



*John Barleycorn by Mary Azarian*

<growseed.org>

working draft

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# Restoring Our Heritage Of Wheat

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*Join us in the work to revitalize the biodiversity of wheat and to share your practical experience.  
It takes a community to grow a seed!*



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## *Restoring Our Heritage of Wheat*

*working draft*



Wheats whisper the journeys of the peoples who carried them, the trading, migrations and conquests that are kneaded into our breads. The heritage wheat grown in North America originated in the Fertile Crescent and Europe. When people immigrated to the New World, they brought landrace wheats from their homeland.<sup>1</sup> These are the wheats that nourished earlier peoples, but today are almost extinct.



*Kansas Wheat Commission  
Modern wheats bred for uniformity,  
dwarf to not lodge with synthetic N*



*Harvesters - Pieter Breugel, 15<sup>th</sup> c  
Large roots for organic nutrients,  
tall for photosynthetic activity*

Since the dawn of agriculture, farmers have been selecting crops to develop the foods we eat today. For over 10,000 years, heritage wheat has been the staple food for humans. However in recent years genetic management has shifted into the hands of industrial breeders but with hidden costs. Modern wheat, the most widely grown crop on earth, is bred for uniformity and yield. Flavor is not a criteria. Nutrition is forgotten. Today's commercial wheats are bred to produce high yields dependent on pesticides and synthetic fertilizers. The unprecedented erosion of diversity has resulted in fewer varieties, limiting food security, nutrition and culinary art. Modern wheat is more vulnerable to disease. Its uniformity lacks adaptability to organic fields or to the unprecedented weather extremes of climate change.

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<sup>1</sup> Classification of American Wheat, USDA Bulletin 1922, Clark, Martin and Ball. Descriptions of 207 hexaploid wheat landraces and improved cultivars, collected in the USA: 189 bread wheats 24 club wheats and four spelt wheats.

## ***Returning Wheat to the Hands of Nature and Farmers*** ***'Every Farmer a Breeder.'***

Small-scale farmers are the original breeders, however our traditional knowledge and community values are as threatened as the heritage wheats. Let us build farmer circles to re-vitalize the art and science of on-farm conservation and improvement of wheats best-adapted to our local conditions. Our goals are twofold: to conserve the agrobiodiversity of landrace wheats within the dynamic farming systems where it has evolved over generations (*on-farm conservation*), and to evolve 'new landraces' that are well adapted to our local organic farm and food systems (*on-farm breeding*), especially important in the context of today's globalization. On-farm conservation maintains vital breeding material through a dynamic evolution of the crop with its pathogen and pest complexes, and to climate change. On-farm breeding can generate genetically diverse genepools that can respond rapidly to on-farm selection in organic farms.

Although heritage varieties cannot compete with modern wheat in terms of yield, they have been selected over generations for rich flavor and for complex traits that contribute to disease resistance, weed competitiveness and nutrient uptake.

### ***New Landraces***

The program of 'Northeast Organic Wheat' is to grow out and evaluate world landraces, especially from climates similar to ours, then to cross the best landraces with modern varieties to combine low-input resilience with high-productivity traits. These 'new landrace' genepools are anticipated to adapt rapidly to organic fields in the Northeast. Many landraces may be excellent without crossing in modern varieties and have historic value.

Increasing genetic diversity through the generation of complex multi-line genepools (composite crosses) and use of landrace populations is an effective strategy to increase stable yield in organic fields. Stable yields under low-input conditions tend to favor the polygenetic traits of landraces over modern pedigree uniform varieties. Genetically diverse populations allow for adaptation through self-regulating, evolutionary systems

that echo natural interactions that evolved landrace characteristics, providing adaptable traits.<sup>2</sup>

Quality traits, such as flavor or nutrition, that are not directly influenced by natural pressures, can developed by farmer's selection and introduced by crossing varieties with the traits we seek, such as delicious flavor, baking quality and robust health.

