

Measure, Monitor & Manage

The 3 M's of Pasture Management

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MMM Philosophy

- In order to get the most from our pastures they have to be well **Managed**.
- Management requires knowing what is going on in your pastures. This knowledge is gained through **Monitoring** your paddocks.
- The best way to accurately monitor pastures is through **Measuring** key pasture indicators.

Measure – Monitor - Manage

We have available a set of tools and principals that are useful for **Measuring, Monitoring** and ultimately **Managing** pastures.

In this presentation we will address a number of factors that are important to pasture **Management** as well as the tools used for **Measuring** and **Monitoring**.

Definitions and Concepts

- Average Cover
- Growth Rate
- Feed Demand
- Feed Demand/Pasture Balance
- Leaf Stage
- Grazing Wedge
- Feed Budgets
- Residual
- Pre-Graze

Definitions and Concepts

- Average Cover
 - Amount of dry matter forage averaged across entire effective acre grazing platform
 - Used in conjunction w/ Growth Rate to determine upcoming feeding and fertilization strategies

Definitions and Concepts

- Growth Rate
 - Calculation of forage growth on a daily basis from time point to time point averaged across all growing paddocks
 - Usually measured every 7-10 days
 - May be more often in spring with rapid growth rates or changing weather patterns
 - May be slightly longer interval during slow growing periods and consistent weather (summer drought)
- Used in conjunction w/ Average Cover to determine upcoming feeding and fertilization strategies

Calculating Average Cover and Growth Rate

date	acres	20-May		27-May		gain/loss	average GR	
		lbs/acre	Total	lbs/acre	Total			
1	2	1403	2806	1761	3522	358	358	51
2	2	1403	2806	1739	3478	336	336	48
3	2	1537	3074	1828	3656	291	291	42
4	2	1918	3836	2164	4328	246	246	35
5	2	1896	3792	1604	3208	-292	0	
6	2	1806	3612	2164	4328	358	358	51
7	2	1380	2760	1873	3746	493	493	70
8	2	1380	2760	1873	3746	493	493	70
9	2	1403	2806	1761	3522	358	358	51
10	2	1380	2760	1784	3568	404	404	58
11	2	1492	2984	1828	3656	336	336	48
16a	2	2030	4060	1627	3254	-403	0	
16b	2	2030	4060	1851	3702	-179	0	
16c	2	2366	4732	1761	3522	-605	0	
16d	2	2120	4240	1784	3568	-336	0	
16e	2	2142	4284	1672	3344	-470	0	
16f	2	1873	3746	2388	4776	515	515	74
16g	2	1403	2806	1739	3478	336	336	48
17a	2	1403	2806	1918	3836	515	515	74
17b	2	1380	2760	1896	3792	516	516	74
17c	2	1380	2760	1873	3746	493	493	70
17d	2	1851	3702	2321	4642	470	470	67
17e	2	2030	4060	2568	5136	538	538	77
17f	2	1403	2806	1918	3836	515	515	74
w1	3	1851	5553	1918	5754	67	67	10
w4	3	1537	4611	1873	5619	336	336	48
w5/w6	4	2052	8208	2478	9912	426	426	61
w7	2	1940	3880	2500	5000	560	560	80
w8	2	2590	5180	1896	3792	-694	0	
14 15	4	2030	8120	2478	9912	448	448	64
nap	5	3060	15300	3128	15640	68	68	10
sap	5	2881	14405	3105	15525	224	224	32
	76		146075		162544			
		AV. Cover	1922	AV. Cover	2139			

GROWTH RATE 55

Definitions and Concepts

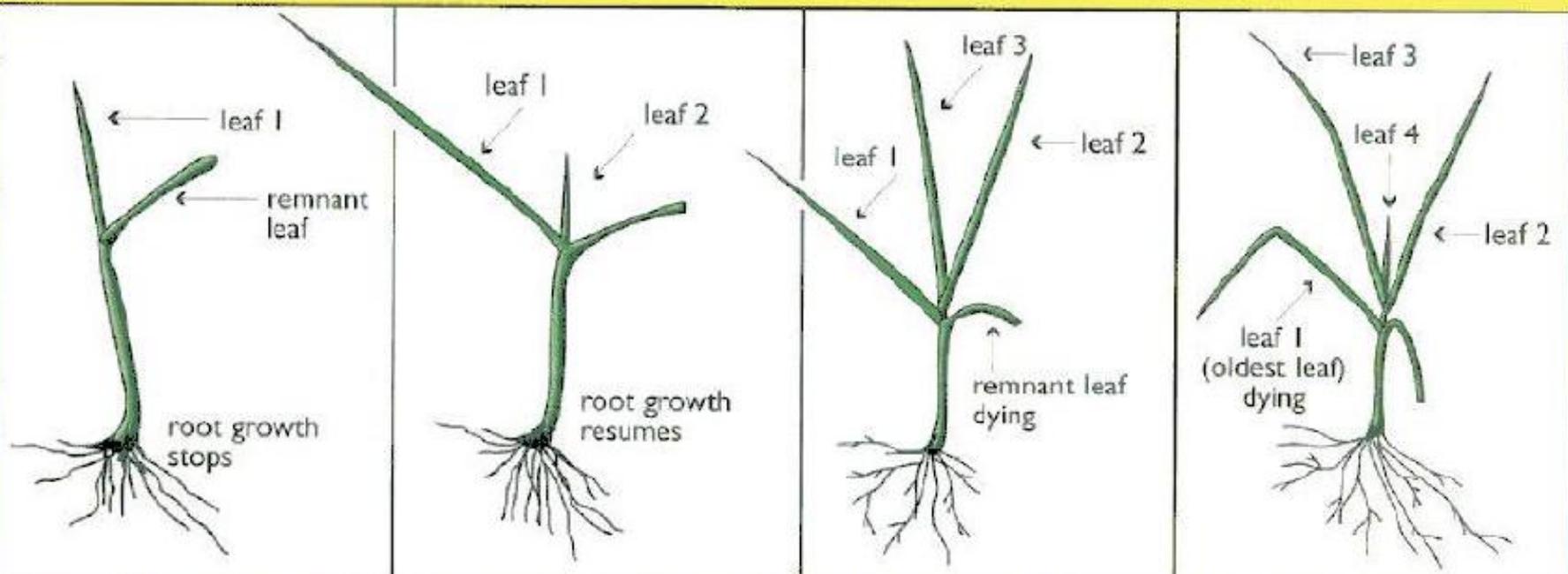
- Feed Demand
 - Amount of pasture forage needed per cow per day above other supplemental feeding (grain, silage, hay)
 - Example:
 - Stocking rate of 1.25 cows/acre
 - Cow requirement of 38# DM/day
 - Feeding 8# grain and 3# DM corn silage /cow/day
 - Feed Demand of pasture forage is 33.75#
 - $(38-(8+3)=27)*1.25=33.75$

Definitions and Concepts

- Feed Demand/Pasture Balance
 - The relationship between what the farm is growing on a daily basis and its current feeding requirements
 - Example
 - In the previous example 33.75#/day was the feed demand of forage from pasture
 - To maintain average cover of the farm then 33.75#/acre of forage must grow daily

Definitions and Concepts

- Leaf Stage
 - The physiological design of the plant that determines the number of live leaves per tiller
 - Species dependent
 - Perennial Ryegrass 3 leaves
 - Tall Fescue 3-4 leaves
 - Orchardgrass 4-5 leaves
 - As plants grow more leaves than their physiological design, the earliest leaf undergoes senescence and forage quality declines



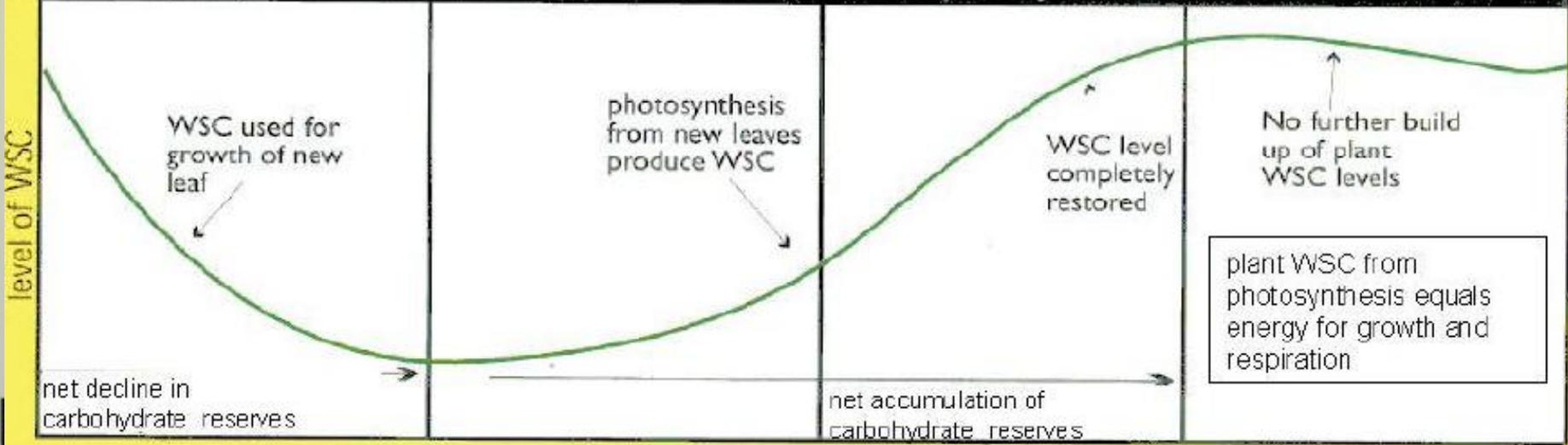
Regrowth of remnant leaf and emergence of first new leaf.

First new leaf fully emerged and second leaf beginning to emerge.

The 3-leaf stage - 3 new leaves fully emerged.

