USE OF ANNUAL FORAGES IN A GRAZING LIVESTOCK SYSTEM

Plum Thicket Farms

- Our mission is to produce high quality cattle, forage, and grain with management practices that foster the best stewardship of our land, our livestock, our soil, and our human resources.

Human Resources

- I serve as General Manager.
- My husband and I manage the cattle.
- My son heads the farming operation and does most of the farming.
- My daughter in law is a large animal vet and is responsible for herd health.
- We hire two summer interns.



Available Resources

- 563 acres farm ground under pivot irrigation
- 1774 acres dry land farm ground
- 2230 acres deeded native pasture
- 1850 acres leased pasture
- 360 acres of corn stalks leased from neighbor

Cattle numbers in 2015

- 286 cow-calf pairs
- 99 yearling heifers
- Will background 141 steers until March 2016
- Will breed 139 yearling heifers in 2016
- 17 bulls through the breeding season
- 499 stocker steers May 1 to July 27

Pasture is our most limiting factor

Yet, we maintain an 11th month grazing season.

HOW???

We graze annual forages!

- Calve on Rye in May
- Graze sorghum swathes in winter
- Utilize crop residue (mainly corn stalks)
- Graze cover crops following wheat, oats, or spring cocktails (if moisture is available)
- Mob graze dry-land cool and warm season forage cocktails

Spring Rye

- Plant rye following irrigated pinto bean harvest (90 #/acre)
- Include 60 # rye in forage cocktail following irrigated wheat harvest
- New cultivar (Elbon Rye) breaks dormancy earlier

  Available from Green Cover Seed
- Dryland rye following a spring crop

Grazing rye can be challenging

- It needs to be 8" tall before you start to graze
- It is very reliable but grows fast and gets rank quickly.
- There is a very short window for grazing if you are grazing it before corn. Beans go in a little later, so staggering use of pivots is helpful.
- It provides excellent cover for young crops



Managing dryland rye for later use.

- You can extend the grazing interval of rye by swathing it just as it starts to head
- Swathe traps nutritional quality & palatability
- You can hit the time you need to graze by choice of mowing height. Will get good regrowth from a short cut as well as leaving a stubble height of 4 to5". There is about a week's difference between the two as to when it is ready to graze.
- We got 0.97 AUM/acre with sub-optimal management
- You may be able to follow it with a warm season CT





Grazing sorghum swathes

- Choose a BMR variety. Semi dwarf cultivars have better leaf to stem ratios and are more drought tolerant. We don't know yet whether they will produce the same volume.
- For optimum quality/quantity, cut just as heads start emerging from the sheath.
- Cut above the growing point so that you get regrowth. It is a valuable add-on.
- Never turn on until at least 5 days after there has been a hard freeze to avoid danger of prussic acid.
- Always check for nitrates
- We do not cross fence or limit access to swathes
- Can count on 3 AUM/acre production
- Works well for backgrounding calves if supplemented with DDG
- Great for wintering cows

Cost of Sorghum Swathes

- Land $25/acre
- Seed 20 #/A BMR Alta $38/acre
- Chemical $14.70
  - 24 oz round up, 8 oz. superb, 0.5# atrazine
- Fertilizer 50# N 4# S $47.06
- Planting $12.00/A
- Swathing $12.00/A

Total cost/acre sorghum swathes **$148.76**

Yield 3AUM/acre

Will take 3.3 # DDG to achieve 2 # ADG

Cost/# Sorghum swathes $0.06/#

Cost of DDG ($155/ton) $.08/#

Ration cost/head-day

$0.98

Rumensin, mineral, care

$0.40

Total cost/head day **$1.38**

Cost of gain **$0.69**



Mob grazing forage cocktails

- **Not for the faint of heart!!**
- Must have a population that can flex because it is totally dependent on the weather
  Yearling heifers offer the most flexibility
- If you take in stockers, make sure your contract specifies their removal in case of drought, hail, or fire

Why a forage cocktail?

