Hybrid Fall Rye

Ken Gross

Ducks Unlimited Canada
Conserving Canada's Wetlands
Outline

• Hybrids - background
• Hybrid attributes
• Field scale demos – lessons learned
• Market opportunities
• Current demo locations – see for yourself
Background

- Breeding Institution is KWS-Lochow
- German-based
From North Germany to Ural:
The European RYE BELT

Central regions:
Germany,
Poland,
Russian Federation,
Ukraine,
Belorussia,
Baltic States,
Scandinavia, Czech Republic,
Slovakia and Austria

.....and Now Canada!
Population move to hybrids

Development from 2003-2013

- 0 - 100%
- 15 - 90%
- 0 - 50%
- 0 - 35%
- 0 - 40%
- 0 - 30%
- 25 - 100%
Some similarities between the regions
## Fall Rye Co-operative Registration Trial

### Brandon, 2011-2012

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (kg/ha)</th>
<th>Heading date (days after Jan 1)</th>
<th>Maturity (days after Jan 1)</th>
<th>Height (cm)</th>
<th>% Winter survival</th>
<th>Hagberg Falling # (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazlet</td>
<td>4640</td>
<td>158 (June 7)</td>
<td>202 (July 21)</td>
<td>110.5</td>
<td>82.5</td>
<td>196</td>
</tr>
<tr>
<td>Brasetto</td>
<td>6881</td>
<td>156.5</td>
<td>201</td>
<td>101.5</td>
<td>95</td>
<td>273.5</td>
</tr>
</tbody>
</table>
Yield Advantage

Conventional fall rye varieties vs Hybrid rye varieties

Jamie Larsen, Lethbridge trials
Current Situation

• 2 hybrid rye varieties supported for Registration February 2014

• FP Genetics is the seed production and sales partner for 1 of the varieties
Field Demos

• 20 ac Brasetto beside 20 ac Hazlet
• Intensive Management

Locations (2013-2014):
• Kelburn and Birtle, MB
• Ponteix and Humboldt, Sask.
• Lacombe, Hughenden, Alta.
### FALL RYE

**2013**

<table>
<thead>
<tr>
<th>Top 6 Varieties</th>
<th>% Market Share</th>
<th>Number of Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZLET</td>
<td>52.4</td>
<td>44,751</td>
</tr>
<tr>
<td>PRIMA</td>
<td>14.9</td>
<td>12,725</td>
</tr>
<tr>
<td>DANKO</td>
<td>7.9</td>
<td>6,747</td>
</tr>
<tr>
<td>AC RIFLE</td>
<td>6.4</td>
<td>5,466</td>
</tr>
<tr>
<td>NO VAR</td>
<td>5.9</td>
<td>5,039</td>
</tr>
<tr>
<td>AC REMINGTON</td>
<td>4.5</td>
<td>3,843</td>
</tr>
</tbody>
</table>

| Total Fall Rye Acres | 85,403 |

*Source: Manitoba Agriculture Services Corporation (MASC) 2011, 2012 & 2013 Market Share Reports. The report includes variety information compiled from the MASC database.*
Management – Paradigm shift

Very similar to winter wheat:

- Seed into stubble
- Optimal seeding period is Aug 25 – Sept 10
- Shallow seed fall rye 1 - 1.5 inches
- Seeding rate based on goal of 18 pls/sq ft
- 3-4 leaves developed prior to winter
- Higher management than “normal rye”
  - E.g. N and disease management
\[ \text{kg/ha} = \frac{\text{desired plant population/sq m} \times \text{TKW (g)}}{\text{seedling survival rate (in decimal form)}} / 100 \]

<table>
<thead>
<tr>
<th>CONVERSION</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>pls/sq ft</td>
<td>lbs/acre</td>
<td>kg/acre</td>
<td>desired plant pop/sq meter</td>
<td>TKW</td>
<td>survival rate</td>
<td>germ</td>
</tr>
<tr>
<td>Brasso 14</td>
<td>43</td>
<td>48</td>
<td>150</td>
<td>29</td>
<td>0.9</td>
<td>0.95</td>
</tr>
<tr>
<td>Brasso 23</td>
<td>72</td>
<td>81</td>
<td>250</td>
<td>29</td>
<td>0.9</td>
<td>0.95</td>
</tr>
<tr>
<td>Falcon 23</td>
<td>89</td>
<td>100</td>
<td>250</td>
<td>30</td>
<td>0.75</td>
<td>0.95</td>
</tr>
<tr>
<td>Flourish 23</td>
<td>113</td>
<td>127</td>
<td>250</td>
<td>38</td>
<td>0.75</td>
<td>0.95</td>
</tr>
</tbody>
</table>
Different sowing depth

Importance of precise seeding, especially at lower seeding rates
• Slow down!
Seeding Depth

Yield (bu/ac)

- .5-.75"
- 1.25-1.5"
- 2-2.25"

Seeding Depth (Inches)

Indian Head, 2002
Brasetto Fall Rye

- Birtle seeded on September 17th
- Kelburn: Sept 18

Photo taken at Birtle, October 16th
Delayed seeding often means delayed maturity

Delayed maturity often pushes winter crops into fusarium window
Seed Treatment

Cruiser Maxx
Vibrance

Photo taken Kelburn, October 21st
2013/14 Soil Temperatures – Southwest Region
Frost keeps pushing deeper into Winnipeg's frozen terrain

