

GRAIN MILLERS

PROFITABLE OATS PRODUCTION

2016

Practical Farmers of Iowa Conference – January, 2016



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THESE ARE NOT YOUR FATHER'S OATS!





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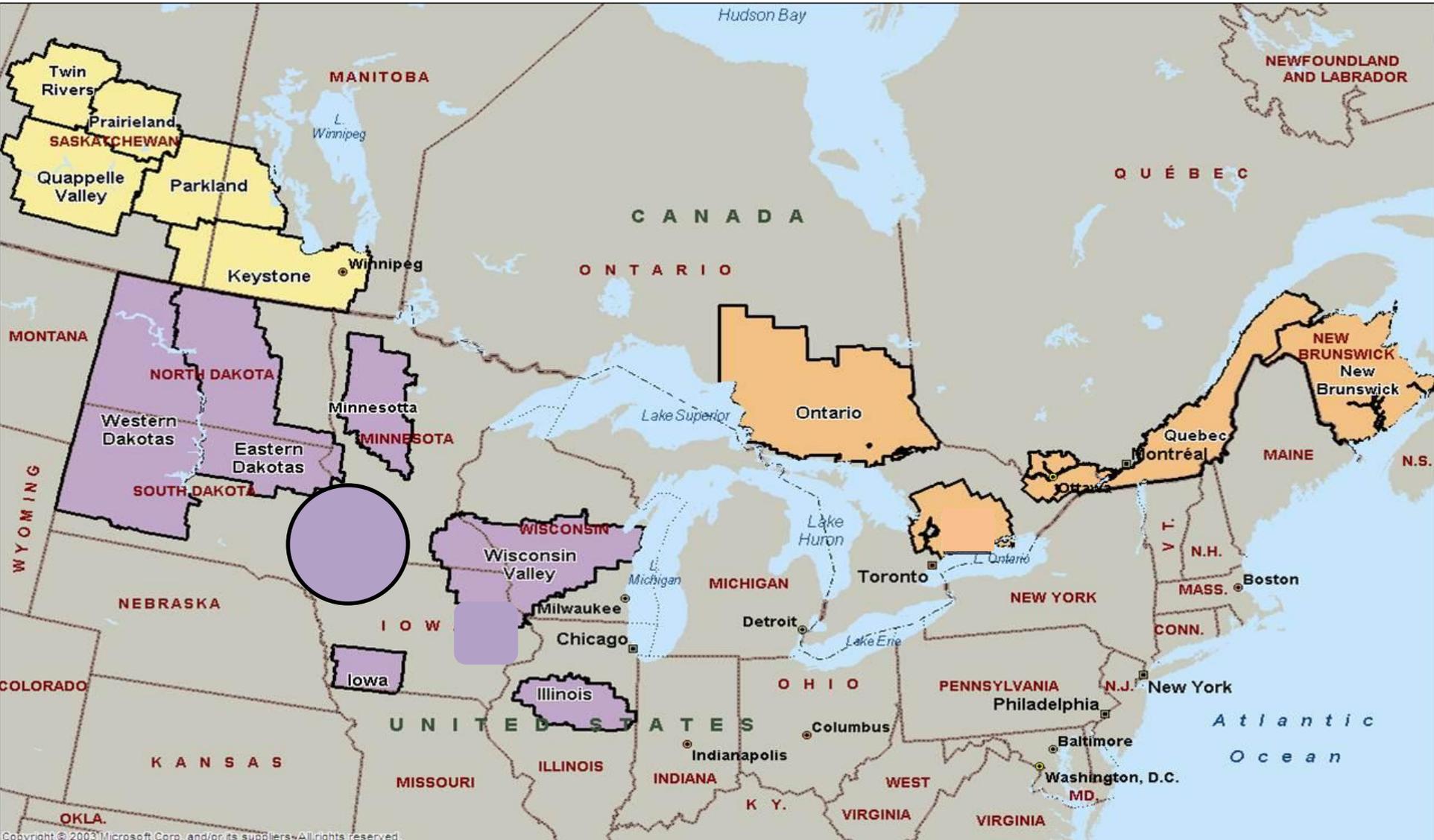
Factors Affecting Oats Production Have CHANGED!

- 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?



