

## Effectively Grazing Winter Pasture & Range

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### Having a plan for year-around use is first step to grazing winter range

- Stocking rate
  - Flexibility or variable stocking rate is essential for year-around grazing



## Some useful definitions

- **Stocking rate:** The number of animals or animal liveweight assigned to a grazing unit on a seasonal basis.
- **Carrying capacity:** The stocking rate that provides a target level of performance while maintaining the integrity of the resource base.

### Why should stocking rate be the same year-around when carrying capacity is not?

### Having a plan for year-around use is first step

- Stocking rate
  - Flexibility or variable stocking rate is essential
- Stock policy
  - Livestock type & number present on the ranch at any given time

### Beef animal nutrient requirements: Highest to lowest

- Finishing on pasture
- First calf heifers in 1<sup>st</sup> 90 days lactation
- Stockers > 2 lb/day
- High milk producing cows
- Moderate milk producing cows
- Stockers < 2 lb/day
- Dry pregnant adults





## Match calving season to forage supply opportunities



## Calendar of the Seasons

- Spring -- March 22-June 21
- Summer -- June 22 – Sept 21
- Fall -- Sept 22 – Dec 21
- Winter -- Dec 22 – March 21

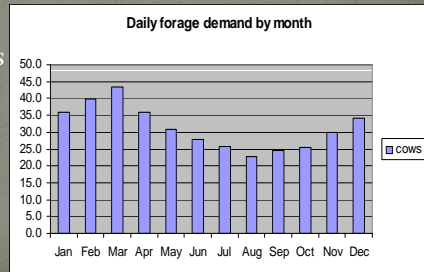
**February is not spring calving  
&  
August is not fall calving**

## Highest energy demand occurs from calving to rebreeding



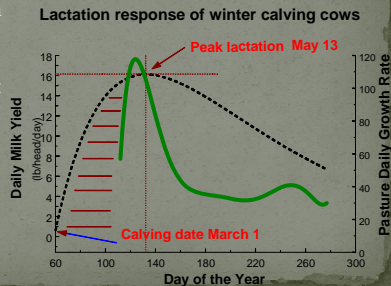
Cow nutritional requirements are seasonal: January calving

Energy demand is highest at peak lactation  
30 to 90 days post-calving



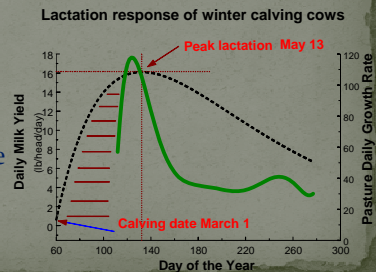
## Lactation and energy demand: Winter calving

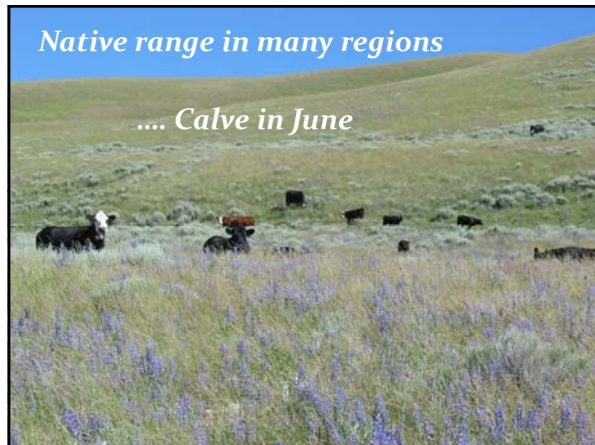
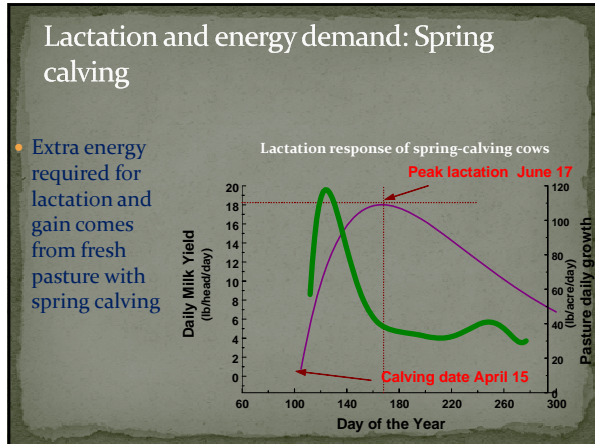
- Hard to maintain weight or gain weight during lactation without high quality feed



