Maximizing Grazing Days- A Grazing Model

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Why Evaluate Your System?

* Failure to Plan is a Plan for Failure!
* If you never wrote it down, it never happened!
* Insanity is doing the same thing over and over and expecting a different result

* Modeling is a tool for Prediction, Planning and Protection

Use of Grazing Model

* New Producers
  * What combinations work for me in my area under my management?
  * What stocking rate works best for management skills?
* Old Timers
  * How does this species work in my system?
  * Do I need to look at different combinations or species?
  * Is my stocking right for me?

* Junk in….Junk out!
  * Be honest

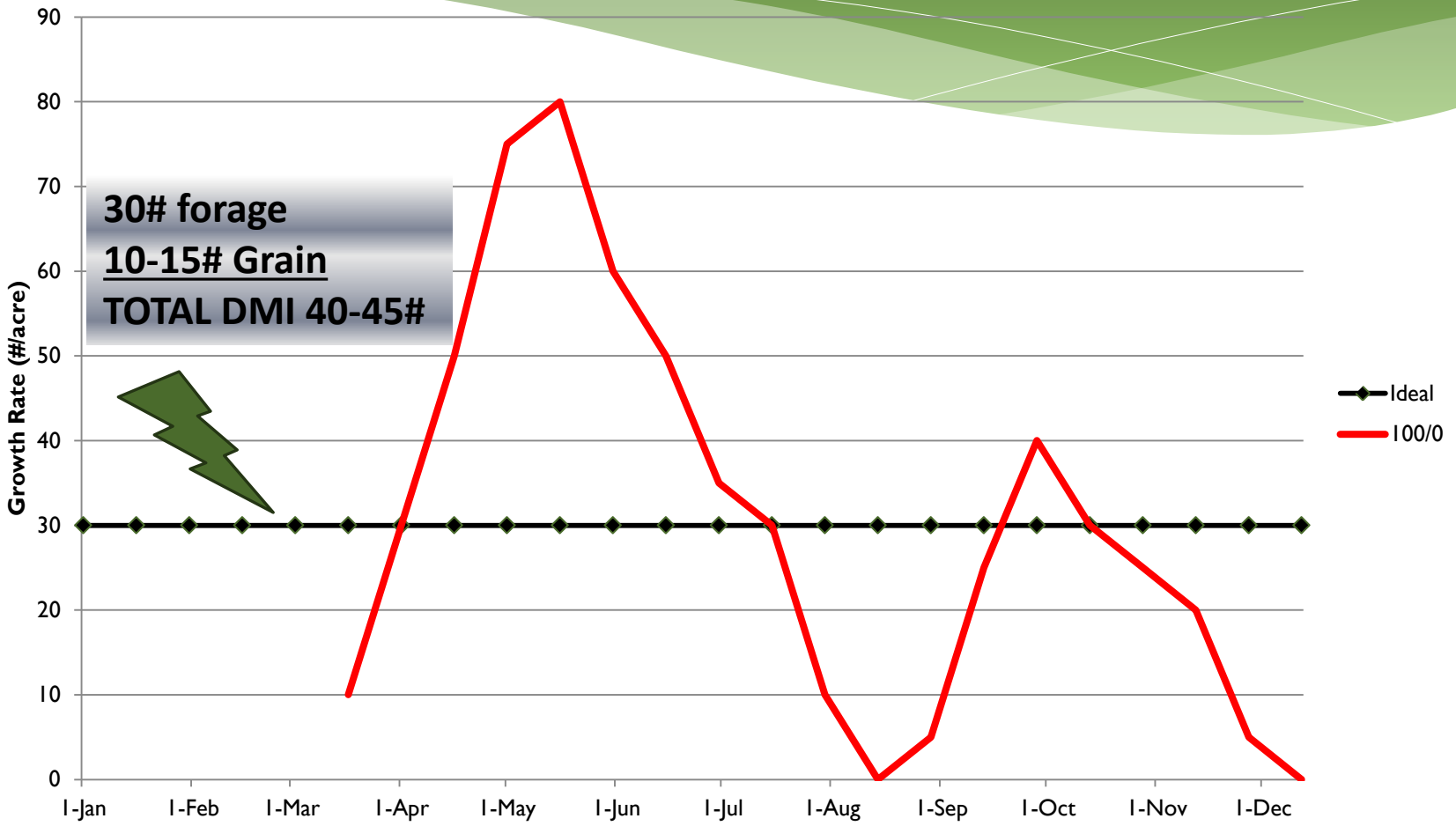
Results of a Model

Feed Cost Summary	Annual Per Herd (lbs.)	Annual Per Herd (tons)	% of Feed	Per Day (lbs.)	Cost Per Cow ($)	Cost Per Cwt. ($)	% of Gross Milk Sales
Grain	282,218	141	28%	9.8	$670.46	$5.23	28%
Dry cow hay	58,724	29	6%	2.0	$37.20	$0.29	2%
Lactating cow hay	20,040	10	2%	0.7	$34.91	$0.27	1%
Silage	54,702	27	5%	1.9	$24.26	$0.19	1%
Baleage	89,196	45	9%	3.1	$19.78	$0.15	1%
Pasture	493,621	247	49%	17.1			
Total	**998,501**	**499**	**100%**	**34.7**	**$786.61**	**$6.13**	**32%**
Economic Summary	Annual			Daily	Per cow	Per Cwt.	
Gross milk sales	$192,413			$527	$2,438	$19.00	100%
Income over purchased feed & forage	$130,330			$357	$1,651	$12.87	68%