### *Mixtures*

*'Looking at the field of ripening grain, Vavilov realized it was not a uniform wheat cultivar, but a panoply of intermixed strains of grain that formed a resilient polyculture. It was necessary to collect hundreds of seedheads for a representative sample of the vast biodiversity in a single field. The traditional farmers' methods of crop selection enhance landrace wheat's' biodiversity; Their criteria of complex traits include: flavor, texture, health, maturation and more.'*<sup>3</sup>



*Yusef chews his grain to decide which seed to save*

Yusef chewed on his landrace seed as he explained, 'I like to eat it when it's green. That's when the flavor is fullest. Each plant is a little bit different in my field. I like the taste of this one to save seed for next season.' as he offered me a handful to munch. 'The plants with the big heads have the deepest roots to reach the water down in the soil. They're good ones' The wheat heads were the size of small corn cobs! In many villages in the area, the eldest grandmother is carried out to the fields to select which plants to save seed from.

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2. A.A. Jaradat. 2007 'Restoring Ancient Wheat' Workshop Proceedings-IGB. USDA-ARS NCSN Research Lab, 803 Iowa Ave. Morris, MN, 56567. [abdullah.jaradat@ars.usda.gov](mailto:abdullah.jaradat@ars.usda.gov)

<sup>3</sup> Where Our Food Comes From: Retracing Nikolay Vavilov's Quest to End Famine. Gary Paul Nabhan. Island Press. 2009

Seed-saving and adaptive selection has been the right and responsibility of farmers since the emergence of agriculture. Wheat will be *returned to the hands of Nature, farmers and bakers* to evolve anew in our local conditions. Farmers may want to work together to discuss what to look for and how to select variable gene pools for the traits they seek.

Women have been the seed-savers in traditional farming communities. The art and science of seed-saving was passed down from generation to generation. Culinary uses of landraces by traditional peoples are based in the unique characteristics, flavors, textures and colors of their heritage varieties. Selecting crops for yield and agronomic traits alone excludes essential aspects of producing food for nourishing, culturally diverse cuisines.

How will we know what to select for without grandmothers to guide us?

*'On-farm breeding is a combination of art and science with the emphasis on ART. That means you rely on your intuition. You don't need to generate a table of numbers and run it through a statistical program to tell you which plant to take seed from. Will you get somewhere by relying on your intuition? Absolutely!'* Dr. Mark Hutton, Maine Cooperative Extension

*'Today people in the industrial world are distant from both agriculture and nature. It is not surprising that few understand the power of selection. The raw material for selection is the natural genetic variation that evolved in landraces and that is created anew by mutations and adaptation. As selection is applied, plants with favorable alleles are chosen. If the non-selected individuals are removed from the population, the remaining population will have a different gene frequency from the original population and selection will have been effective in improving the performance of the population. But, no new individuals or genotypes were created. What Darwin recognized and plant breeders harness is the creative power of selection.'*<sup>4</sup> Dr. William Tracy

### **Liberate Diversity!**

Since there are few heritage wheats available for New England farmers, the purpose of our program is to encourage people to work together to create local seed systems, by growing-out the tiny packets of landraces available from the HSC collection and from genebanks, by saving seed of the healthiest plants in mixtures and gene pools, and especially by exchanging seed and knowledge with our neighbors. Genebanks preserve tiny amounts of seed. Each seed is a unique Noah's Ark of traits. Each person is an essential link in building a community-based seed supply.

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<sup>4</sup> 4. Dr. William Tracy. The Creative Power of Plant Breeding. Seeds and Breeds Proceedings. 2005. Dept of Agronomy. UW-Madison, WI 53706 [wfrtracy@wisc.edu](mailto:wfrtracy@wisc.edu)

## *Guidelines for On-Farm Trials and Selection*

Farmers will receive small amounts of seed to grow-out at conferences or by ordering from the Heritage Wheat Conservancy <[growseed.org/seed.html](http://growseed.org/seed.html)>. Plant in optimal controlled conditions in the first season so we can learn which varieties do well in our region. Each trialer will also receive a modern variety to use as a control. Save the seed of the most robust, delicious plants to bring to seed exchanges. Seed will be combined together at our seed exchanges and re-distributed back to everyone. Year by year a community seed supply of locally-adapted populations can grow.

### **Which wheat variety to trial?**

Select heritage varieties that you feel a personal connection to. Seeds have a cellular memory carried to the present. Steward seeds from a culture or place you care about. The seeds you steward will continue to evolve and change on your farm, as you select the seeds from robust plants with natural resistances to local pathogens and pests.

