GRAZE 300
Virginia Cooperative Extension
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Graze 300

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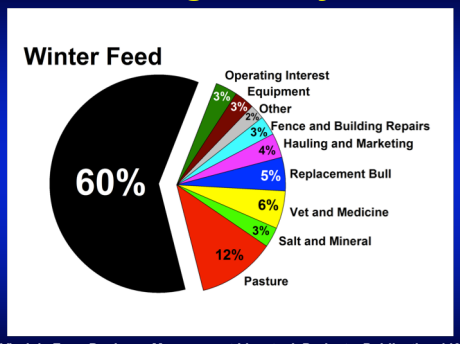
What is Graze 300

- Graze 300 is a "systems" approach to forage and livestock management to extending the grazing season and reduce feed costs
- Optimization of stocking rate, forage resource, labor resource to maximize net return to labor, land and capital.
- Goal is 300 days of grazing as optimum

Fall Calving on Hay Ration



2011 Virginia Farm Business Management Livestock Budgets, Publication 446-048

Slide Courtesy of Chris Teutsch

Cow-Calf Production Costs

- IRM-SPA data states that the greatest impact on profitability is variability on costs.
- Feed costs are #1; 60% of variability
- Trends: Big farms are getting bigger
- Need for all farms to be low cost producers

McGrann, et al., Guidelines for Production and Financial Performance Analysis For Cow-Calf Producers, NCBA, Extension Beef Cattle Resource Comm. 1993.

Maximizing Grazing Days

- Improving forage management is a process
  - Infrastructure – Fence and Waterers
  - Grazing System Design
  - Implement/Improve Rotational Grazing
- Every day grazed will net +$0.35/cow
  - More with more intensive management

How Do We Maximize Grazing Days?

- Managed Rotational Grazing System
  - Crossfencing
  - Water
  - Take half leave half principle
- Delay Turnout – Late April
  - Always allow grass a headstart
- Stockpile
  - Objective 20%-25% of total acreage
- Intense grazing of stockpile

This slide courtesy of David Fiske and Jon Repair

Operation Goal: Extend Grazing

- What grazing records do we have now?
- What management do we have?
- What is our overall stocking rate?
- How much hay have we currently been feeding?
- How many days are we feeding hay?
- Can we make long term strategic improvements to grazing system?
- Contingency Plan: Drought/Winter

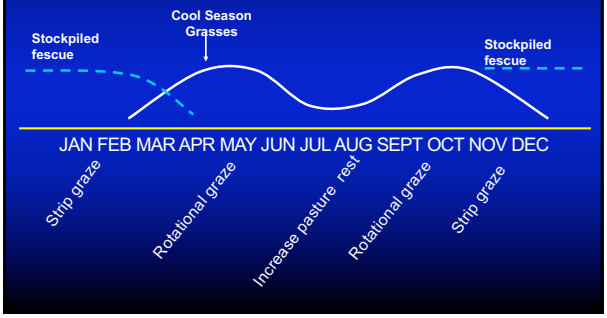
Delayed Turnout

Photo courtesy of Jon Repair

Limit graze stockpiled forage

Image courtesy of David Fiske Shenandoah Valley AREC/McCormick Farm

Grazing plan



Grazing Recordkeeping

- Number fields
- Date and duration of grazing
- Date of turnout and of hay feeding
- Cow grazing days is a function of forage management and is calculated
- $Xdays * Ycows = Z\ cow\ grazing\ days$
- $\frac{(Xdays*Ycows)}{acre} = \frac{Z\ cow\ grazing\ days}{acre} = CDA$