The oldest leaf dies with the emergence of the fourth leaf

WATER SOLUBLE CARBOHYDRATE LEVELS (WSC) IN RYEGRASS PLANTS

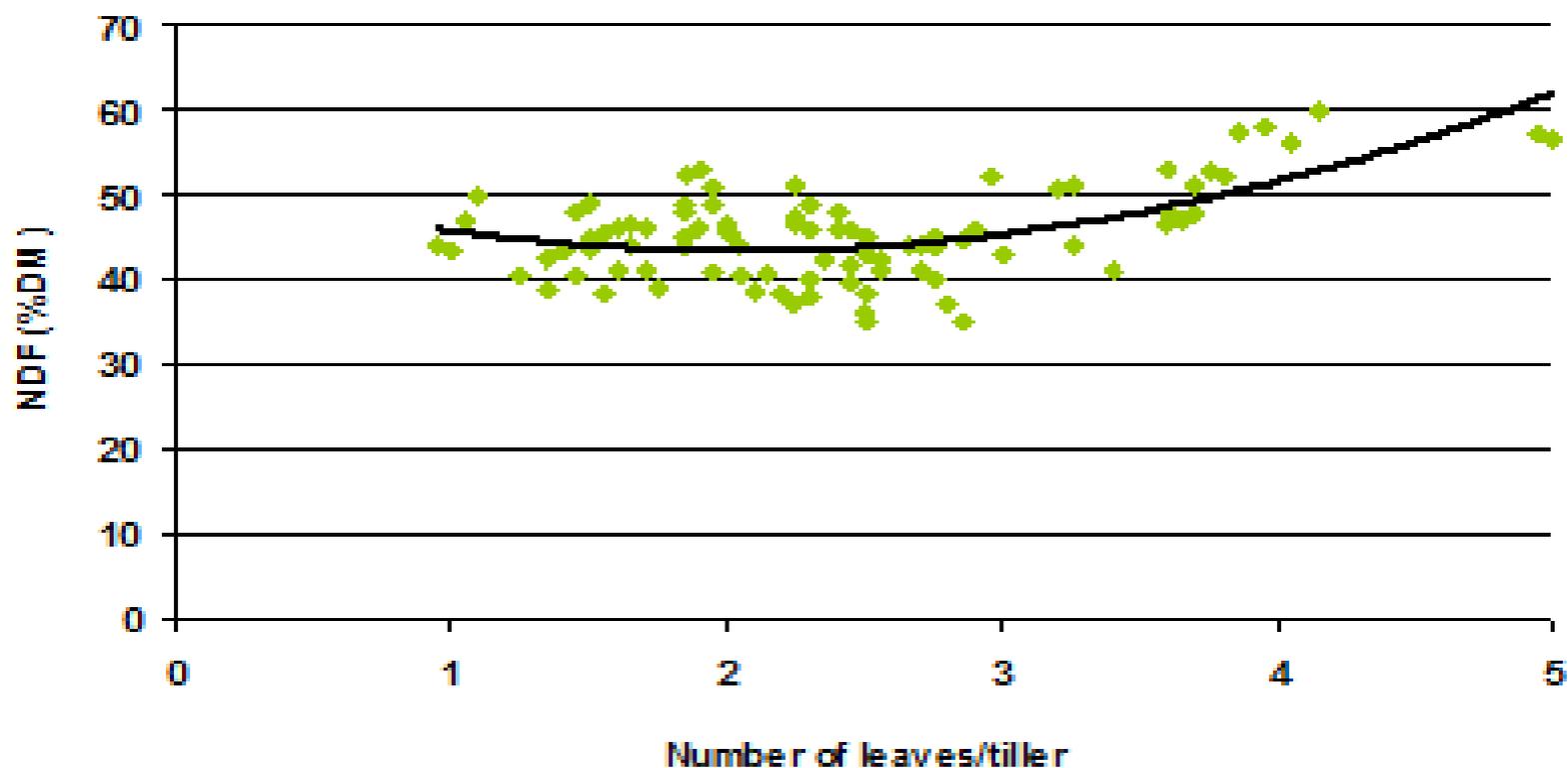




What about NDF?

Affected by:

- stem formation, stress, senescence



Dr Danny Donaghy, pers. comm.

Pasture Quality

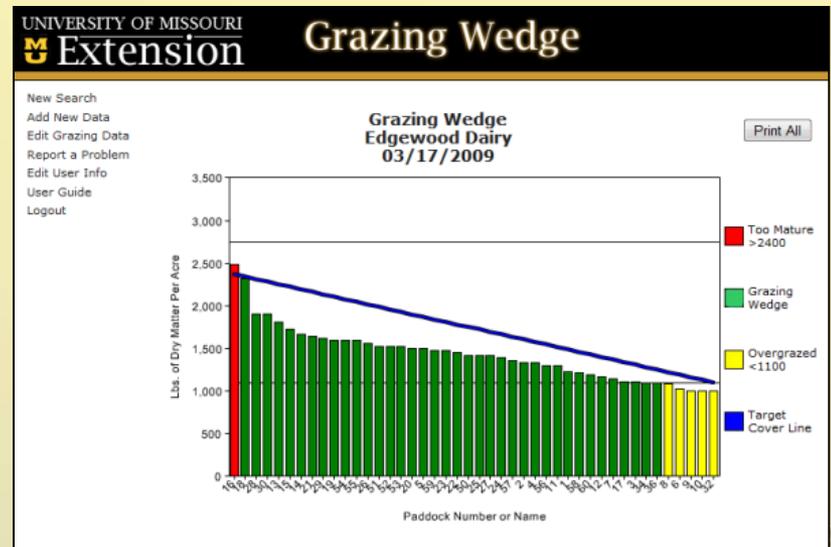
<u>Description</u>		<u>NEI(MCal/#DM)</u>
Leafy tiller	.10 MCal NE or 10% TDN	.73 - .80
Stem starting to develop, Flag leaf appearing (4 th)		.64 - .70
Seed head developing, 1cm long		.60 - .68
Seed head starts to emerge		.58 - .62
Seed color changes, seed starts to fill		.55 - .58
Seed shedding		.51 - .58
		.39 - .51

Definitions and Concepts

- Grazing Wedge
 - A graphic evaluation at a set point in time of the grazing platform ranking paddocks in ascending or descending order based on dry matter yield
 - Calculates Average Cover and Growth Rate (if previous point in time measurement)
 - Visual appraisal of entire farm to assist in determining:
 - Paddocks grazing order
 - Paddocks for mechanical harvest
 - Selective paddock nitrogen application
 - Feeding strategies

Monitoring pasture growth

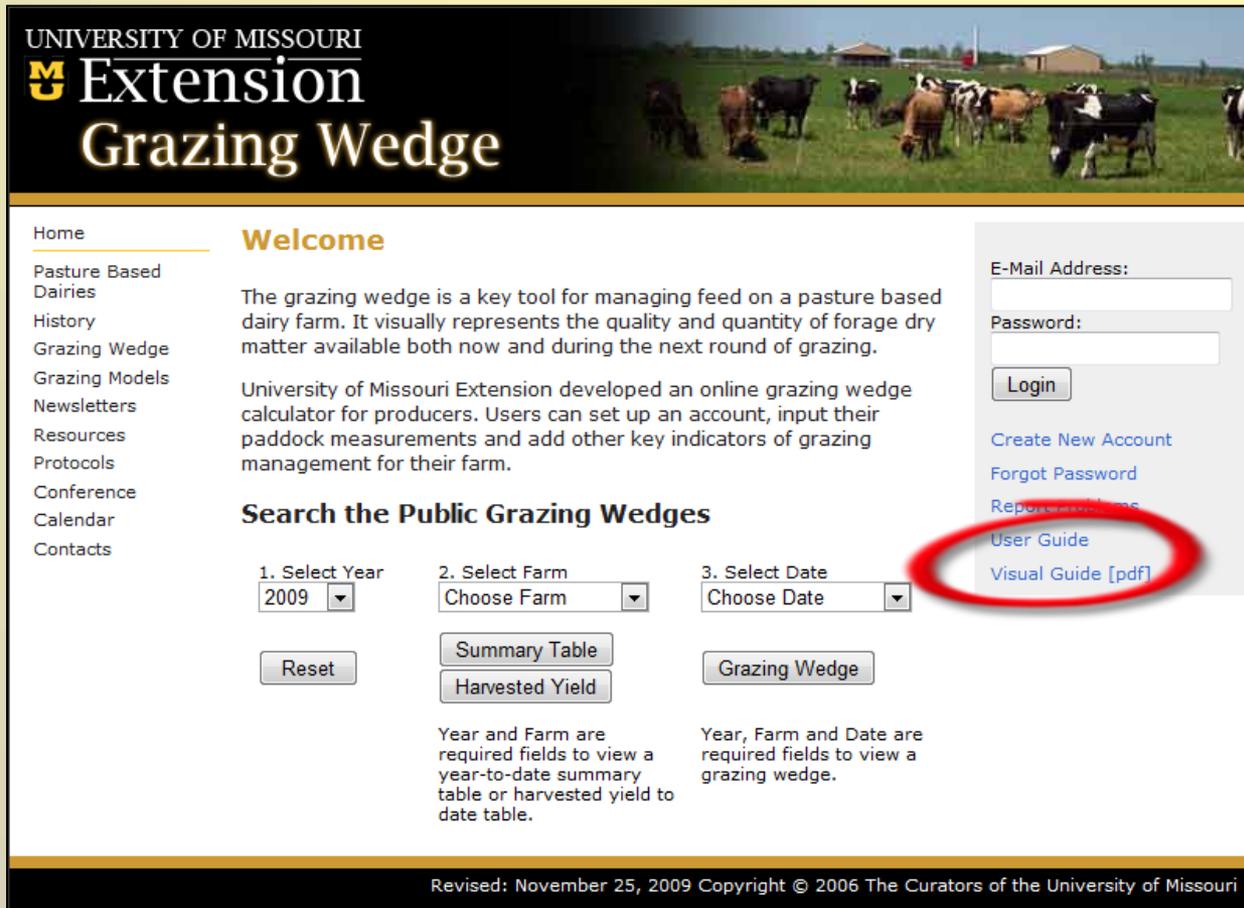
- ✘ We often have little idea of how much feed we have or what might be coming
- ✘ Monitoring forage in the pasture can help us make better decisions about fertilizer, supplements, renovations and stocking rates



Measuring pasture growth



Pasture Monitoring Website



UNIVERSITY OF MISSOURI
M Extension
Grazing Wedge

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Welcome

The grazing wedge is a key tool for managing feed on a pasture based dairy farm. It visually represents the quality and quantity of forage dry matter available both now and during the next round of grazing.

University of Missouri Extension developed an online grazing wedge calculator for producers. Users can set up an account, input their paddock measurements and add other key indicators of grazing management for their farm.

Search the Public Grazing Wedges

1. Select Year
2009

2. Select Farm
Choose Farm

3. Select Date
Choose Date

Reset

Summary Table
Harvested Yield

Grazing Wedge

Year and Farm are required fields to view a year-to-date summary table or harvested yield to date table.

Year, Farm and Date are required fields to view a grazing wedge.

E-Mail Address:
Password:
Login

[Create New Account](#)
[Forgot Password](#)
[Reset Password](#)
[User Guide](#)
[Visual Guide \[pdf\]](#)

Revised: November 25, 2009 Copyright © 2006 The Curators of the University of Missouri

Report

Graph of current DM yield available in each paddock

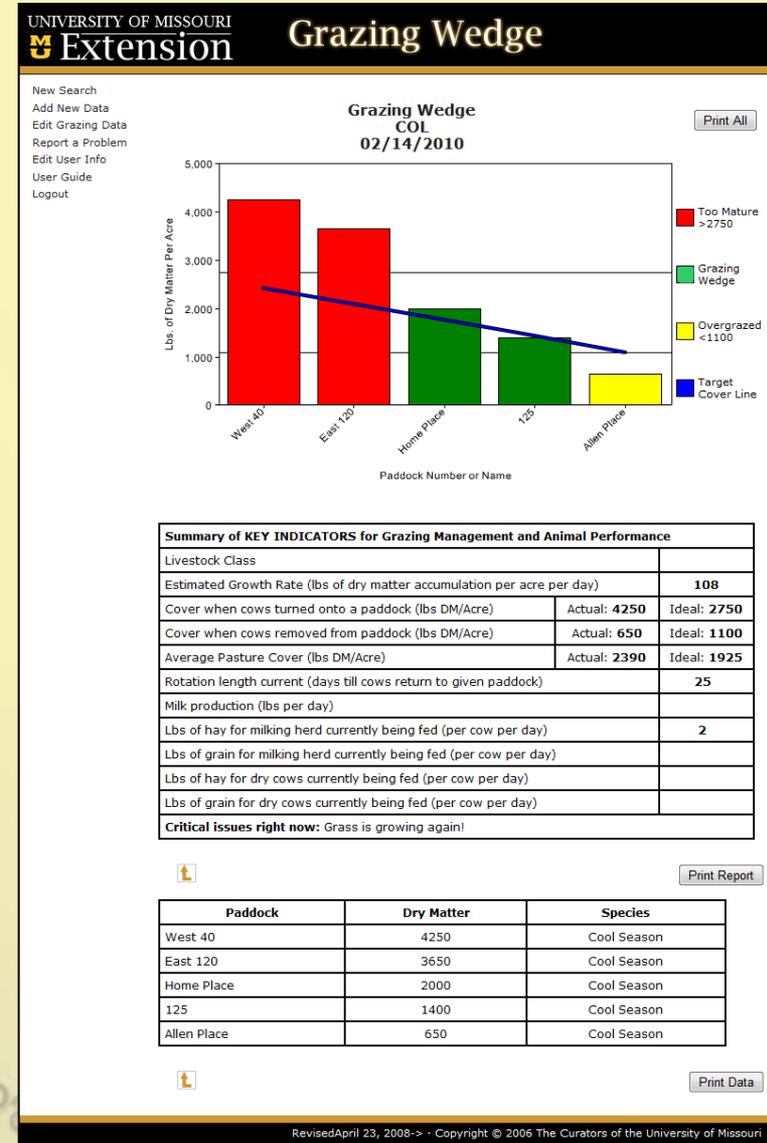
- Paddocks in **red** bars indicate that forage is too mature
- Paddocks in **green** are ideal for grazing
- Yellow bars indicate paddocks that are overgrazed

