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 4
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Overwhelming news

When there is such a devastating loss of human life as that experienced at the hands of terrorists, this September eleventh, the only immediate priority is to save and care for the survivors. Nothing else is of importance for the moment. But afterwards, one of the best ways to honor those who have died and suffered so terribly, is to live our own lives to the fullest; especially in the sense of working to provide each other with truly helpful and pleasing products or services, in a way that is sustainable on this planet earth, and not damaging. Farmers who produce their crops and care for their animals in an organic environment are indeed providing truly helpful products, in a way that is ever more sustainable, as their experience allows. Following this tragedy, an incredibly healing activity was to go the local farmer's market, to find it magnificently well stocked, and to be served so kindly by organic farming people.

Harvest 2001

The weather was perfect for wheat this year. We had enough rain during the winter. Then after most varieties had headed up, in late April and early May, there was no more rain and the weather was hot. The result was higher protein than we had ever seen before. The effect was most evident in inland Capay Valley. This strengthens the concept of choosing varieties for a given location so that they head up after the winter rains have ceased, and at the time when high summer temperatures begin. In this way the highest protein possible for each variety should be achieved.

Wheat seed propagated by the *Whole Grain Connection* was of sufficient interest to 11 farmers during the season 2000/2001, for them to purchase seed or propagate seed from previous years. They had some heartening successes that give everyone courage to think that we are moving in the right direction with this work. There was also outright failure from which to learn.

Deer were the main cause of the failure, which showed that of course the wheat is vulnerable to foraging animals while it is green and delicate and before it has headed up. The varieties chosen were bearded, but this characteristic was of no use in fending off the deer, before the heads appeared! Some means of protecting the field from grazing to zero, is a necessity in the wilds of Marin county. Fortunately the plots were very small, so the seed loss was not excessive.

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In Siskiyou county Gary Black simply decided to wait until next year to plant the seed that he had acquired, so that it could be planted early in the fall.

The dramatic Mauri and Blue beard varieties are being successfully continued for use in flower arrangements, by Dru Rivers in Yolo county.

In two cases the wheat is being grown in small plots for distinctly educational purposes; by George Levenson for an educational film in Santa Cruz county, and as part of a university agricultural program in Stanislaus county, by Ida Bowers. Kelly Humphry in Marin county tried several varieties, in small protected plots, in order to discover whether they could possibly grow wheat on a larger scale. These farmers were successful in that they produced a crop, although one plot of Turkey wheat failed to come up at all, and we could not find a reason for this.

Sonora wheat has been expanded for us by David Cook at Ardenwood Museum farm (Alameda county) by growing out 50 pounds on half an acre. The yield was very approximately 750 pounds or 20-30 bushels per acre, after combine harvesting with equipment from the early 1900's. This was achieved without the expense of irrigation, and the protein value (11.81% protein at 12% moisture) makes it desirable for baking. The appeal to a farmer can be for the sustainability of a particular variety, on their farm, rather than absolute yielding power. No need to buy new seed stock after the initial investment. A baker likes to stay with a variety from the same farmer, once a formula has been perfected for a favorite bread. We shall be using this Sonora wheat as seed source, this year however, because it is of interest as one of the varieties first introduced into California by the Spaniards. The same variety grown out in the Capay Valley (Yolo county), with hotter temperatures sooner in the summer, this year, had an extremely high protein value (15.57% protein, calculated on a basis of 12% moisture). Actual moisture content was 8.3%. This is a variety that we are looking forward to selling to bakers, who are interested in a historical white wheat for breadmaking. These results also reveal that so far our wheat selections have been for the central valleys rather than for the coastal or foothill regions of California. It is time to intensify our efforts to find interesting varieties more appropriate for other microclimates in California.

At *Live Power* farm inland in Mendocino county, Cameron Genter an apprentice took charge of the experimental wheat growing and successfully grew out Baart, Mauri and White Australian varieties on quarter acre plots. White Australian is a longer season winter wheat, that needed to be planted early enough in the winter to come to satisfactory fruition; it's appropriate for the wetter, cooler micro-climates of California.