Grazing Records Example

Grazing Season	Turnout	Summer Stockpile	Fall Hay	Fall Stockpile	Winter Hay	Grazing Days	Hay Days	Comment
2007	26-Mar	None	19-Aug	10-Nov	22-Feb	220	145	Extremely dry fall
2008	24-Apr	20-Aug	21-Nov	27-Nov	1-Feb	275	90	
2009	26-Apr	18-Aug		26-Nov	19-Dec	254	111	3' of snow on 12/19/09
2010	20-Apr	20-Aug	7-Nov	17-Nov	24-Jan	268	97	
2011	21-Apr	22-Aug		15-Nov	27-Feb	316	49	
2012	16-Apr	16-Aug		13-Nov	7-Feb	288	77	
2013	25-Apr	20-Aug		18-Nov	18-Feb	289	76	
2014	5-May	14-Aug		30-Oct	10-Jan	264	101	Dry fall
					Average	272	93	

Data Courtesy of David Fiske, Shenandoah Valley AREC/McCormick Farm

Grazing Management

- $X days * Y cows = Z$ *cow grazing days*
- Example
- Farm 1: 200 acres, 100 cows, 229 days
- $230\ days\ * 100\ cows = 23000$
- $22900\ cow\ grazing\ days; \frac{115\ days}{acre}$
- 115 cow grazing days/acre

Grazing Management

- $X days * Y cows = Z$ *cow grazing days*
- Farm 2: 200 acres, 100 cows, 275 days
- $275\ days\ * 100\ cows = 27500$
- $27500\ cow\ grazing\ days; \frac{138\ days}{acre}$
- 138 cow grazing days/acre
- Difference, 20% improvement in grazing management (45 days)

Improving Grazing Management

- Rotational Grazing
  - Biggest benefit is allowing forage to rest
  - Increase stocking rate or length of grazing
  - Pays for investments in infrastructure
- Must design or improve grazing system to increase resting days
- Increase in paddock number increase grazing efficiency

Impact of Paddock Number

- Farm with one 200 acre field
- Turn in 100 cows
- Assume 2 ton yield=4000 lbs
- Assume 1400 lb cows using 3% of wt
- $200 acres * 4000 lbs = 800,000 lbs$
- $(100 * 1400 *. 03) = 4,200 lbs$
- $\frac{800000}{4200} = 190\ days$

Impact of Paddock Number

- Farm with five 40 acre fields
- Rotate herd of 100 cows
- Same assumptions: 2 ton yield
- 1400 lb cows using 3% of wt
- $40\ acres * 4000 lbs = 80,000 lbs$
- $(100 * 1400 *. 03) = 4,200 lbs$
- $\frac{80000}{4200} = 19\ days$

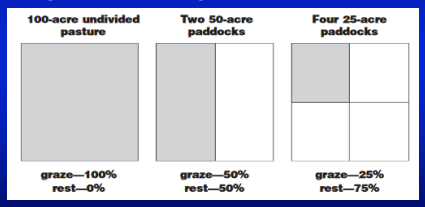
Impact of Paddock Number

- Paddock 1: 19 days of grazing
- Paddock 2-5: 19 days of grazing each
- $19 * 4 = 76\ days\ of\ rest\ for\ Paddock\ 1$

- 95 days of grazing for one rotation
- Two rotations = 190 days
- Two and half rotations = 238 days
- Limiting factor is length of growing season

Impact of Paddock Number

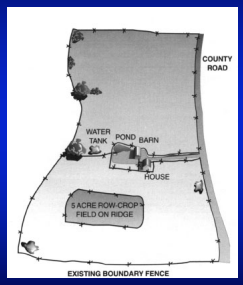
- Increasing paddock number increases rest period on a per acre basis

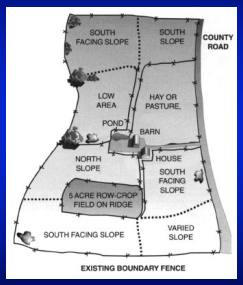


- This is critical during summer or drought, rest time increases

Undersander, D., B. Albert, D. Cosgrove, D. Johnson, P. Peterson.Pastures for profit: A guide to rotational grazing