Estimated growth rate

Estimated DM yield on offer when stock are turned into a paddock

Estimated DM yield left when stock leave a paddock

Table of DM yield for each paddock



How I Use It

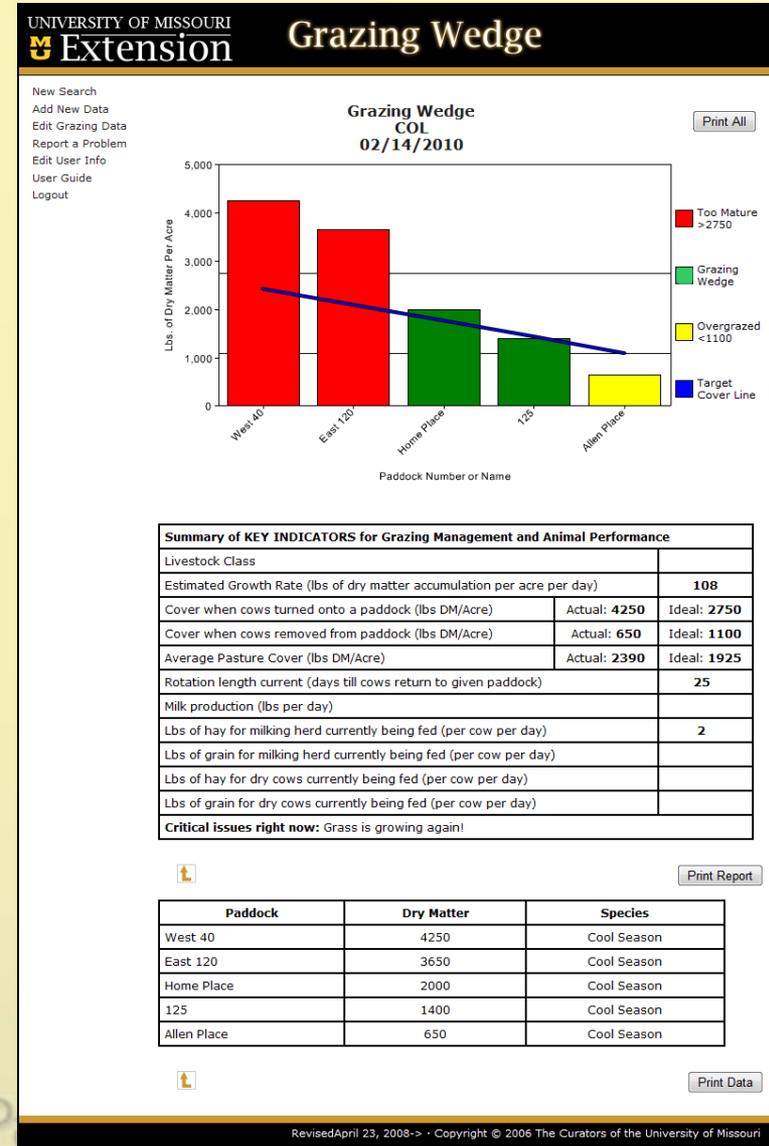
If possible, I would mechanically harvest those paddocks in red

I would move stock to the paddock with the tallest green bar for grazing

I would shorten my rotation to avoid “yellow” paddocks

I use the “growth rate” calculation to roughly predict the future.

- At growth rates over 75 lb/acre/day, I would not fertilize or encourage growth.
- If I have a lot of green bars almost ready for grazing this week, I can bet that next week I'll have too much forage



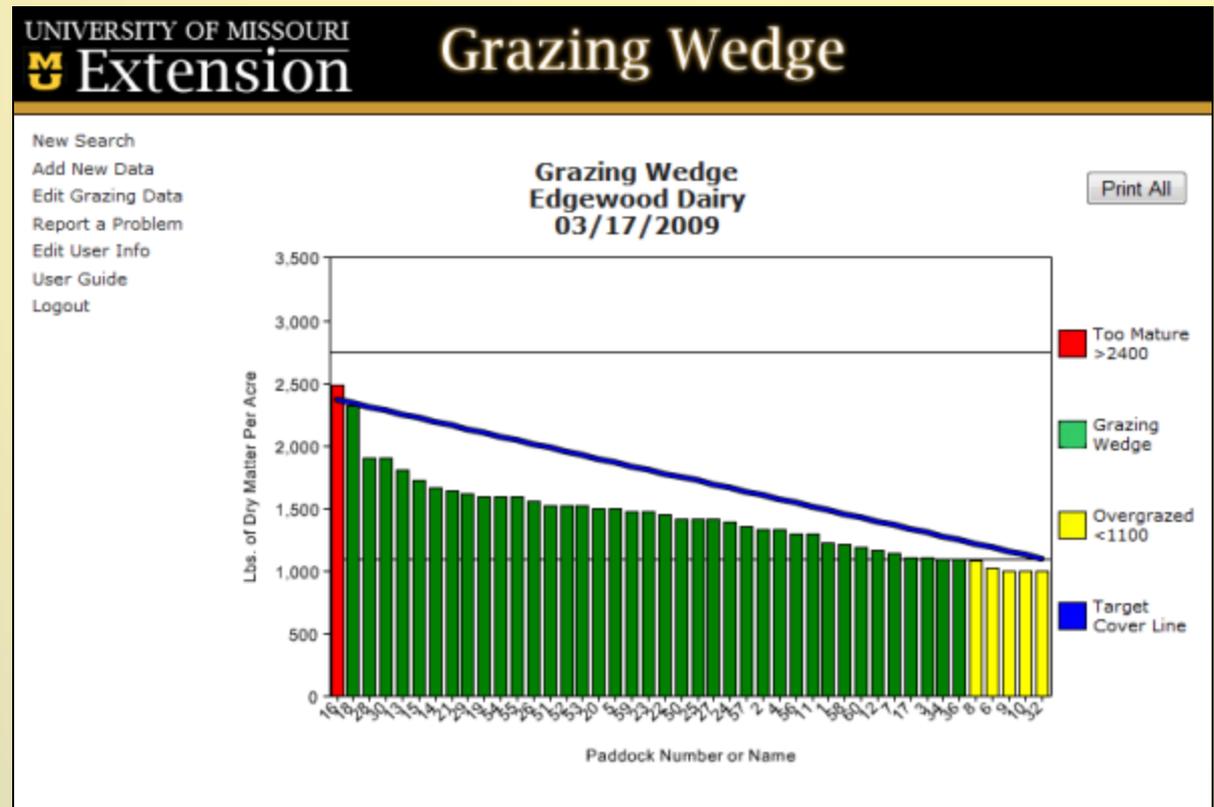
Examining “Wedges”

Growth rate is limiting factor here

At current usage, forage will run out if growth rate does not improve

Options:

- Feed more supplements
- Decrease stocking rate
- Take some condition off of livestock
- Fertilize to improve growth rate
- Expand the grazing platform



Growth rate is 33 lb/a/day

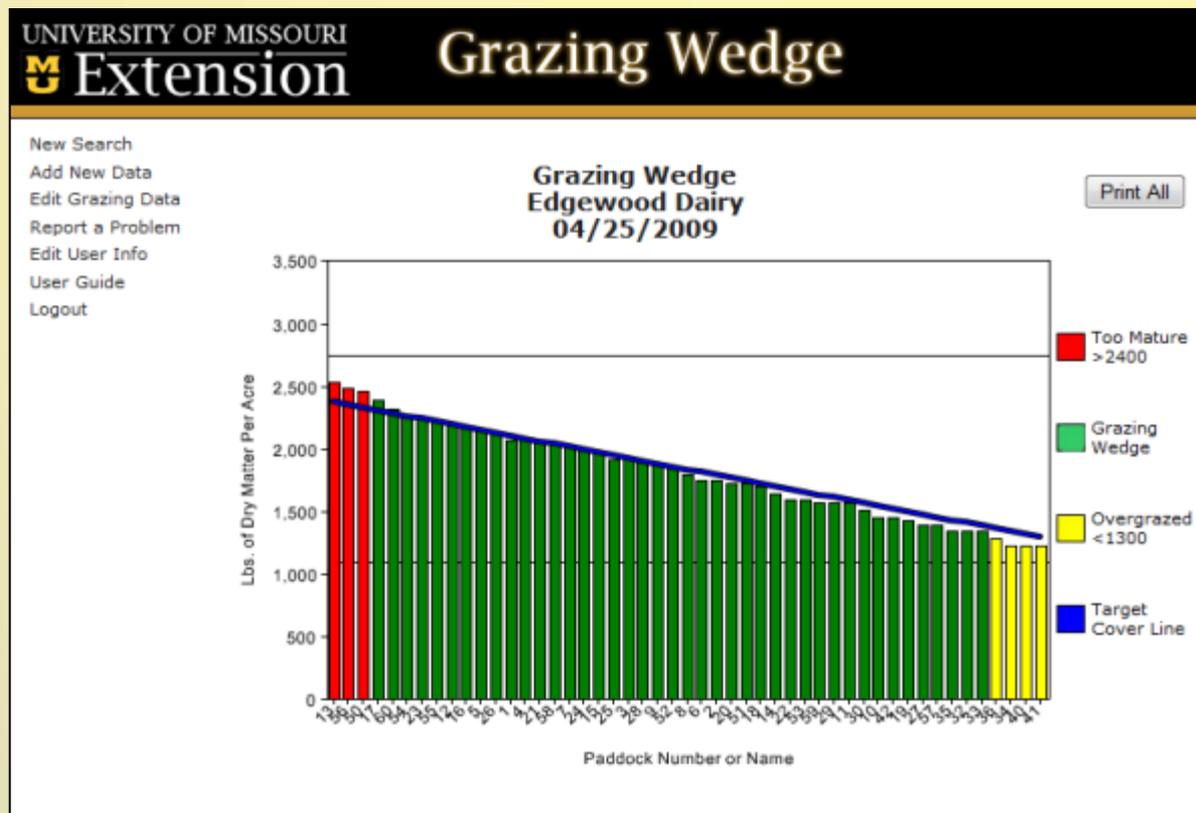
What about this one?