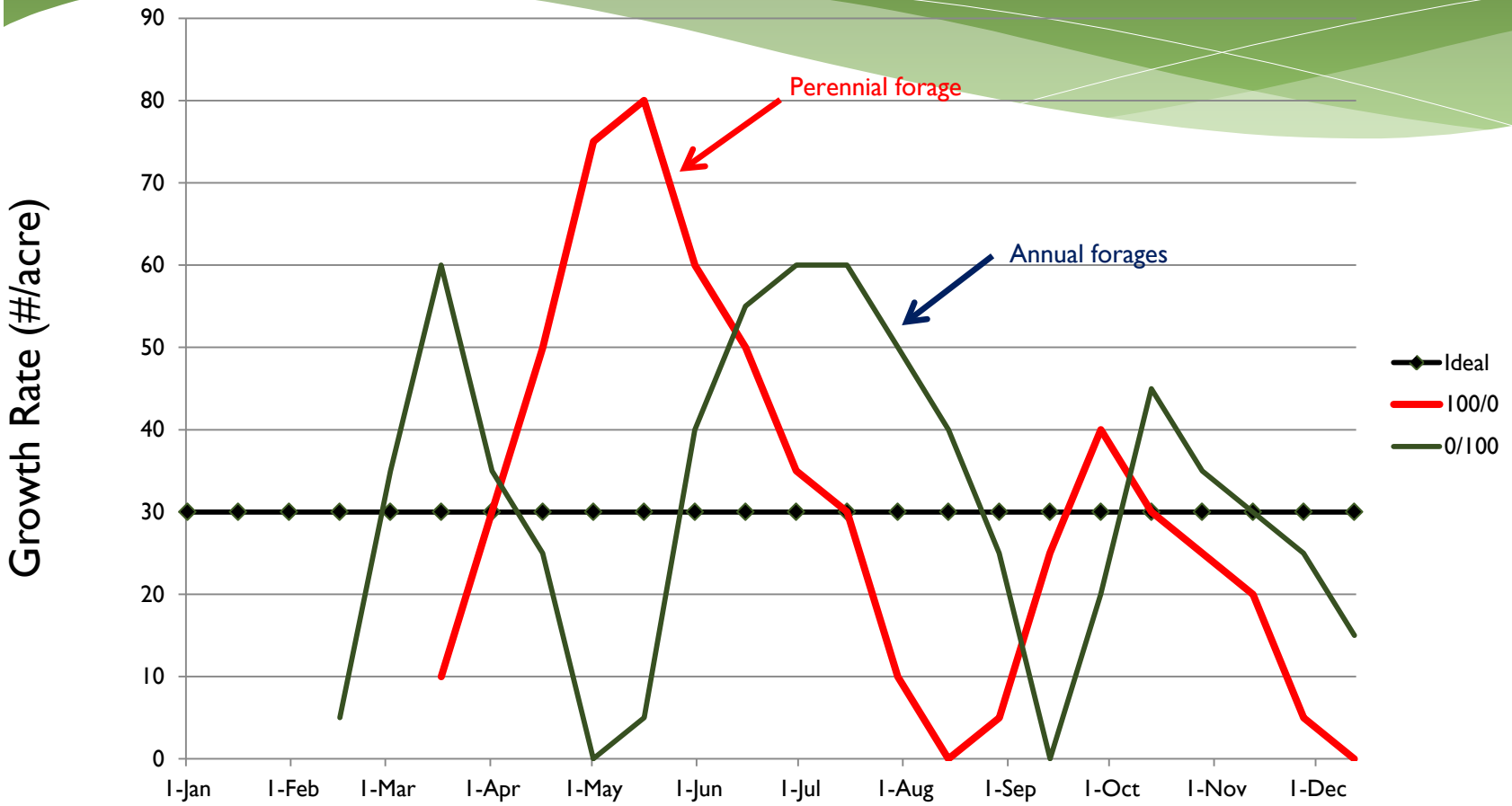
Broad Ideas of Your System

* Stocking Rate = 1 cow per 1 acre
* Forage Yield = 4 tons/acre
* Utilization = 80%
* Actual consumed = 3.2 tons
* What does she need annually?
