

The
WHOLE GRAIN CONNECTION

Aiming to enhance the desirability and availability of 100% whole grain breads, and other 100% whole grain products, from organically and sustainably grown grains, and thereby connecting farmers and bakers

Newsletter Number 6
October 2003

Sonora Wheat and a Season of Rust

Sonora wheat came into California around 1820, by way of Sonora in Mexico, where it was grown at the Magdalena Mission as early as 1770. The ripe heads are beardless and unusually velvety and russet brown in color, in contrast to the shining creamy straw color of the stem. The color explains descriptions, by Frank Norris writing in 1901, in *The Octopus*, of wheat fields in California turning brown rather than golden as the grain ripened.

There is no doubt that *Sonora* was a highly successful wheat under Californian conditions. Its reliability was noticed by the Australian wheat breeder, William Farrer, who chose it as the first wheat that he worked with in the 1890's. He knew it under the names *Allora Spring* and *Pugh's Rustproof*. Other names for it in Australia were *Lowrie's Prolific*, *Ninety Day*, *Three Months*, and *Kelly's Rustproof*. Taken together, these names explain the success of *Sonora*. In regions of California and Australia, with generally mild wet winters and scorching dry summers, there are some years when the pattern is broken. In the Spring of 2003 we certainly saw a break in that pattern. Most of the winter rain came between March and May, instead of between December and March and kept temperatures cool in early summer;

perfect conditions for the rust fungus to thrive. Until this year we have not had the chance to notice whether any of the varieties we have been testing, could throw off an attack of rust, or would succumb. When news came of rust descending onto much of Californian wheat I hastened to look at ours in Yolo County. Sure enough many varieties of the wheat were smitten, but with the glorious exception of *Sonora*. Sally Fox in Yolo County and Degge Hays in Sonoma county, as well as Nan Rohan a wheat weaver growing her own wheat in Berkeley, had already declared *Sonora* to be their wheat of choice, even before this year of the rust.....

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All the wheat has headed up by now, and in many cases appears to have grown through the rust attack. Only at harvest will we discover whether the grain has been affected at all, and whether the *Sonora* is truly supreme.

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In the Capay Valley, the *Sonora* wheat has been harvested, and the yield seems to be better than in 2002; such is the difference in varietal response to prevailing conditions. The yield of the *Sonora* wheat after combine harvesting, and without further cleaning, was approximately 2,000 pounds per acre or 33 bushels per acre. The yield range for wheat is 20 – 70 bushels per acre, but the highest yields are generally produced as a

result of very high input of herbicides, irrigation, and fertilizers. The protein value on the *Sonora* this year was low for use as a bread wheat, and this is attributed to using the same field as last year without any enrichment. This was a matter of expedience when time ran short; the plans for next year are to plant following a sequence of mixed black eyed peas and cotton, then fallow. Another explanation for the drop in protein value is that the weather was so unseasonably cool when the heads appeared. In the past the rule of thumb seems to have held true, that protein would be maximized when the wheat headed up into dry heat in early summer.

Federation wheat also grown in the Capay Valley was very obviously attacked by rust, but it appeared to recover and was a harvestable crop, but the yield was unsatisfactory. However the yield was sufficient to preserve seed for next year. The first reaction might be to abandon this variety and the several others that have been attacked by rust. Further consideration however, suggests that varieties that have performed well in the past 10 years, and that have been without major rust damage, should not be abandoned so swiftly. Perhaps the better plan would be to grow 2-3 varieties continuously, on a farm, and to choose those varieties to compensate for the extremes of the local microclimate. A good year for one variety might be a poor year for another, and vice versa. In the Capay Valley for example the varieties currently grown on the largest scale are *Federation*, *Sonora*, *Mauri* and *Spelt* (42). Of these only *Federation* could not withstand this year's weather.

The variety trials in the Capay Valley revealed that few wheat varieties planted could withstand the extraordinary conditions imposed by the weather in 2003. *Wit Wilkoring*, *Mauri* and *Spelt*

were the varieties that thrived and did not become infected with rust. Other varieties were little affected by the rust but were stunted by the drought of January and February 2003. The ideal wheat varieties to select will be those that can withstand even the extreme years in California and still give a reasonable yield and good quality grain.