Nearly perfect balance – a few paddocks getting ahead

At current usage, forage growth rate is nearly ideal

Options:

- Not much to do, except harvest a few paddocks
- Beware that growth rates change quickly sometimes – don't get complacent



Growth rate is 61 lb/a/day

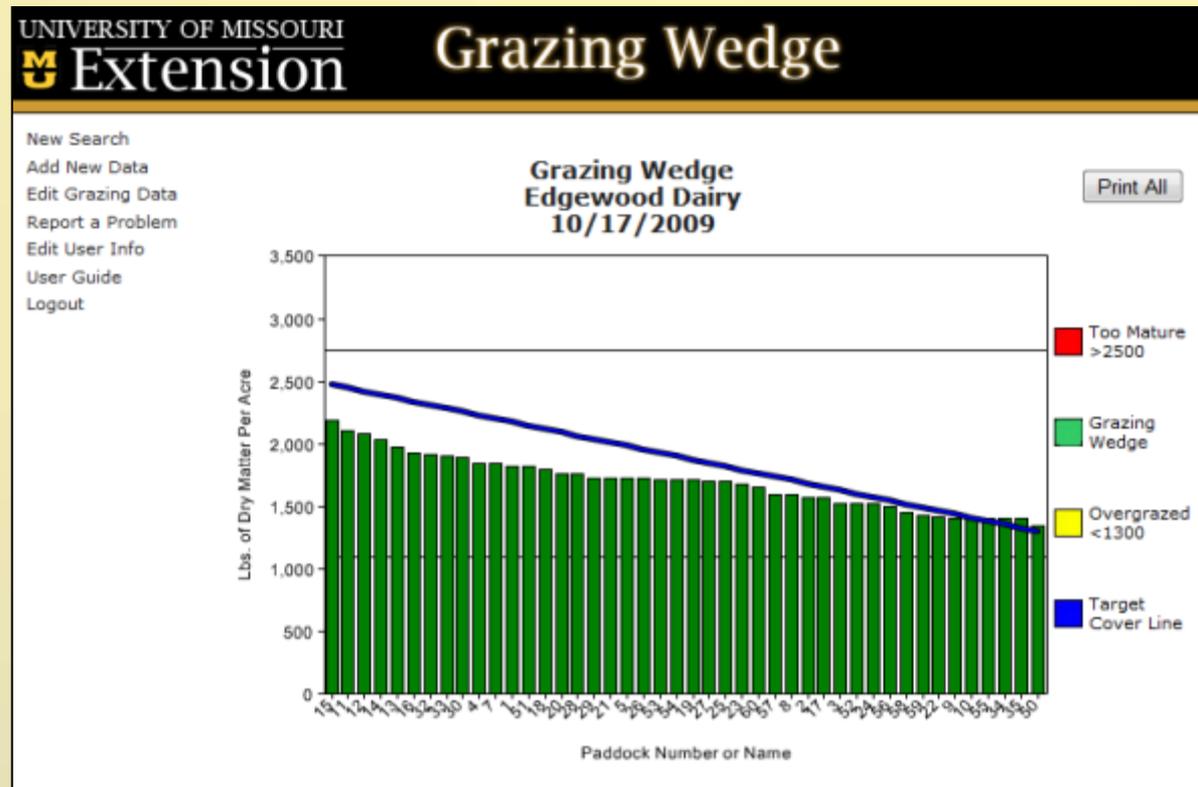
Autumn Growth

Many paddocks available for grazing but rotation length will be short

Growth rate low, but unlikely to improve much due to time of year

Options:

- Graze what you can but it won't last long
- Consider giving growing livestock priority access to pasture
- Could increase supplements if you want to continue on pasture



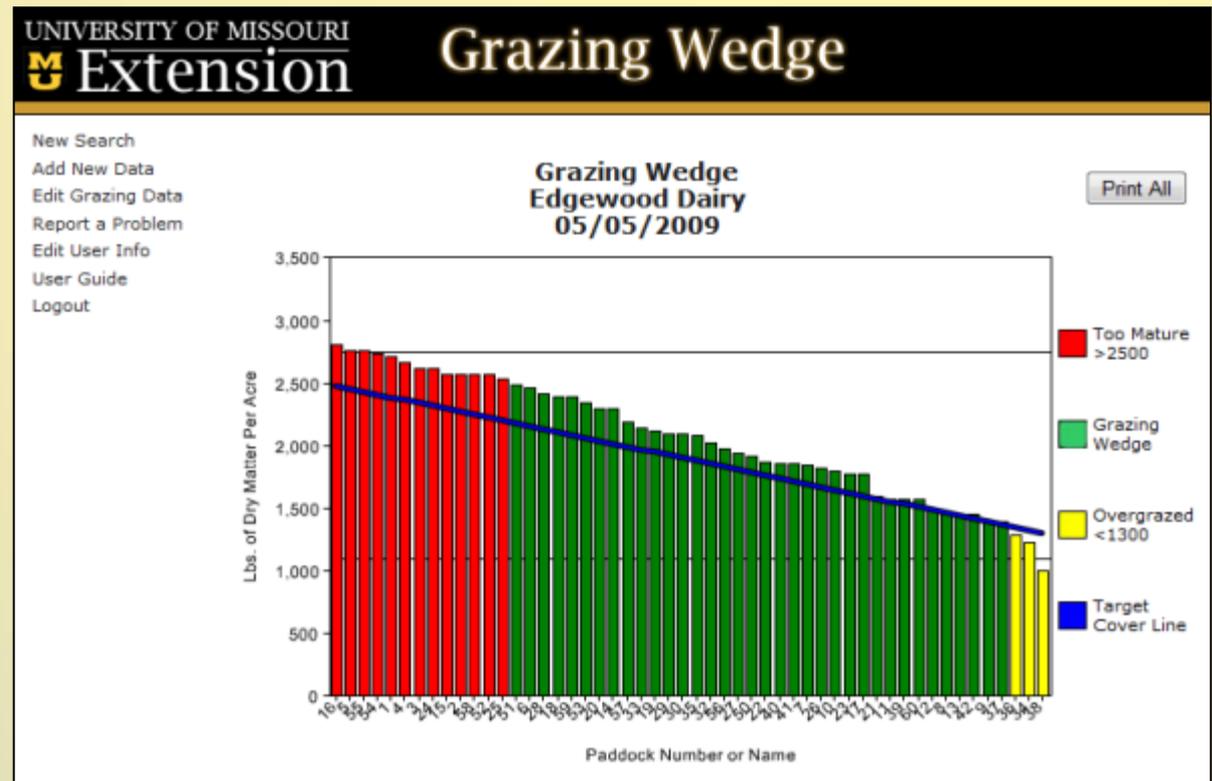
Growth rate is 16 lb/a/day

What do you do about this?

Too much forage – If some paddocks are not harvested then all of the forage in the system will be of low quality

Options:

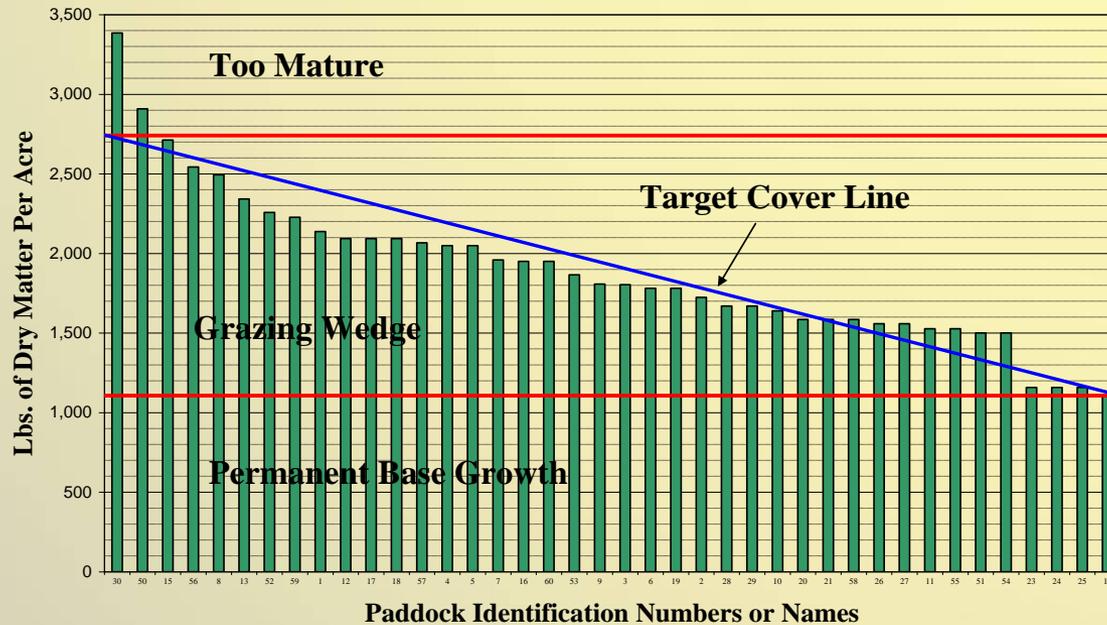
- Harvest paddocks in red
- Graze the paddock with the tallest green bar
- Reduce or eliminate supplements so that stock will harvest forage



Growth rate is 63 lb/a/day

Let's Look at a Year's Data for an Example Farm

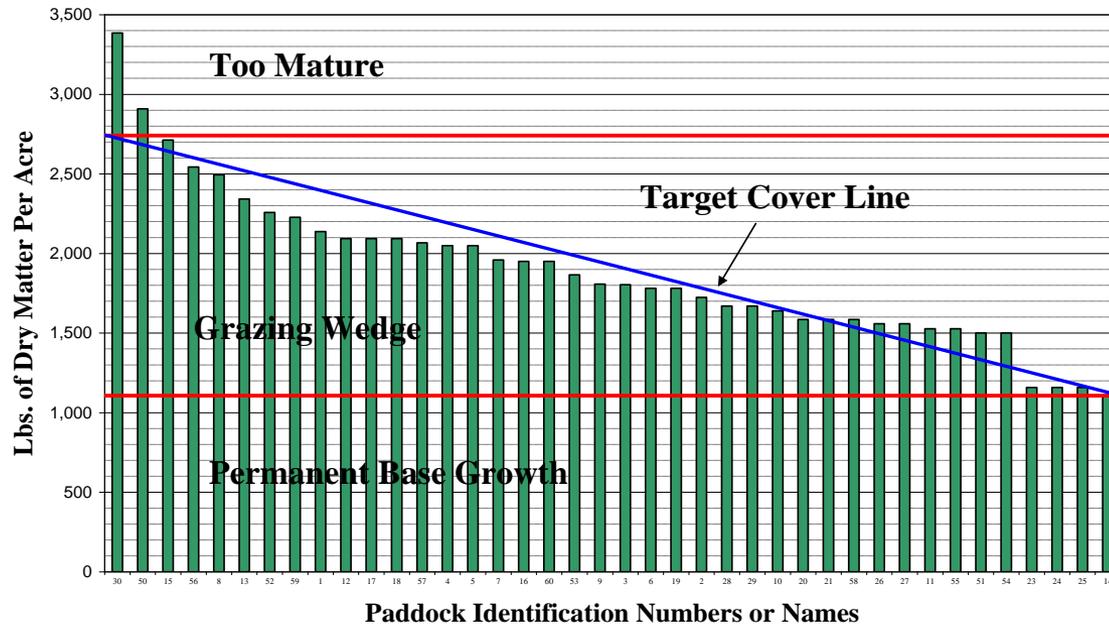
Grazing Wedge at Missouri Farm #7
4/3/2006