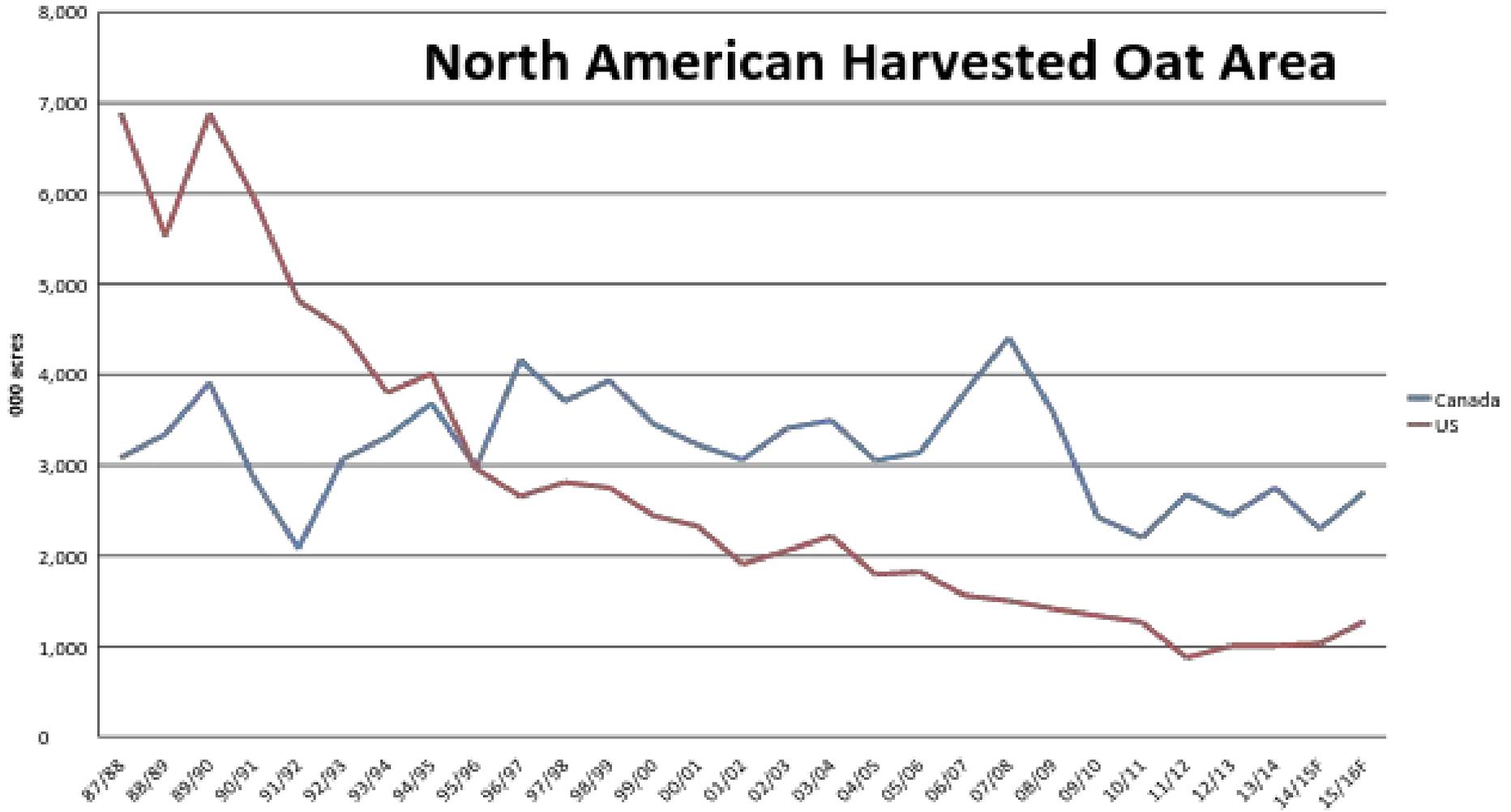
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Historic North American Oat Sourcing Regions For Milling Oats