Grazing System Layout



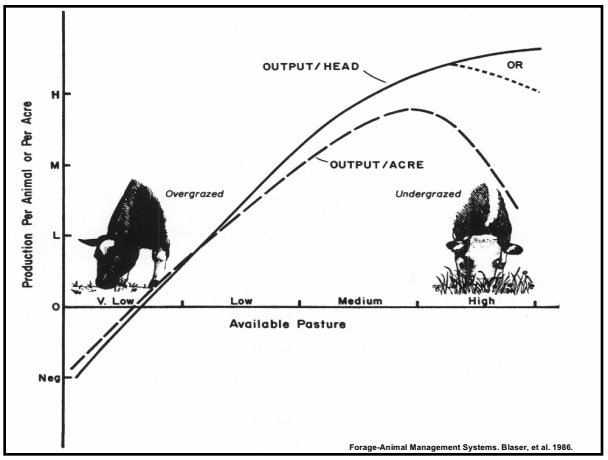


Improvements over time may be needed

H. White, Wolfe, D. Controlled Grazing of Virginia's Pastures VCE 418-012

Optimize Stocking Rate

- Traditional thinking is that 2 acres a cow is proper stocking rate
- 2.0 to 3.0 acres/cow seems to be optimum
  - Allows for optimal forage growth while covering feed costs
- Understocking/undergrazing
  - Poor use of forage and inability to cover fixed costs



Forage-Animal Management Systems. Blaser, et al. 1986.

Determining appropriate stocking rate

- 250 acres, variable stocking rate
  - What do net returns look like?
- $Xdays * Ycows = Z$ *cow grazing days*
- $275days * 100cows = 27500$ *cow grazing days*
- Hold 27500 constant to solve for grazing days
- Stocking Rate=2.0acres/cow

Stocking rate

- $275days * 100cows = 27500$ *cow grazing days*
- 2.5 acres/cow
- ***What if we reduced cows to 90?***
- $Xdays * 90cows = 27500$ *cow grazing days*
- $Xdays = 305$ *cow grazing days*
- $hay\ feeding\ days = 365 - 305 = 60$
- What does that do to profitability?

Stocking Rate Budget Assumptions

- Assume $20,000 fixed costs
- $144/cwt steers; $130/cwt heifers
- 85% calves weaned per cow exposed
- $71/ton hay
- Cow numbers and hay feeding only variable that changes.

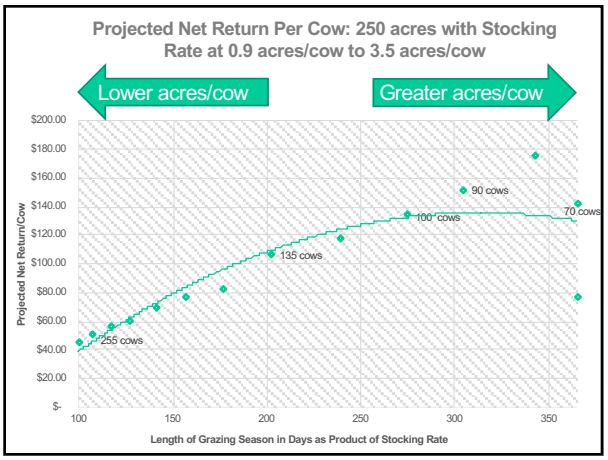
Stocking Rate Budget Assumptions

Cow Herd Size	90 cows		Cow Herd Size	100 cows
Gross Revenue	$61,650		Gross Revenue	$67,918
Gross Rev/Per cow	$685		Gross Rev/Per cow	$679
Variable Costs			**Variable Costs**	
Hay Feeding Days	60		Hay Feeding Days	90
Hay/Grain Costs	$8,029		Hay/Grain Costs	$13,398
Salt & Mineral	$1,346		Salt & Mineral	$1,496
Total Variable Costs	$27,983		Total Variable Costs	$34,541
Total Fixed Costs	$20,000		Total Fixed Costs	$20,000
Net Return			**Net Return**	
Total Net Return	**$13,667**		Total Net Return	**$13,376**
Net Return/Per Cow	**$151**		Net Return/Per Cow	**$133**

Net Revenue per Cow

Relationship between Stocking Rate, Grazing Season Length, Projected Net Revenue and Net Revenue per Cow