Grazing Wedge at Missouri Farm #7

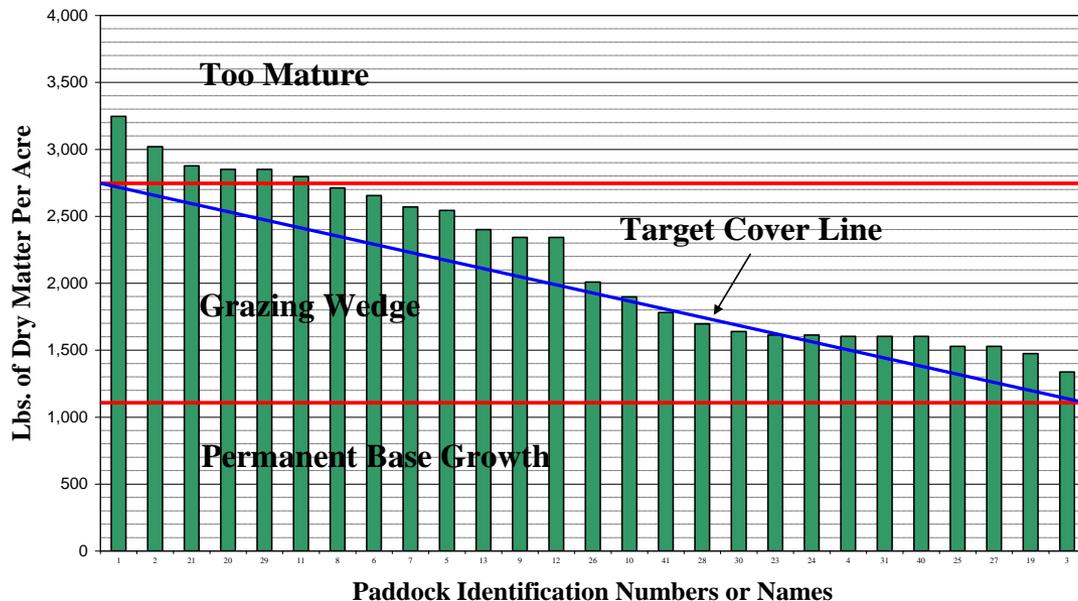
4/3/2006

Date paddocks measured:
4-03-06



Summary of KEY INDICATORS for Grazing Management and Animal Performance		
Estimated Growth Rate (lbs of dry matter accumulation per acre per day)		66
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 3,385	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 1,104	Ideal: 1,100
Average Pasture Cover (lbs DM/Acre)	Actual: 1,889	Ideal: 1,925
Rotation length current (days till cows return to given paddock)		-
Lbs of hay currently being fed per cow per day		0 – milking, 10 - dry
Lbs of grain currently being fed per cow per day		12 – milking, 5 - dry
<p><u>Critical issues right now</u></p> <p>The total farm cover is increasing. We received .5 inch of rain Sat night 4/1/06. The cows are currently grazing winter rye and starting to graze the matua. The orchard grass is growing, but more slowly. Dairy feed is still at 12#/cow/day. No hay is currently needed. Dry cows are getting 5#/cow/day and 10# hay/cow/day, but eating less every day. This causes some concern because of the high potassium levels in their pasture, leading to the possibility of retained placentas. Going to put 50# of N on the orchard grass and improved fescue pastures tomorrow.</p>		

Grazing Wedge at Missouri Farm #7



Date paddocks measured:
5-23-06

Summary of KEY INDICATORS for Grazing Management and Animal Performance

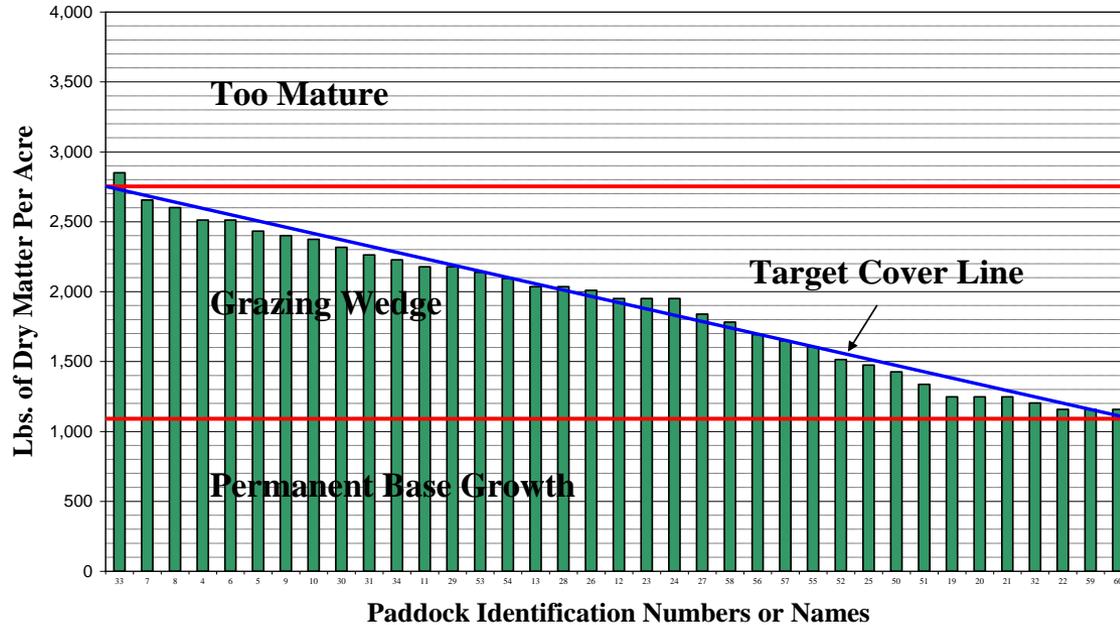
Estimated growth rate (lbs of dry matter accumulation per acre per day)	116	
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 3,247	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 1,336	Ideal: 1,100
Average pasture cover (lbs DM/Acre)	Actual: 2,153	Ideal: 1,925
Rotation length current (days till cows return to given paddock)	25	
Milk production (lbs per day)	58	
Lbs of hay currently being fed (per cow per day)	0	
Lbs of grain currently being fed (per cow per day)	12	

Critical issues right now

It looks like we have adequate cover, but we are monitoring the paddocks 2 to 3 weeks out to determine when the next application of N will be necessary. The heat is beginning to cause some stress so we are moving the cows to shade in the afternoon. The cows are receiving about 55% of their daily dry matter after the evening milking and the balance after the morning milking.

Grazing Wedge at Missouri Farm #7

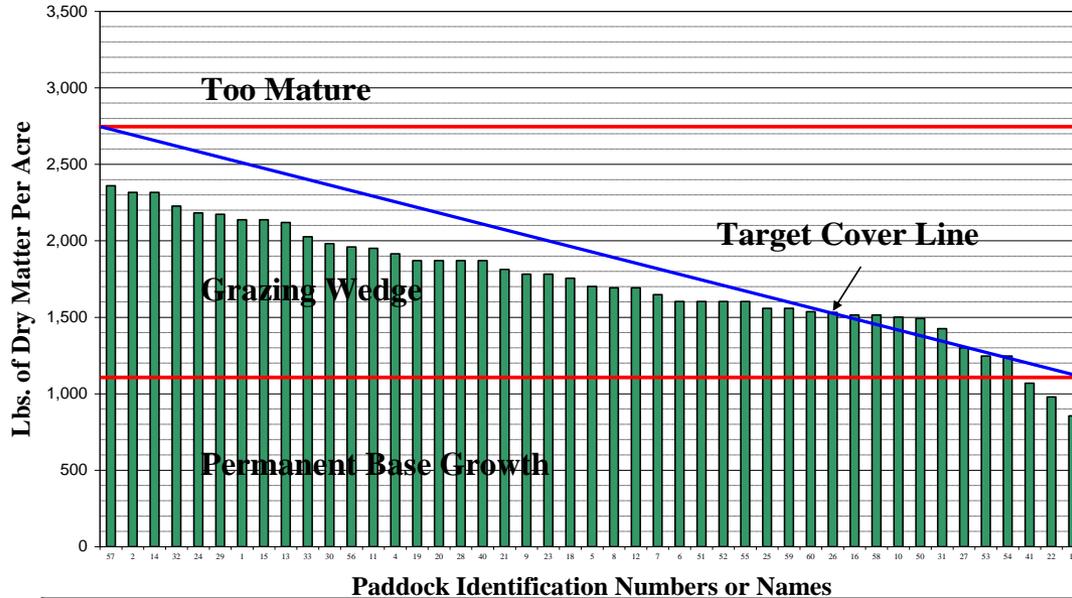
Date paddocks
measured:
6-28-06



Summary of KEY INDICATORS for Grazing Management and Animal Performance

Estimated growth rate (lbs of dry matter accumulation per acre per day)		57
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 2,820	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 1,158	Ideal: 1,100
Average pasture cover (lbs DM/Acre)	Actual: 1,902	Ideal: 1,925
Rotation length current (days till cows return to given paddock)		30
Milk production (lbs per day)		51
Lbs of hay currently being fed (per cow per day)		0
Lbs of grain currently being fed (per cow per day)		14
<u>Critical issues right now</u> Rain 6/17/06 .10, 6/22/06 .60, 6/25/06 .30 Rotation is 30 days but if we receive some rain in the near future we will speed back up.		

Grazing Wedge at Missouri Farm #7



Date paddocks
measured:
7-27-06

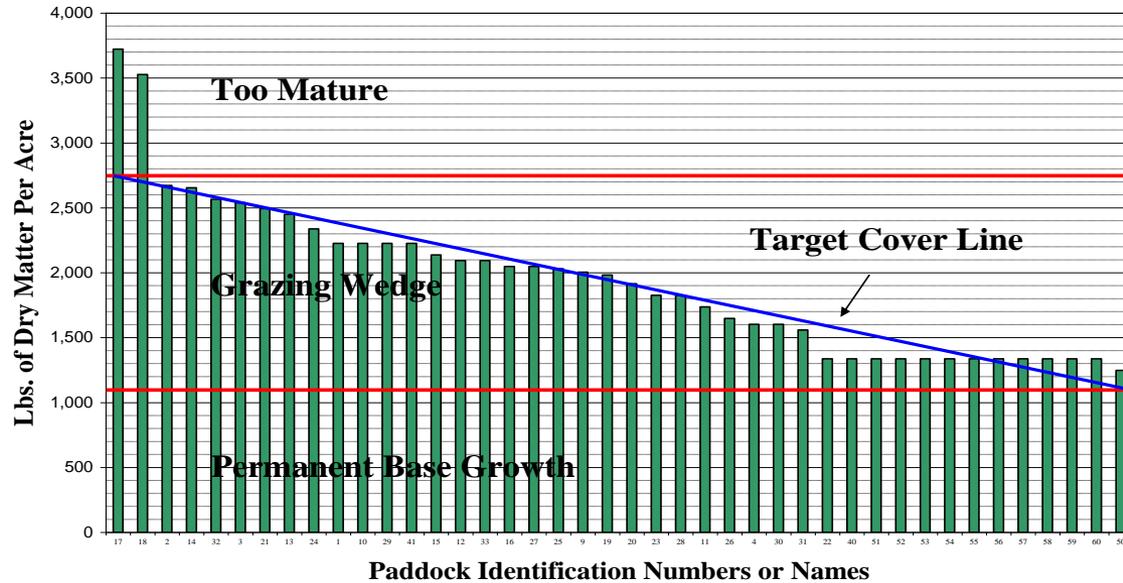
Summary of KEY INDICATORS for Grazing Management and Animal Performance

Estimated growth rate (lbs of dry matter accumulation per acre per day)	37	
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 2,360	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 855	Ideal: 1,100
Average pasture cover (lbs DM/Acre)	Actual: 1,731	Ideal: 1,925
Rotation length current (days till cows return to given paddock)	21(Warm) 40 (Cool)	
Milk production (lbs per day)	48	
Lbs of hay currently being fed (per cow per day)	0	
Lbs of grain currently being fed (per cow per day)	14	

Critical issues right now

The cows are giving 48# of milk. The heat was very hard on intake even though grass quality was good. As of now we haven't received any rain. Hoping for some tonight or tomorrow. We will begin supplementing with silage again tomorrow. Rotation is around 21 days for the warm season grasses and closer to 40 days for the cool season grasses.