Notes: There are some wheat types that are generally resistant to rust. *Turgidum* wheat, including *durum* pasta wheats and *Mauri* that we have planted, are not usually attacked. Another notable exception was *Wit Wilkoring* which is remarkably similar to the *Sonora* except in color; the *Wit Wilkoring* has a cream colored velvety head.

References:

Soft Wheat: Production, Breeding, Milling, and Uses. W. T. Yamazaki and C. T. Greenwood, editors, American Association of Cereal Chemists, 1981
Wheat Breeding and varieties in Australia. S. L. MacIndoe, et al., Science Bulletin #76, New South Wales Department of Agriculture, 1952



Whole Grain Connection Status

The burgeoning herb garden of The Frog's Leap Winery in Rutherford was a delightful setting for the second meeting of the board of Directors, early in May. Yes, we've had two meetings by now, the first was in March, and there are six directors: **Degge Hays**, gardener at Frog's Leap Winery; **Alan Scott** the brick oven builder; **Sally Fox** of naturally colored cotton fame; **Kelly Humphry**, gardener at McEvoy ranch; **Dave Miller**, the miller and baker from Yankee Hill near Chico; and **Monica Spiller**. The president is Dave Miller, and the Secretary and Treasurer combined position is continued by Monica Spiller. We are widely ranging in age, and we have all worked on growing old fashioned wheat

varieties ourselves, or in close cooperation with a farmer, under organic conditions or better.

Establishing *The Whole Grain Connection* as a legal non-profit corporation is taking a lot of time and form filling, but we have made progress, although it has been at the expense of a skipped issue or two of this newsletter. *The Whole Grain Connection* name is ours. We are now recognized as an exempt California non-profit corporation with an Employer Identification Number (EIN), and we now have our own bank account, which was not possible before. Application for tax exempt status to California, and to the IRS, required various descriptions of our goals, and this was a valuable exercise in realizing what we should be able to achieve, after we are fully recognized as a non-profit organization.



Old-fashioned wheat varieties to grow locally - delving into the past via the literature

At first in the early 1990's, all I wanted was to learn how all the different types of wheat looked while growing, and to understand their classification. For this John Percival's, *The Wheat Plant*, published in 1921 was an incredible revelation. There are plenty of illustrations and chapters on each group of wheat, detailed enough to be read many times over and still yield some valuable information. There are also chapters on wheat agriculture, hybridization and the origins of wheat..... And as an appendix there is a list of wheat varieties, their botanical classification and the country of origin. This is especially useful because it is a list of all the wheat varieties known to the author before 1921.

For whole grain bread, I thought that perhaps the white wheats once must have been popular because they produced the whitest bread. Shortly after that I discovered that California and the West coast had the ideal climate for white wheats and that indeed these were the preferred wheat varieties until the age of roller milling began in the 1880's. The resource that gave this revelation was *Soft Wheat*, published in 1981, by the American Association of Cereal Chemists, as part of a series of books on each of the most important cereal grains. Then began my search for samples of *Sonora* and *Little Club* wheat, the first California white wheat varieties. The search went from one telephone contact to another, made more dramatic by a few calls to Reading, England, to the University where John Percival had worked as a Professor. From there I was very sensibly directed to the *USDA Small Grains Collection* in Aberdeen, Idaho. This collection is extraordinarily vast,

and includes grains other than wheat as well. But the truly wonderful part was that I could ask for almost any wheat that I had read about in Percival's book, and they could supply some to me, free of charge. The amount is small, 5-10grams, but it is quite enough to plant in a 4 square foot plot, and care for either as a curiosity, or with the idea of expanding it. The most important requirements for making use of this collection are that you should know exactly what it is that you would like to ask for, and that you will be willing to answer a questionnaire at a later date about the varieties that you selected.