- Multiple species crops are more drought tolerant, have mutually beneficent traits
- Legumes fix nitrogen
- Brassicas (turnips, collards, radishes, canola)
  help make P more available
  help feed soil bacteria & increase soil biomass
  down side: increase cycling rate of residue
- Improve nutrient quality to grazing animal
- You have to watch seed costs

Water Management

- 1 ¼" black plastic pipe (300 ft rolls) $0.75/ft
- Quick couplers every 300 ft $13.00 each
- Float and Float Arm (per tank) $60.00
- 150 gal. Rubber Tank $150.00
  – (We used two tanks per system)









Cool Season Cocktails

- Plant end of March through first week of April
  - 60 # oats
  - 60 # bin run peas (Screen pods)
  - 2 # buckwheat
  - 2 # forage collards
- Fertilize 50 # N
  - collards really respond to nitrogen

Grazing management of cool season CT

- Do not turn in until oats are 12" tall
- Do not take off more than 4" on your first trip
  - Properly done, this will increase stooling
- Keep your paddocks small enough so you can control rate of removal and move through them quickly
- Stocking density is the hardest thing to figure out
- Take forage down to 4" on your second trip through
- Third graze is dependent on moisture and ambient temperature
- In case of heavy precipitation, temporarily remove from paddock.














560













Cool Season Grazing Records

pasture	acres	class	head #	AU	head #	AU	Date in	date out	days	aum	st rate	Cum. st rate
SW School O&P	80	steers	290	0.57			8-Jun	17-Jun	9	49.59	0.62	
SW School O&P	80	pairs	200	1.49			2-Jul	16-Jul	14	139.07	1.74	
SW School O&P	80	pairs	133	1.49	9	1.5	17-Jul	19-Jul	3	21.17	0.26	
SW School O&P	60	heifers	101	0.8	3	1.5	1-Aug	14-Aug	13	36.96	0.62	**3.24**
Frohman 2 O&P	70	steers	210	0.57			8-Jun	17-Jun	9	35.91	0.51	
Frohman 2 O&P	70	steers	499	0.61			24-Jun	30-Jun	6	60.9	0.87	
Frohman 2 O&P	70	pairs	67	1.59	1	1.8	28-Jul	30-Jul	3	10.83	0.15	
Frohman 2 O&P	70	pairs	200	1.59	9	1.5	31-Jul	5-Aug	5	55.25	0.79	**2.33**
Mid. School O&P	40	pairs	201	1.29			17-Jun	20-Jun	3	25.93	0.65	
Middle School	40	pairs	133	1.49	9	1.5	21-Jul	31-Jul	10	70.56	1.76	**2.41**

Cost of a Cool Season CT

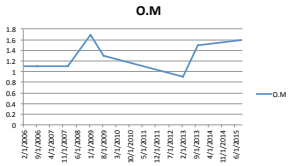
- Land Costs = $25.00/acre
- Seed costs = $27.20
- Chemical = $12.77
- Fertilizer 25-50-0-10 $60.89
- Total cost **$125.86**

Return on investment

- 192 acres of cool season CT allowed us to take in 500 stockers for 3 months Those acres returned $53.00/acre
- SCA 2015 summer pasture avg. for NW NE (full care) $76 per pair-month
- 1300 # cow with March calf = 1.6 AU so AUM is worth $47.50
- Crop pays $126.82 per acre at 2.67 AUM/acre
- No dry land crop is profitable this year
- It allows you to rest native pasture during the critical June-August window. It is especially valuable during drought recovery
- Saves labor, machinery wear, and fuel
- Benefits you can't measure: You are building soil
  - Mulch rich in manure
  - Symbiotic relationships created by diverse plant community
  - Increased biomass leading to increased organic matter

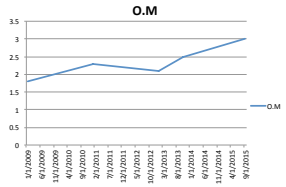
Organic Matter Trends

SW School Section		Sandy Loam Soil, Rotation 3/4 grazed crops 1/4 harvested small grains					
Year	O.M	K	P	Test	factor	lbs available N	
2/15/2006	1.1	257	29	Melrich	0.9	26.1	
9/29/2006	1.1	296	26	Melrich	0.9	23.4	
1/15/2008	1.1	273	32	Melrich	0.9	28.8	
1/7/2009	1.7	345	39	Melrich	0.9	35.1	
8/24/2009	1.3	282	37	Melrich	0.9	33.3	
2/12/2013	0.9	417	22	Olson Bray	2	44	
10/1/2013	1.5	496	27.9	Olson Bray	2	55.8	
9/10/2015	1.6	470	21.9	Olson Bray	2	43.8	



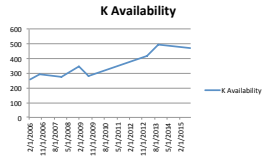
Organic Matter Trends

Bartel 3 North					
Year	O.M	P	test	factor	lbs available
1/5/2009	1.8	31	m-P	0.9	27.9
1/28/2011	2.3	29	m-P	0.9	26.1
1/14/2013	2.1	22.1	O-P	2	44.2
10/1/2013	2.5	13.5	O-P	2	27
9/10/2015	3	12.4	O-P	2	24.8

