PROFITABLE OATS PRODUCTION

2016
THESE ARE NOT YOUR FATHER’S OATS!
Factors Affecting Oats Production Have CHANGED!

- Larger, heavier tillage equipment
- Larger planting equipment – equipment width, seed placement, crop row width
- New Varieties – Targeted Usage
- New cropping patterns and fertility needs: i.e. – rotations, canola, corn, soy, fallow/no fallow, etc.
- Plant disease pressures have changed - increased
- New harvesting and storage capabilities
- Quality specs have changed
- Climate change?
Historic North American Oat Sourcing Regions For Milling Oats
Profitable Oats Production in the Future Requires a Strategy

Strategy Includes:

• Crop Rotation Strategy
• Field Selection
• Variety Selection
• Weed Control Strategy
• Harvesting and Storage Strategy
• Marketing Strategy
Field Selection

• Choose fields relatively free of wild oats contamination and minimal herbicide residue carryover.
• Oats are a desirable rotational crop with canola, soybeans, and/or legumes
• Rotate with corn, beans, canola, hay fields – best to NOT rotate with other cereals back to back.
• Oats can tolerate cooler, wetter soils better than many other cereal crops.
• Good, clean viable seed oats will germinate well at 45 degrees F.
Seeding Oats

- **Clean Seed** – Recommend Certified Seed
- **Treated** (if not organic)
  - Fungicide for smut
  - Oats respond well to some bacterial based inoculants
- **Dates** – EARLY!
  - Mid March in Iowa to early May in North Dakota
  - Better returns from early dates – yield and TW’s
- **Rate**
  - 2.5 to 3.5 bu per acre
  - Goal of 18-23 plants per sq foot final stand
Seeding Rate

- Optimum plant populations range from 18 to 23 plants per square foot. Use 1,000 kernel weight of the seed and the following formula to determine seeding rate:

\[
\text{Seeding rate} = \text{desired plants/sq. ft. x TKW (g) x 10 \% expected seed survival}
\]

- Expected seedling survival is used in its decimal form (90 per cent = 0.9).
- Seeding Rate is expressed in pounds per acre of seed.
Whole Oat Kernel
Cross Section Of Oat Kernel
VARIETY SELECTION

Iowa, Minnesota, Wisconsin, South Dakota, North Dakota

Grain Millers Preferred:  Acceptable:

Badger  Betagene
Spurs  Colt
Sabers  Horsepower
Deon  Tack
Souris
Hayden  Excel
Shelby 427
Newburg
Rockford
<table>
<thead>
<tr>
<th>Variety</th>
<th>Breeding Origin</th>
<th>Maturity</th>
<th>Crown Rust</th>
<th>Stem Rust</th>
<th>BYDV</th>
<th>Hull Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badger</td>
<td>U of Wisconsin</td>
<td>Early</td>
<td>S</td>
<td>S</td>
<td>MR</td>
<td>Yellow</td>
</tr>
<tr>
<td>Colt</td>
<td>SDSU</td>
<td>Early</td>
<td>MS</td>
<td>S</td>
<td>MS</td>
<td>White</td>
</tr>
<tr>
<td>Sabers</td>
<td>U of Illinois</td>
<td>Early</td>
<td>MR</td>
<td>S</td>
<td>R</td>
<td>Yellow</td>
</tr>
<tr>
<td>Spurs</td>
<td>U of Illinois</td>
<td>Early</td>
<td>MR</td>
<td>S</td>
<td>R</td>
<td>Tan</td>
</tr>
<tr>
<td>Tack</td>
<td>U of Illinois</td>
<td>Early</td>
<td>R</td>
<td>S</td>
<td>R</td>
<td>Tan</td>
</tr>
<tr>
<td>Excel</td>
<td>Ag Alumni Seed</td>
<td>Early</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>Yellow</td>
</tr>
<tr>
<td>Shelby 427</td>
<td>SDSU</td>
<td>Medium</td>
<td>S</td>
<td>MR</td>
<td>R</td>
<td>White</td>
</tr>
<tr>
<td>Souris</td>
<td>NDSU</td>
<td>Medium</td>
<td>S</td>
<td>MS</td>
<td>MS</td>
<td>White</td>
</tr>
<tr>
<td>Horsepower</td>
<td>SDSU</td>
<td>Medium</td>
<td>S</td>
<td>S</td>
<td>MR</td>
<td>White</td>
</tr>
<tr>
<td>Deon</td>
<td>U of MN</td>
<td>Late</td>
<td>MS</td>
<td>MS</td>
<td>MR</td>
<td>Yellow</td>
</tr>
<tr>
<td>HIFI</td>
<td>NDSU</td>
<td>Late</td>
<td>S</td>
<td>MR</td>
<td>R</td>
<td>White</td>
</tr>
<tr>
<td>Rockford</td>
<td>NDSU</td>
<td>Late</td>
<td>S</td>
<td>MR</td>
<td>R</td>
<td>White</td>
</tr>
<tr>
<td>Newburg</td>
<td>NDSU</td>
<td>Late</td>
<td>S</td>
<td>R</td>
<td>MS</td>
<td>White</td>
</tr>
</tbody>
</table>
Fertilizer Requirements for Oats

