Many Ways to Feed Cows

• Must follow some basic rules
• Some strategies are more effective than others
• Balance
  • Cow Health
  • Herd Production
  • Feed Resources
  • Economics
Many Ways to Grow Crops

• Certain Crops fit Certain Situations
• Some strategies are more effective than others
• Balance
  • Soil resources
  • Production efficiency
  • Economics
  • Environment

---------the Chicken or the Egg

Crop Rotation matched to Herd Needs

Production Strategy matched to Crop Resources
Adapting Resources and Needs

Sometimes minor changes make all the difference
• Facilities can be renovated
• Land can be improved
• Herd characteristics can be changed
• Management can adjust

But will the change be adequate and does it match you?

Does the Peg fit the Hole?

Assessing the Situation

S  Strengths – What do you do well?
W  Weaknesses – What areas could be improved?
O  Opportunities – What resources can you capitalize on?
T  Threats – What areas could cause major problems?
Many Pieces

Production Strategies

Conventional
- Land base to meet forage needs

Pasture Based
- Contiguous acres
- Winter Forage Supply

GMO Free
- Land base to meet forage needs
- Land base to meet grain needs

Organic
- Land base to meet forage needs
- Land base to meet grain needs

Does the system match:
- Land Resources
- Facilities
- Available Markets
Herd Size
• Optimize production efficiencies
• Spread cost across production units

Production Goals
• Milk production in line with inputs
• Ration Ingredients meet Herd Goals
• Does the facility support level of production

Does the system match:
• Land Resources
• Facilities
• Labor Resources
• Storage Infrastructure

Crop Rotation
• Soil Health
• Pest Management

Does the system match:
• Soil Management Goals
• Crops
• Forage Needs

Owned/Rented
• Core Acres
• Land security
• Investments in Improvements

Soil Type / Growing Season
• Support desired crops
• Timely Harvest

Equipment
• Timely Harvest
• Match Crop Operation
Dairy Farm Case Study

14 year study of yield variation

- Q1: consistently high yield
- Q2: variably high yield
- Q3: variably low yield
- Q4: consistently low yield

Half of fields yielded higher
Half lower (22T/A @ 60% M)

Does the system match:
- Herd Size
- Crop Types
- Forage Needs

Footprint
- Adequate Space to Store Properly
- Minimize Losses

Intended Use
- Quality matches Animal Group
- Special Considerations
  - Low Potassium

Storage Infrastructure

Carry Over
- Feed Consistency
- Buffer against Crop Shortfalls
## Storage Capacity

<table>
<thead>
<tr>
<th>Bunk</th>
<th>Avg. Current DM Density</th>
<th>Capacity at Current Densities</th>
<th>Capacity at 16 lbs/cuft</th>
<th>Capacity at 18 lbs/cuft</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lbs DM/cuft</td>
<td>tons (As Fed)</td>
<td>tons (As Fed)</td>
<td>tons (As Fed)</td>
</tr>
<tr>
<td>Corn 1 (Bunk 1)</td>
<td>12.8</td>
<td>1553</td>
<td>1942</td>
<td>2185</td>
</tr>
<tr>
<td>Corn 2 (Bunk 3)</td>
<td>10.2</td>
<td>815</td>
<td>1278</td>
<td>1437</td>
</tr>
<tr>
<td>Corn 3 (Bunk 5)</td>
<td>12</td>
<td>1640</td>
<td>2186</td>
<td>2460</td>
</tr>
<tr>
<td>Corn 4 (Bunk 6)</td>
<td>15.4</td>
<td>2637</td>
<td>2739</td>
<td>3082</td>
</tr>
<tr>
<td>SUM</td>
<td></td>
<td>6644</td>
<td>8145</td>
<td>9163</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td>1501</td>
<td>2519</td>
<td></td>
</tr>
<tr>
<td>Haylage 1 (Bunk 2)</td>
<td>12.4</td>
<td>919</td>
<td>1186</td>
<td>1335</td>
</tr>
<tr>
<td>Haylage 2 (Bunk 4)</td>
<td>11.7</td>
<td>1732</td>
<td>2368</td>
<td>2664</td>
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<tr>
<td>SUM</td>
<td></td>
<td>2651</td>
<td>3555</td>
<td>3999</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td>903</td>
<td>1348</td>
</tr>
</tbody>
</table>

## Excess Feed

- Right Structure, Right Location
Soil Health

• Short Rotations
• Cover Cropping

Pest Management

• Short Rotations

Does the system match:

• Herd Needs
• Land Base

Soil Type / Growing Season

• Consistent Production
• Weather influences quality

2016 NY Corn Silage Hybrid Trials

Field Resiliency

Madrid

• Corn – Sod Rotation
  1st yr. corn after sod
• History of manure

Aurora

• Row Crop Rotation with no recent manure history

Table 1. NYS Corn Silage Trials, 2016 Weather Data

<table>
<thead>
<tr>
<th>Month</th>
<th>Precipitation (inches)</th>
<th>GDD (86/50 F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aurora</td>
<td>Madrid</td>
</tr>
<tr>
<td>May</td>
<td>2.00</td>
<td>0.94</td>
</tr>
<tr>
<td>June</td>
<td>0.74</td>
<td>2.37</td>
</tr>
<tr>
<td>July</td>
<td>1.90</td>
<td>2.22</td>
</tr>
<tr>
<td>August</td>
<td>4.56</td>
<td>3.25</td>
</tr>
<tr>
<td>Seasonal</td>
<td>9.20</td>
<td>8.78</td>
</tr>
</tbody>
</table>

