Economic Issues and Drought Recovery

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Topics

- Drought recovery issues
- Profitability with increased costs of production
  - Forage production
    - Pasture establishment costs
    - Pasture fertilization strategies
  - Cattle
    - Are they still a good option for you?
    - Production strategies
- Cash flow issues
Drought Recovery

- **Past Costs**
  - Major effects on forage production
  - Dramatically increased purchased forage and feed costs of most cow-calf producers
  - Reduced income from selling lighter weight calves
  - Losses incurred selling sound cows at beef prices

- **Future Costs**
  - Cost of renovating or replacing damaged pastures
  - Cost of rebuilding the herd and/or reduced calf numbers and income

- What is the optimal herd size and management strategy?
Profitability

- Typically, low margins
- Varies from farm to farm
  - Owners goals and motivation
  - Type of operation
    - Commercial brood cows
    - Seed stock
    - Stocker
    - Finishing
  - Scale of operation, management
  - Stage in Cattle cycle
Where Profits Headed?

- Forage Production
  - Higher fertilizer prices and tight supplies
  - Higher fuel prices
  - Scarce seed supplies
  - General cost increases resulting from higher energy costs

- Cattle
  - Higher forage costs
  - Higher purchased feed prices
  - General cost increases resulting from higher energy costs
  - Little change in cattle prices in 2008
US BEEF PRODUCTION AND CATTLE PRICES, 1975-2007

PRODUCTION, MIL. LB.

FED CATTLE PRICE, $/CWT.


PRODUCTION
PRICE
• PRICE TREND
Feeder Cattle Futures, $/100 lb, 3/14/08

Mar '08  April  May  Aug  Sep  Oct  Nov  Jan '09
99.30  102.40  105.20  109.10  110.30  110.20  110.10  109.30

$ per cwt.
**Step 1: Assess Forage Options**

- Grow your own
  - Renovate or replace
  - Plant temporary pastures for summer grazing in the summer of 2008
  - Adjust fertilization practices
- Rent added pasture acreage
- Buy feed
  - Hay or other forages
  - Supplements, forage extenders and byproducts
## Forage Costs, $/ton of dry matter

<table>
<thead>
<tr>
<th>Crop</th>
<th>2006</th>
<th>2008&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perennial cool season grass pasture</td>
<td>60</td>
<td>71</td>
</tr>
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<tr>
<td>Rye/ryegrass</td>
<td>60</td>
<td>69</td>
</tr>
</tbody>
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<sup>a</sup>Preliminary
Costs in the Budgets

- Operating inputs -- fuel, fertilizer, chemicals, labor, seed, interest
- Fixed costs -- depreciation, interest, taxes, insurance on machinery and buildings
- Yield estimates and “unit costs”
- Some include harvesting cost. NO cost of getting the forage to the animal.
- NO farm overhead cost
- NO land charge
Perennial Forage Crops

- Establishment year costs
  - Variable costs -- lime, fertilizer, seed, equipment operation
  - Fixed costs – equipment ownership
  - Labor

- Annual costs
  - Fixed costs include a share of the establishment costs
## Establishment Costs, 2008a, $/acre

<table>
<thead>
<tr>
<th>Crop</th>
<th>Operatingb</th>
<th>Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perennials:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool season grass</td>
<td>216</td>
<td>15</td>
</tr>
<tr>
<td>Cool season grass - clover</td>
<td>236</td>
<td>15</td>
</tr>
<tr>
<td><strong>Annuals:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small grain, silage</td>
<td>243</td>
<td>11</td>
</tr>
<tr>
<td>Summer annual, pasture</td>
<td>163</td>
<td>11</td>
</tr>
<tr>
<td>Rye/ryegrass, pasture</td>
<td>160</td>
<td>11</td>
</tr>
</tbody>
</table>

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a Preliminary estimates  
b Includes a labor cost or charge of $8 to $11 per acre
## Replanted Cool Season Perennial: Stand Life and Yield Effects

<table>
<thead>
<tr>
<th>Item</th>
<th>Reduced Stand Life</th>
<th>Base Budget</th>
<th>Reduced Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand life, years</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Yield, DM tons/acre</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cost/ton of Dry Matter</td>
<td>$82</td>
<td>$71</td>
<td>$107</td>
</tr>
</tbody>
</table>
Coping with High Nitrogen Cost

- Shop around -- price N by the pound
  - Anhydrous Ammonia = 82% N
  - Urea = 46% N (but subject to losses)
  - N solutions = approx 30% N
  - Other???