### **On-Farm Breeding:**

We offer mixtures for the farmer-breeders among us and instructions for hand-pollination if you want to combine traits from different plants. Download on: [growseed.org/now.html](http://growseed.org/now.html).

### **Soil Preparation:**



Dig as deep as possible. Provide balanced fertility with ample mineral amendments so that the plant has good conditions and is not stressed. *In future years, after we have an ample supply, we'll screen varieties under adversity to learn which populations adapt well and to build resilient populations.* Grains can "lodge" or fall over in highly fertile soil, so plant in your typical organic soil treatment. Do not baby them. Plant to a depth of an inch or two by hand. Lightly cover the seed with soil.

### **Spacing:**

You'll receive a tiny amount of seeds. Give each seed a foot in all directions for good root development and to observe each plant fully. Grow as large a population as possible of healthy plants to maintain a diverse pool of traits.

**Cropping Rotation:** Plant in a cover crop rotation with a cover crop. Notice which treatments promote plant health and yield.



	<h2>Northeast Organic Wheat</h2> <h3>Trial Chart</h3>	
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*Observe from the moment that the seed starts to germinate. Look at the whole plant.*

Early emergence	
Tillers and spikes	
Days to flowering	
Weed suppression	
Diseases	
Robustness health and color	
Lodging score 0 = all the plants are upright 2 = 20% - 18 degrees 5 = 50% - 45 degrees 10 = 100% - 90 degrees	
Winter hardiness – percent of survival	
Height	
Days to harvest	
<u>Yield</u> - grains per 5 spikes, spikes per plant	
1,000 kernel weight	

### *Quality Traits*

Glutin strength by chewing	
Loaf volume	
Flour protein content and micro-nutrients	
Flavor, aroma	
Texture	
Color	

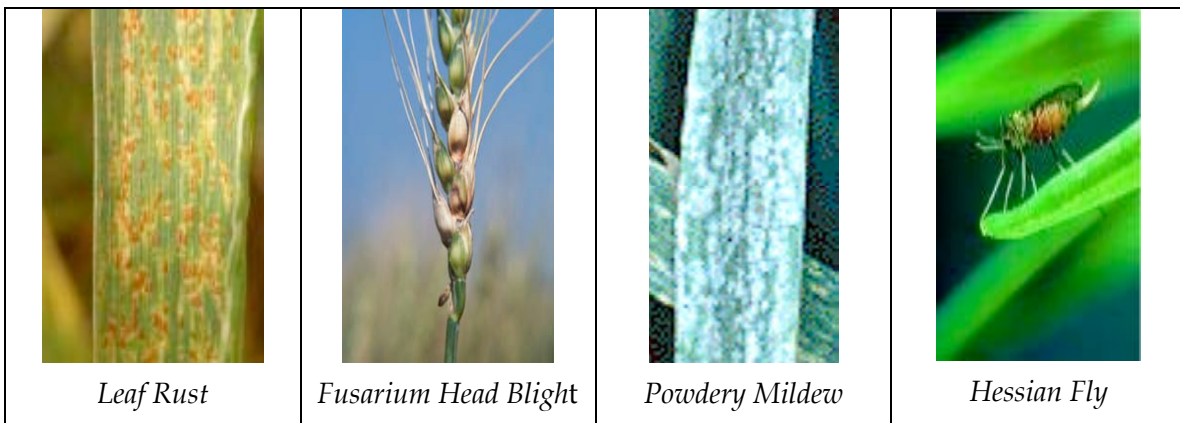
*Replications: Plant three small plots the same size for **each** variety in a random pattern. Label each plot and make a map for back-up so you know what's what.*

### Variable Hues:

The first stage of our program is to develop on-farm trial methods and evaluation criteria for variable landraces and mixtures, and ways to measure the plants that are useful for farmers. *Fertility Management:* Since manure usually is not homogenous, measure out equal amounts for each plot and spread evenly. *Evaluating Weed Suppression:* Allelopathy is the release of plant-produced phytotoxins that suppress weeds. Weed suppression from alleopathic root exudates and competition resulting from the plant height and shading is important to evaluate in organic variety trials. Low clover planted for a ground cover may help suppress weeds and can be evaluated. Rapid early growth is related to root development and may be support successful competition of water and nutrients. Ground cover by the crop at the end of tillering may be correlated with weed suppression.<sup>5</sup> *Evaluating Mixtures and Yields in Multiple Locations:* Increasing genetic diversity by mixing cultivars is an effective biological control of disease, however they are complex to evaluate. Trialing the wheats on different farms will give variable scores and can increase our understanding of the potential and adaptability of the crop.