It takes several seasons to discover whether a variety is sustainable on a particular farm. Starting with just 25 pounds of seed for a quarter acre and propagating it for a few years is an economical and sensible way to test a variety on a farm. Certainly along the way samples can be given to bakers so that they can gain experience in using the variety that seems also to grow well, year after year.

In Petaluma (Marin county), Charles Belford and Frank Maack, are in their second year of propagating Federation wheat. This year they also grew White Australian, and Hard Federation. The Federation wheats are also Australian, and of interest to Alan Scott who lives nearby, and is the famed woodfired brick oven designer and builder. Other wheat varieties that they grew out were Baart and Turkey. Approximately 30 acres were seeded, and all these varieties were grown out successfully. Their harvesting equipment is a small John Deere combine dating from the 1950's. They are still in need of a means of giving the wheat a final cleaning to remove weed seeds. However, they can supply other farmers with seed from these varieties, and

they have enough to begin supplying hand cleaned samples to bakers for their assessment.
John Bayer is pioneering in Merced county with his second year of growing Little Club, Baart, and Mauri varieties.
In Idaho, Wayne Carlson who is already famous for his teff, is now taking a preliminary interest in growing old fashioned, climate matched wheat.

Harvest 2001 for the Whole Grain Connection

For the *Whole Grain Connection*, we used a 2 acre lot in the Capay Valley (Yolo county), to grow out 34 varieties of wheat. Eight varieties were grown on plots up to a quarter acre each, and the rest on smaller plots, some just four feet square. The larger plots were for propagation and the smallest to begin investigating varieties of interest. Successful varieties produced in enough quantity for sale are included in the catalog produced with this newsletter. Certainly the variety that attracted the most attention while it was growing, was the Bluebeard wheat with its dramatic long bearded blue black heads; it was hard to keep it in the field, everyone who saw it wanted to take some home!
The ground was disked to turn under weeds just before planting, and the time chosen for planting, was during the few days before rain was forecast, early in January. The larger plots were planted, with a mechanical seeder pulled by a tractor, in long strips that were 4 feet wide, in readiness for combine harvesting with minimal turning, and a cutting width 4-5 feet. Space was left between rows so that the wheat could be inspected and weeds removed. In actuality the weeds between the rows were allowed to grow freely. Ideally the weeds between rows, should have been mown at intervals to keep them low. The wheat shaded out weeds very well within the plots, except in a few areas where seeding was sparse or the ground less fertile. Expediency came into play when the other varieties, available in small amounts only, were planted. These were simply sprinkled by hand in rows, 8 inches apart, and very approximately at the rate of one seed every 2-3 inches. No attempt was made to cover the seed, and the birds no doubt took some, but enough was left to produce a good stand in each case. A few varieties were evidently not suitable for the climate and timing chosen, but this realization was part of the expectation from the trial plantings. The larger plots were marked out with large painted stakes, as seeding progressed because we wanted to use all the seed, rather than to seed a specific area. For the smaller plots, strips 4 feet wide were marked off along the length of the field, using string between stakes. A 4 foot gap was left between each strip. Small stakes were placed at the beginning of each varietal planting. The seed was spread in rows across the bed, and a stake placed at the end of the varietal planting. Between each variety a gap of 1-4 feet was left, and was planted with flax seed. The idea of the flax seed was to provide a natural marker between varieties and some discouragement for weeds. The flax seed was from our local health food store. Similarly poppy seed normally used for sprinkling on breads was used to mark the space between the long rows. The use of poppy seed caused some consternation among connoisseurs who realized that they were oriental poppy seeds, whereas I had thought that they were seeds of the red poppy, so frequently associated with European wheat fields. The flax grew well enough to produce pretty blue flowers between each variety, but the poppies grew very sparsely; they were also stunted, and revealed their true identity by producing pale purple flowers. Both the flax and poppies seemed to require more rainfall and or earlier planting to reach their full potential. All the stakes and string were removed from the field by the end of the planting; they were used as a guide only during the planting. Each variety was recorded on a map as it was planted. It was possible to monitor progress of each variety thereafter by using the map. Then when the wheat began to head up, the location of each