- Consider broiler litter, etc.
  - Book value 57N-72P-40K/Ton but analyze it if you can
  - Not all the N is available (~50%?)

- Substitute legumes for bought N
- Substitute time & management for N and other bought inputs
Pasture Fertilization

Five Questions

- Production response to nitrogen
- Cost of additional production
- Average cost of production
- Cost to graze a cow
- Effect on carrying capacity
Table 3. Estimated yield* response of tall fescue to annual nitrogen application. Use these as general guidelines only.

Source: Mueller & Green, NCAES, AG 338
## Nitrogen Response per acre

- **Fescue: From Mueller & Green’s graph**

<table>
<thead>
<tr>
<th>N applied, lb/acre</th>
<th>Production, lb of DM/ac</th>
<th>Average</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1,500-2,100</td>
<td>1,800</td>
<td>--</td>
</tr>
<tr>
<td>100</td>
<td>4,200-5,450</td>
<td>4,825</td>
<td>3,025</td>
</tr>
<tr>
<td>150</td>
<td>6,000-8,100</td>
<td>7,050</td>
<td>2,225</td>
</tr>
</tbody>
</table>
N response in Seeded Bermuda

Source: Chris Teutsch, VPI&SU

y = 3804 + 43.05x - 0.0442x^2

r^2 = 0.80  P < 0.001

487 lb N/A
# Nitrogen Responses

<table>
<thead>
<tr>
<th>N Applied</th>
<th>Fescue</th>
<th>Bermuda</th>
<th>RR Crab grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>~1,800</td>
<td>3,804</td>
<td>3,940</td>
</tr>
<tr>
<td>100 lb v. 0</td>
<td>~+3,025</td>
<td>+ 3,865</td>
<td>+2,755</td>
</tr>
<tr>
<td>150 lb v. 0 (+ over 100)</td>
<td><del>+5,250 (</del>+2,225)</td>
<td>+5,465 (+1,600)</td>
<td>+3,725 (+970)</td>
</tr>
</tbody>
</table>
Key Question

- Response to N depends on soil pH and availability of other nutrients such as P and K
- Adding lime and other nutrients affects cost
- Two examples
  - No lime, P, K, etc. needed
  - Lime, P, K, etc needed at a cost of $60 per acre, applied
### Average Cost per lb of DM

- **Fescue**: from Mueller & Green
- **Average response**: ~ 30 lb DM/1 lb N
- **No lime, P, K, etc. needed** (unlikely)

<table>
<thead>
<tr>
<th>Cost: $/lb of N</th>
<th>0 lb N</th>
<th>100 lb N</th>
<th>150 lb N</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.50</td>
<td>$0</td>
<td>1.0¢</td>
<td>1.1¢</td>
</tr>
<tr>
<td>$0.75</td>
<td>$0</td>
<td>1.6¢</td>
<td>1.6¢</td>
</tr>
<tr>
<td>$0.90</td>
<td>$0</td>
<td>1.9¢</td>
<td>1.9¢</td>
</tr>
</tbody>
</table>
**Average Cost/Cow, No lime, P,K**

- If a cow needs 30 lb DM per day
- 180 days of grazing/acre (no hay)
- Grazing loss = 50% of production

<table>
<thead>
<tr>
<th>N Cost</th>
<th>0 lb N</th>
<th>100 lb N</th>
<th>150 lb N</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.50/lb</td>
<td>$0</td>
<td>$112</td>
<td>$115</td>
</tr>
<tr>
<td>$0.75/lb</td>
<td>$0</td>
<td>$168</td>
<td>$172</td>
</tr>
<tr>
<td>$0.90/lb</td>
<td>$0</td>
<td>$201</td>
<td>$207</td>
</tr>
</tbody>
</table>
Average Cost per lb of DM

- Fescue: Mueller & Green
- Average response ~ 30 lb DM/1 lb N
- $60/acre of lime, P, K, etc. needed