### *Wheat Diseases and Pests*

See: <http://wheat.pw.usda.gov/ggpages/wheatpests.html>



Select the best ~50% of the plants and bring them to our seed exchange to bulk together and redistribute. We are looking for a complex of traits that produce stable yields in organic fields over years of diverse weather patterns, not just the highest yielding in one year.

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<sup>5</sup> Bertholdsson and Jönsson, 1994

**Winter wheats** are planted in the fall from late August to mid-September and put their energy into setting roots before freezing occurs, then becomes dormant under snow cover until the soil warms up in spring. A period of about six weeks of winter vernalization, freezing weather, stimulates the plant to flower in spring. The wheat grows until ready to be harvested by July to early August. Hard winter wheats tend to be high in protein and gluten and are used for yeast breads.

**Spring wheat** can be planted as early as the ground can be worked. Both fall and spring plantings are harvested before August, opening possibilities for mid-summer sowings of other crops.



*Threshing Wheat in Macedonia <aegilops.gr>*

Harvest ripe seed when the plants have dried completely. Pick or cut the 50% or so of the most robust individual heads. You can thresh by hand or foot rubbing. Dan Jason uses a wooden threshing box about 3 feet by 4 feet by 1 foot high with thin slats screwed onto the inside bottom for extra abrasion. A foot shuffle over the hard grains removes the chaff from the kernels. Winnow off the chaff by pouring it outdoors on a windy day, over a tarp or in front of a fan, or blow off the chaff with a hair dryer.

Biodiversity is the farmer's best security against disease, fluctuating markets and climate change. Conserving and increasing the diversity of foodcrop varieties not only can improve the livelihoods of farmers and gardeners at the local level, but is a key link for robust local food systems for a planet facing unprecedented climate change and globalization pressures.

## *Heritage New England Wheats*

### *Red Lammas*

the earliest wheat grown in colonial New England, brought over by British farmers in the 1600's, is excellent for scones and light breads. In the [Modern Husbandman, 1784](#), [William Ellis](#) wrote: 'Red Lammas is deemed the 'King of Wheats' for having deservedly the reputation of the finest, full bodied flour. It fetches the best price at market.'



is a soft red winter wheat with aromatic flavor and crispiness enjoyed in light breads and pastries. It is the earliest recorded wheat grown in America; grown before the American Revolution by British settlers. It is the same or a direct descendent of *Red Lammas*, an old Celtic wheat grown in Britain from the time Romans carried it up from the Fertile Crescent. Ancient Celts celebrated the midsummer wheat harvest in a festival called *Lughnasad* (Lugh means Sun-King) when light dwindles after summer solstice. *Lammas* (Middle English 'Hlammasse' or loaf - mass) refers to the Celtic wheat festival where the first sheaf of wheat was ceremonially reaped, threshed, milled and baked into a loaf. As Christianity entered, the community's first loaf was consecrated at 'Loaf-Mass'

in thanksgiving for the harvest.

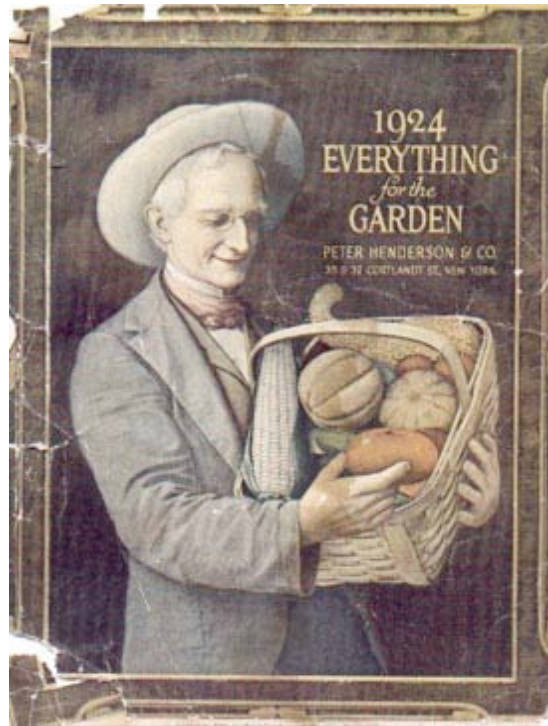
*We offer seed generously contributed by Glenn Roberts of Anson Mills, NC.*