## Lactation and energy demand: Winter calving

Extra energy required for lactation and gain typically comes from harvested forage with winter calving







## Having a plan for year-around use is first step

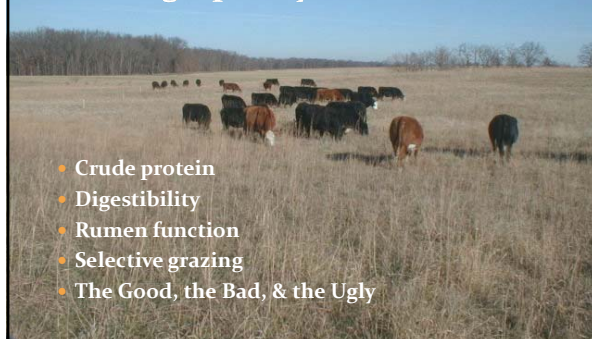
- Stocking rate
  - Flexibility or variable stocking rate is essential
- Stock policy
  - Livestock type & number
- Calving season
  - Tremendous impact on seasonal demand
- Assessing range & pasture resources
  - Make the best use of each opportunity

## Having winter forage requires summer growth

- Season long rest vs. partial use
- Both shots taken on July 31



## Understanding animal needs and forage quality



- Crude protein
- Digestibility
- Rumen function
- Selective grazing
- The Good, the Bad, & the Ugly

## Some useful definitions

- Crude protein
  - Determined by measuring N content of plant and multiplying by 6.25
  - Can include N incorporated into amino acids as well as free N in the plant (nitrates, nitrites, ammonium, etc.)
  - Ruminants can use **any** of this N while monogastrics can only use amino acids

## Some useful definitions

- Digestibility (DMD)
  - The portion of the plant readily digested by rumen fluid
  - In Vivo DMD – actual digestibility determined in a live rumen
  - In Vitro DMD – estimated digestibility determined in an artificial rumen
  - Frequently a calculated value based on measurement of fiber content

*Usually the values are similar*

## Some useful definitions

- DMD:CP ratio = Digestibility/ crude protein
  - For most ruminant livestock this ratio should usually be between 4-6
  - Lower ratio for producing animals
  - Higher ratio for animals at maintenance

## A little about forage samples & what they tell us

- Whole plant sample
  - Common in agronomic research trials
  - Does not represent what the animal eats
  - Typically 3-5% lower CP
  - Typically 7-10% lower TDN



## A little about forage samples & what they tell us

- Imitation grab samples
  - Common in grazing research trials & ranching
  - The cow still does a better job than people
  - Typically 1-4% lower CP
  - Typically 3-8% lower TDN



## A little about forage samples & what they tell us

### Rumen fistula samples

- The only way to know what a cow is really eating
- This is to what we compare all other methods
- Surprising how effective cows are at selecting the best diet from what's available

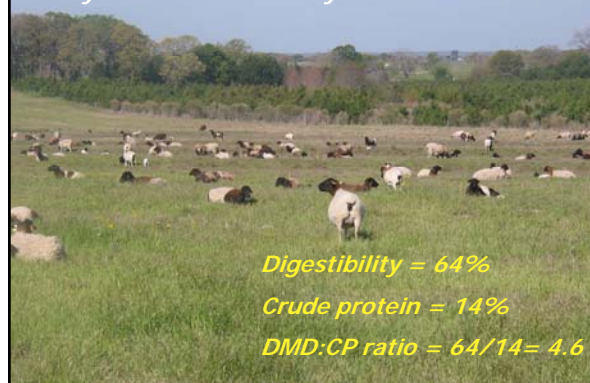


## Stockpiled grass samples taken at MARC 11-22-2010 and 1-4-2011

Sample date	Pasture	Description	C.P.	TDN	Ratio
11-22-10	45AW	Tall Fescue - regrowth	10.2	66	6.5
1-4-11	45 AW		10.0	64.2	6.4
11-22-10	76 W4	Big Bluestem - regrowth	5.1	56.1	11.0
1-4-11	76 W4		7.5	60.6	5.3
11-22-10	38 D	Smooth Brome - regrowth	16.5	61.5	3.7
1-4-11	38 D		16.7	66.9	4.0
11-22-10	38D	Mixed grasses - regrowth	8.9	57.9	6.5
1-4-11	38D		9.4	60.6	6.4
11-22-10	53 BE	Orchard grass	14.7	73.1	5.0
1-4-11	53 BE		12.6	66.9	5.3
11-22-10	38 BC	Mature Big Bluestem	2.5	48.9	19.6
1-4-11	38BC	- whole plant	3.6	51.6	14.3