<table>
<thead>
<tr>
<th>Cost: $/lb of N</th>
<th>0 lb N</th>
<th>100 lb N</th>
<th>150 lb N</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.50</td>
<td>3.3¢</td>
<td>2.3¢</td>
<td>1.9¢</td>
</tr>
<tr>
<td>$0.75</td>
<td>3.3¢</td>
<td>2.8¢</td>
<td>2.4¢</td>
</tr>
<tr>
<td>$0.90</td>
<td>3.3¢</td>
<td>3.1¢</td>
<td>2.8¢</td>
</tr>
</tbody>
</table>
Average Cost/Cow, N + $60/acre

- If cow needs 30 lb DM per day
- 180 days of grazing/acre (no hay)
- Grazing loss = 50% of production

<table>
<thead>
<tr>
<th>N Cost</th>
<th>0 lb N</th>
<th>100 lb N</th>
<th>150 lb N</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.50/lb</td>
<td>$360</td>
<td>$246</td>
<td>$207</td>
</tr>
<tr>
<td>$0.75/lb</td>
<td>$360</td>
<td>$302</td>
<td>$264</td>
</tr>
<tr>
<td>$0.90/lb</td>
<td>$360</td>
<td>$336</td>
<td>$299</td>
</tr>
</tbody>
</table>
Carrying Capacity, Fescue e.g.

- Cow needs 30 lb DM per day X 180 days of grazing/acre (no hay) X 2 for grazing loss of 50% = 10,800 lb/ DM production per cow

<table>
<thead>
<tr>
<th></th>
<th>0 lb N</th>
<th>100 lb N</th>
<th>150 lb N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM prod/ac</td>
<td>1,800</td>
<td>4,825</td>
<td>7,050</td>
</tr>
<tr>
<td>Acres/cow</td>
<td>6.0</td>
<td>2.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Cows per 100 acres</td>
<td>17</td>
<td>45</td>
<td>65</td>
</tr>
</tbody>
</table>
Fertilization strategy

- N response depends on soil fertility – pH, P, K, etc. status
- Soil Test! Apply what is needed
- Fertilizer cost affects grazing cost per cow – no N may not be the cheapest strategy
- Pasture response affects carrying capacity – joint decision about fertilization and number of cows
- What is the optimal number of cows?
Step 2: Assess Cattle Options

- What cattle types and numbers?
  - Cow numbers (fewer)
  - Selling fewer calves at heavier weights?
  - Stockers

- Prepare feed budgets
  - Example: 50 brood cows, 30 lb. dry matter per cow per day, 180 day grazing period
  - \( \frac{50 \times 30 \times 180}{2000} = 135 \text{ tons of dry matter} \)
  - Account for dry matter content
    - Hay ~ 85% DM (75 tons DM = 88 tons of hay)
    - Pasture ~ 20 to 25% DM
    - Corn Silage ~ 35% DM
Why Do You Have Cattle?

OR

FUN OR MONEY?
Are Cattle Still a Good Option?

What are your long term goals & objectives?

- Life style
  - Occupation
  - Location
  - Use of your time
- Annual income for family living
- Tax benefits
- Increasing your wealth
- Providing for the next generation
Do you know your cost of production?

- Operating cost - out of pocket expenses, e.g. forage production, other feed, vet, fuel, repairs.
- Labor cost or charge for the value of your time
- Fixed/Investment costs
  - Depreciation
  - Interest
  - Taxes & insurance
### NC Cow-calf budget, 2006 & 2008 est.

<table>
<thead>
<tr>
<th>Item</th>
<th>2006 $/cow</th>
<th>2008&lt;sup&gt;a&lt;/sup&gt; $/cow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating cost</td>
<td>525</td>
<td>626</td>
</tr>
<tr>
<td>Fixed cost, incl. pasture estab.</td>
<td>185</td>
<td>196</td>
</tr>
<tr>
<td>Total</td>
<td>710</td>
<td>822</td>
</tr>
<tr>
<td>Labor &amp; Management charge</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Total economic cost</td>
<td>755</td>
<td>867</td>
</tr>
<tr>
<td>Total economic cost/calf&lt;sup&gt;b&lt;/sup&gt;</td>
<td>860</td>
<td>985</td>
</tr>
</tbody>
</table>

<sup>a</sup> Preliminary estimates  
<sup>b</sup> Assumes weaned calf crop of 88% of cows exposed
## MN Cow-calf Cost & Returns, 2006