## *Mediterranean*



a rich flavored bearded winter landrace wheat used as an all-purpose bread flour, was brought to North America from Genoa, Italy in 1819 by John Gordon. The strong navel fleet of the city-state of Genoa controlled most of the wheat trade of the Mediterranean Basin well into the mid-1800s. Wheats from Genoa at this period were brought from Cyprus, Asia Minor and the Black Sea coast where Genoa had established colonial posts when the Byzantine Empire was overthrown in 1204. Genoa shipped wheat to ports in the south of France and Spain.<sup>i</sup>

Gordon made his fortune in the wheat trade based in his home port of Wilmington, Delaware. Mediterranean wheat soon spread throughout the east because it ripened early, escaping rust and insect damage, and adapted well to the wet, cool weather common in the mid-Atlantic eastern seaboard.<sup>ii</sup> 1862 in Mifflin County, Pennsylvania, Abraham Fultz, while passing through a field of Lancaster (also known as Mediterranean) wheat, which is an awned variety, found three spikes of awnless wheat. He sowed that seed and planted larger amounts each year until he obtained sufficient seed to distribute widely. His wheat became known as Fultz.<sup>iii</sup>



*The Mediterranean line carried by The Peter Henderson Seed Company in 1884 was entered into the USDA Genebank, and is the variety we are restoring to commercial production from a five gram packet. Seed source: USDA Genebank*

## *Turkey Red - Crimean*



is a hard red winter wheat with a rich nutty flavor from Crimean landraces that survive harsh Ukrainian winters. Turkey Red was brought from the Ukraine by Mennonites who migrated to Kansas in 1873. *Samuel Zook, bishop of the River Brethren Church* reported in 1880:

*'I sowed eighty acres of Russian wheat introduced by Mennonites from Russia. We have been interviewing that field very closely all winter and have come to the conclusion that it is by far the hardiest wheat we have seen in Kansas. Our advice is to sow a larger breadth of this hardy variety next fall. If millers insist upon having the finer tender varieties let them rise up and out of their easy chairs, take to a farm and grow tender varieties themselves.'*

Turkey Red was heartiest wheat and soon became the favored Kansas wheat until modern breeding created shorter, higher yield varieties.

In the 1922 USDA Agriculture Bulletin No. 1074, the exact origin of Turkey Red is revealed. Turkey Red is a Ukrainian landrace hard winter wheat from the Crimean regions encompassing the Krymka and Kharkiv areas. With this information, I have searched out Crimean landrace wheats collected by Nickolai Vavilov in the 1930s. I was able to secure a modest packet of 100 authentic grains of Red Turkey entered in 1890 in a genebank. I have grown them all out. The growth habits and morphology are identical, concluding that we can restore this reknowned line from its homeland parent population in Crimea. In 1898, Mark A. Carleton was sent by the USDA on his first plant exploration trip to Russia. He brought back new durum and hard red wheat varieties most of them from Crimea, to grow in the United States. Five years after the



introduction of wheat from Russia, wheat production in the United States exploded from 60,000 to 20 million bushels a year. Not only did the drought tolerance of these new varieties open up the Great Plains and the Northwest for wheat growing, the durum wheat tasted better in pasta, and the hard red wheat made better bread.



