



*Using the Qualities  
of Heritage Grains  
to Build Local  
Markets*

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# What heritage grain is not

- Selling food by the pound
  - Cost of production is higher
  - Yield is lower
- Modern wheat
  - Is for weight and uniformity
  - Principally grown as a filler
  - Has been bred to accept inputs, hold air and absorb water

# Heritage • Landrace • Ancient

- Ancient Grains
  - Emmer, Einkorn, Spelt, (Farro)
  - Domestication @ 7500-10000BC
- Landrace
  - 1700-1920
  - Adaptable to region
- Heritage
  - Open pollinated
  - Pre-green revolution (1940)
- Primarily includes Wheat and Barley

# Other Heritage Grains

- Amaranth:
  - Aztec culture, higher protein & mineral content
- Quinoa
  - Inca culture, higher protein & mineral content
- Millet
  - Small seeded grasses, important in semi-arid tropics
- Sorghum
  - Single species native to Africa, drought and heat tolerant
- Teff
  - staple in Ethiopia, very tiny seed, higher mineral content
- Gluten Free

# Diverse Genetics

- Genetic “plasticity”
  - Barley has 7 chromosomes
  - Rye (Diploid 2 copies of 7 = 14)
  - Einkorn Wheat (Diploid 2 copies of 7 = 14)
  - Durum Wheat (Tetraploid 3 copies of 7 = 28)
    - Emmer
  - Bread Wheat (Hexaploid 6 copies of 7 = 42)
    - Spelt