<table>
<thead>
<tr>
<th>Category</th>
<th>Low Profit</th>
<th>Avg. Profit</th>
<th>High Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$394</td>
<td>$552</td>
<td>$710</td>
</tr>
<tr>
<td>Operating cost</td>
<td>$481</td>
<td>$398</td>
<td>$376</td>
</tr>
<tr>
<td>Fixed &amp; O/H cost</td>
<td>$149</td>
<td>$91</td>
<td>$79</td>
</tr>
<tr>
<td>Total cost</td>
<td>$629</td>
<td>$489</td>
<td>$454</td>
</tr>
<tr>
<td>Labor &amp; Mgt charge</td>
<td>$83</td>
<td>$79</td>
<td>$102</td>
</tr>
<tr>
<td>Net Return</td>
<td>-$319</td>
<td>-$15</td>
<td>$154</td>
</tr>
</tbody>
</table>

Source: MN Farm Business Management database
### MN Backgrounding, per Head, 2003-5

<table>
<thead>
<tr>
<th></th>
<th>Low Profit</th>
<th>Avg. Profit</th>
<th>High Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value added</td>
<td>$109</td>
<td>$208</td>
<td>$346</td>
</tr>
<tr>
<td>Operating cost</td>
<td>$156</td>
<td>$134</td>
<td>$127</td>
</tr>
<tr>
<td>Fixed &amp; O/H cost</td>
<td>$24</td>
<td>$18</td>
<td>$15</td>
</tr>
<tr>
<td>Total cost</td>
<td>$180</td>
<td>$152</td>
<td>$143</td>
</tr>
<tr>
<td>Labor &amp; Mgt charge</td>
<td>$26</td>
<td>$17</td>
<td>$16</td>
</tr>
<tr>
<td>Net Return</td>
<td>-$96</td>
<td>$39</td>
<td>$187</td>
</tr>
</tbody>
</table>

Source: MN Farm Business Management database
## 2006 Example: Feeding 32 Heifers for 120 days @ 15lb DM/day

<table>
<thead>
<tr>
<th>Option</th>
<th>Total Cost</th>
<th>Cost per Head/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intensively grazed fescue</td>
<td>$3,374</td>
<td>$0.88</td>
</tr>
<tr>
<td>2. Extensively grazed fescue</td>
<td>$4,039</td>
<td>$1.05</td>
</tr>
<tr>
<td>3. Hay</td>
<td>$5,317</td>
<td>$1.34</td>
</tr>
<tr>
<td>4. Extensively grazed rye or R/G</td>
<td>$4,354</td>
<td>$1.13</td>
</tr>
</tbody>
</table>

Costs based on 2006 NCSU Enterprise Budgets
Example

- $1,943 high-low difference on 32 heifers fed for 120 days
- This is only an example -- Many factors affect cost & feasibility on a specific farm
  - Time available
  - Labor cost or charge per hour
  - Distance to the animals
  - Equipment used
### Step 3. Evaluate Costs: NCSU

**Budget Forage Costs, $/ton of DM**

<table>
<thead>
<tr>
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<td>60</td>
<td>69</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Preliminary
Forage Cost

- Choice of forage has a big impact on cost per cow:
  - For example, if a beef cow needs to be offered 30 lb. of dry matter per day, feed needs are 5.5 tons per cow per year.
  - Full economic cost of production is:
    - $391 at $71 per ton of dry matter
    - $765 at $139 per ton of dry matter
  - This does not include the cost of managing grazing or putting out feed.
Grazing options

- Use controlled grazing to reduce waste
  - Loss ~ 25% with strip or rotational grazing
  - Loss ~ 50% if set stocked for, say, two weeks per pasture

- Controlled Grazing Example
  - 10 acres at 2 tons DM/acre
  - Permanent fencing & water exist
  - It costs $15 per move X 12 moves = $180
  - Cattle eat 15 tons v. 10 tons if set stocked
  - Cost of saved feed = $180/5 = $36/ton DM

- Add any cost of transporting cattle, etc.
Grazing Management Cost

- Investment in fencing, water, lanes, etc.
- Time & equipment to move livestock

Example:
- Pick-up @ $17.64 /hour
- Labor @ $ 9.00 /hour
- Total = $26.64 /hour
Hay Making Cost

With 2006 equipment and 2008 fuel:
- Small square bales -- $80 per ton of DM
- Large round bales -- $68 per ton of DM

→ Add cost of growing the hay crop to this, at say $71 per ton!!!