  * ~ 6 Tons?
  * 53% of her intake!
* What time periods are the deficits and surpluses?
* Can I use other forages to fill gaps and increase yield?

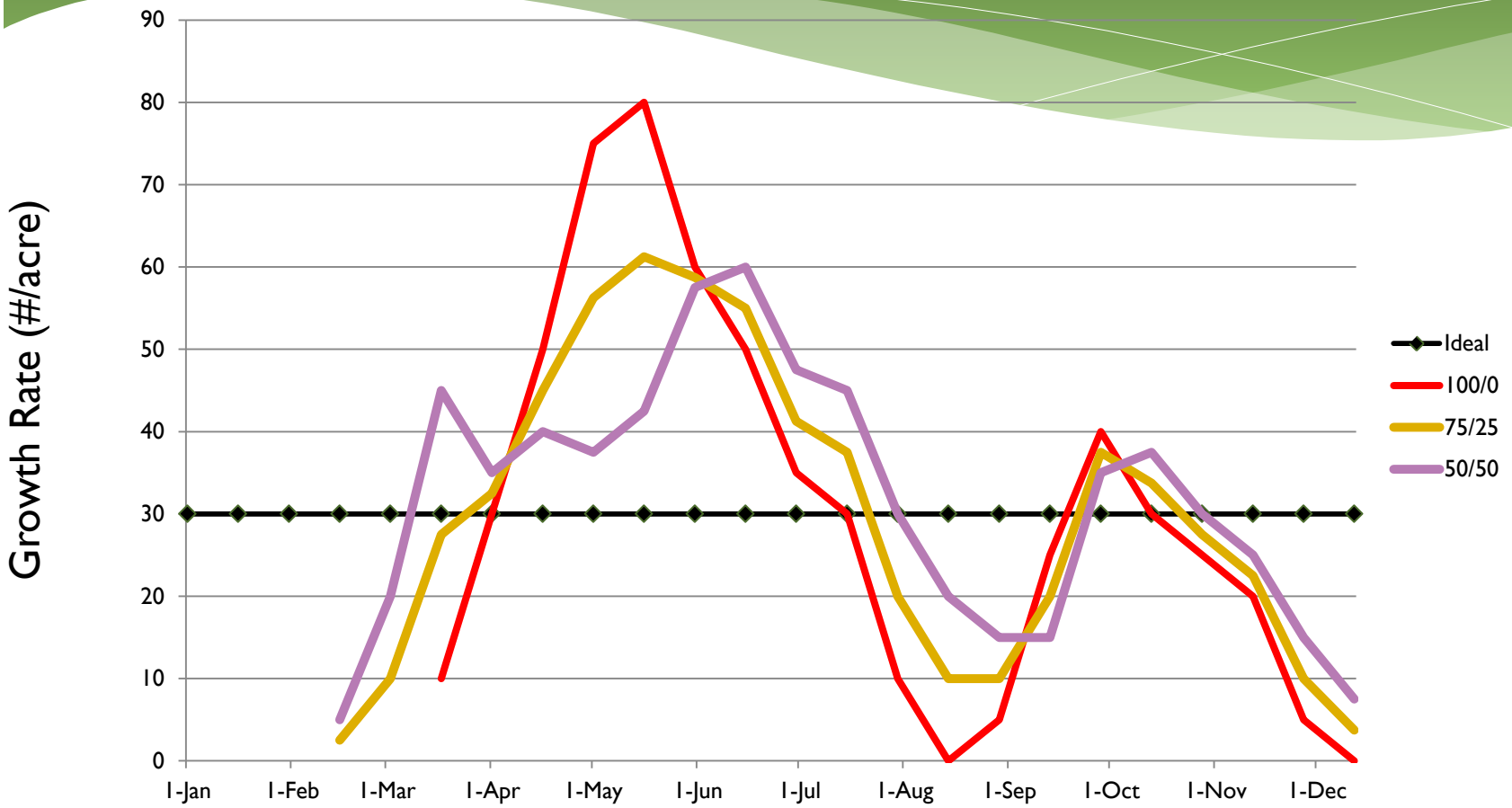
100% Perennial vs. “Ideal”