The book *Soft Wheat* summarizes and refers to much of the information that has been collected and published by the USDA, in the form of bulletins. *The basis for the improvement of American wheats*, written for the USDA in 1900 by Mark Alfred Carleton, is one such reference and is remarkably relevant to modern organic agriculture. Already there was interest in producing hard red wheat everywhere, to supply the roller mills. Yet Carleton still describes the characteristics of the main wheat growing areas in the USA, and lists the wheat types and varieties that are best suited to each of those regions. So here is an interesting starting point for discovering the names of wheats once grown successfully for many years, in a given region. In this same bulletin, Carleton also discusses the characteristics of the botanic groups of wheat, including common wheat, Poulard wheat, Durum wheat, Polish wheat, Spelt, Emmer and Einkorn. Although his motivation for this discussion was towards wheat breeding it is still useful reading for a farmer interested in choosing a wheat variety that truly fits the local conditions. Carleton's final statement is astonishing in the light of modern wheat breeding

and genetic engineering practices: "*The wheat plant is so closely self-fertilized in nature that the practice of composite crossing produces some most interesting and remarkable results. There is apparently no end to the variations exhibited by the sporting progeny in such cases, and, accompanied by discriminating selection, the possibilities of wheat improvement in this way is practically unlimited*"

Wheat breeding was continued at such a pace that new varieties were being introduced ever more frequently by 1922 when J. Allen Clark wrote his bulletin for the USDA: *Classification of American Wheat Varieties*. This bulletin is a good companion to Carleton's work; it gives an encyclopedic description of each known variety including a map showing the location and extent of its growth in 1922. It is possible to discover from all this, which varieties were grown reliably over a long period in each region, and which were just a short-lived fashion. Many wheat varieties acquired new names when introduced into different areas, and the synonyms are conveniently included with each description.

The USDA bulletins by Carleton and Clark are available in University libraries. Because they are US Government documents, and because they are more than 70 years old they can be copied freely for publication. Plastic spiral bound copies are available from *The Whole Grain Connection*, and are listed in our catalog. Copies of Percival's book will be made available next year, enquire if you would like a copy sooner!



Letter from Anne Greenfield, Bodega, California:

Summer 2002 – a bonanza harvest for me! For four years I have been attempting to grow a quarter acre each of

wheat and rye for my own grain and flour consumption, but various problems have kept the harvests quite small. The number one problem has been weed competition....

My Farm is 5 miles from the coast, 70 miles north of San Francisco; rainfall averages 50 inches, falling between November and April, and temperatures rarely go below 30 degrees..... (For the 2002 harvest season) I completely covered my wheat plot with trucked in turkey manure, half to one inch thick. This was an expensive move but in the midst of (previous)poor harvests I noticed a good patch of rye in the one spot where I had spread compost. So money was spent to test my theory that fertilizer could help (wheat) out-compete weeds.

I drilled about 20 pounds of *Federation* seed into the fertilized, disked ground, covered it with a light straw mulch, created three scary scarecrows, and waited for the rains which were just around the corner. As I said, 'twas a bonanza harvest: weeds were almost non-existent, the grain heads were long and full, the grain large and plump. And the seed threshed out easily.

Threshing had been the second major problem in my operation. Not having the size operation to warrant use of a combine, I have been cutting with a scythe and threshing with a Briggs-Stratton leaf shredder... the *Federation* threshed out easily!

In conclusion, I believe the right seed and fertilizing were the factors contributing to a rich harvest. I still have some questions, the wheat did lodge, and made cutting more difficult (so perhaps less fertilizer?)

The experiment goes on, always looking to decrease labor and money investment while harvesting bountifully. To save fertilizing costs I've created a mobile chicken house, 6feet x10feet..... Last year I planted a rich crop of crimson clover

which, when turned over in the spring, may be a fertile enough bed for my wheat this year... In the past my plantings of Austrian peas and bell beans seemed to have little effect.

My aim is to grow all my own food and grain essential to my diet. Some of the labor looks intensive but it's a matter of adapting to the rhythms of the work until they become routine. The benefit is healthy delicious food and the joy of being outside producing it.



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We would like to run advertisements from makers and suppliers of small scale farm, milling and baking equipment, from farmers who are growing and selling organic wheat, and from 100% whole organic wheat millers and bakers who would like to buy organic wheat. Photo ready copy can be submitted, or we can design a simple ad. for you from your information. Prices will be \$20.00 for a quarter page, \$10.00 for an eighth page, and \$5.00 for a sixteenth page-size advertisement.



The Whole Grain Connection, Newsletter

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The Whole Grain Connection is a California non-profit corporation, in the process of being registered with the IRS, aiming to enhance by education, and research, the desirability and availability of 100% whole grain breads, and other 100% whole grain products, from organically and sustainably grown grains, and thereby connecting farmers and bakers.

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