*In the growing season, availability and quality is usually there for almost any class of livestock*





## Can pasture be too good ?

- Digestibility = 72%
- Crude Protein = 24%
- DMD / CP = 3

*These animals need more energy !*

## How bad is still okay ?

- Digestibility = 48%
- Crude protein = 4%
- DMD / CP = 12

*These animals need more protein !*

## Do they need extra protein every day?

Every 3<sup>rd</sup> day as effective as every day!

## So what does all this mean?

- We feed the bugs first
  - Digestible substrate for energy source
  - N source (either protein or NPN)
- We feed the animal second
  - Microbial protein or by-pass protein
  - VFAs produced by rumen fermentation
  - Other sugars passing from rumen to omasum

## Rate of passage

- Determined primarily by:
  - Fiber digestibility
  - Nitrogen availability
- 12-24 hours for very high digestibility feeds
- 72-96 hours for low digestibility fiber with low protein
- May be as long as 8-10 days...
  - ... in which case the animal usually dies

*Typically 36-48 hours*



How will livestock graze this pasture ?

*It depends !*

Set stocked

- Animals will select only what they like
- Good plants quickly disappear and low digestibility stems are left behind
- Animals lose body condition, fail to breed, die, etc.

*What will this cow eat the first day?*

*Whatever she wants!*

What will she eat on the 100<sup>th</sup> day?

*Not nearly what she needs to!*

What if it were strip-grazed ?

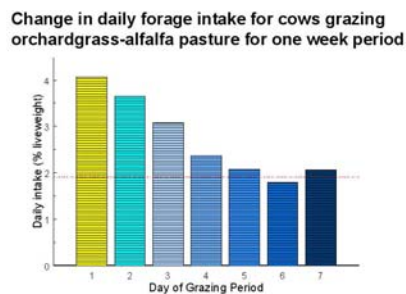
Using strip grazing to manage the rumen

- Cattle will selectively graze given the opportunity
- Protein is needed by rumen bugs to digest fiber and release energy
- Rate of passage is 36 to 72 hours, depending on forage quality

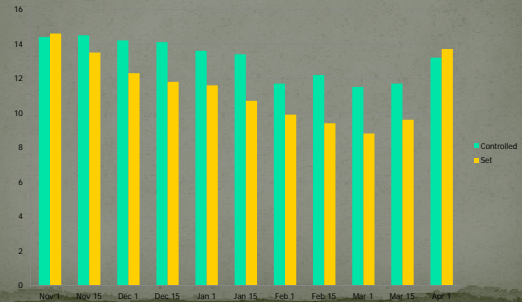


## Time basis of the grazing period: Animal perspective

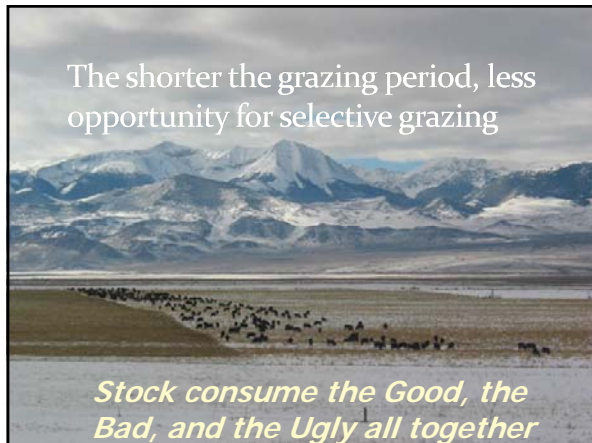
Both quantity and quality of available forage decline with each additional day on the pasture