Grazing Wedge at Missouri Farm #7

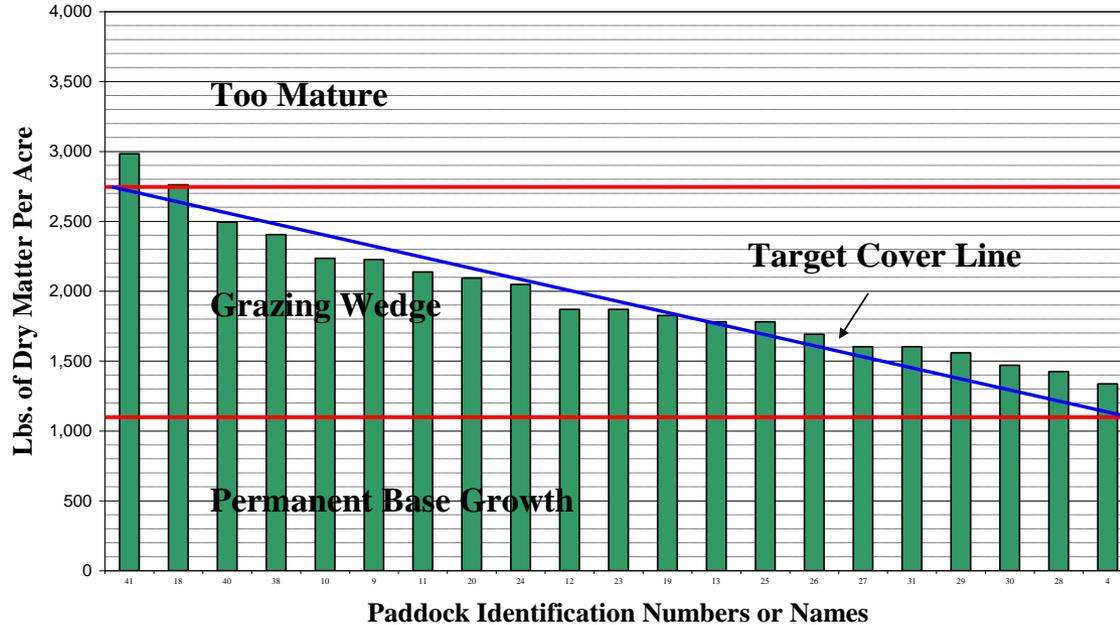


Date paddocks
measured:
8-27-06

Summary of KEY INDICATORS for Grazing Management and Animal Performance		
Estimated growth rate (lbs of dry matter accumulation per acre per day)		49
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 3,723	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 1,247	Ideal: 1,100
Average pasture cover (lbs DM/Acre)	Actual: 1,936	Ideal: 1,925
Rotation length current (days till cows return to given paddock)		-
Milk production (lbs per day)		-
Lbs of hay currently being fed (per cow per day)		-
Lbs of grain currently being fed (per cow per day)		-
<u>Critical issues right now</u>		
We received .6 inches of rain on 8-22-06 and 3.5 inches on 8-27-06		

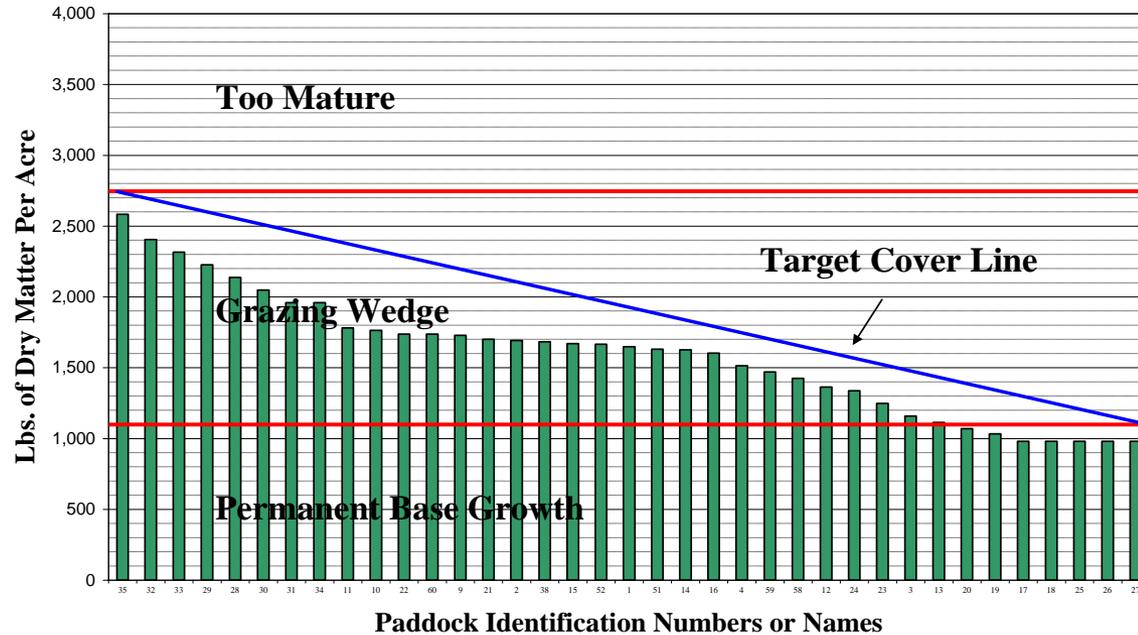
Grazing Wedge at Missouri Farm #7

Date paddocks measured:
9-28-06



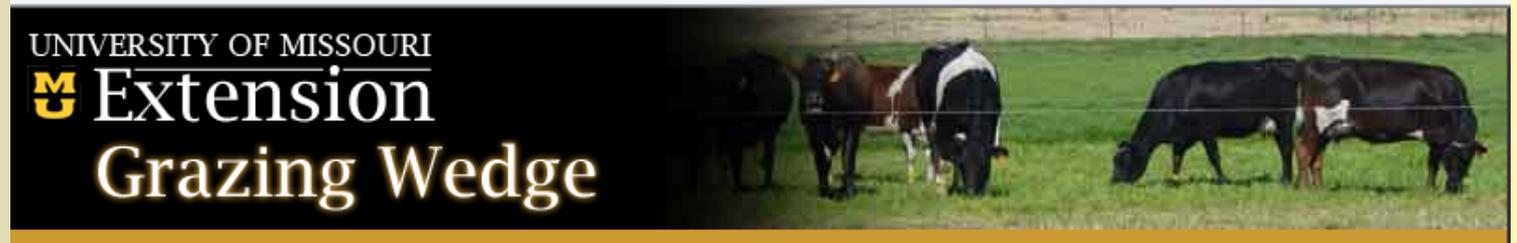
Summary of KEY INDICATORS for Grazing Management and Animal Performance		
Estimated growth rate (lbs of dry matter accumulation per acre per day)		14
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 2,984	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 1,336	Ideal: 1,100
Average pasture cover (lbs DM/Acre)	Actual: 1,962	Ideal: 1,925
Rotation length current (days till cows return to given paddock)		-
Milk production (lbs per day)		-
Lbs of hay currently being fed (per cow per day)		0
Lbs of grain currently being fed (per cow per day)		0
<u>Critical issues right now</u> Rain 9/23/06 .50 in		

Grazing Wedge at Missouri Farm #7



Date paddocks
measured:
11-01-06

Summary of KEY INDICATORS for Grazing Management and Animal Performance		
Estimated growth rate (lbs of dry matter accumulation per acre per day)		15
Cover when cows turned onto a paddock (lbs DM/Acre)	Actual: 2,583	Ideal: 2,750
Cover when cows removed from paddock (lbs DM/Acre)	Actual: 980	Ideal: 1,100
Average pasture cover (lbs DM/Acre)	Actual: 1,593	Ideal: 1,925
Rotation length current (days till cows return to given paddock)		-
Milk production (lbs per day)		-
Lbs of hay currently being fed (per cow per day)		-
Lbs of grain currently being fed (per cow per day)		-
<u>Critical issues right now</u> Rain 10/16/06 .70 in		



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Welcome

The grazing wedge is a key tool for managing feed on a pasture based dairy farm. It visually represents the quality and quantity of forage dry matter available both now and during the next round of grazing.

University of Missouri Extension developed an online grazing wedge calculator for producers. Users can set up an account, input their paddock measurements and add other key indicators of grazing management for their farm.

Search the Public Grazing Wedges

1. Select Year: 2013
2. Select Farm: Choose Farm
3. Select Date: Choose Date

Reset Summary Table Grazing Wedge Harvested Yield

Year and Farm are required fields to view a year-to-date summary table or harvested yield to date table.

Year, Farm and Date are required fields to view a grazing wedge.

E-Mail Address: Password: Login Create New Account Forgot Password Report Problems User Guide Visual Guide [pdf]

NOTE: A new website has been developed specifically for Beef Producers. If you do not see your data listed on the Dairy Grazing Wedge site please visit the [Grazing Beef web site.](#)



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- Contacts

Welcome

The grazing wedge is a key tool for managing feed for a beef operation. It visually represents the quality and quantity of forage dry matter available both now and during the next round of grazing.

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Search the Public Grazing Wedges

1. Select Year 2013	2. Select Farm Choose Farm	3. Select Date Choose Date
<input type="button" value="Reset"/>	<input type="button" value="Summary Table"/> <input type="button" value="Harvested Yield"/>	<input type="button" value="Grazing Wedge"/>

Year and Farm are required fields to view a year-to-date summary table or harvested yield to date table.

Year, Farm and Date are required fields to view a grazing wedge.

E-Mail Address:

Password:

- [Create New Account](#)
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- [User Guide](#)
- [Visual Guide \[pdf\]](#)

NOTE:
This is a newly designed grazing wedge site for Beef Producers. If you do not see your data listed on this site please try the original Dairy Grazing Wedge.

Recording Your Own Grazing Wedge

- <http://www.grazingwedge.missouri.edu/>
- <http://www.grazingbeef.missouri.edu/>

Definitions and Concepts

- Residual (post-graze)
 - Height or dry matter yield of forage after cow removal from paddock
- Pre-Graze
 - Height or dry matter yield of forage before cows enter paddock

Tools to Measure Pasture Dry Matter Yields

- Rising plate meter
- Yard stick or forage stick
- CDax rapid pasture measure
- Feed Reader
- Visual appraisal

- Platemeter
- Pasture stick





CDax Rapid Pasture Measure





FarmWorks Feed Reader



Optimizing Grazing Management

3 aspects of well managed grazing systems

1) Rest or Interval

- Amount of time between grazing episodes
- Knowing “when to graze”

2) Intensity

- Knowing “how hard to graze”
- Post-grazing residuals

3) Duration

- Knowing “how long to keep cows on a paddock”

Monitoring Leaf Stage



Two blue baseball caps are lying on a field of green grass. The caps have handwritten text in white marker. The text on both caps reads: "somewhere in the Pacific" on the top line, "AOTEAROA NEW ZEALAND" on the second line, and "AOTEAROA NEW ZEALAND" on the third line. The caps are positioned side-by-side, with a few blades of grass in the foreground.

somewhere
in the Pacific
AOTEAROA NEW ZEALAND

somewhere
in the Pacific
AOTEAROA NEW ZEALAND

Rest Period or Interval

- Harvest of forage should be based on leaf stage in conjunction w/ forage height
- Leaf stage is the INDICATOR the rest period has been sufficient for plant survivability
- Forage height indicates the duration of time or amount of dry matter to be harvested to leave ideal residual (Intensity)
- Leaf appearance can range from 5-30 days
 - Weather dependent

To Graze or Not to Graze?



Stage 1

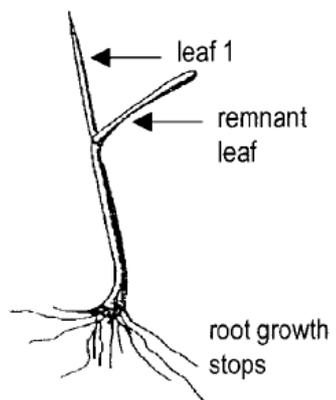


Figure 1. Regrowth of a ryegrass tiller following defoliation (Donaghy 1998).

Intensity of Grazing

- Ideal grazing residual in most bunch-type grasses is 2-3 inches
 - Jointed grasses will be higher
- Residual of less than 1.5 inches (decking)
 - Reduced WSC plant reserve
 - Weeds
 - Plant death
 - Root systems compromised
 - Soil temperatures increase
 - Daughter tiller death

Why 2 inch Residuals?