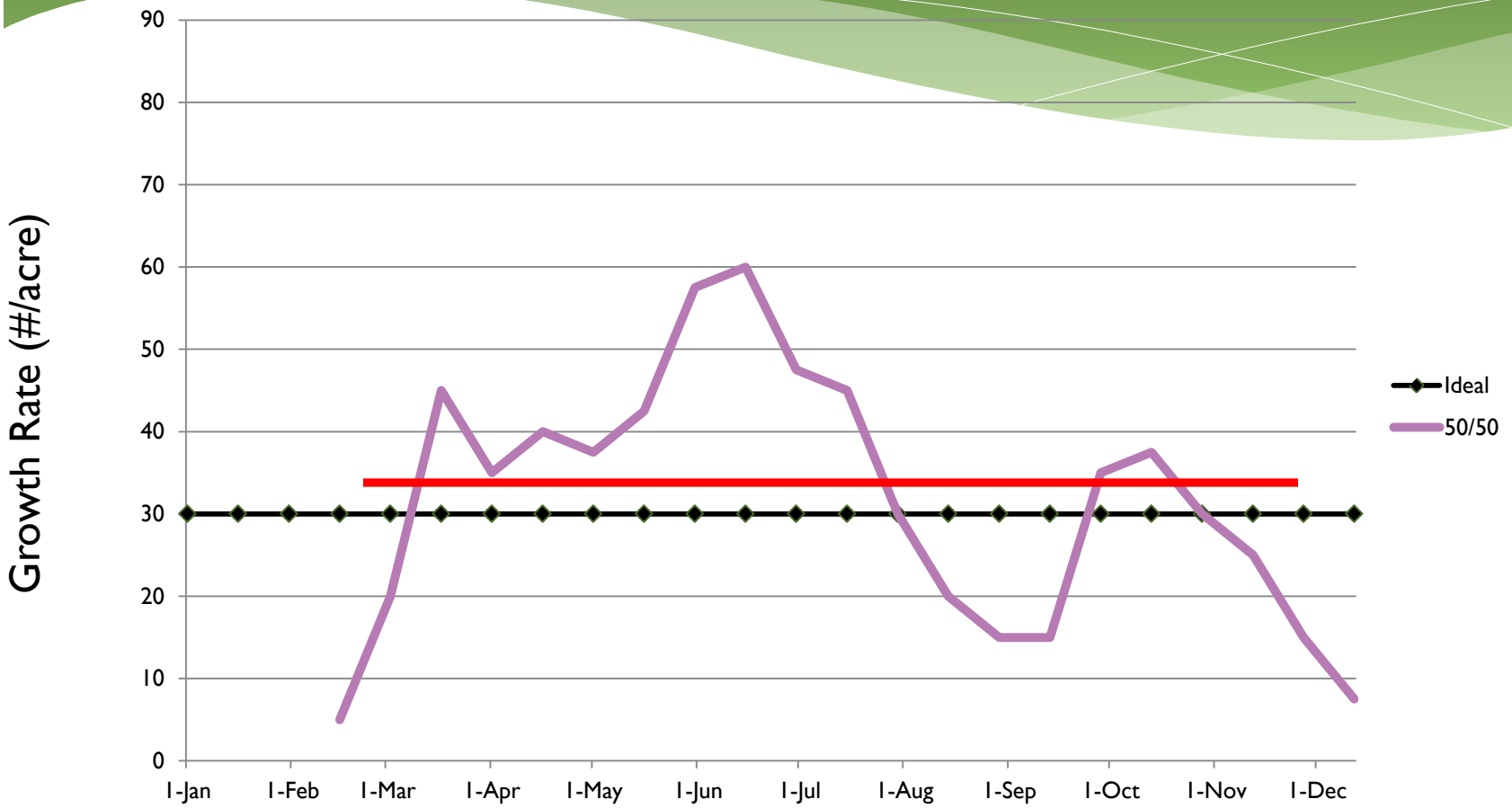
100% Annual vs. 100% Perennial



Combinations?



50:50 perennial: annual?



How do I know what to Input?

* How much pasture is out there?
* 100 cows
  * 30# DM/day desired
  * 3,000 # DM/day
  * Grazed 3 acres/day
  * So offered/grew 1,000# DM

  * If Grazed 4 acres/day
  * Then offered/grew 750# DM

How do I know what to Input?

Date	Round Length	#/acre	Growth Rate
1-Mar			
10-Apr	40	1000	25
1-May	21	1000	48
15-May	14	1000	71
30-May	15	1000	67
20-Jun	21	1000	48
20-Jul	30	750	25
30-Aug			
15-Sep	16	500	31
10-Oct	25	750	30
1-Nov	22	750	34
1-Dec	30	750	25
		8500	

How do I know what to Input?

Date	Round Length	#/acre	Growth Rate Base Paddock	Growth Rate Data Base
1-Mar				
10-Apr	40	1000	25	20
1-May	21	1000	48	51
15-May	14	1000	71	77
30-May	15	1000	67	70
20-Jun	21	1000	48	55
20-Jul	30	750	25	32
30-Aug				
15-Sep	16	500	31	15
10-Oct	25	750	30	32
1-Nov	22	750	34	28
1-Dec	30	750	25	18
		8500		

The Model…starting off

Cows

Beginning herd size (milking and dry cows)	90
Average weight of cow (lbs.)	1,150
Expected forage utilization (%)	75%
Expected annual milk price	$19.00
Number of acres in grazing platform	80

Expected Intake

		1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr
% of herd persisting by month		100%	100%	100%	99%	98%	97%	96%	95%
% in milk		0%	0%	50%	80%	95%	100%	100%	100%
Actual herd size		90	90	90	89	88	87	86	86
Milk production (milk/cow/day)		0	0	30	45	50	52	55	58
Estimated intake (cow per day)		24.7	24.7	32.5	37.0	38.5	39.1	40.0	40.9
Input intake if different from line above		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total intake (lbs.)		31,154	37,829	40,950	49,450	47,540	58,028	48,384	55,951
Average milk production per cow (lbs/year)	12,831	0	0	18,900	48,114	58,653	77,173	66,528	79,344