## Crude Protein content of stockpiled tall fescue-legume pastures



The shorter the grazing period, less opportunity for selective grazing



## Back to rate of passage

- Rumen does not need continuous input of protein (or N)
- Dosing with protein every 3 days gives similar results as feeding every day
- Match strip-graze period to rumen rate of passage
- Moving every 3 days may optimize animal nutrition and labor demand

## Getting more N into the rumen

- Raise the protein content of what they are grazing

## Protein content of various winter forage options

- Winter annuals – grasses & forbs
- Cool season perennials
  - Legumes
  - Grasses
- Warm season annuals
- Warm season perennials



### Tall fescue vs annual ryegrass on Dec 30 in north Missouri



### Getting more N into the rumen

- Raise the protein content of what they are grazing
- Change the way they are grazing the pasture



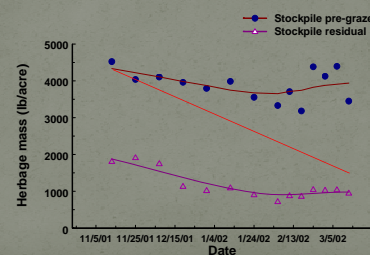
### Strip grazing increases utilization efficiency



### Management needed to achieve target utilization rate

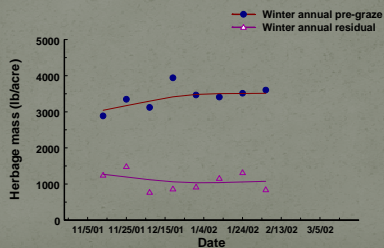
Utilization rate	Stockpiled pasture	Winter annual	Hay feeding
80 %	1-day strip graze		Ring feed 2-day
70 %	3-day strip graze		Ring feed 3-day Unroll daily
60 %	7-day strip graze		Ring feed 5-day
50 %	14-day strip graze		Unroll 2-day
40 %	Set stock		Cows are in the hay yard!

### Forage availability for stockpiled tall fescue pastures





## Forage availability of winter annual pasture



## The power of strip grazing

- Preserve winter feed supply deeper into winter
- Preserve forage quality deeper into winter
- Improve animal body condition deeper into winter
- Raise overall performance level of livestock



## Getting more N into the rumen

- Raise the protein content of what they are grazing
- Change the way they are grazing the pasture
- Provide supplemental protein or NPN
  - Limited access pasture
  - Hay or silage
  - Actual protein supplement
  - NPN

## Limited access pasture for protein supplementation

Remember,  
protein only  
needs to be  
supplemented  
every 3<sup>rd</sup> day!



## Another example from central Kansas mixed crop-livestock farm

- Stockpiled native grass is strip grazed adjacent to cool-season cover crop
- Cover crop allocated as a strip-grazed protein supplement







### Using the fence wire as a feed bunk

- Feed on clean ground every day
- Eliminates cost of feed bunks
- Eliminates hassle of moving bunks as cattle are moved
- Waste is minimal as long as feeding rates are low to moderate

### Adjusting management to animal needs

- Graze animals with highest requirements first
- Clean up with lower demanding animals
- No pasture is ever all or nothing

### Example from our old north Missouri farm

- 260 acre grass farm (2 acre/AUY)
- We needed about 1/3<sup>rd</sup> of farm stockpiled each year
- Alternated which 1/3<sup>rd</sup> each year



### Basic layout of an 80-acre unit

- Buried pipeline w/ water to every paddock
- Three permanent tanks
- All other water was movable tank at Quick Coupler valve
- 23 permanent paddocks