# Percival 1921

## Sports – Discontinuous Variation

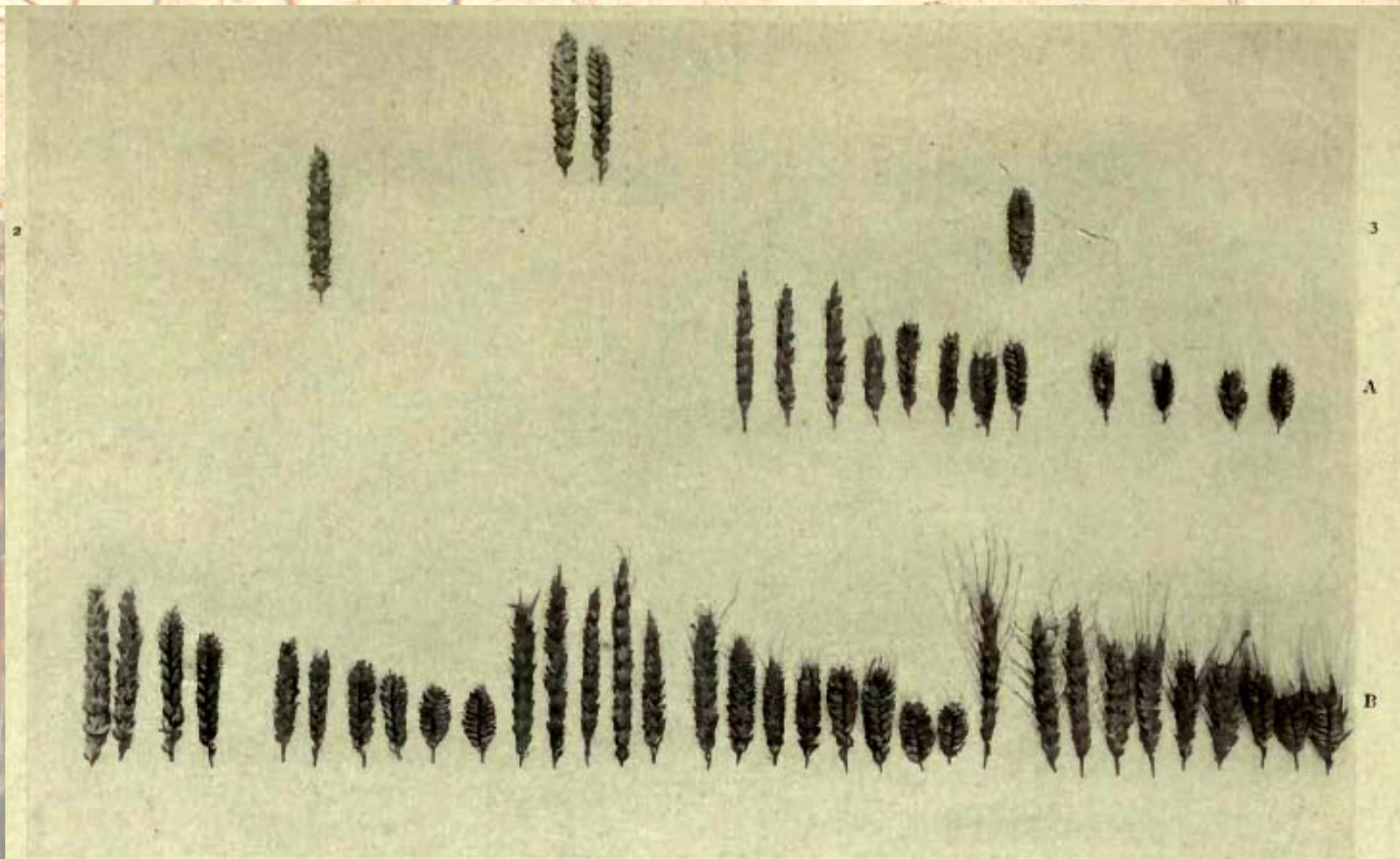


FIG. 215.—(3) "SPORT" FOUND IN PEDIGREE CULTURE OF (1).

A. Forms of the first generation raised from (3).  
B. Forms present in the second generation.

# Farmer Qualities of Heritage Grain

- Early breeding efforts
  - Stiff straw
  - Non-shattering
  - Heavy bushel weight
  - Early maturity
  - Winter hardiness
  - Disease resistance
  - Pre-harvest sprouting
  - Low inputs
- Not just about gross yield

# Baker Qualities of Heritage Wheat

- Milling values and baking values
  - Flour yields (Flour, short and bran)
  - Protein
  - Loaf volume, weight, colour, and texture
  - Water absorption
- 
- USDA Bulletin 1183 Milling and Baking Experiments, Feb 7, 1924



# Red Fife Hard Red Spring Wheat

- Long growing period
- High protein 15%-16%
- Milling break down by weight:
  - 15% Superfine
  - 52% Fine
  - 22% Midlings
  - 11% Bran
- No Fusarium for 3 years
- Started with a lb of seed at the Keremeos Grist Mill, Sharon Rempel in 1989

# Features vs Benefits

- Features
  - Heritage Seed
  - Tends to be tall
  - Variety name recognition
  - Performs well with low inputs
  - Canadian history
- Increasing public interest
- Fewer allergenic reports
- Reportedly more nutrient dense
- Excellent straw yield
- More easily digestible
- ‘Familiar’ gluten