10 yr Mean | 14.10 | 14.89 | 2094   | 1831   |
## 2016 NY Corn Silage Hybrid Trials

<table>
<thead>
<tr>
<th>Relative Maturity Days</th>
<th>Madrid</th>
<th>Aurora</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yield, 35% DM</td>
<td>Dry Matter</td>
</tr>
<tr>
<td></td>
<td>tons/acre</td>
<td>%</td>
</tr>
<tr>
<td>84-95</td>
<td>27.6</td>
<td>34.6</td>
</tr>
<tr>
<td>96-100</td>
<td>28.3</td>
<td>33.9</td>
</tr>
<tr>
<td>101-107</td>
<td>29.3</td>
<td>31.9</td>
</tr>
</tbody>
</table>

**Graph:**

- **Equation:**
  - Madrid: $y = -1.2599x + 142.39$, $R^2 = 0.1496$
  - Aurora: $y = 0.5748x + 81.473$, $R^2 = 0.0155$
Grains

Soil Type / Growing Season
- Consistent Production
- Crop Consistently reaches Maturity

Straw
- Use on Farm

Storage
- Evaluate Risk of Loss

Additional Acreage
- Suitable for Grain Crops

Does the system match:
- Herd Needs
- Land Base
**Winter Cover Crops**
- Soil Health
- Nutrient Management

**Double Cropping**
- Place in Ration
- Timely Harvest
- Storage Capacity

**Soil Type / Growing Season**
- Establishment of Cover Crops
- Establishment of Crop Following Cover Crop

**Summer Annual**
- Planned vs. Emergency Forage
- Niche in Crop Rotation
- Place in Ration

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**Summer & Winter Annual Forages**

What are your overall forage needs?
- Where does this feed fit into feeding plan?
  - Class of animals
  - Other ration ingredients
- How many acres are needed to make it useful?
  - Enough to integrate into ration at meaningful level for meaningful length of time
- Where will it be stored.
Double Cropping

What do you need most?

• Total Season Yield
  • In some years double cropping may out-yield single crop
  • In other years total season yield may be equivalent
    • Example
      • Corn Silage 24 tons/acre
      • Winter Grain + Corn Silage 6 tons/acre + 18 tons/acre

• Do you need all the corn silage you can get to meet ration needs or does the small grain haylage meet a need in your feed plan?

Winter Cereal Forage

• N at Spring Greenup
• Target Optimum Quality
  • Flag Leaf Stage (stage 9)
  • Before head emergence!!!!
    • Approx. 1 week before 1st cutting of hay crops
    • Later harvest will only result in modest yield increase with big drop in quality = non-lactating feed
• High Pottassium?

Does the system match:
- Herd Needs
- Land Base
- Labor Resources

Alfalfa / Grass
- Improved Yield & Quality
- Grass that matches Alfalfa

Grass
- Fiber Digestibility
- Nutrient Management

Alfalfa
- Soil Drainage
- Pest Management

30% Average Grass vs. Pure Average Alfalfa

1/3 to 2/3 more tons/a of dry matter per season
6-7% units higher NDFD in mixture
CP near 20%, (vs. 20%+)

Meadow fescue 1-2% units higher NDFD in mix (30%)
HQ Alfalfa 1-2% units higher NDFD in mix (70%)

30% MF/HQ Alfalfa (vs. pure alfalfa) may be:
1/3 to 2/3 more tons/acre and
8-11% units higher NDFD
OR about 20% higher NDFD in mixture

Slide Credit: Jerry Cherney, Cornell
Harvesting Mixed Stands

First Cut Forage Quality vs. Yield

**Alfalfa**

<table>
<thead>
<tr>
<th>Cutting</th>
<th>Yield (lb/day)</th>
<th>RFV per day</th>
<th>RFQ per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>-2 to -3</td>
<td>-5</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>-2</td>
<td>-4</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>-1</td>
<td>-4</td>
</tr>
</tbody>
</table>

Undersander, Wisconsin

**Grass**

- Yield gain: ~150 lbs DM/a/day*
- NDFd decline: 1%/day
- Alfalfa/grass mix: falls in between
- Feeding trials: cows drop 0.5-1.0 lbs/cow/day with each 1% drop in NDFd

*N leading up to maturity;
when crop reaches maturity DM increase/day slows way down

Cherney, Cornell

For 100 acres: ~5-7 ton DM/day *during vegetative growth*
Grasses

Potential for very good feed on land not as well suited for other crops.
• Nitrogen for yield and protein.

Pure Grass – Select early heading variety

Early heading cultivars/species can be 10% units higher in NDFD at heading compared to late heading cultivars/species at heading.

- Jerry Cherney, Cornell

• Are you equip to harvest early and often?
• Can you get on ground in the spring?

Each Puzzle is Unique

• Analyzing your resources & how they fit your goals.

• Ability to adapt to align your business with your resources and goals.

• Develop a Plan and stick with it.
  • Too much on the line to “fly by the seat of your pants”
Thank You!

Joe Lawrence, CCA
Dairy Forage Systems Specialist
Cornell University PRO-DAIRY

jrl65@cornell.edu
315-778-4814
http://prodairy.cals.cornell.edu/