Double Cropping With Winter Forage

Tom Kilcer
Advanced Ag Systems LLC
www.advancedagsys.com

We Don’t Do Cover Crops
We Do Winter Forage

Growth Potential - light intensity & hours

Winter Forage
Summer Annual
Winter Forage

Research at Cornell Valatie Research Farm

Advanced Ag Systems LLC

We Don’t Do Cover Crops
We Do Winter Forage

You could broadcast and disk in corn!!

Forage for the High Cows

Produces the Highest Quality Forage Available on Today’s Farm

Purdue research

<table>
<thead>
<tr>
<th>Type of Forage</th>
<th>ADF</th>
<th>NDF</th>
<th>Crude Protein</th>
<th>IVOMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triticale®</td>
<td>31.9</td>
<td>50.9</td>
<td>10.2</td>
<td>79.7</td>
</tr>
<tr>
<td>Alfalfa haylage</td>
<td>32.3</td>
<td>42.7</td>
<td>21.4</td>
<td>71.5</td>
</tr>
<tr>
<td>Corn silage</td>
<td>22.5</td>
<td>37.1</td>
<td>8.6</td>
<td>74.8</td>
</tr>
</tbody>
</table>

1) IVOMD = In vitro dry matter digestibility
2) Average of two varieties
3) Average of two crops
**Winter Triticale Forage Quality**

**Fermented Samples, Flag Leaf Stage**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>15</td>
</tr>
<tr>
<td>Sol Protein</td>
<td>73</td>
</tr>
<tr>
<td>ADF</td>
<td>34</td>
</tr>
<tr>
<td>NDF</td>
<td>58</td>
</tr>
<tr>
<td>Lignin</td>
<td>2.9</td>
</tr>
</tbody>
</table>

**Fermented Samples, Flag Leaf Stage**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFC</td>
<td>16</td>
</tr>
<tr>
<td>NSC</td>
<td>11</td>
</tr>
<tr>
<td>Starch</td>
<td>2.1</td>
</tr>
<tr>
<td>Sugar</td>
<td>8.5</td>
</tr>
<tr>
<td>Kd/hr</td>
<td>6.58</td>
</tr>
</tbody>
</table>

**Winter Triticale Acreage in NY from 2010 to 2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>Acreage (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>5,000</td>
</tr>
<tr>
<td>2012</td>
<td>10,000</td>
</tr>
<tr>
<td>2013</td>
<td>15,000</td>
</tr>
<tr>
<td>2014</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Winter Forage Choices and Management**

- Barley
- Rye
- Winter Wheat
- Winter Triticale

**N Rate Study Results**

**Optimal N Rate**

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of Fields</th>
<th>Average (tons DM/acre)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rye</td>
<td>8</td>
<td>1.67</td>
<td>1.00</td>
<td>2.41</td>
</tr>
<tr>
<td>Triticale</td>
<td>33</td>
<td>2.14</td>
<td>1.10</td>
<td>3.02</td>
</tr>
<tr>
<td>Wheat</td>
<td>4</td>
<td>1.15</td>
<td>0.44</td>
<td>1.61</td>
</tr>
</tbody>
</table>

**Dr. Ketterings, Cornell**

**Cornell Cooperative Extension in Rensselaer Co.**

- >50 lbs/A N on Rye Lodged

**How To Grow Winter Forage Triticale**

- No-till
- Minimum till
- Aeration till
- Conventional till
Silage Yield @ 90 lb/a Fall N rate

Oct 5 vs Sept 10 Same N

Late plant/no herbicide

Impact of Sulfur on Protein

N Rate Study Results Nitrogen Uptake

About 50 lbs of N removed for every 1 ton DM per acre

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</tr>
</thead>
<tbody>
<tr>
<td>Rye</td>
<td>8</td>
<td>93</td>
<td>32</td>
<td>131</td>
</tr>
<tr>
<td>Triticale</td>
<td>33</td>
<td>99</td>
<td>62</td>
<td>163</td>
</tr>
<tr>
<td>Wheat</td>
<td>4</td>
<td>14</td>
<td>9</td>
<td>95</td>
</tr>
</tbody>
</table>

N Rate Study Results Yield and Optimum N Rate

Predicting Fall Uptake from Shoots

Ketterings et al.
10/30/2014

Fall Nitrogen Uptake

Advanced Ag Systems LLC

Dr. Ketterings: Valatie Research Farm

Advanced Ag Systems LLC

2.50

3.50

4.50

5.50

6.50

7.50

8.50

0

30

60

90

120

Tons 35%DM Silage/A

Lbs N/A Spring

Oct 5 Fall vs Spring N Response Preliminary

Harvesting Winter Triticale

“Stage of growth has a bigger effect on forage quality than the species of winter grain chosen”