### Then we strip grazed each paddock in several sections





The basic tools of strip grazing



One way of moving fence



O'Brien 3:1 geared reel



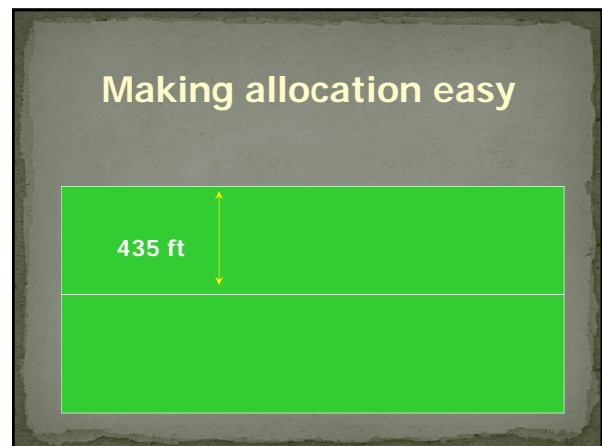
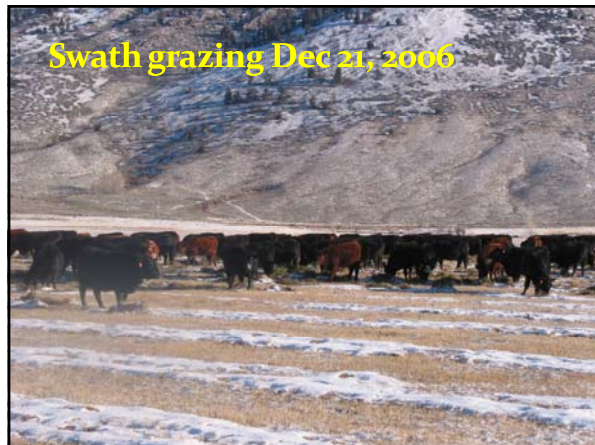
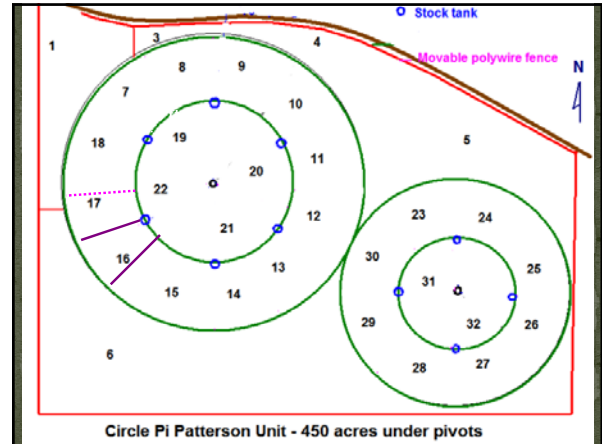
O'Brien Treadline Step-in post

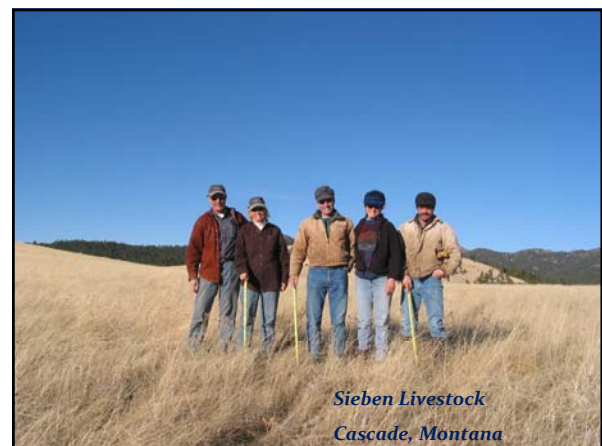
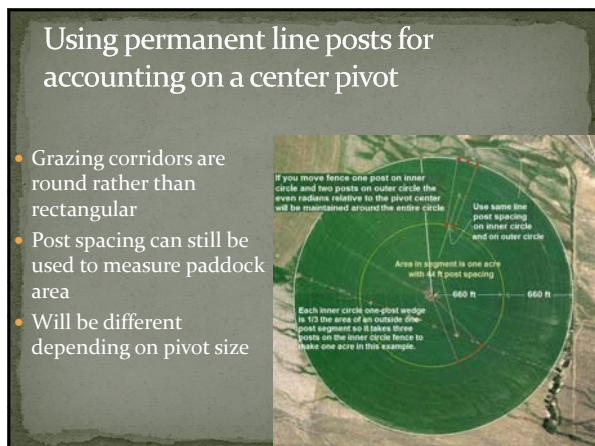
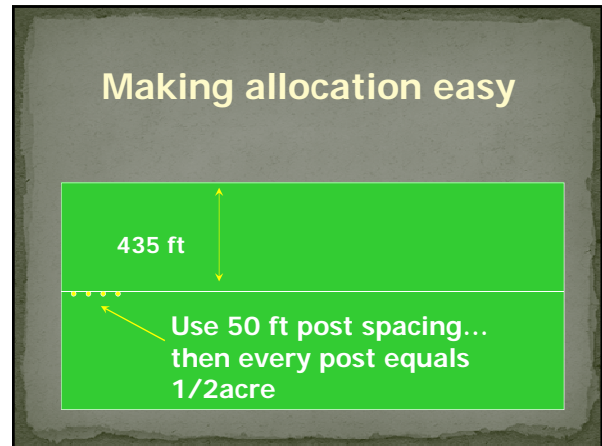
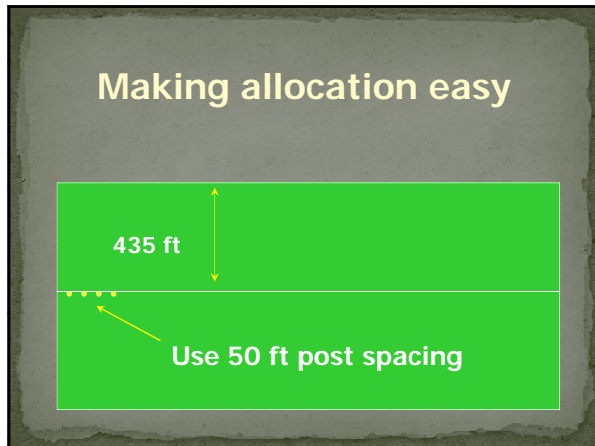