*M.A. Carleton in 1900*

The official who sent Carleton on his 1898 collecting trip would later write, "We have forgotten how poor our bread was at the time of Carleton's trip to Russia. In truth, we were eating an almost tasteless product, ignorant of the fact that most of Europe had a better flavored bread with far higher nutritive qualities than ours."<sup>6</sup>

The spring wheat line in Crimea is Halychanka (Red Fife), known in Maine as 'Scotch Red', that contributes its excellent bread-baking qualities to spring wheats.<sup>7</sup>

*We are growing Turkey Red from the original Ukrainian Crimean collected by Nilokai Vavilov.*

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<sup>6</sup> <http://www.ars.usda.gov/is/timeline/germplasm.htm>

<sup>7</sup> <http://res2.agr.gc.ca/publications/marquis> Marquis wheat success story in Canada to its roots in the Ukraine . Stephan Symko



## *Maine's Heritage Wheats*



*'There was a time when wheat was a sure crop in Maine. It was raised without serious difficulty in quantities adequate to the wants of the people. It was the most common and reliable of crops. Wheat was a surer crop than Indian corn, more bushels of it were annually harvested and consumed. The only flour brought into our State was borne hither from vessels from Baltimore and Richmond, but seldom used except in small measure by families in our seaport towns for pastry purposes. The Erie Canal had not yet opened. NY's Genessee flour was unknown here.*

*For wheaten bread our population relied upon the home article. Few stores were without ample bins of wheat. Our wheat was not white like the brands of St. Louis. It was sweet and nutritious but of brownish hue. Much of the bran was mingled in the flour.*

*The best variety of winter wheat cultivated in Maine is known as the Banner wheat. In 1844 we received a small package of this grain from the Patent Office, just imported from the Baltic. We sowed it and its proceeds, till three years afterwards, a harvest of thirty-two bushels was obtained. We distributed it in various parts of the State for cultivation. As uniformly as with us, it proved a good success. Siberian, aka Java or China Tea, and Black Sea winter wheats also have been grown with great success.*

*The Banner wheat has been raised to this day. It is a splendid grain. Sowed on grounds that the frosts do not heave badly, it is found to survive the winter nearly as well as herdsgrass or clover. But it should be sown in August that it may get firmly rooted before winter. If a pasture is*

*plowed in July, fertilized, harrowed, sown and rolled in August, or if the seed is scattered in the cornfield previous to the last hoeing, the chance is sure of an ample harvest in July following.'*  
Maine Agriculture Society Report of 1857

What was the origin of the Banner wheat that did so well Maine? I want to run out and plant it on my Maine farm today! Why would the U.S. Patent Office send wheat to Maine? With this clue, I researched the Patent Office activities of the period and discovered the following puzzle pieces. Henry L. Ellsworth wrote in his report of 1837:

*'The introduction of a new variety of wheat promises the most gratifying results in securing production under the adverse effects of severe winters. A short time ago, the most eastern State of our Union was, in a measure, dependent on others for her bread-stuffs. That State is now becoming able to supply its own wants, and will soon have a surplus for exportation; and this is effected by the extensive introduction of new wheat. Among the varieties of this wheat, however, there is great room for selection; there is at least 20 percent difference, if regard is paid to the quality and quantity of the crop.'*<sup>8</sup>

Reports from the USDA wheat researcher, Mark A. Carleton shed light on cold-hardy varieties from Eastern Europe. In his 1894 monograph 'Successful Wheat Growing', Carleton states that the hardiest winter wheats originate from the Crimean regions of Karkov, Kuban and Samar. *'The very best winter wheat is Kharkov wheat - the most hardiest of all known winter wheats'.*



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<sup>8</sup> [http://www.ipmall.fplc.edu/hosted\\_resources/PatentHistory/poar1839.htm](http://www.ipmall.fplc.edu/hosted_resources/PatentHistory/poar1839.htm)

## *Red Fife - Halychanka*



is known as *Galician Spring* in Europe and as *Halychanka* in its home in the Ukraine. In 1842 David Fife of Ontario received from a friend in Scotland a packet of wheat from a Ukrainian ship from Danzig (Gdansk). Fife planted the grains but only five plants germinated. Of those, some were eaten by the family cow before the last plants were saved by Mrs. Fife. Most of the wheats were winter lines, but the plants that headed in spring became known as 'Red Fife'. Soon this cold-hardy spring wheat spread throughout Canada. Red Fife was introduced to the US in the mid-1850s and was called in Maine 'Scotch Fife'.