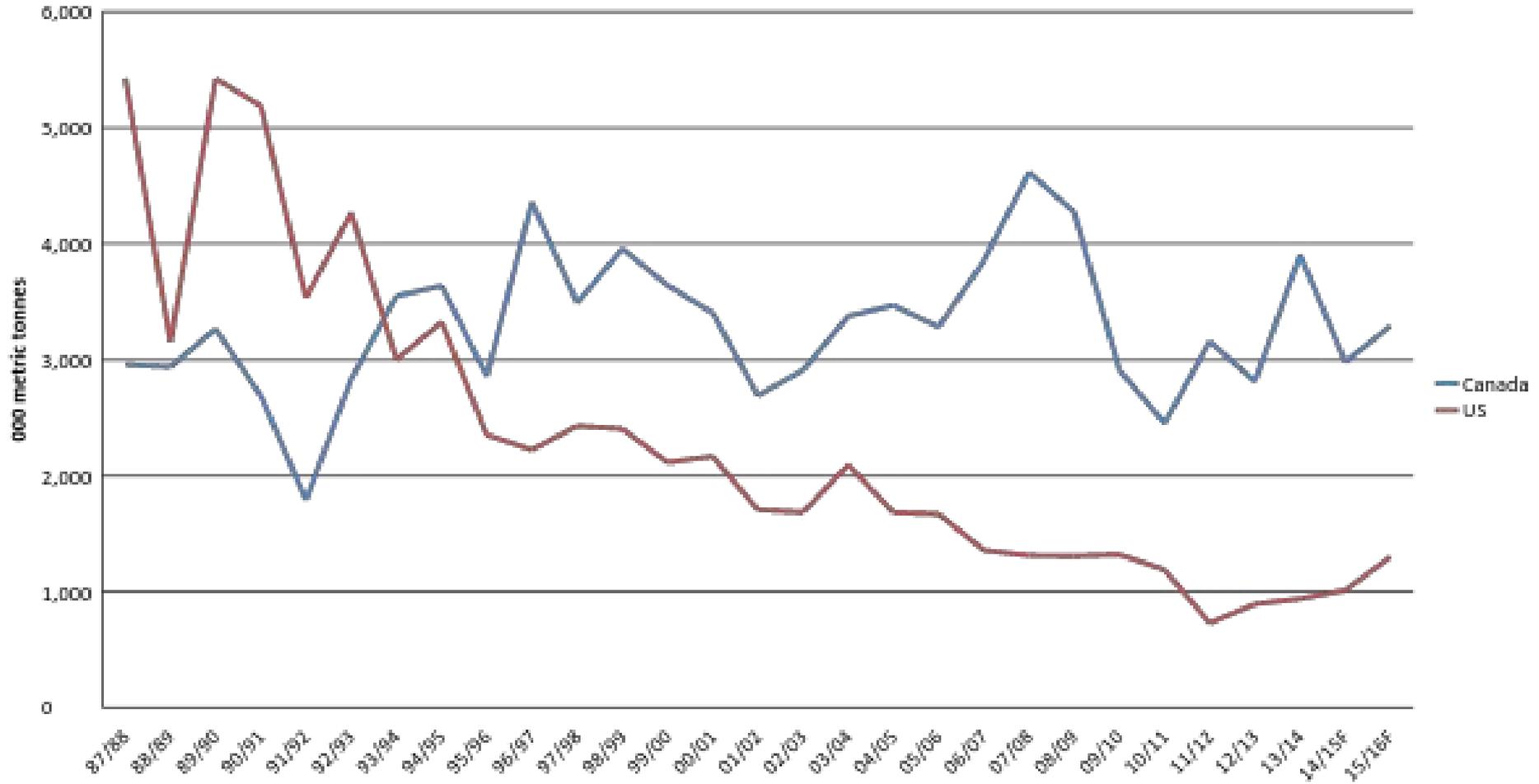
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North American Oat Production





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North American Oat Yields





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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



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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.**



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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





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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:

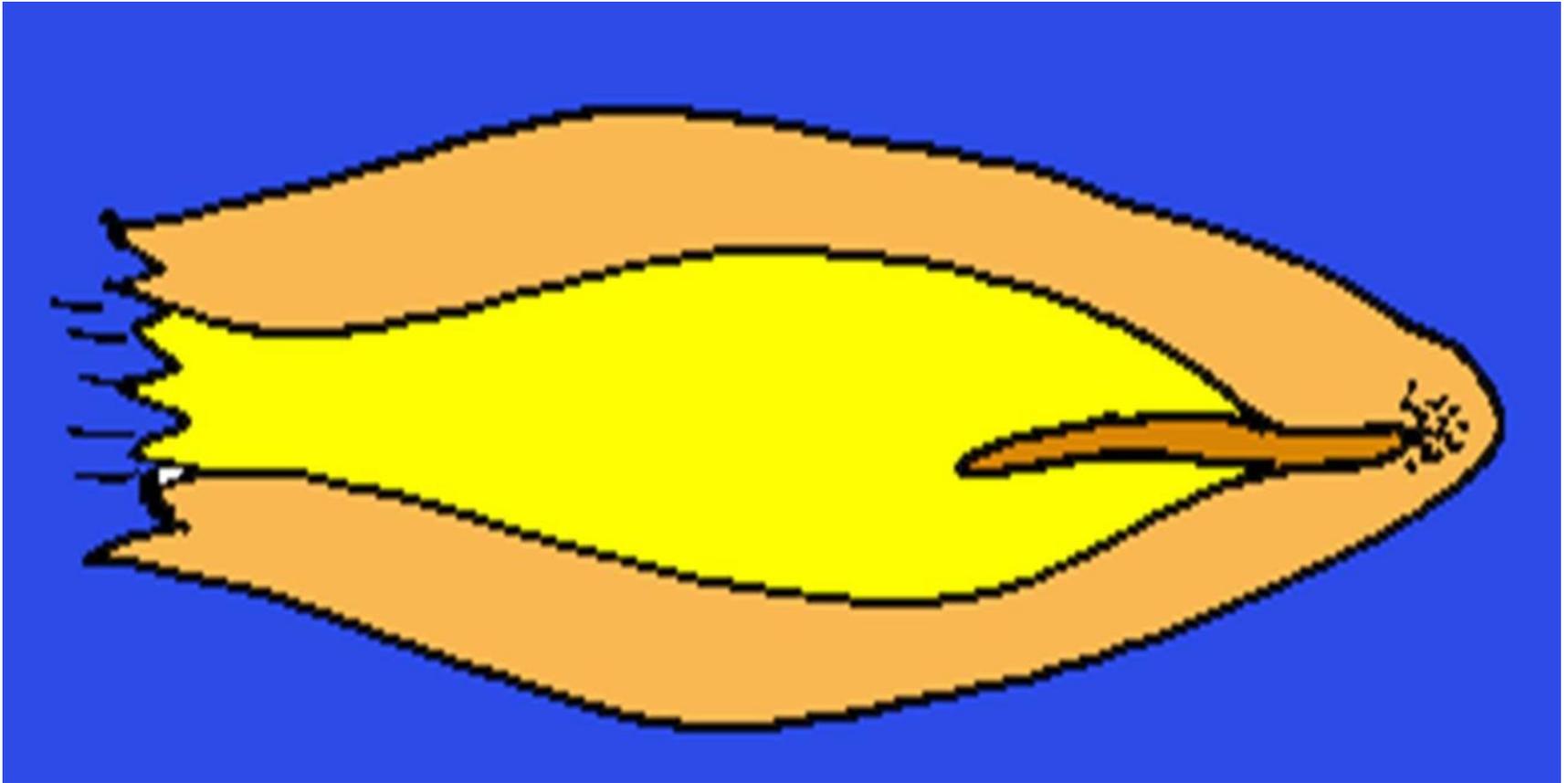
$$\text{Seeding rate} = \frac{\text{desired plants/sq. ft.} \times \text{TKW (g)} \times 10}{\% \text{ expected seed survival}}$$