Long stretches may require other tools !











**What is your business ?**

- Cow-Calf
- Feeder cattle
- Range-finished lambs
- Feeder lambs
- Seedstock range
- Targhee sheep
- Trophy elk, deer, & antelope



**This is their terrain**

**60,000 deeded acres**

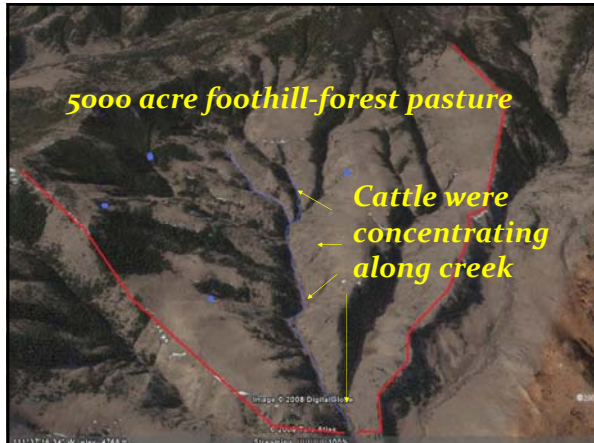
**90,000 public land acres**

*How do you increase utilization here?*



**5000 acre foothill-forest pasture**

**Cattle were concentrating along creek**



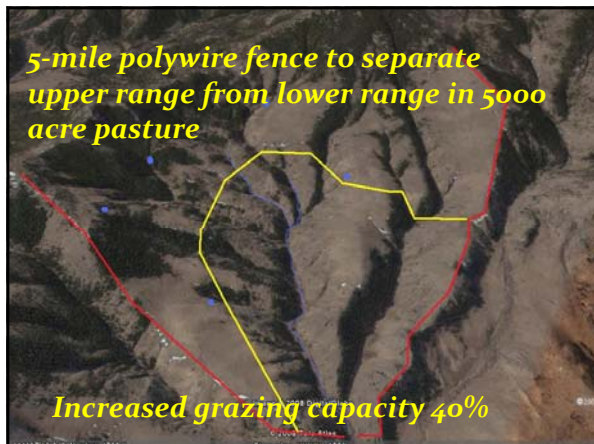
**Is there a place for temporary fence on rangeland ?**