→ Hay cost of $139 per ton

→ Add to this the risk of rain & losses in storage and feeding plus feeding costs

What are your hay costs? Can you buy it cheaper? Can you change your crop management to reduce hay needs, e.g., by changing fertilization, stockpiling?
### Bale Feeding Costs

2006 Tractor, 75 HP, + spear

- Annual ownership cost: $6.24/hr
- Operating cost: $12.40/hr
- Total Machine cost: $18.64/hr
- + Labor: $9.00/hr
- Total cost: $27.64/hr
Forage Costs

- Good pasture is the cheapest forage to produce
- Budget costs do not include cost of getting feed to the cow
- Measure total cost of the ration actually eaten by livestock
  - Forage, including grazing and hay
  - Supplements
  - Harvesting, storage and feeding costs, including losses
**Losses Add to Feed Costs**

- Harvest losses – range from 5% to 50% of harvestable production
- Storage losses -- 5% to 20% of feed made
- Feeding losses -- 5 to 15% of feed available
- Combined losses -- 15 to 50%

E.g. Hay bought or made at $80/ton with a 25% loss factor is $107/T hay eaten

Source: Sustainable Dairy Systems Manual, UT & UK
What is Your Total Ration Cost?

- Yields & quality vary for different forages
- Figure the nutritional needs of the animal to achieve desired performance
- Figure **total** ration cost when comparing alternative forages including:
  - Supplementary feeds, minerals, etc.
  - Storage and feeding losses
  - The cost of putting out feed(s)
- If different rations produce differences in animal performance, figure both income and cost, e.g., income over feed cost
Partial Budget Changes

- Figure Change in Profits:
  - + Costs saved
  - - Added costs
  - + or - Change in income (if livestock performance changes)

- Look at the year-round effects
Make a Risk Management Plan

- Carry a hay reserve
- Plan for more acres than needed normally
  - Harvest and store any surplus
  - Harvest and sell any surplus
- Diversify
  - Grow more than one forage crop
  - Spread production geographically
- In years when yields are poor
  - Buy supplementary forages
  - Buy commodities and by-products to stretch supplies

All incur cost. Which is more profitable with your farm history?
Cash Flow & the Drought

- Major increase in feed 2007 costs for most cow-calf producers
- Reduced income from selling lighter calves
- Outlays for renovating or replacing damaged pastures
- Outlays for providing feed until pastures recover
- Fewer cows and fewer calves = less income next fall
- Investment cost if the herd is rebuilt
+ Reducing the herd boosted cash flow but is an economic loss -- selling sound breeding stock at beef prices is a capital loss
Summary

- Sharply higher forage production costs
- Know your cost of production whether selling or feeding
- Increases in other cattle raising costs including purchased feed
- Can your cattle operation meet family goals and needs with increased costs of production?
  - Goals of cattle operations differ
  - Production practices differ
  - Profitability varies among farms
Summary

- Evaluate your forage options
  - Grow your own forages
    - Renovate or replace
    - Plant temporary pastures for 2008
    - Optimum fertilizer use
  - Rent pasture
  - Buy forages and feedstuffs
    - Forages
    - Supplements, extenders and byproducts
  - Substitute time and management for cost
- Make a feed budget
- Evaluate your cattle options
Summary

- Forages must be “processed” through livestock so look at forage production, animal performance and economics
- Measure forage costs at an animal’s mouth
- Estimate impact of forage choices on total feed cost, including supplements, year round
- Include any effects on animal performance and income
- Consider risk
Summary

- Several other factors affect profits besides cost of production
  - Animal performance
  - For cow-calf
    - Prices & premiums related to selling weight, frame, breed/color, season, choice of market etc.
  - For Stockers
    - Buying and selling prices

- Run your numbers
  - Past history
  - Projections
  - Look for ways to cut costs -- custom work, shares, contract production, etc.
Summary

- You must know your own costs before you can evaluate options
- No $ilver Bullet$
- No $imple an$wer$!!
Enterprise Budgets web site:
http://www.ag-econ.ncsu.edu/extension/Ag_budgets.html

Includes selected forages, other crops and livestock budgets
- Annual forage crop budgets
- Perennial forages have two budgets
  - Establishment year costs
  - Annual operating costs that include a share of the establishment year cost
“If it’s easy, fun or can be done from the seat of a tractor, there ain’t no money in it”

Anonymous Cowboy
What Next?
Geoff Benson

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