For specific recommendations, have your soil tested. If soil analyses are not available, a general recommendation is as follows:

• **Nitrogen (N):** Apply 0-30 lb/acre N following fallow or legume breaking, 30-55 lb/acre following grass and grass-legume breaking and 55-90 lb/acre N following stubble. The primary nitrogen deficiency symptom is leaf yellowing starting with the older leaves.

• **Phosphate (P2O5):** Apply phosphate at 30-40 lb/acre. The primary phosphorus deficiency symptom is leaf purpling/browning starting at the tips of older leaves on the seedling.

• **Potassium (K2O):** On sandy-textured or organic soils apply potassium at 15-30 lb/acre potash (K2O) in a sideband or 30-60 lb/ac broadcast. Where required, potassium should be placed with the seed. Deficiency symptoms are difficult to detect but include short internodes and weak stems.

• **Sulphur (S):** Apply sulphate sulphur at 15 lb/acre on well-drained soils. Sulphur deficiency may occur in many soils and in any area of the province. A soil test is recommended to establish the available sulphur status of fields, especially if in rotations with canola.
# Selected Crop Nutrient Needs

(Minimum plant needs)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Yield (A)</th>
<th>N</th>
<th>P$_2$O$_5$</th>
<th>K$_2$O</th>
<th>Mg</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>8 ton</td>
<td>408</td>
<td>96</td>
<td>392</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>Barley</td>
<td>120 bu.</td>
<td>166</td>
<td>67</td>
<td>182</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>Canola</td>
<td>60 bu.</td>
<td>180</td>
<td>90</td>
<td>150</td>
<td>37</td>
<td>30</td>
</tr>
<tr>
<td>Corn</td>
<td>150 bu.</td>
<td>135</td>
<td>57</td>
<td>41</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Oats</td>
<td>100 bu.</td>
<td>73</td>
<td>27</td>
<td>18</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Wheat</td>
<td>80-bu. Grain</td>
<td>120</td>
<td>48</td>
<td>27</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>
WEED CONTROL

• Best early weed control – Early planting with thick stands.

• Oats tolerate preplant glyphosate application for clean field conditions at planting.
• Some successes seen with early mechanical tillage for weed control

• **Good News** – Oats are very tolerant of all registered amine formulations of herbicides for broadleaf weed control. Avoid ester formulations

• **Dicambas, 2,4-Ds, MCPA formulations** all good – depends on weeds being controlled.

• **Bad News** – No good wild oats controls other than early planting
• Control broadleaf weeds at or before 4th leaf stage (preboot) for best effective control, yield potential, and lower risk of crop injury.
• Most all milling companies have no restrictions on herbicide use as long as manufacturers application rates and timing are obeyed. There are registered tolerances, but limited testing at present time.
Primary Oat Diseases –
- Crown Rust (leaf rust)
- Stem Rust
- Barley Yellow Dwarf Virus (BYDV or “Red Leaf”)
- Septoria
- Fusarium

Fungicides work well on oats to control diseases, and have been shown to boost yields when applied timely. However – be aware that fungicide application can delay maturity up to 7 days.
- Stratego
- Tilt
- Headline
- Others
Harvesting and Storage

- **Swathing**
  - Target average kernel moisture of 25 percent or below
  - Greenest kernels just changed to cream coloured
  - Green hulls not desired

- **Dessication**
  - Legal
  - Caution needed – timing critical
  - Quality implications

- **Combine**
  - Avoid dehulled kernels
  - Slow cylinder speed and widen concave clearances if dry conditions

- **Drying**
  - Target of 12-13 percent moisture
  - Bin aeration possible
  - Dryer temps less than ~70C (160F)
  - Grain temps between ~45 to 50C (110 to 120 F)

- **Storage**
  - See drying section above!
  - CLEAN, dry storage with air is best
Like Beauty –

**QUALITY** is in the “eye of the beholder”

- Farmers raise a “crop”

- Grain Millers buys “an **ingredient**”