The old landrace wheats of the Carpathian mountains, the birthplace of Red Fife - Halychanka, belong to one basic landrace with winter hardiness, resistance to drought and excellent baking qualities. These are mostly winter wheats but in northwestern Ukraine (Galicia) spring wheats such as Red Fife – Halychanka thrive.

*We are growing Red Fife-Halychanka from the Vavilov Institute in Russia.*

## *Vermont's Defiance*

When Vermont became the 14th state in the Union in 1791, wheat was a common crop with good yields. In the mid-1800s, Cyrus Pringle, a farmer-breeder from Charlotte, Vermont, developed a strain of wheat better-adapted to northern New England.



*C. G. Pringle*

In the mid-1800s, Cyrus Pringle, a farmer-breeder from Charlotte, Vermont, bred a wheat for northern New England. However Pringle's work was interrupted by the Civil War. With an abiding belief in non-violence, Pringle was imprisoned in a military camp in 1863 for refusing to fight. President Lincoln intervened and released Pringle and the three other Quakers. Pringle's journal: *The Record of a Quaker Conscience* [gutenberg.org/files/16088/16088-h/16088-h.htm](http://gutenberg.org/files/16088/16088-h/16088-h.htm)

After recovering from his ordeal, Pringle returned to his family farm in Charlotte, Vermont. From 1864 to 1880, he bred wheat, oats, grapes and potatoes. Pringle wheats:

**Defiance** - a soft white spring,

**Champlain** - hard red spring, and

**Surprise** - a soft white spring club

Hello Eli,

I went carefully through my great-grandfather's diaries and here is what I've found. I thought the dates might be important, the weather in the 1880's somewhat colder than today's, although I'm sure that varied from year to year. One entry, June 1, 1886, mentions "planted the sweet corn again" Was there a late frost or an invasion by crows?

My great-grandfather bred horses and did the usual 19th century diversified farming with sheep, hens, pigs, etc. The only things other than wheat he mentioned by variety were apples and potatoes. We know there was a huge amount of trading between farmers and stores and my grandfather did hauling. Most Vermont farmers did outside work, hauling, carpentry, blacksmithing, etc, in order to get cash. He mentions oats, hay, grass seed, clover, corn and beans, so when he mentions 'threshing', it is anyone's guess what they were threshing. Both my grandfather and grandmother made diary entries. Here is what I've copied from the diaries:

*June 11, 1885 -Clinton finished plowing the India wheat ground and harrowed it.*

*June 12, 1885- I sowed the India wheat in forenoon.*

*July 1, 1885 - Buell [local store owner] brought up the Hungarian.*

*July 4, 1885 - Finished the piece of Hungarian.*

*August 3, 1885- Commenced to cut wheat today.*

*August 8, 1885- Finished binding the wheat and cutting the stubble. Got in the stubble.*

*September 19, 1885- Father and Clinton thrashed 3 load of India wheat.*

*September 21, 1885- Clinton and I thrashed 4 loads and got in 5 of India wheat.*

*September 22, 1885 - Finished threshing the wheat.*

*June 7, 1886 - Father plowed the India wheat piece.*

*June 8, 1886 - I harrowed the India wheat ground and got it fixed so that the horse could be turned out.*

*September 2, 1886- Threshers came about 2.*

*December 16, 1886*

*I bought 4 1/2 bu. of India wheat of S.F.F. & Co. [S.F. Frary & Co. general store in the village]*

*December 22*

*[Jenny's entry]Arthur got some India wheat of S.F.F. & Co. Bought 100 pounds meal and bran for Joe and bought 50 bu. India wheat of John Barrett(another local store) and paid him \$2 toward it.*

*[1886 is the last year Arthur mentions planting India wheat, but there were other references to it which I have included - to add to the confusion. I'd love to be able to spend the next three years doing nothing but solving the mysteries in the diaries.]*

1887

*January 5, 1887*

*[Arthur's entry] I paid J.L. Barrett 8.33 for India wheat .*

*January 8, 1887*

*[Arthur's entry] Father paid J.L. Barrett 8.33 for India wheat. Got two bags of it.*