- Expected seedling survival is used in its decimal form (90 per cent = 0.9).
- Seeding Rate is expressed in pounds per acre of seed.



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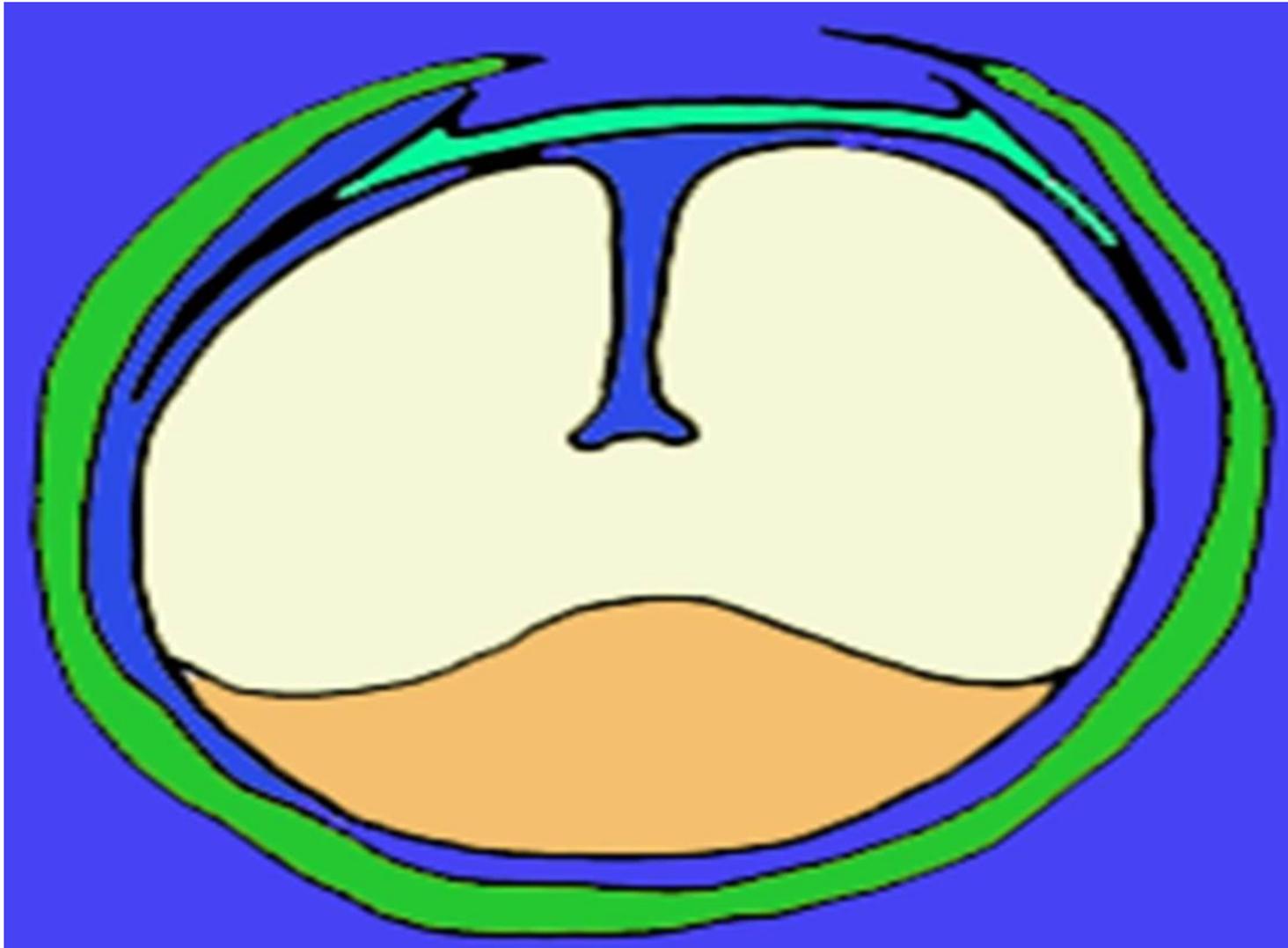
Whole Oat Kernel