**The Lloyd Fence**



**5-mile polywire fence to separate upper range from lower range in 5000 acre pasture**

**Increased grazing capacity 40%**

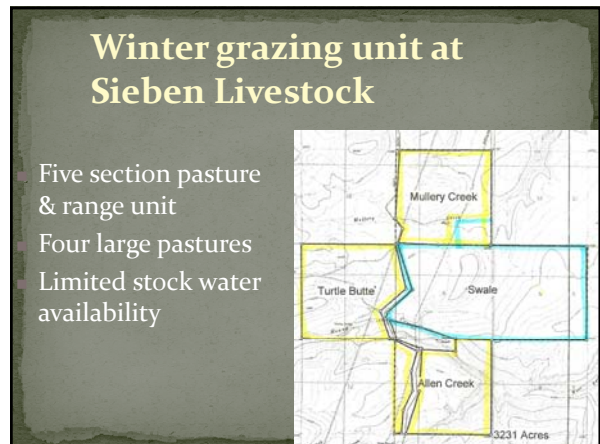


**Winter grazing unit at Sieben Livestock**

Five section pasture & range unit

Four large pastures

Limited stock water availability

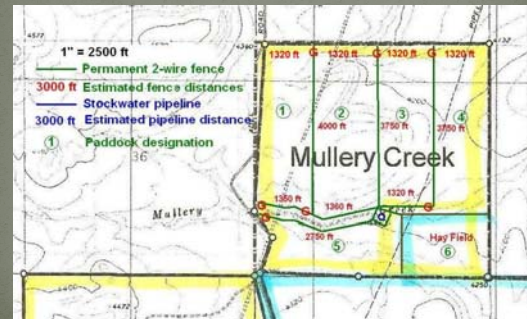


## Winter grazing unit at Sieben Livestock

- Five section pasture & range unit
- Took one section as trial area for winter MiG



## Winter grazing unit at Sieben Livestock



## Sieben Livestock

*"3 years of MiG did more for range health than 20 years of rest-rotation"*

Chase Hibbard, 2009



## Blaine Hoversland Wolf Point, Montana



*Fenced 11,000 acres into one-section pastures = 18 paddocks*

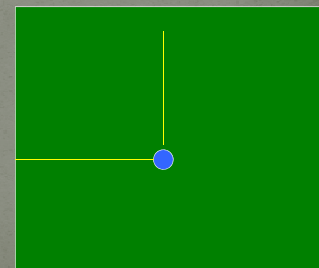
## Stock water developments



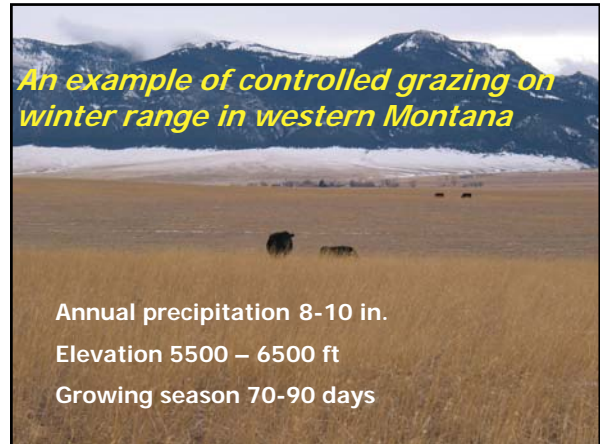
*Stock tank at the center of every section*

## Dividing sections into quarter sections

- Can use polywire to create  $\frac{1}{4}$  sections for a total of 72 paddocks in the winter

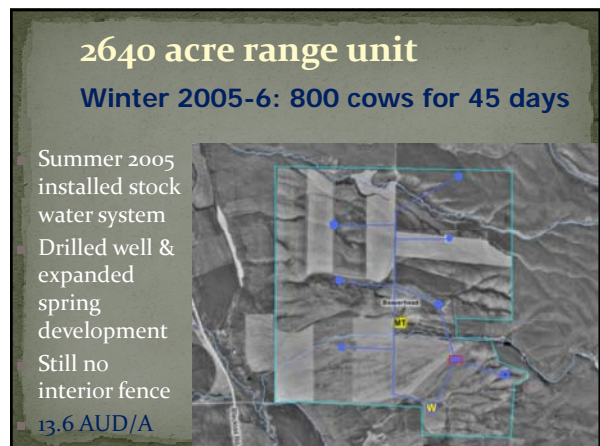
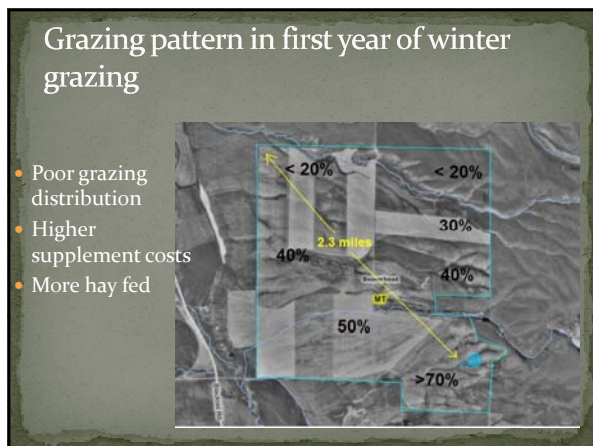
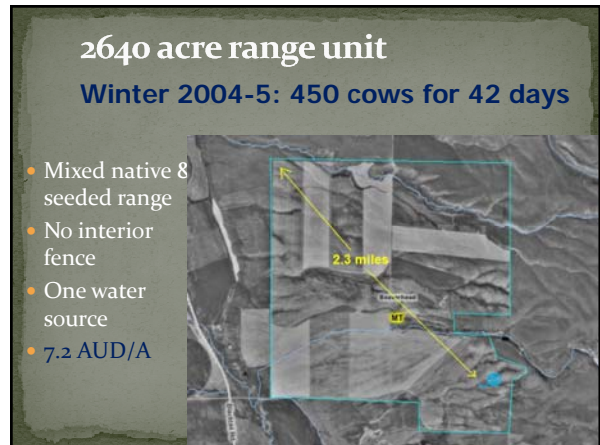