*January 18, 1887*

*Arthur drawed three loads of India wheat.*

*January 19, 1887*

*Father got 600 lbs. of India wheat.*

*February 8, 1887*

*I bought a barrel of flour @6.00 (charged). . .their own wheat]*

*April 11, 1887*

*Arthur ordered up two barrels of flour & Osmand [local miller] brought them up. \$6.00 [Their own wheat?]*

*The diaries for 1888, 89, and 90 are missing.*

1891

*May 1, 1891*

*I sowed an acre of wheat and about 2 acres of timothy. (This is a month earlier than his entries for sowing India wheat.)*

*August 29, 1891*

*I cut a little buckwheat. After that some wheat.*

*September 1, 1891*

*We cut the rest of the first piece of buckwheat. Got in 7 loads of grain [?]*

*September 3, 1891*

*We finished cutting wheat and got it in.*

*October 2, 1891*

*Bert and I helped Prescott till 4 and then came home and threshed 50 bu. of buckwheat. I let Charles Brown the job to do our threshing \$6.00 [wheat?]*

*October 5, 1891*

*We got in straw. [wheat?]*

*October 6, 1891*

*Prescott helped us an hour to get in straw.*

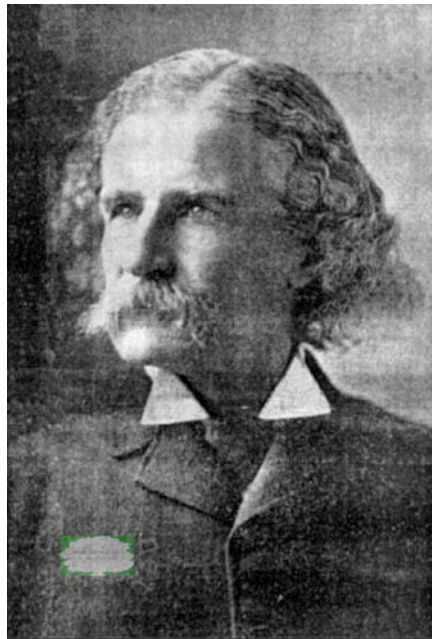
The diary for 1892 ends in August and the next diary we have is 1900, kept by Jenny and revolves around her homemaking duties mainly. By that time, Arthur's father, with whom they were living and who owned the farm had died, Arthur and Jenny moved to a smaller place, they had 5 children and had lost 2, Arthur seemed to have started the change to dairying. He became a successful and prosperous farmer who retired from farming to a house in the village as he and Jenny became older, and there is no more mention of raising wheat in any of the several pages of farm records we have with the diaries.

Arthur farmed in Strafford Vermont, Orange Country, which is in the middle of Eastern Vermont, 20 miles from the Connecticut River Valley, in the Piedmont region. I don't know the actual soil and any specific weather conditions that would be unique to that area. It is higher in elevation than the Connecticut River Valley area. He mentions ordering a side hill plow.

Roberta Parker



## *Elbert Carman and the Rural New Yorker*



'His earliest experiments with wheat involved testing all known varieties of England, France, Russia, and the United States to ascertain which were the hardiest and most productive. Then followed exhaustive tests as to best depth, quantity of seed, mode of sowing and best fertilizers, such as salt, ashes, plaster and lime. Potash, phosphoric acid and nitrogen, singly and in various combinations were thoroughly tested. his work of crossing varieties of wheat was begun and has continued down to date, with results valuable to science and to agriculture. In 1881 Carman succeeded in crossing rye with wheat, the first and only successful attempt on record so far as we know. This crossing was followed up for years with the progeny. Most of the hybrids resembled the wheat parent, rather than the rye. Last year a large proportion of the plants and heads came true, and it is believed that a tolerable stability has been reached. The stems are twice as thick as those of wheat, and leaves broader, the color brighter, the tendency to tiller stronger, and the plants seem not subject to winter-killing. Several of the wheat and rye-wheats are now offered by seedsmen.'

Carman's 'Rural New Yorker' soft red winter wheat was released in 1884.

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<sup>9</sup> <http://www.carman.net/elbert.htm>





"O'er all the fragrant land this harvest day,  
What bounteous sheaves are garnered, ear and blade."