Energy reserves

WSC from photosynthesis,
N from soil

- respiration
- growth
- stored - future use

} Life

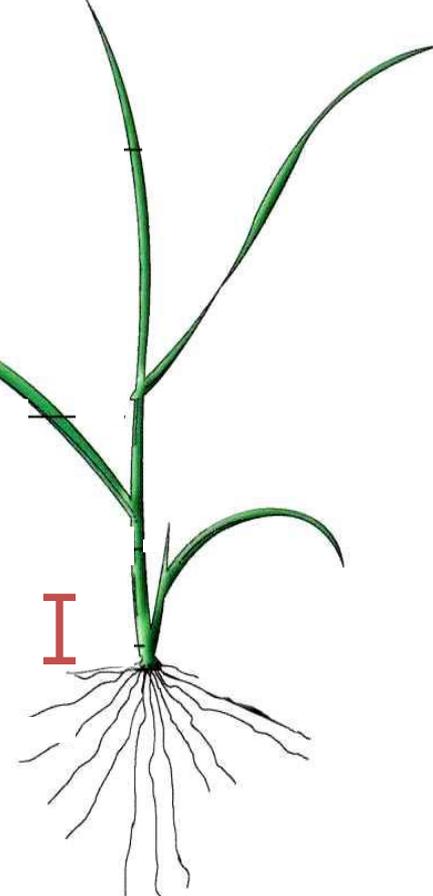
Majority stored in tiller base (bottom 2 inches)

Regrowth

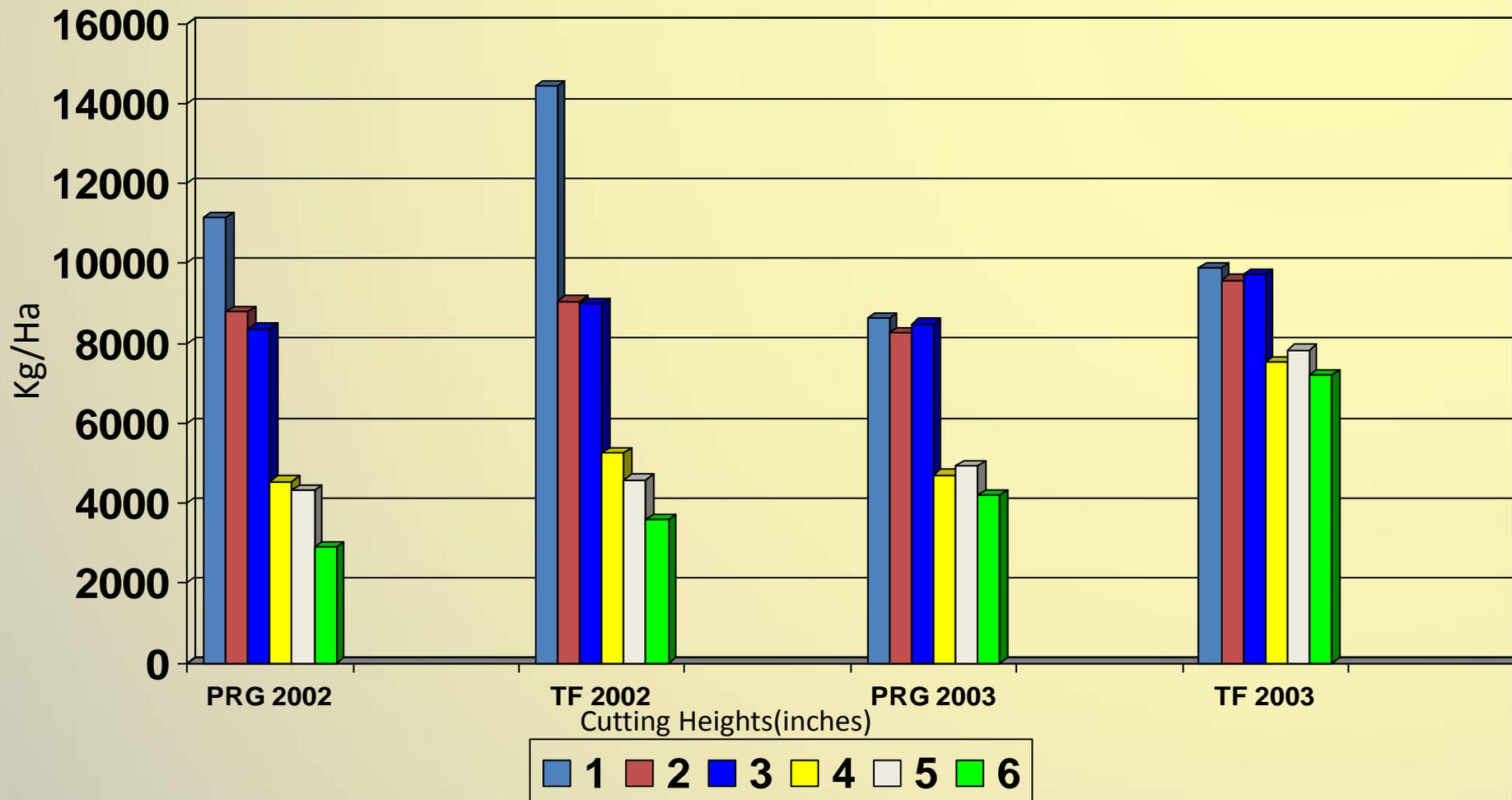
Persistence

Survival

CHO Store



Perennial Ryegrass and Jesup MaxQ Yields for 2002 & 2003



University of Missouri; unpublished data

Residual height on Productivity

- Five defoliation severities:
20, 40, 60, 80 or 100 mm stubble height

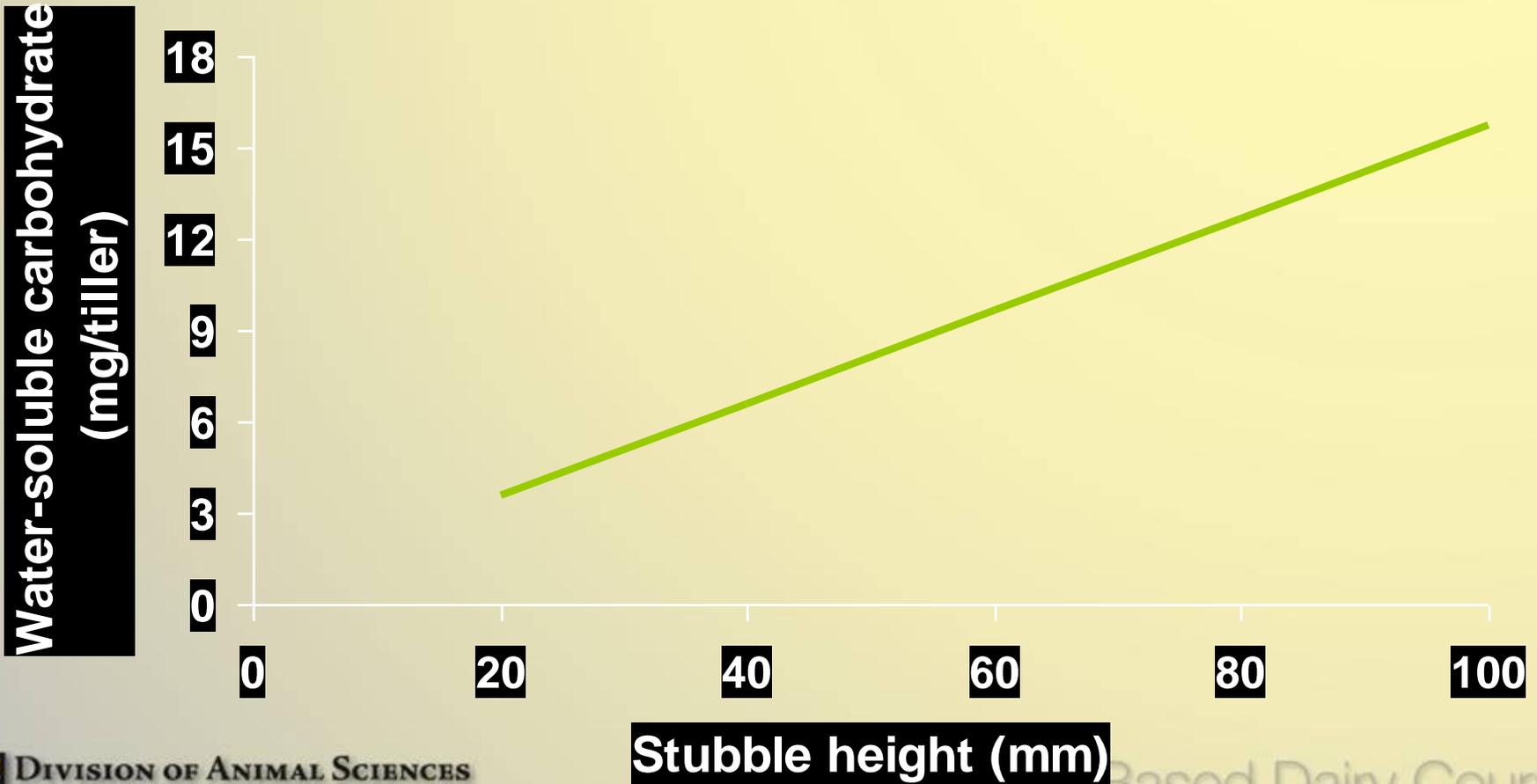


- Seven harvests over six-month period
(Nov 2005 – April 2006)

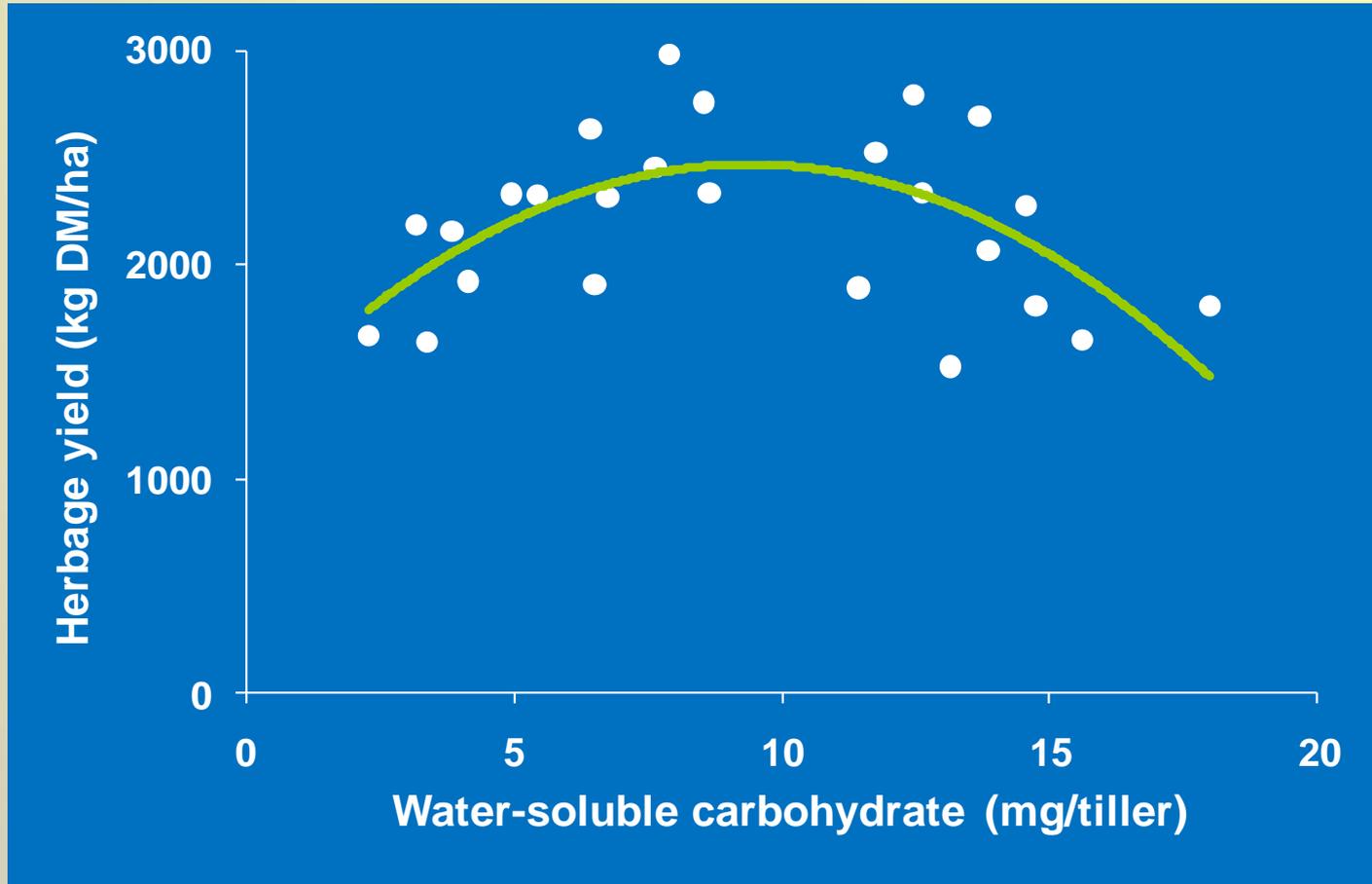
Influence of Stubble Height (Residual) on Total Herbage Yield



WSC content



WSC influences regrowth



Severe defoliation - 20 mm (0.5 inches)

Less residual leaf



Reduced photosynthesis



Increased reliance on WSC



Replenishing WSC stores is priority

Lax defoliation -100 mm (5 inches)

Less light penetration



Increased stem development



Reduction in tiller density

So How do I get Residuals Right?

