fuel, oil		25.24	25.24	25.24	25.25	25.25	25.25
Other - Repair		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		48.79	48.79	48.79	48.81	48.81	48.81
Interest - Operating		6.30	6.30	6.30	5.47	5.47	5.47
Labor		52.85	52.85	52.85	51.49	51.49	51.49
Total Variable Production Costs		123.39	149.59	178.39	121.02	149.52	176.02
Net Returns over Variable Costs		-51.93	132.25	248.27	-29.42	242.58	380.85
less estimated Fixed Costs:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs**		-172.93	11.24	127.26	-150.42	121.57	259.85

\* Calculated average of seeding year and established yields over stand life.

\*\* Production costs only - does not include costs to store or sell the crop.

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Table B12.

BUDGET ASSUMPTIONS FOR TIMOTHY HAY CROP, 1997, MT. PLEASANT, NY,  
WITH 88 LB OF N ADDED AS MANURE.

Factor	Mgmt level: Lb N/ac	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4.0	4.0	4.0	3.0	3.0	3.0
Yield, tns/ac	Established	0.8	2.8	3.9	1.0	4.2	5.5
	Seeding year	0.38	1.38	1.97	0.51	2.10	2.76
	Average*	0.70	2.56	3.66	0.95	3.90	5.12
Feed value per ton							
	Dry Hay Equivalent, (estimated)	101.40	110.25	116.53	96.15	100.61	108.84
	(Cost /unit)						
Seed, lb/ac or cost/ac	3.15						
(w/o companion crop) Timothy	0.78	10	10	10	10	10	10
Lime, tn/ac (seeding year or annual)	28.91	0	0	0	0	0	0
Fertilizer							
	Seeding year or plant N lb/ac	0.24	50	50	50	50	50
	P lb/ac	0.23	10	10	10	10	10
	K lb/ac	0.13	20	20	20	20	20
Top or side dressing	N lb/ac		0	32	152	0	32
(maint)	P lb/ac		10	0	0	10	0
	K lb/ac	0.13	20	0	0	20	0

Note: All budgets are for crops produced on the same land resource and with the same equipment complem

\* Calculated average of seeding year and established yields over stand life for hay crops.

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Table B13. Economic Comparison of Timothy Hay Crops Harvested as Dry Hay as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, NY, 1997.\*

Factor	Mgmt level:		Early			Late	
	Hay Crop:		0	120	240	0	120
Stand life, yr (excluding the seeding yr)			6	6	6	6	6
Cuts per year, number			4	4	4	3	3
Yield, tons/acre**			0.70	2.56	3.66	0.95	3.90
Feed value per ton of dry HE, \$			101.40	110.25	116.53	96.15	100.61
Returns			\$	\$	\$	\$	\$
Crop value per acre			71.47	281.84	426.66	91.60	392.10
Variable Growing Costs							
Seed	(includes prorated seeding cost		1.11	1.11	1.11	1.11	1.11
Fertility							
- Fertilizer			7.31	10.09	38.89	7.31	10.09
Pesticides - Lime			0.00	0.00	0.00	0.00	0.00
Equipment			2.18	2.18	2.18	2.17	2.17
- Fuel, oil			2.17	2.17	2.17	1.98	1.98
Other - Repair			2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Cc	(overhead, scouting, soil tests)		15.46	18.24	47.04	15.26	18.04
Variable Harvesting Costs							
Equipment			10.71	10.71	10.71	10.71	10.71
- Fuel, oil			13.76	13.76	13.76	13.76	13.76
Twine - Repair			6.54	6.54	6.54	4.06	4.06
Other			4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs			35.03	35.03	35.03	32.56	32.56
Interest - Operating			5.52	5.52	5.52	4.49	4.49
Labor			55.53	55.53	55.53	54.18	54.18
(seeding & harvest)							
Total Variable Production Costs			111.55	114.33	143.13	106.48	109.26
Net Returns over Variable Costs			-40.08	167.51	283.53	-14.87	282.84
less estimated Fixed Costs for:							
Equipment			83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)			37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs***			-161.08	46.51	162.53	-135.88	161.84

\* Assumes 88 lb N/yr are added as manure.

\*\* Calculated average of seeding year and established yields over stand life.

\*\*\* Production costs only - does not include costs to store or sell the crop.

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Table B14. Economic Comparison of Timothy Hay Crops Harvested as Hay Crop Silage as Influenced by N Fertilization and Cutting Management Level, Mt. Pleasant, 1997.\*

Factor	Mgmt level: Hay Crop:	Early			Late		
		0	120	240	0	120	240
Stand life, yr (excluding the seeding year)		6	6	6	6	6	6
Cuts per year, number		4	4	4	3	3	3
Yield, in dry Hay Equiv, tons/acre**		0.70	2.56	3.66	0.95	3.90	5.12
Feed value per ton of dry Hay Eq, \$		101.40	110.25	116.53	96.15	100.61	108.84
		\$	\$	\$	\$	\$	\$
Returns							
Crop value per acre		71.47	281.84	426.66	91.60	392.10	556.87
Variable Growing Costs							
Seed (includes prorated seeding cost)		1.11	1.11	1.11	1.11	1.11	1.11
Fertility							
- Fertilizer		7.31	10.09	38.89	7.31	10.09	38.89
Pesticides - Lime		0.00	0.00	0.00	0.00	0.00	0.00
Equipment		2.18	2.18	2.18	2.17	2.17	2.17
- Fuel, oil		2.17	2.17	2.17	1.98	1.98	1.98
Other - Repair		2.68	2.68	2.68	2.68	2.68	2.68
Tot. Var. Growing Co (overhead, scouting, soil tests)		15.46	18.24	47.04	15.26	18.04	46.84
Variable Harvesting Costs							
Equipment		19.53	19.53	19.53	19.53	19.53	19.53
- Fuel, oil		25.24	25.24	25.24	25.25	25.25	25.25
Other - Repair		4.02	4.02	4.02	4.02	4.02	4.02
Total Variable Harvesting Costs		48.79	48.79	48.79	48.81	48.81	48.81
Interest - Operating		6.30	6.30	6.30	5.47	5.47	5.47
Labor		52.85	52.85	52.85	51.49	51.49	51.49
Total Variable Production Costs		123.39	126.17	154.97	121.02	123.80	152.60
Net Returns over Variable Costs		-51.93	155.67	271.69	-29.42	268.30	404.27
less estimated Fixed Costs:							
Equipment		83.35	83.35	83.35	83.35	83.35	83.35
(depreciation, interest,							
Land insurance, housing)		37.65	37.65	37.65	37.65	37.65	37.65
(average rent/ac)							
Returns over all Costs***		-172.93	34.66	150.68	-150.42	147.29	283.27

\* Assumes 88 lb N/yr are added as manure.

\*\* Calculated average of seeding year and established yields over stand life.

\*\*\* Production costs only - does not include costs to store or sell the crop.

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