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Cross Section Of Oat Kernel





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VARIETY SELECTION

Iowa, Minnesota, Wisconsin, South Dakota, North Dakota

Grain Millers Preferred:

Badger
Spurs
Sabers
Deon

Hayden
Shelby 427
Newburg
Rockford

Acceptable:

Betogene
Colt
Horsepower
Tack
Souris
Excel





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Milling Oats Varieties

Variety	Breeding Origin	Maturity	Crown Rust	Stem Rust	BYDV	Hull Color
Badger	U of Wisconsin	Early	S	S	MR	Yellow
Colt	SDSU	Early	MS	S	MS	White
Sabers	U of Illinois	Early	MR	S	R	Yellow
Spurs	U of Illinois	Early	MR	S	R	Tan
Tack	U of Illinois	Early	R	S	R	Tan
Excel	Ag Alumni Seed	Early	S	S	R	Yellow
Shelby 427	SDSU	Medium	S	MR	R	White
Souris	NDSU	Medium	S	MS	MS	White
Horsepower	SDSU	Medium	S	S	MR	White
Deon	U of MN	Late	MS	MS	MR	Yellow
HIFI	NDSU	Late	S	MR	R	White
Rockford	NDSU	Late	S	MR	R	White
Newburg	NDSU	Late	S	R	MS	White



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.



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Selected Crop Nutrient Needs

(Minimum plant needs)

lb/A

Crop	Yield (A)	N	P ₂ O ₅	K ₂ O	Mg	S
Alfalfa	8 ton	408	96	392	43	43
Barley	120 bu.	166	67	182	17	23
Canola	60 bu.	180	90	150	37	30
Corn	150 bu.	135	57	41	14	12
Oats	100 bu.	73	27	18	4	7
Wheat	80-bu. Grain	120	48	27	12	8



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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.



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Plant Disease Controls

- **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





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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





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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

GRAIN MILLERS

- **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



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Test Weight Conversions

Lb/W.bu	g/0.5L	Lb/W.bu	g/0.5LL
34.0	219	39.0	251
34.5	222	39.6	255
35.1	226	40.0	258
35.5	229	40.5	261
36.0	232	41.0	264
36.5	235	41.6	268
37.1	239	42.1	271
37.6	242	42.5	274
38.0	245	43.0	277
38.5	248	43.5	280



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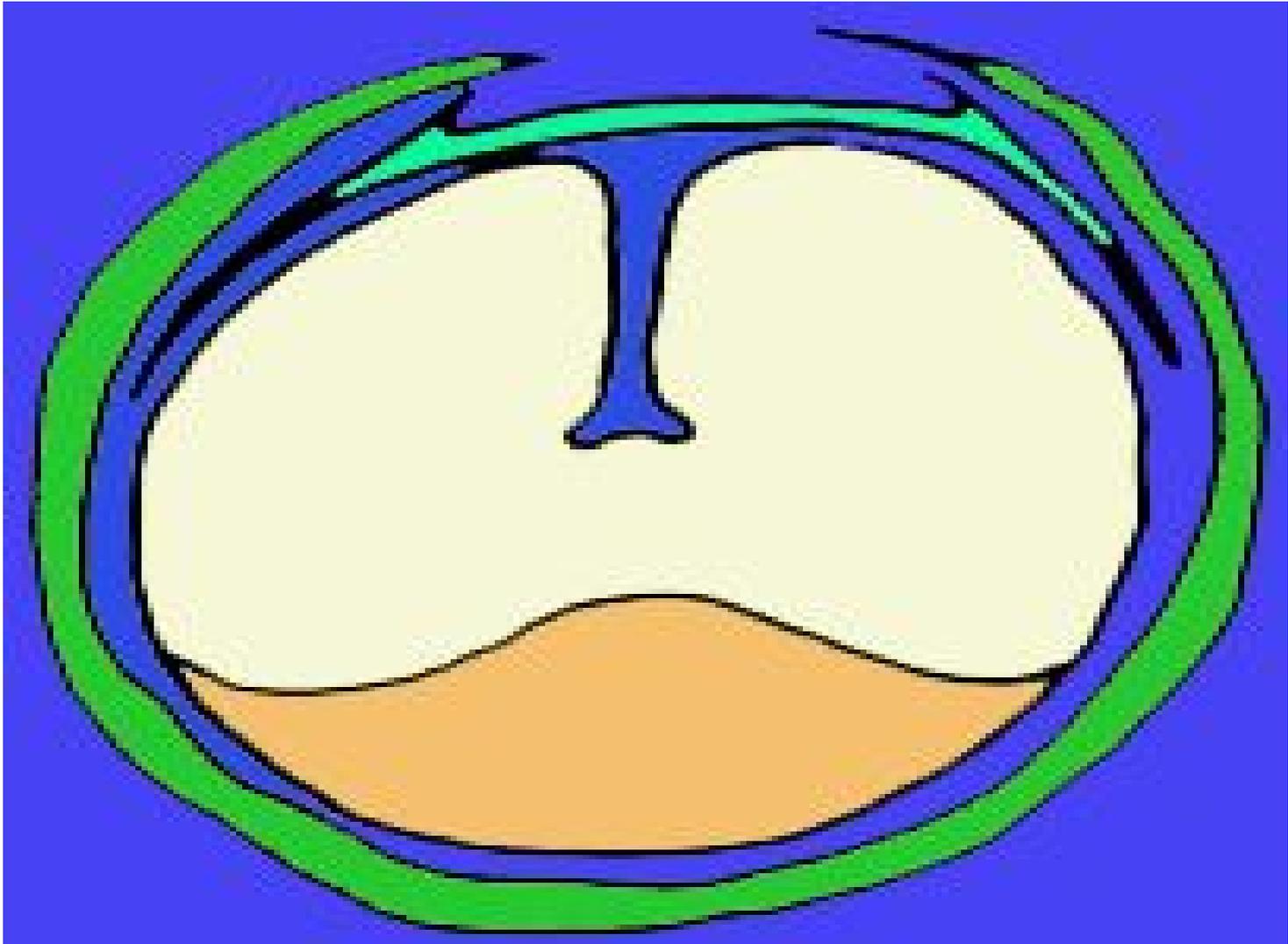
Keys to Become a Strategic Supplier to a Food Manufacturer