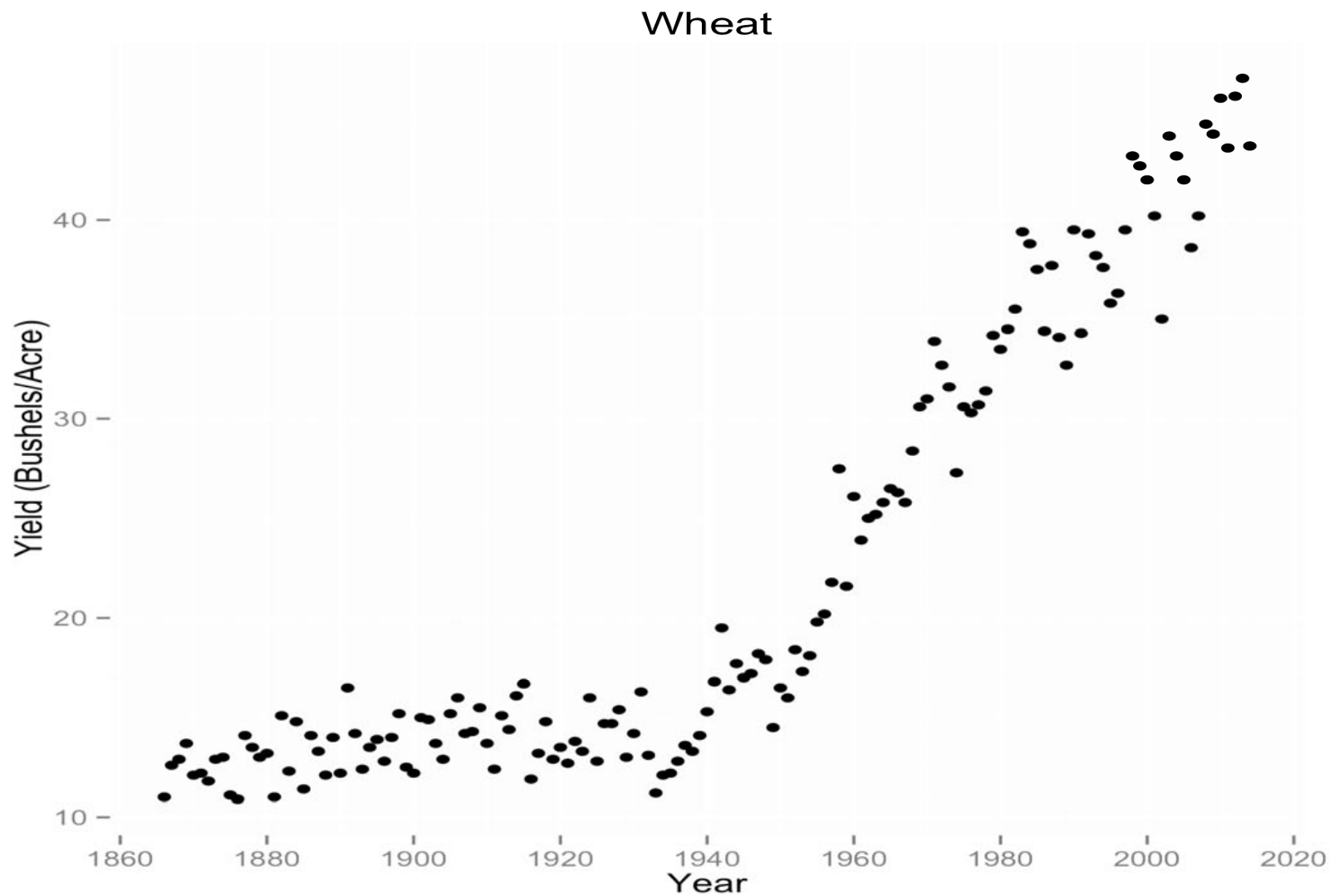
# Gluten

- Storage proteins called Prolamins
  - Gliadin and Glutenin
- Heritage - shorter amino acid chain length
- Protein will drive market sector
  - High protein – bread flour
  - Lower protein – baking/brewing

# Organic Benefit (Include)

- Higher protein
- Older protein
- Lower yield\*
- Nutrient dense
- Long straw / carbon
- Better weed suppression (shade)
- Lower fusarium ( farther from soil, or possibly resistant)

# Wheat Yield: Heritage vs Modern



# Organic Benefit (disclude)

- No Pesticide / Herbicide residue
- No Artificial aging agents
- No Fortification ( after nutrients are removed)
- No Anticaking agents
- No Bleaching, maturing and dough conditioning agents
- No Starch modifying agents
- No Yeast food
- (CFIA Allowable flour additives)

# Local Markets

- 'Heritage' does not mean its organic.
- Organic adds a lot of the 'value'.
- Local is proximity to end user
- Local is strength relationship
- Local often means fresher
- Shipping 50 km dbls cost
- Shipping 2000km doesn't

# Market Building

- Market needs to be based on your production
- If the 'need' is not there you need to create it
- Sometimes the market will find you
- Direct to consumer or not
- Web, social media very important



# Future growing conditions

- Hotter
- Drought & Floods
- More extreme winds
- More in number and higher intensity fires\*
- Longer growing seasons
- Change in flora / fauna

## GOOD WHEAT FROM THE YUKON.

Grown in Quicker Time than That of Red River Valley.

*Special to The New York Times.*

DULUTH, Minn., Oct. 9.—Evidence that the term “frozen North” is not applicable to the Yukon country was brought down from Canada a day or two ago. There was a large sheaf of grain, besides thrashed kernels of wheat, oats, and barley in the list of evidence.

It all came from near Dawson City and was grown this year. The wheat was sown late in May on ground thawed a few inches deep, and it was harvested from seventy-five to eighty-five days later, thoroughly ripe. That is from ten to twenty days quicker than the best average performances of the famous Red River Valley. In the samples were white fife, red fife, and Scotch wheat that would pass the best grades here. The oats are fully as good as anything raised in the Northwestern States or in Manitoba, and the barley is six-rowed of the highest quality.

The seed grain from which this was produced was sent to Dawson last Fall at the suggestion of Clifford Sifton, Canadian Minister of the Interior. The samples have been forwarded to Montreal and Ottawa and are very interesting and suggestive.