- Monitor post-graze residuals
 - Goal of clumps (4-6 inches) of less than 25% of paddock
- Determine if residual is too high (>3 inches) or too low (less than 2 inches)
 - High residual
 - Reduce supplement
 - Allocate less area per grazing allocation
 - Increase stocking rate
 - Low residual
 - Increase supplement
 - Allocate larger area per grazing allocation
 - Decrease stocking rate

HABITS

1. Clear vision and written strategic plan
2. All decisions consistent with the strategic plan
3. All decisions based on thorough, timely and relevant research
4. Constantly questioning what you are doing and why you are doing it
5. Constantly identify and tackle current or future limiting factors

Grow Lots of green leafy grass



Eat all the grass

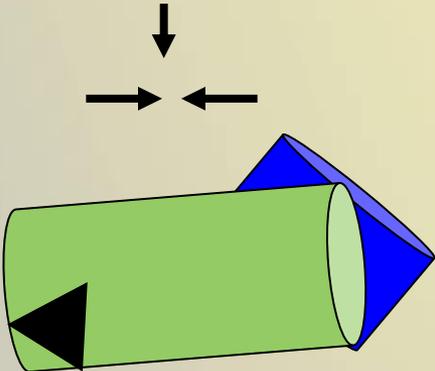


Any Questions?



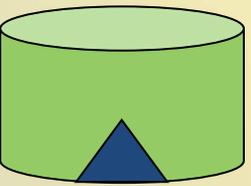
How hard to graze

Needs reference

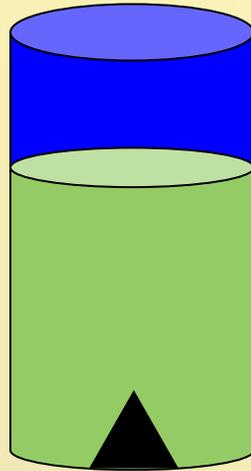


2 cm

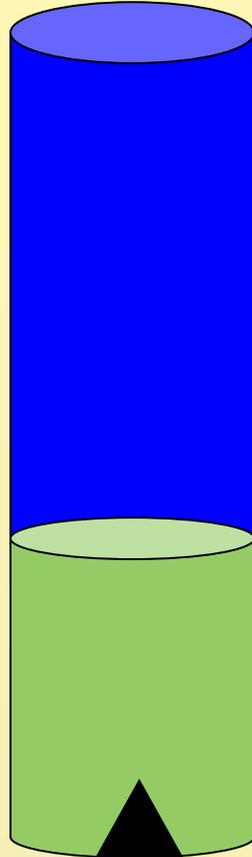
- following 2 to 3 rotations



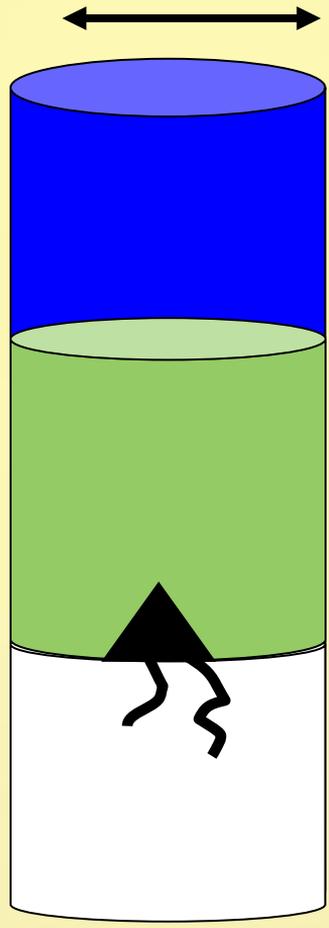
2 cm



5 cm



10 cm



10 cm

- following 2 to 3 rotations

Definitions and Concepts

- Feed Budget
 - Annualized methodology to determine weekly or bi-weekly feed requirements of the grazing platform
 - Utilizes historical growth rates of forages to predict:
 - Surplus/deficits in pasture forage
 - Supplemental feeds
 - Forage mechanically harvested on grazing platform

Excel Spreadsheet displaying Annualized Feed Budget

# cows	110	stocking rate	1.34	12251.8milk		#													
# acres	82			8yield		cow/day	%	cost											0# milk for days
wt cows	1100	DROP DOWN MENU	% farm			sudan balage/c/d	8.1	22.0%	0.05	0.37	45.0								
% DMI	0.031	Forage	Perennial Ryegrass	0.378	31.0	grain c/d	6.5	17.6%	0.09	0.58									
# DM day	34.0	Forage	Fescue w/ high N	0.378	31.0	purchased hay c/d	0.8	2.1%	0.07	0.05									
grazing efficiency	0.85	Forage	RRCG-Cereal Rye rotation	0.171	14.0	wrapped hay on farm	3.3	8.9%	0.05	0.15									
summer stand-off		Forage	Bermuda-Cereal Rye	0.073	6.0	GRASS	18.2	49.4%	0.03	0.55									
						TOTAL	36.9	100.0%		1.70	cost/cwt	3.77136							
						forage off farm		58.3%		8									

add forages (doubled cropped 82.0 only once)

	# DM grass grown per day																	
	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep
Perennial Ryegrass	0	0	0	0	5	18	45	68	90	90	72	68	36	32	5	0	5	27
Fescue w/ high N	0	0	0	0	0	9	36	63	90	99	77	72	54	27	18	5	9	36
RRCG-Cereal Rye rotation	0	0	5	6	32	72	90	45	0	27	81	90	81	72	54	32	0	5
Bermuda-Cereal Rye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	5	6	32	72	90	45	23	81	108	108	99	81	45	32	14	36

	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	
% DMI	0.0225	0.0225	0.0291	0.0291	0.0291	0.0291	0.032	0.0333	0.035	0.0361	0.0355	0.0349	0.034	0.0333	0.032	0.032	0.032	0.032	
running balage						71.9733													71.9733
# DMI/c/d	24.75	24.75	32.01	32.01	32.01	32.01	35.2	36.63	38.5	39.71	39.05	38.39	37.4	36.63	35.2	35.2	35.2	35.2	
total surp/def	40837.5	-43560	-51466	-44135.6448	41270.5	19898.1	6590.94	7	8	6	31345.14	56060.54	11545.3	32220.5	49636.3	50591.1	24609.9		
total grass surp/def/c/d	24.8	26.4	31.2	26.7	25.0	12.1	4.0	8.3	13.4	22.8	19.0	18.3	3.7	7.0	19.5	30.1	30.7	14.9	
# grass available/cow/day	0.0	0.0	0.7	1.0	5.9	17.6	33.3	38.2	44.2	51.9	49.3	48.2	34.9	25.6	13.3	5.9	3.9	17.2	
# Grass Fed/c/d	0.0	0.0	0.70	1.00	5.90	17.60	29.20	32.00	32.00	33.20	32.50	31.85	30.90	25.60	13.30	5.90	3.90	17.20	
sudan balage/c/d	19.75	19.75	18.1	10	10	4.4	0	0	0	0	0	0	0	0	0	0	0	1.5	
grain c/d	5	5	10	10	10	10	6	4.6	6.5	6.5	6.5	6.5	6.5	8	6	6	6	6	
purchased hay c/d	0	0	3.2	11	6.1	0	0	0	0	0	0	0	0	0	0	0	0	0	
wrapped hay on farm	0	0	0	0	0	0	0	0	0	0	0	0	0	3	15.9	23.3	25.3	10.5	
difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Segment of Feed Budget

# cows	110	stocking rate	1.34	12251.8	8milk yield	
# acres	82					
wt cows	1100		DROP DOWN MENU	% farm		
% DMI	0.031	Forage	Perennial Ryegrass	0.378	31.0	
# DM day	34.0	Forage	Fescue w/ high N	0.378	31.0	
			RRCG-Cereal Rye rotation	0.171	14.0	
grazing efficiency	0.85	Forage		1	0	
		summer stand-off	Forage	Bermuda-Cereal Rye	0.073	6.0
					add forages (doubled cropped only 82.0once)	

Segment of Feed Budget

Growth rates of Forages

	# DM grass grown per day									
	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May
Perennial Ryegrass	0	0	0	0	5	18	45	68	90	90
Fescue w/ high N	0	0	0	0	0	9	36	63	90	99
RRCG-Cereal Rye rotation	0	0	5	6	32	72	90	45	0	27
Bermuda-Cereal Rye	0	0	0	0	0	0	0	0	0	0
	0	0	5	6	32	72	90	45	23	81
% DMI	0.0225	0.0225	0.0291	0.0291	0.0291	0.0291	0.032	0.0333	0.035	0.0361
				running balage		71.9733				
# DMI/c/d	24.75	24.75	32.01	32.01	32.01	32.01	35.2	36.63	38.5	39.71

Segment of Feed Budget

Supplements and Pasture Utilized

# DMI/c/d	24.75	24.75	32.01	32.01	32.01	32.01	35.2	36.63	38.5	39.71
total surp/def	-40837.5	-43560	-51466	-44135.6448	-41270.5	-19898.1	6590.94	13740.57	22184.48	37657.66
total grass surp/def/c/d	24.8	26.4	31.2	26.7	25.0	12.1	4.0	8.3	13.4	22.8
# grass available/cow/day	0.0	0.0	0.7	1.0	5.9	17.6	33.3	38.2	44.2	51.9
# Grass Fed/c/d	0.0	0.0	0.70	1.00	5.90	17.60	29.20	32.00	32.00	33.20
sudan balage/c/d	19.75	19.75	18.1	10	10	4.4	0	0	0	0
grain c/d	5	5	10	10	10	10	6	4.6	6.5	6.5
purchased hay c/d	0	0	3.2	11	6.1	0	0	0	0	0
wrapped hay on farm	0	0	0	0	0	0	0	0	0	0
difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Segment of Feed Budget Summary

	# cow/day	%	cost	0# milk for days	
sudan balage/c/d	8.1	22.0%	0.05	0.37	45.0
grain c/d	6.5	17.6%	0.09	0.58	
purchased hay c/d	0.8	2.1%	0.07	0.05	
wrapped hay on farm	3.3	8.9%	0.05	0.15	
GRASS	18.2	49.4%	0.03	0.55	
				0.00	
TOTAL	36.9	100.0%		1.70	cost/cwt
forage from farm		58.3%			3.771368