CBC News Posted: Mar 19, 2014 11:29

“Winnipeg's frozen ground has now reached as deep as eight feet”

"What we do know is it's continuing to grow so it could get deeper."
Air conditioners whirring in Winnipeg, but hundreds still have frozen pipes

Read more: http://www.ctvnews.ca, June 1

"They were still unthawed late last week, even as the Manitoba capital was Canada's hot spot at 32 C."
Winter and spring wheat root growth
May 30

Winter wheat

Spring wheat

Total roots (intercepts/cm)
Early growth

Flourish vs Brasetto
June 12
Delayed spring growth delays maturity
Fertility

- 1 lb/N/bushel target yield minus residual N
- Fall rye: 60 bushel acre avg in Birtle
- 2 rates: target Hazlet and Brasetto yield
Share of single plant organs in yield formation

(WALBORCZYK 1978)

Wheat

Rye

Triticale

Ear

Leaf

Stalk
Height difference

- Brasetto vs Hazlet

Photo taken at Birtle, August 8th
Lodging:

Brassetto

Hazlet
Uniformity – disease!

Brasetto

Hazlet
Ergot becomes a problem if:
- Late and uneven tilling
- Green and late heads in tramlines in field
- Varieties with low pollination

### German trials with artificial infection

<table>
<thead>
<tr>
<th>Variety</th>
<th>Type</th>
<th>Ergot Scale 1 – 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>9 = receptive.</td>
</tr>
<tr>
<td>Dukato</td>
<td>P</td>
<td>3</td>
</tr>
<tr>
<td>KWS Magnifico</td>
<td>H</td>
<td>3-4*</td>
</tr>
<tr>
<td>Palazzo, Brasetto</td>
<td>H</td>
<td>4</td>
</tr>
<tr>
<td>Kapitaen</td>
<td>S</td>
<td>4</td>
</tr>
<tr>
<td>Helltop, Evolo</td>
<td>H</td>
<td>5</td>
</tr>
<tr>
<td>SU Drive</td>
<td>H</td>
<td>6</td>
</tr>
<tr>
<td>SU Mephisto</td>
<td>H</td>
<td>7**</td>
</tr>
<tr>
<td>SU Satellit</td>
<td>H</td>
<td>8**</td>
</tr>
</tbody>
</table>

Bescribing Sortenliste 2013, Bundessortenamt
* Evaluation from German and one Danish trial
** Sold in Denmark as a mix with 10% Dukato
Here’s the info from our Kelburn site, near Winnipeg:

- Bresetto 62.6 bu/acre. The yield monitor was hitting 90-100 in lots of areas but winterkill was a factor.

- Hazlet 47.6 bu/acre. The highest value the yield monitor hit was around 70. And a lot more straw.
Market Development

- 2014 Canadian Market Introduction
  - Milling
  - Feed
  - Distilling

- DU Trials
- 2015 Commercially Available
Small grains such as fall rye and triticale are starting to be delivered in preparation for the cover crop season. A steady increase in deliveries and in anticipation of more demand we have been able to secure even more supply for our customer base. We have seen the demand for fall rye and triticale continue to grow.
Feeding value of each cereal in the cereal trials 2009 – 2012 in Denmark

<table>
<thead>
<tr>
<th>Cereal</th>
<th>Feeding value in FEsv</th>
<th>Feeding value in MJ pr. 100 kg (dt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter wheat</td>
<td>115</td>
<td>849 MJ</td>
</tr>
<tr>
<td>Hybrid Rye</td>
<td>110</td>
<td>812 MJ</td>
</tr>
<tr>
<td>Winter Barley</td>
<td>105</td>
<td>775 MJ</td>
</tr>
<tr>
<td>Triticale</td>
<td>113</td>
<td>834 MJ</td>
</tr>
</tbody>
</table>

The feeding values on each cereal has been calculated according to the Danish feed evaluating system. The differences between the cereals in MJ has been calculated on the bases of potential physiological energy in pigs (PPE), 1 FEsv = 7,38 MJ
<table>
<thead>
<tr>
<th></th>
<th>Spring Wheat</th>
<th>Winter Wheat</th>
<th>Conventional Fall Rye</th>
<th>Hybrid Fall Rye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
<td>287.76</td>
<td>273.69</td>
<td>222.74</td>
<td>273.69</td>
</tr>
<tr>
<td>Yield (bu)</td>
<td>42</td>
<td>58</td>
<td>46</td>
<td>64</td>
</tr>
<tr>
<td>Price ($/bu)</td>
<td>8.34</td>
<td>7.76</td>
<td>5.41</td>
<td>5.41</td>
</tr>
<tr>
<td>Gross</td>
<td>350.28</td>
<td>450.08</td>
<td>248.86</td>
<td>346.24</td>
</tr>
<tr>
<td>Net</td>
<td>62.52</td>
<td>176.39</td>
<td>26.12</td>
<td>72.55</td>
</tr>
<tr>
<td>Rank</td>
<td>3rd</td>
<td>1st</td>
<td>4th</td>
<td>2nd</td>
</tr>
</tbody>
</table>

Source: Crop production costs western Manitoba. MAFRD
What is required in order for you to discuss hybrid rye with your growers?

a) I’ve already bought in – will discuss it now with my growers

b) I’ll watch the early adopters for the first few years, then decide

c) I’ll wait until the yield advantage is proven

d) I’ll wait until the marketability is proven

e) Not interested – only soybeans and corn please!