Grazing Season Length	Cow Numbers	Projected Net Revenue	Net Revenue per cow	Acres Unadjusted	Stocking rate
100	275	$12,696.20	$46.17	250	0.91
107	255	$13,090.80	$51.34	250	0.98
117	235	$13,455.86	$57.26	250	1.06
127	215	$12,986.99	$60.40	250	1.16
141	195	$13,654.54	$70.02	250	1.28
157	175	$13,468.70	$76.96	250	1.43
177	155	$12,751.71	$82.27	250	1.61
203	135	$14,461.15	$107.12	250	1.85
230	115	$13,681.99	$118.54	250	2.17
275	100	$13,376.27	$133.76	250	2.50
305	90	$13,666.86	$151.85	250	2.78
343	80	$13,987.78	$174.85	250	3.13
365	70	$9,893.14	$141.33	250	3.57
365	60	$4,664.46	$77.74	250	4.17
365	50	-$659.63	-$13.19	250	5.06



Findings

- Net Revenue per cow is optimized at 275-300 days
- Understocked begins around grazing 340+ days…Not enough rev to cover fixed costs

- Good Hypothetical Example
  - Will it work in real life?

Graze 300 Case Study #1

- 250 acre operation: 245 cows
- Farm was losing $25/per cow
- Stocked at a rate of 1.0 acre per cow
- Feeding 147 days
- Hay was $120/ton

- Recommendations?
  - Improve stocking rate to 2.0-2.5

Case Study #2

	2005	2006	2007	2008	2009	2010	2011
Cows in Field	245	168	174	153	137	138	90
Value Calves Weaned	113,152	95,790	96,278	97,554	85,725	87,757	$60,888
Fixed Cost	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Days Hay Feeding	147	73	78	58	43	44	0
Cost Hay per Ton	120	120	120	120	120	120	120
Total Hay Cost	$64,903	$21,964	$24,568	$16,004	$10,511	$10,828	$-
Total Cost	$119,403	$68,764	$71,968	$61,304	$54,211	$54,628	$39,00
Income	$(6,251)	$27,026	$24,310	$36,250	$31,514	$33,129	$21,888

Data courtesy of Carl Stafford

Case Study #2

- Farm continued to add numbers
- Maintained multiple breeding groups
- Pastures not allowed to rest
- No improvements to grazing design
  - Water limitations
- Stocking rate 1.85 acres/cow
- Recommendations?
  - Reduce cow numbers 10%,..etc.

Case Study #2

Cows in Field	884
Value Calves Weaned	$411,095.18
Days Hay Feeding	180
Cost Hay per Ton	$193
Total Purchased Hay Cost	$152,100
Total Operating Costs	$438,275
Income	($27,180)

Case Study #3

- 310 Cows on 710 acres
  - owned & rented
- Feeding Hay 144 days
  - Thanksgiving to April
- Limited rotational grazing
- Recommendations?
  - Improve grazing to limit hay feeding days

Case Study #3

	2010	2011
Cows in Field	310	310
Value Calves Weaned	$213,135	$213,135
Fixed Cost	$10,957	$10,957
Days Hay Feeding	144	60
Cost Hay per Ton	100	100
Total Hay Cost	$44,000	$15,120
Total Cost	$54,628	$39,00
Income	$38,295	$89,675

Case Study #3

- $221\ days * 310\ cows = 68,510$
- $\frac{68510\ cow\ grazing\ days\ (CDA)}{710\ acres} = 97\ CDA$
- $300\ days * 310\ cows = 93000$
- $\frac{93000\ cow\ grading\ days\ (CDA)}{710\ acres} = 131\ CDA$
- Improvement in 34 cow grazing days an acre resulted in an income increase of 42%!

But what about Rented Ground?

- Rented ground does make some of these aspects impractical
  - if economies of scale are the goal then rented ground is an option
- Temporary fencing may still be an option

Conclusions

- Lastly, the better you graze, the more expensive you make your hay
  - Pasture utilization/grazing ↑
  - Pasture Costs ↓
- Questions?