- *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*



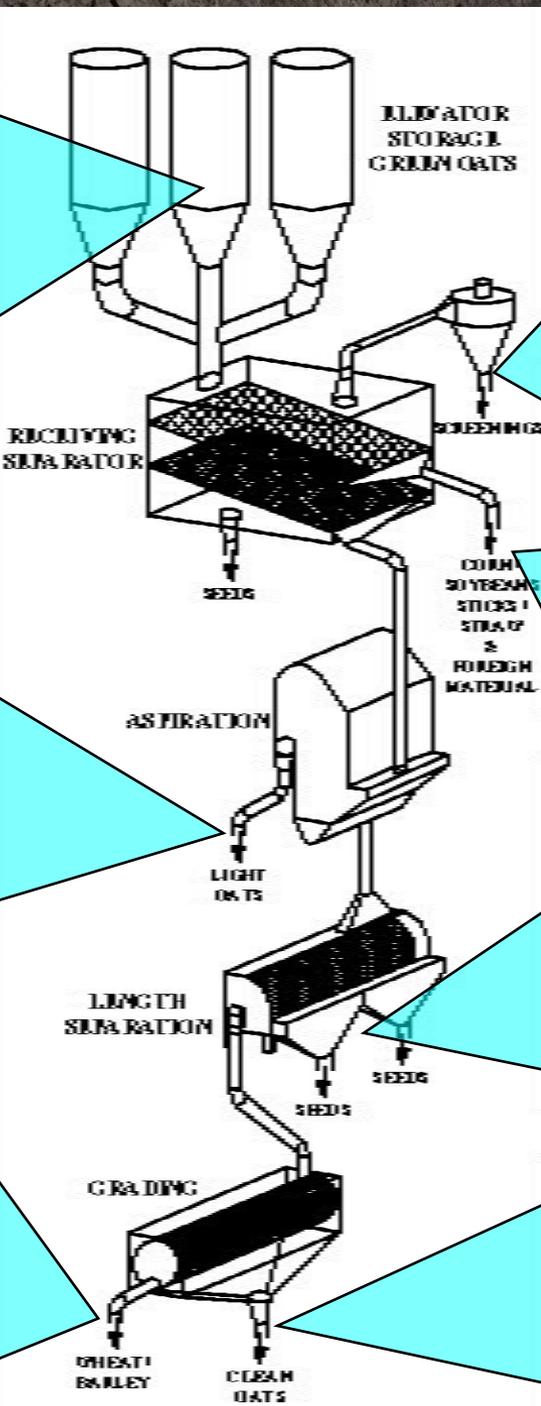
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Cross section of oats kernel