Forage Plan

Beginning baleage inventory (lbs.)	0

Select Forage	Acres	Default Yield (tons per acre)	Expected Yield (tons per acre)	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar
Annual Ryegrass	0	2.97		0.0	0.0	0.0	0.0	0.0	0.0

The Model…starting off

Cows

Beginning herd size (milking and dry cows)	90
Average weight of cow (lbs.)	1,150
Expected forage utilization (%)	
Expected annual milk price	
Number of acres in grazing platform	

850
1000
1150
1300

Expected Intake

		1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr
% of herd persisting by month		100%	100%	100%	99%	98%	97%	96%	95%
% in milk		0%	0%	50%	80%	95%	100%	100%	100%
Actual herd size		90	90	90	89	88	87	86	86
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Select Forage	Acres	Default Yield (tons per acre)	Yield (tons per acre)	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar
Annual Ryegrass	0	2.97		0.0	0.0	0.0	0.0	0.0	0.0

The Forage System

Forage Plan

Beginning baleage inventory (lbs.)	0								
Select Forage	Acres	Default Yield (tons per acre)	Yield (tons per acre)	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar
Annual Ryegrass	0	2.97		0.0	0.0	0.0	0.0	0.0	0.0
Bermuda Grass		3.88		0.0	0.0	0.0	0.0	0.0	0.0
Cereal Rye	28	2.56	3	0.0	5.9	8.2	11.7	46.8	87.8
Crabgrass	28	2.63	3.25	0.0	0.0	0.0	0.0	0.0	0.0
Fescue	54	3.85	4	0.0	0.0	0.0	0.0	5.2	15.6
Millet	0	2.03		0.0	0.0	0.0	0.0	0.0	0.0
Orchardgrass	0	3.52		0.0	0.0	0.0	0.0	0.0	0.0
Perennial Ryegrass	0	3.69		0.0	0.0	0.0	0.0	0.0	0.0
Sudan	0	3.06		0.0	0.0	0.0	0.0	0.0	0.0
Wheat	0	2.41		0.0	0.0	0.0	0.0	0.0	0.0

Feed Plan

	$ per ton	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr
Grain (DM lbs./cow/day)	$375.00	5	5	12	12	12	12	12	12
Dry cow hay (DM lbs./cow/day)	$100.00	4.7	4.7						
Lactating cow hay (DM lbs./cow/day)	$275.00			18.5	10	6	4.1		4.9
Silage cow/day (DM lbs./cow/day)	$70.00	10	10		12	6.5			
Baleage from farm (DM lbs./cow/day)	$35.00	5	4						
Pasture available (DM lbs/cow/day)		0	1	2	3	14	23	31	24
Pasture fed (DM lbs./cow/day)			1	2	3	14	23	28	24
Total feed intake (DM lbs./cow/day)		24.7	24.7	32.5	37.0	38.5	39.1	40.0	40.9
Deviation from expected intake		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The Forage System

Select Forage	Acres	Expected Yield (tons per acre)	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun
Annual Ryegrass	0		0.0	0.0	0.0	0.0	0.0	0.0
Bermuda Grass			0.0	0.0	0.0	0.0	0.0	0.0
Cereal Rye	28	3	87.8	58.5	0.0	0.0	0.0	0.0
Crabgrass	28	3.25	0.0	0.0	0.0	0.0	6.2	67.8
Fescue	54	4	15.6	36.4	57.2	62.4	62.4	52.0
Millet	0		0.0	0.0	0.0	0.0	0.0	0.0
Orchardgrass	0		0.0	0.0	0.0	0.0	0.0	0.0
Perennial Ryegrass	0		0.0	0.0	0.0	0.0	0.0	0.0
Sudan	0		0.0	0.0	0.0	0.0	0.0	0.0
Wheat	0		0.0	0.0	0.0	0.0	0.0	0.0

April 1

- Cereal Rye grew 58.5#/acre with 28 acres for 1638#
- Fescue grew 36.4#/acre with 54 acres for 1966#
- Total grown for April 1 is 3604# forage @ 75% utilization = 2703# consumed
- Predicts 31.2# forage available per day per cow

The Forage System

* This is a SNAP SHOT in TIME!
* The more snap shots the more accurate
* 365 snapshots (days) is the most accurate
  * Roaring pain!
  * 2 week interval reasonable and accurate
  * Monthly can have complications
  * Don't over-think it! It's not rocket science!