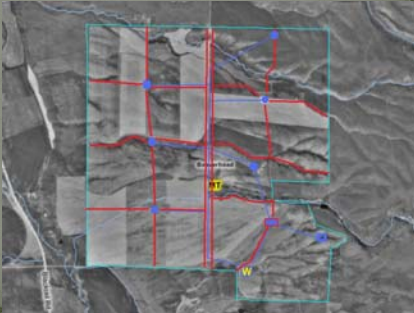
Expected range production based on Soil Survey

Map Unit #	Soil type classification	Slope	Acres	Normal year Range yield/acre	Total Range Yield	Pasture AUM yield / acre	Total Pasture AUM
30B	Threat loam	0-4	235	712	167177.6	0.94	221
35C	Kalsted sandy loam	4-8	0	959	0	1.36	0
36E	Kounter-Amesha rock outcrop	8-35	10	795	8268	0.39	4
60C	Kalsted loamy sand	2-8	9	1920	16896	0.96	8
91E	Nuley-Rook outcrop complex	8-35	44	1140	50388	0	0
130S	Threat-Scravo complex	0-4	167	593	99108.9	0.55	87
136C	Amesha-Kalsted complex	2-8	379	813	308370.9	0.89	338
177C	Sappington-Kalsted complex	2-8	113	851	96333.2	1.23	138
187C	Chinook-Oleandrie complex	0-8	60	935	56174	0.18	11
225B	Scravo cobbly loam	0-4	225	431	96975	0.05	11
233C	Vamey-Sappington-Kalsted	2-8	284	986	280122.6	1.19	338
277C	Sappington-Kalsted-Kalsted	2-8	774	972	752619.6	1.25	968
335E	Kalstis-Scravo stony Cobblest	15-45	264	628	166993.1	0.03	8
336D	Amesha-Bronic-Sappington	4-15	74	950	62985	0.67	50
			2640				
				Average yield per acre	819	7.2 (lb/A) (AUD/A)>	24.0
				Total dry matter yield	2161812		1706384
				Conversion to AUD (26 lb = 1 AUD)	83147		65631
				Utilization target	50%		100%
				Potential harvested AUD	41573		65631
				Length of grazing season	42		9
				Potential carrying capacity for designated period	462		725




**2640 acre range unit**  
**Winter 2007-8: 900 cows for 85 days**

- Summer 2006 installed subdivision fences
- Basically created 16 160 A paddocks
- 29 AUD/A



**2640 acre range unit**  
**Winter 2008-9: 1200 cows for 100 days**  
**45.5 AUD/A**



*May have pushed it too hard !*

**Simple grazier's math**

- 900 cows
- Add 40 more days of grazing
- Grazing saves \$1/day
- Annual saving is \$36,000

➤ What did the fence cost ?  
 ➤ **\$33,046.81**

**Five years ago this ranch fed 2 ½ to 3 tons of hay/cow every winter**



**In 2007-8 they fed 300 lb/cow**

**More pasture production plus greater utilization = higher carrying capacity**



**Increased carrying capacity could mean running more animals...**