Cleaning System

GREEN (RAW) OATS



SCREENINGS



CORN & SOY



STICKS, STRAW, FM



LIGHT OATS



SEEDS



WHEAT & BARLEY



CLEAN OATS



CLEAN OATS



DEHULLING

CLEAN OATS

HULLED FRACTION

ASPIRATION

HULLS

LENGTH SEPARATION

CLEANED GREEN GROATS

DENSITY SEPARATION

HULLED OATS BACK TO DEHULLING

CLEANED GREEN GROATS

Dehulling System

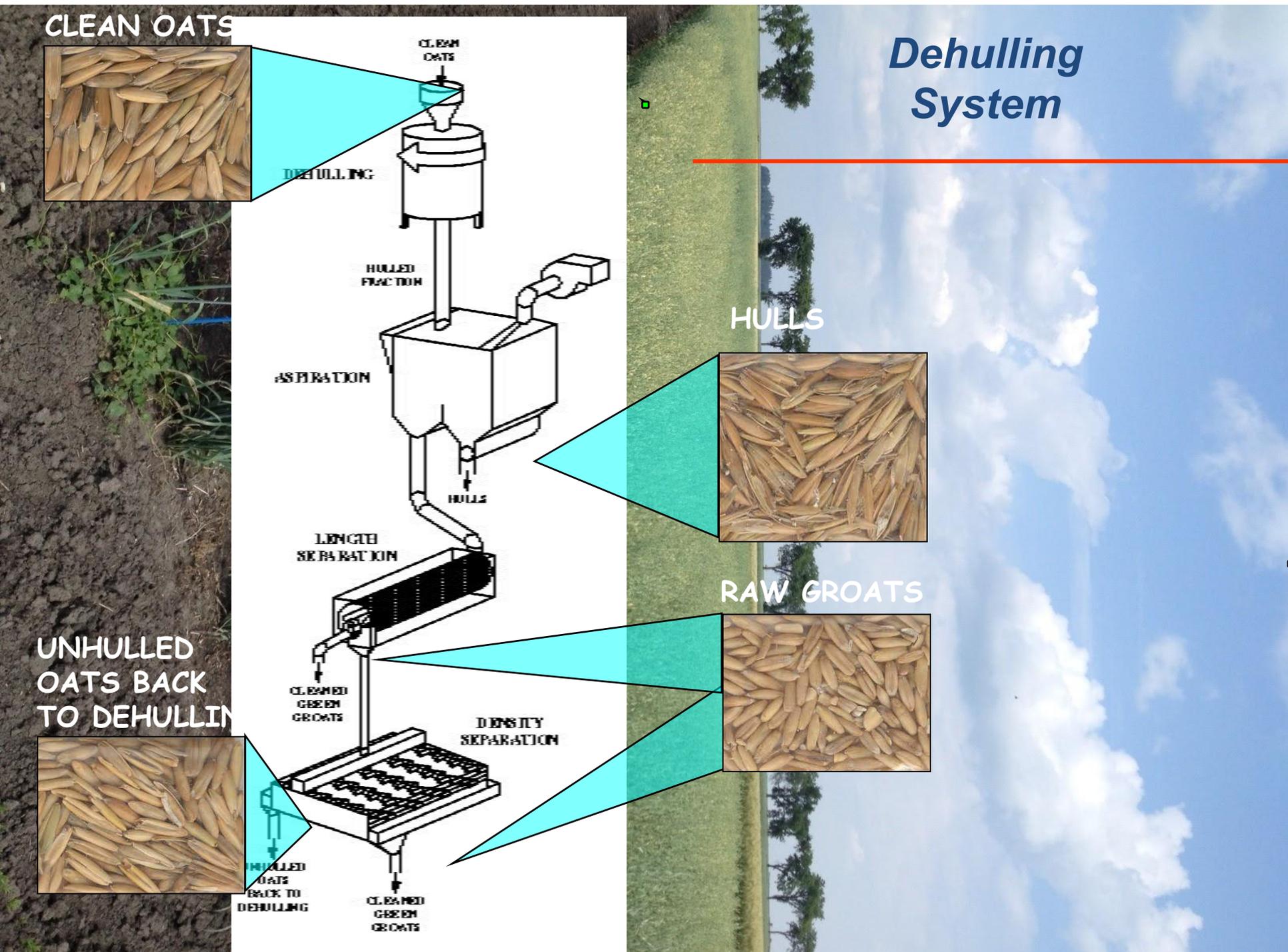
HULLS



RAW GROATS

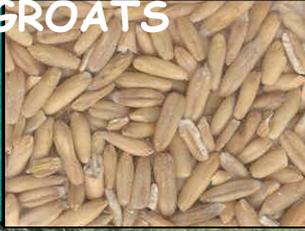


UNHULLED OATS BACK TO DEHULLING



Kilning & Sizing System

RAW (UNKILNED) GROATS



DRY (KILNED) GROATS



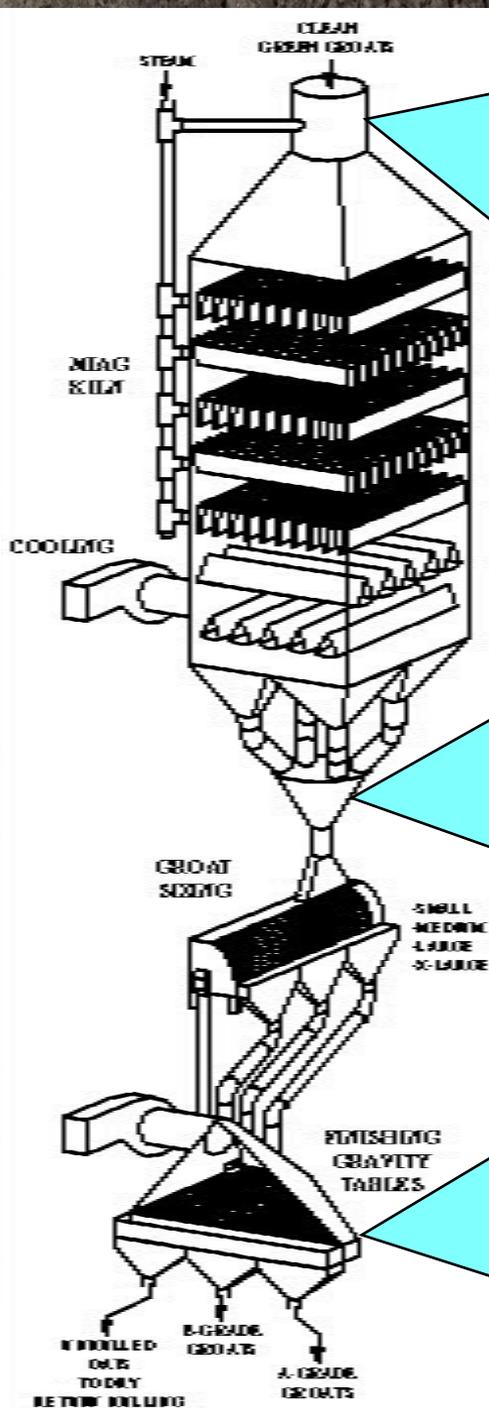
LARGE GROATS



MEDIUM GROATS