Feed Thy Cow!

Feed Plan

	$ per ton	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr
Grain (DM lbs./cow/day)	$375.00	5	5	12	12	12	12	12	12
Dry cow hay (DM lbs./cow/day)	$100.00	4.7	4.7						
Lactating cow hay (DM lbs./cow/day)	$275.00			18.5	10	6	4.1		4.9
Silage cow/day (DM lbs./cow/day)	$70.00	10	10		12	6.5			
Baleage from farm (DM lbs./cow/day)	$35.00	5	4						
Pasture available (DM lbs/cow/day)		0	1	2	3	14	23	31	24
Pasture fed (DM lbs./cow/day)			1	2	3	14	23	28	24
Total feed intake (DM lbs./cow/day)		24.7	24.7	32.5	37.0	38.5	39.1	40.0	40.9
Deviation from expected intake		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture beginning cover (DM per acre)		1,750	1,676	1,674	1,667	1,660	1,667	1,716	1,711

Summary of Forage and Feed Plan

	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr
Total pasture available (DM lbs.)	0	1,720	2,408	3,441	16,710	34,648	37,837	32,425
Pasture available (per cow per day)	0.0	1.1	1.9	2.6	13.5	23.3	31.3	23.7
Pasture fed for period (DM lbs.)	0	1,530	2,520	4,010	17,287	34,134	33,869	32,832
Surplus/deficit pasture (DM lbs.)	0	190	-112	-569	-577	514	3,969	-407
Balage fed (DM lbs.)	6,300	6,120	0	0	0	0	0	0
Running baleage inventory available (DM lbs.)	-6,300	-12,230	-12,341	-12,910	-13,487	-12,974	-9,005	-9,412
Total grain (DM lbs.)	6,300	7,650	15,120	16,038	14,818	17,809	14,515	16,416
Total dry cow hay (DM lbs.)	5,922	7,191	0	0	0	0	0	0
Total lactating cow hay (DM lbs.)	0	0	23,310	13,365	7,409	6,085	0	6,703
Total silage (DM lbs.)	12,600	15,300	0	16,038	8,026	0	0	0
Total pasture (DM lbs.)	0	1,720	2,408	3,441	16,710	34,648	37,837	32,425

Summary of the Plan

Feed Cost Summary	Annual Per Herd (lbs.)	Annual Per Herd (tons)	% of Feed	Per Day (lbs.	Cost Per Cow ($)	Cost Per Cwt. ($)	% of Gross Milk Sales
Grain	309,751	155	28%	9.8	$670.46	$5.23	28%
Dry cow hay	60,756	30	6%	1.9	$35.07	$0.27	1%
Lactating cow hay	122,963	61	11%	3.9	$195.18	$1.52	8%
Silage	51,964	26	5%	1.6	$21.00	$0.16	1%
Baleage	51,699	26	5%	1.6	$10.44	$0.08	0%
Pasture	498,782	249	46%	15.8			
Total	1,095,916	548	100%	34.7	$932.15	$7.26	38%
Economic Summary	Annual			Daily	Per cow	Per Cwt.	
Gross milk sales	$211,185			$579	$2,438	$19.00	100%
Income over purchased feed & forage	$130,438			$357	$1,506	$11.74	62%

Written by: Stacey Hamilton, Joe Horner and Ryan Milhollin Developed: 11/28/2012

UNIVERSITY OF MISSOURI Extension
Pasture-Based Dairy Program

Use of Grazing Model

* Remember this is only a tool
* Allows "What if ?" scenarios…
  * Forage combinations
  * Stocking rates
  * Grain feeding

* Junk in….Junk out!
  * Be honest
  * If it looks to good to be true….well it probably is!