Forage Systems to Increase Productivity

Tim Fritz, Forage Agronomist

King’s AgriSeeds Inc.

2016 Winter Southeast Meetings
Forage Systems
Forage Systems

- **PERENNIAL CROPS** (Alfalfa, Grass, Grass-Clover Mixes)
- **WINTER ANNUALS**
- **SUMMER ANNUALS**
- **VEG. CORN**
- **CORN SILAGE**
- **Spring OATS**
- **Spring OATS**
Making Forage Choices

- Is the crop adapted to your farms soils and expected weather?
- Do the planting and harvest dates work?
- How will the crop impact crop rotation and total farm productivity?
- Do you have adequate storage capacity?
- What nutritional value does the crop bring to the ration?
Forage Nutrition

- Dense Energy (starch)
  - Corn, Forage Sorghum and Soft Dough Small Grains
- Protein
  - Legumes (Alfalfa and Clovers)
- Fiber Energy & Balanced Protein
  - Vegetative grasses
    • Perennial Grasses
    • Annuals harvested before heading
Legumes
Perennial Legumes

- **Alfalfa**
  - Drought tolerant

- **Red Clover**
  - High yield in short rotation
  - Tolerant to wetter soils
  - Better Protein Quality
    - Lower soluble protein

- **White and Ladino Clover**
  - Tolerant to wet soils and long lived
Grass Breeding Advancements

- Maturity to match alfalfa
- Fiber digestibility
  - More leaf, less stem
  - Softer plants (less lignin)
- Sugar Content
### Perennials

<table>
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<tr>
<th></th>
<th>Tons of DM</th>
<th>CP</th>
<th>NDF</th>
<th>NDFd30</th>
<th>KD Rate</th>
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<td>7.3</td>
<td>20.8</td>
<td>34.9</td>
<td>49.5</td>
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</table>

2014 Data from King’s AgriSeeds Mount Joy Research Plots. Mount Joy weather was relatively dry. Alfalfa, Red Clover and Alf Grasses were cut 5 times. Grass Mixes were cut 4 times. Quality Data is an average from 1st and 3rd cuttings using CVAS.
Corn Breeding Advancements

- Yield
- Fiber digestibility
  - Conventional
  - BMR
- Starch Digestibility
  - Floury Starch
Sorghums and Sudans

- High Sugars
- Fiber Digestibility
  - Delayed Maturity
  - BMR
- Improved Agronomics
Forage Systems

WINTER  SPRING  SUMMER  FALL  WINTER
J  F  M  A  M  J  J  A  S  O  N  D

PERENNIAL CROPS (Alfalfa, Grass, Grass-Clover Mixes)

WINTER ANNUALS  SUMMER ANNUALS  WINTER ANNUALS

VEG. CORN  CORN SILAGE

Spring OATS  Spring OATS
Example Farm 1

- Deep Well Drained Soils
Example Farm 2

- Droughty Soils
Winter Annual Forages
Cool Season Annuals

- **Straights**
  - Spelt
  - Wheat
  - Triticale
  - Rye
  - Barley
  - Annual & Italian Ryegrasses
  - Oats

- **Mixtures**
  - Many combinations!
  - Add legumes crimson clover, hairy vetch, winter peas for more protein.

January 21, 2016
## FORAGE YIELD COMPARISON - TRICAL® TRITICALE VS RYE

<table>
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<tr>
<th></th>
<th>BOOT STAGE</th>
<th>HARVEST</th>
<th>SOFT DOUGH</th>
<th>HARVEST</th>
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<td></td>
<td></td>
<td>DATE</td>
<td>0% Water</td>
<td>DATE</td>
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<tr>
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<td>T/A</td>
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<td><strong>AVG.</strong></td>
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<td>WHEELER RYE</td>
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Research Location-VPI North Piedmont Research & Ext. Ctr., Orange, VA.

January 21, 2016
Winter Annuals
2004 Penn State Landisville
April 29

Rye already past prime
April 29

Wheat

Italian Ryegrasses

 Marshall Annual Ryegrass
Two weeks after harvest

Wheat
Marshall A. Ryegrass
Italian Ryegrass
May 20

Three weeks after harvest

Wheat

Marshall A. Ryegrass

Italian Ryegrass

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Winter Annual Mixtures

Soil Builder Plus
Summer Annuals

- Forage sorghums
- Sorghum-sudans
- Sudangrass
- Millets
BMR Forage Sorghum
Brachytic Dwarf BMR

A major advancement in standability and ease of harvest
BMR Sudangrass

- Easy Dry Down
- High Yield
- Drought Tolerant
- Strong Regrowth
- High Quality
- Multi-Cut / Graze
Example 4 Year Rotation

- Yr 1-2 Barduro Red Clover
- Yr 3 Corn Silage followed by Forage Sorghum
- Yr 3 fall plant Winter Annual mixture
- Yr 4 Harvest WA followed by Sudangrass
- Yr 4 Seed Barduro Red Clover
Forage Cropping Systems

- Annuals
- Long Term Perennial
Example Rotation

- **Y1:**
  - Harvest barley, wheat or spelt
  - Sudangrass or millet followed by Rye.

- **Y2:**
  - Harvest Rye at flag leaf
  - Short Season Corn
  - BMR Forage Sorghum (harvest at frost)
  - Triticale and Annual Ryegrass

- **Y3:**
  - Harvest Triticale and Annual Ryegrass Twice
  - BMR Forage Sorghum harvest at soft dough
  - Plant barley, wheat or spelt

January 21, 2016
## Annual Yield Potential

<table>
<thead>
<tr>
<th>Crop</th>
<th>Dry Matter</th>
<th>65% Moist</th>
<th>11% Moist</th>
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<tbody>
<tr>
<td>Triticale Plus 1&lt;sup&gt;st&lt;/sup&gt; cut</td>
<td>2.85</td>
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<td>Triticale Plus 2&lt;sup&gt;nd&lt;/sup&gt; cut</td>
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<td>BMR S. sudan 2&lt;sup&gt;nd&lt;/sup&gt;</td>
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<tr>
<td>Everleaf Oats</td>
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<tr>
<td><strong>Total 2008 Yield</strong></td>
<td><strong>14.09</strong></td>
<td><strong>40.15</strong></td>
<td><strong>15.7</strong></td>
</tr>
</tbody>
</table>

2008 Leola, PA field weights.

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Forage Planning

- Crop Rotation
  - Key for sustained yield and profitability

- Crop Selection
  - Adapted to soils, climate, harvest methods, and nutritional needs.

- Team Approach
  - Forage Agronomist
  - Nutritionist
  - Financial Consultant
Forage Planning

• Bridging Agronomy, Nutrition and Profitability
  – Yield with risk management
  – Quality with risk management

• Requires Multiple Crops
Forage Nutrition

- Dense Energy (starch)
  - Corn, Forage Sorghum and Soft Dough Small Grains
- Protein
  - Legumes (Alfalfa and Clovers)
- Fiber Energy & Balanced Protein
  - Vegetative grasses
    - Perennial Grasses
    - Annuals
Attend Field Days

January 21, 2016
Oakley Research Farm
Questions?

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