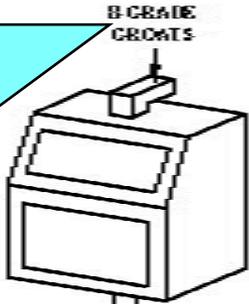
SMALL GROATS



GROATS



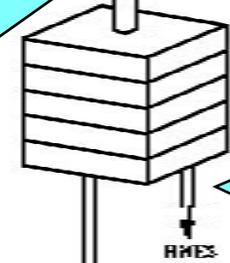
CUTTING



CUT GROATS



SIFTING



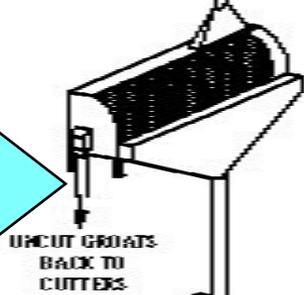
FINES



UNCUT BACK TO CUTTERS



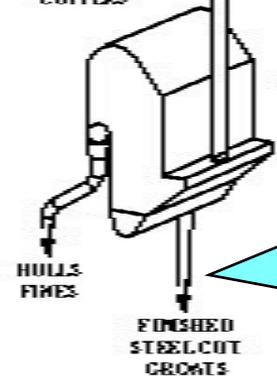
LENGTH SEPARATION



SIZED CUT GROATS



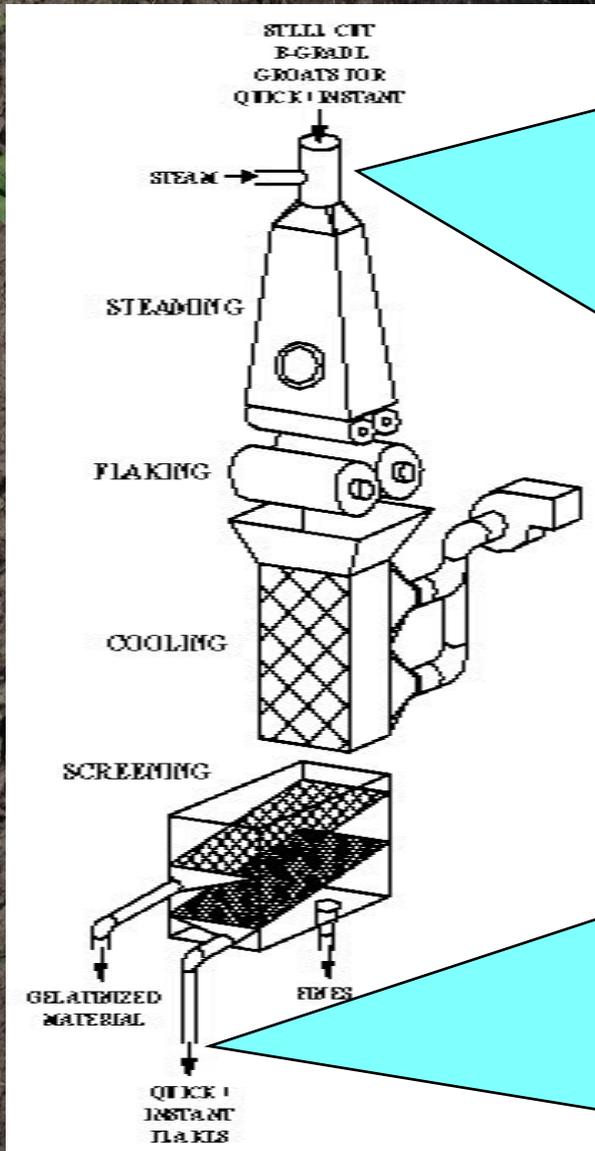
ASPIRATION



FINISHED STEEL CUT GROATS

Cutting System

FLAKING SYSTEM



SIZED CUT GROATS



INSTANT OATMEAL



REGULAR AND OLD FASHIONED OATMEAL





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Thanks for listening!

Questions?

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