Dr. J. Cherney, Cornell University

Winter Grains (triticale) For Replacement Heifers

- Late Boot through Milk Stage is intermediate on protein;
- moderate in energy,
- a digestibility that will not inhibit intake
- for good heifer growth without the heifers getting fat. (Dr. Charles Sniffin, FenCrest LLC)

Change in Feed Quality

Harvest Date

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**Triticale & Red Clover**

**Dry Matter**

- Red Clover: 62%
- Triticale: 78%

**Crude Protein**

- Red Clover: 14.5%
- Triticale: 11.5%

**NDFD 30**

- Red Clover: 65
- Triticale: 50

**kd%/hr**

- Red Clover: 2
- Triticale: 4

**Simple Sugars**

- Red Clover: 9
- Triticale: 7

**Deflector Down vs Deflector Up**

**Uniform**

- Scott narrow: 15%
- Scott wide: 17%
- Hunter wide: 19%

**Drying Rate Lump vs Uniform**

**Bruce McNaig, Lancaster, Ontario**
Tedding Speeds Drying

Harvest Management for Successful Triticale Forage

Relationship between overnight DM loss and minimum night temps

16.00% 18.00% 20.00% 22.00% 24.00% % Dry Matter

Initial Sidebar
Initial Conditioner
Final Sidebar
Final Conditioner
Final Conditioner + Tedded

Advanced Ag Systems LLC

Relationship between overnight DM loss and minimum night temps

May 10
May 11
May 12
May 13
May 14
May 15

Winter Triticale Harvest 2013

Date
High Temp
Low Temp
May 10
77
52
May 11
63
47
May 12
53
39
May 13
49
33
May 14
60
31
May 15
86
49

Harvest of Winter Triticale Forage

• Mow wide
• Chop longer 1 inch???
• Ensilage/wrap the same day as mowed
• Homolactic acid type bacteria
• Very high sugar allows full fermentation

Cropping System Concept

• Always keep the ground covered
• Stay off of ground early spring late fall
• Double crop for high yield
• Minimum/no till save time, fuel, soil structure.
• Off peak harvest / planting to spread workload
• Maximum use of legumes to save N
• Very high quality dairy forage

Double Crop System

May 10
May 8-10
Harvest Triticale
June 1
Short Season Corn
Sept 1
Till/Plant Annual
Till/Plant Triticale

Implements Structure Benefits Next Crop

Corn grain increased yield 4 – 7%
Soybeans 3yr avg. increased yield 8 – 15%
Nitrate in drainage water reduced 21-38%
Surface permeability in clay loam increased 7X

Dr. Cox, Cornell

Double Crop with Short Season vs Straight Traditional Corn Silage
3/4 ton of silage lost for every 5 day shorter season corn

\[ 105 - 85 = 3 \text{ tons corn silage} \]
\[ 1.05 \times 3700 = 3780 \text{ lbs of milk lost/acre} \]

6 – 12 Tons of Winter Forage/A

\[ 2-4.2 \text{ tons of DM/a} \]
\[ 2-4.2 \text{ tons of DM/a @ 4200 lb milk potential/ton DM} \]

8400 – 17640 lb. milk /A

**Single vs Double Crop Silage Yield**

**BMR Sorghum sp.**

- Has rapid C4 photosynthesis like corn
- Cool season grasses use C3 photosynthesis

**Consistent Yield on Droughty Soils**

1 inch water = .84 tons Corn silage
1 inch water = 1.76 tons BMR SS silage

High Yield
- Short Season
- Summer Energy Forage

- Shorter Season Corn
- Shorter Season BMR Sorghum-Sudan
- BMR Sudangrass
- Shorter Season Sorghum
Feeding Value of Brachytic Forage Sorghum Compared with Corn Silage from First or Second Harvest for Lactating Dairy Cows

J. K. Bernard and S. Tao

Results of this trial suggest that silage produced from brachytic forage sorghum could support similar intake, milk yield and composition as diets based on corn silage.

University of Georgia Brachytic Sorghum Feeding Trial
Double Crop System

Year 2

Watch Fall N Rates

Early spring the fall planted clover has a running start

Windrow Depth
0.64 for 7.5 inch row
3.8 inches ever
Winter Grains Have Allelopathy

- Exude compounds that keep other plants from growing.
- Can restricting weeds and the next crop
- Management controls the effect

Winter Triticale
Is it Fool Proof??