- When you truly understand your crop’s role as a food ingredient and the process to convert that grain into food, you begin to fully appreciate the **SPECIFICATIONS** and the steps necessary to make **QUALITY**.
Grain Millers Purchasing Specification

- **38# Test Weight** (Winchester bushel) Minimum 36# with discounts
- **13.5% Spec., 13.0% Moisture Target**, Maximum 14% with discounts over 13.5%
- 1.0% Wheat Allowed, Maximum 2%
- 1.0% Wild Oats Spec. Discounts to 2.5%
- 1.0% Barley Allowed, Discounts to 2.0%
- .5% Max Canola Spec., 1% Maximum with discounts
- 8% dehulled oats allowed, maximum of 12%
- 12% Small Oats (Thins) Allowed, (thru a 5/64 X3/4 inch slotted sieve) Discounts to 20%
- 0.1% Heat Damage Allowed
- 2.0% FM Allowed, Max. 3.0%
- .02% Ergot maximum
- All other Grain Millers analysis and discounts to apply.
- All oats must meet all applicable USDA, EPA, FDA, and/or CFIA (Canada) guidelines.
- No LIVE insects
- Oats must not contain any detectable levels of pesticide, chemicals, or odors
## Test Weight Conversions

<table>
<thead>
<tr>
<th>Lb/W.bu</th>
<th>g/0.5L</th>
<th>Lb/W.bu</th>
<th>g/0.5LL</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.0</td>
<td>219</td>
<td>39.0</td>
<td>251</td>
</tr>
<tr>
<td>34.5</td>
<td>222</td>
<td>39.6</td>
<td>255</td>
</tr>
<tr>
<td>35.1</td>
<td>226</td>
<td>40.0</td>
<td>258</td>
</tr>
<tr>
<td>35.5</td>
<td>229</td>
<td>40.5</td>
<td>261</td>
</tr>
<tr>
<td>36.0</td>
<td>232</td>
<td>41.0</td>
<td>264</td>
</tr>
<tr>
<td>36.5</td>
<td>235</td>
<td>41.6</td>
<td>268</td>
</tr>
<tr>
<td>37.1</td>
<td>239</td>
<td>42.1</td>
<td>271</td>
</tr>
<tr>
<td>37.6</td>
<td>242</td>
<td>42.5</td>
<td>274</td>
</tr>
<tr>
<td>38.0</td>
<td>245</td>
<td>43.0</td>
<td>277</td>
</tr>
<tr>
<td>38.5</td>
<td>248</td>
<td>43.5</td>
<td>280</td>
</tr>
</tbody>
</table>
Keys to Become a Strategic Supplier to a Food Manufacturer

• Understand who truly is the customer and what drives their decisions to buy
• Understand the customer’s definition of QUALITY
• Understand the differences between “a crop” and “an ingredient”, and those factors that drive value for the end user.
• Fully understand and document your market, your product, and your capabilities better than your competitors.
• Food purchasing is the most year-round process affecting consumers. Grain marketing should also be a year round process
Cross section of oats kernel
Dehulling System

CLEAN OATS

HULLS

RAW GROATS

UNHulled OATS BACK TO DEHULLING
Kilning & Sizing System

RAW (UNKILNED) GROATS

DRY (KILNED) GROATS

LARGE GROATS

MEDIUM GROATS

SMALL GROATS
FLAKING SYSTEM

SIZED CUT GROATS

INSTANT OATMEAL

REGULAR AND OLD FASHIONED OATMEAL
Grain Millers Purchasing Specification

- **38# Test Weight** (Winchester bushel) Minimum 36# with discounts
- **13.5% Spec., 13.0% Moisture Target**, Maximum 14% with discounts over 13.5%
- 1.0% Wheat Allowed, Maximum 2%
- 1.0% Wild Oats Spec. Discounts to 2.5%
- 1.0% Barley Allowed, Discounts to 2.0%
- .5% Max Canola Spec., 1% Maximum with discounts
- 8% dehulled oats allowed, maximum of 12%
- 12% Small Oats (Thins) Allowed, (thru a 5/64 X3/4 inch slotted sieve) Discounts to 20%
- 0.1% Heat Damage Allowed
- 2.0% FM Allowed, Max. 3.0%
- .02% Ergot maximum
- All other Grain Millers analysis and discounts to apply.
- All oats must meet all applicable USDA, EPA, FDA, and/or CFIA (Canada) guidelines.
- No LIVE insects
- Oats must not contain any detectable levels of pesticide, chemicals, or odors
Thanks for listening!

Questions?

A. Bruce Roskens
Director – Crop Sciences
Grain Millers, Inc.
952-983-1310 office
630-309-9524 cell