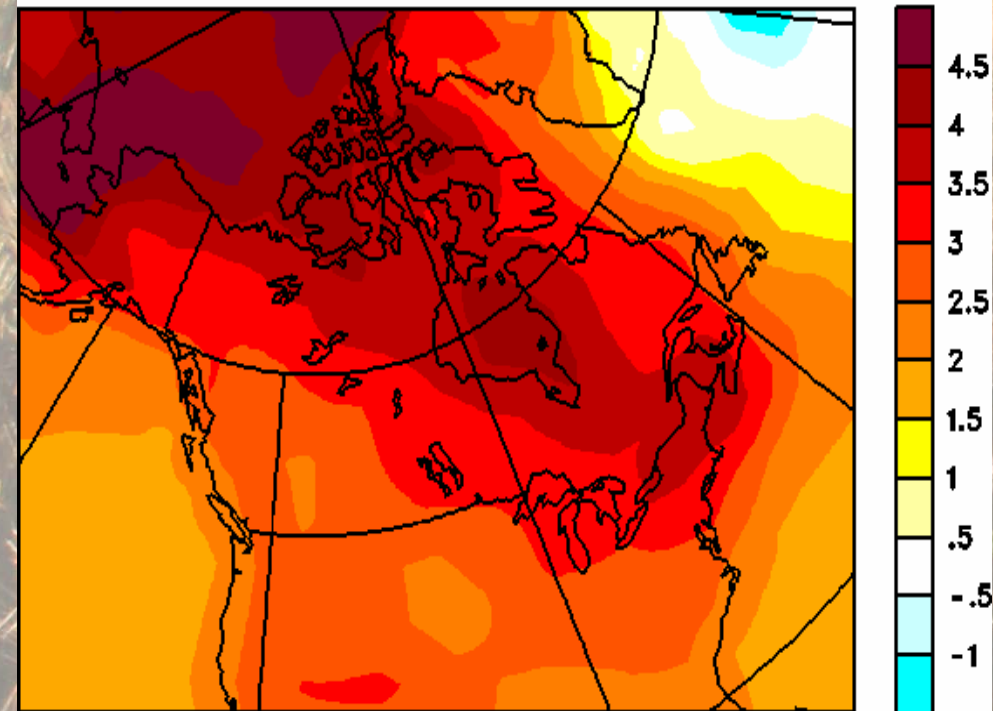
**The New York Times**

Published: October 10, 1899

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# Changing Times

CGCM3/T47 A1B 5-yr mean temp. change yr=2089 vs 1981-2000



# Cost of Sale

- Size of package vs number of sales
- Proximity to point of sale
- Cost vs Benefit
  - Requires more intimate customer relationship
  - If product has intrinsic value, you need to educate consumer ( e.g. no additives)
- Deliver or ship?

# Farm & Market Size Match

- Scale of production tied to “market”
  - Number of customers
  - Scale of customer products/consumption
  - Frequency of sale
    - Daily store
    - Weekly Market
    - Monthly drops
    - Annual bulk

# Yield Alternatives

- Absolute yield (Tons/acre)
- Labour yield (\$ / hr)
- Revenue yield (\$ /acre)
- Food yield (Mouths fed/acre)
- Average seed size ( bigger kernel higher flour:bran ratio)
- Number of seeds/lb
- Protein content (12% - 17%)
- Carbon sequestered/hr worked
- Straw houses built / acre
- Amount of time off per year

# Value Add or Not

- Grain represents a “base value”
- End users that add additional value
  - Home consumers
  - Artisanal bakers
  - Craft Brewers
  - Regional distribution centres
- Consider their business / ingredients ratios
- Milled, bolted, malted?

# Scale of Sale

- Smaller packages
- More sale transactions
- Higher cost of sales
- Higher packaging costs
- More time selling
- Better customer knowledge
- Larger scale
- Fewer sales
- Lower cost of sale
- Less time selling
- Less customer relationship

# Competition

“Thou shall not compete”

- Competition is about price
  - Goes against ‘Organic cost of production’
- Low price is drives low cost of production
- Low cost of production often drives ecological deterioration



# Cost / Value Proposition\*

- What portion of grain price is not grain?
  - Local economy
  - Local health
  - Local ecosystem services
  - Cost to restore grain variety
  - New farmer capital costs

# Conclusions

- Choose to be an early middle or late adapter
- Select varieties by looking forward
- Choose the scale 'sweet' spot right for you
- Price must reflect
  - Yield
  - Quality
  - Scale
  - Value
  - Environment leave-behinds

# On-line Resources

- Quantitative and qualitative evaluation of selected wheat varieties released since 1903 to increasing atmospheric carbon dioxide: can yield sensitivity to carbon dioxide be a factor in wheat performance?  
... hard-red spring wheat released in 1903, 1921, 1965 and 1996.  
*USDA 2004*
- Haploidy in einkorn.  
*USDA 1946*
- The influence of the awns upon the rate of transpiration from the heads of wheat.  
*USDA 1939*
- Studies in natural hybridization of wheat.  
*Secretary of Agriculture, US 1927*
- Lessons from the grain-rust epidemic of 1904.  
*USDA 1905*

# Resources

- USDA National Library
  - “Classification of Wheat Varieties Grown”
  - “Classification of Barley Varieties Grown”
- “The Wheat Plant” John Percival, 1921
- Google books
- Archive.org
- Etenion.org/organic\_Production
  - Management for High Quality Wheat and Ancient Grain Production in the North East
- NCAP (National Centre for Appropriate Technology)
  - “Making Organic Small Grains Work on Your Farm”

A close-up photograph of a field of golden-brown grasses or wheat. The stalks are dense and have a feathery appearance. The lighting is warm, suggesting late afternoon or early morning. The sky in the background is dark and overcast.

# Questions?