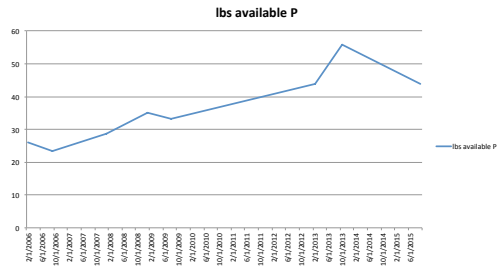


Pot Ash trends

K chart is included because K Availability has nearly doubled despite not having any K applied over the time period as part of the fertilizer program.



Phosphorus trends



Conclusions

- We believe our phosphorus levels are at a point that we will no longer include it in our fertilization program except where it can be put in row with a cash crop to aid early establishment.
- We still need to be adding nitrogen in spite of increased availability because microbiologic activity eats up a lot of N in residue break down. You have to feed the bugs.

Warm Season Cocktails

- Gabe Brown says that if you don't have at least one failure a year, you are not pushing the envelope hard enough. Why does it always have to be next to the county road for all the world to see?

Warm season Cocktail planted May 15th.

- 12 # soy beans
- 10 # grazing corn
- 1.5 # forage collards
- 2 # buckwheat
- 1 Pound sunflowers

Cost of Dry-land warm season

- Seed $22.72
- Chemical $15.19
- Fertilizer $45.00
- Land $25.00
- Planting $12.00
  - **Total per acre cost $119.41**

Early Planted Cocktail

- May was so cold and wet, nothing came up until early June along with all of the summer weeds that we could not control.

Pasture	acres	Hd #	AU	Hd #	AU	date in	date out	days	AUM	Stk rate	total
Frohman 1 summer CT	65	197	1.59	9	1.5	5-Aug	6-Aug	2	21.78	0.34	
	65	197	1.59	8	1.5	13-Aug	20-Aug	8	86.728	1.33	**1.67**

Economic Return

- Cost of crop $119.41
- Grazing value $79.32
- Loss ($40.09 per acre)
- The weed burden we created will increase cost of later crops
- **We won't try this one again. We are too far north for reliable growing weather in May.**

Later planted summer cocktails

- We planted a crop after we took the rye off the NE School Section. We turned calves on to it at weaning. It was fence line weaning after the calves had had nose blebs in for 7 days.
- They were used to the feed and just put their heads down and grazed. There was very little stress, no sickness, and they were on a diet rich in nutrients.
- Once they have finished this cocktail, they will go to an irrigated cool season cocktail planted after wheat. My guess is that we are achieving 1.5 to 2 # ADG
- This may not pencil if you just look at AUM/acre, but the management value and pounds added make up for it.



Feed Rumensin to prevent AIP!!!

- If you are coming off mature native pasture onto a lush cover crop, you could lose cows to cow asthma (Atypical Interstitial Pneumonia)
- Begin feeding a rumensin containing range block 3 to 4 days before moving them to the cocktail and continue for the first couple of weeks. This should remove the risk.
- AIP is fatal, untreatable, and will affect a lot of cows

Warm Season Cocktail planted as primary crop

Bartels 7N summer CT	**70**	**85**	**1.65**			**7-Sep**	**1-Oct**	**25**	**116.8**	**1.67**
Bartels 1 summer CT	**80.5**	**85**	**1.7**			**2-Oct**	29-Oct	28	134.8	1.68







Value of this crop is high

- We had 85 first calf heifer pairs on this cocktail from Sept. 7 to Nov. 1
  - The young cows have an avg. BCS of 5.8
  - All calves born in last week in April to first week in May. Calves weaned Nov 1. Avg. weight 543 #
    - Avg wt/day of age = 2.5
  - On native range, the cows would be melting and the calves would probably be standing still.

Dryland Crop Rotation

1. Spring Cash Crop (oats, peas, spring wheat)
2. Wheat ➡ cover crop for fall grazing
3. Corn
4. Warm season cocktail (include clovers)
5. Cool Season Cocktail
6. Wheat
7. Rye for grazing ➡ warm season cocktail
8. Sorghum for swathes

Irrigated Crop Rotation

1. Oats & peas for silage ➡ Warm season C.T.
2. Wheat ➡ cool season C.T. including rye
3. Rye for grazing ➡ beans ➡ Rye for spring
4. Corn