variety was fully evident. All this is described for the benefit of farmers who would like to begin propagating wheat from the smallest amount, perhaps from a single head or from a sample obtained from the USDA Small Grains Collection.
In earlier years, single seeds were planted in pots and the young plants were transplanted into the field. Certainly this gives the best return on valuable seeds, but is very time consuming.
Tom Kearney from the University of California Co-operative Extension, and his assistant Daniel, the master mechanic, came out and harvested the larger plots in just two hours. Their Massey Harris combine harvester from the 1950's worked without a hitch this year, and we are very grateful to have been able to call on them for this harvest. Again there was a lesson; the driest hardest long grains of Mauri wheat were easily broken by the threshing action. Care was necessary to set the threshing unit to keep this breakage to a minimum.
Our intention to buy a small combine harvester, that could be guided in the field by walking behind it, was stalled unfortunately. When the machine was demonstrated it became evident that it was designed for rice harvesting only. Combine harvesting rice involves two main steps: cutting the stem and separating the rice grains from the heads. Wheat harvesting involves a third step: separating the husk from the grains, in the form of chaff. Because the harvester had no means of dispensing the chaff, it collected inside the machine, and could not easily be cleaned out!
The smaller plots were harvested by hand, using a serrated sickle. The left hand was protected with a leather glove; the sickle was held in the right hand. A handful of the heads could be cut at once, a few inches below the heads. A large light plastic bucket was used to collect the heads, before transferring them to a large bag. After a little practice this method of harvesting was quite speedy, and valuable because it is possible to avoid any weeds and to be selective of the heads to be harvested. It is also possible to take a little time out to watch the insects and other creatures at work in the fields. The best was to discover a large number of praying mantis, evidently enjoying themselves as they moved from one stalk of wheat to another, in their search for other insects.
The collecting bag for the wheat heads, was made from woven plastic, but untreated burlap would have been the preferred material for the bag, if it had been available.
A small bundle thresher by ALMACO, electrically driven, was used for the threshing. Seed cleaning was with a Clipper office size screen type cleaner. Beyond that, some final removal of weed seeds and other debris, from the combine harvested varieties, was by hand.

Editorial Meanderings

Plant selection vs plant modification
Reasons frequently given for modifying plants by hybridization or genetic engineering are: to combat devastating plant disease or infestation, to increase yield, and to make them more nutritious. But supposing instead we ask, why is the disease or infestation there, why is the yield insufficient, and why should the nutrients be modified? Such questions lead to a quite different approach. Taking each farm individually, the first consideration would be a description of the unmodified environment that is there, and whether this is the best environment for the planned crop. The ideal match between environment and crop will reduce disease and infestation practically to zero, will utilize a truly sustainable crop variety, and will optimize the nutrients in that sustainable crop. Changing the nutrient content by genetic engineering makes little sense, because another crop can be used to provide a supply of the wanted nutrient. For example, I find it illogical to expect that genetically modified rice would be useful for supplying carotenoids. If rice can be grown, then cannot carrots, greens, or canteloupe melons also be encouraged, that would supply

carotenoids, and also provide variety in the diet?
The case for modifying wheat seems to be particularly weak, because so very many selected varieties are in existence, with a very wide range of tolerances for climate and soil types. Then, if we expect to use the wheat in a product already known to be typical for the variety, no reason seems to remain to modify it by hybridization or genetic engineering. Land race varieties of wheat have been collected from practically all the wheat growing countries. They have been propagated at intervals since their collection and so they are available to us if we would like to expand the seed (e.g. from USDA, Aberdeen, Idaho). Modification of wheat so that we can eliminate weeds with a chemical herbicide, and in so doing take away also plants that harbor useful insects, makes no sense at all, especially since wheat itself can be used to assist in the suppression of weeds in its immediate location. Where indeed is the sense of using herbicides at all, when there is the possibility of damaging the habitat of beneficial insects and microbes? There may eventually be a reason to modify wheat, but it seems unnecessary at the moment given our present collection of wheat varieties. As for using wheat to contain genes for making pharmaceutical products - the idea seems too fraught with danger to be tenable, since its accidental escape into the outer world would bring pharmacologically active materials into a major part of our diet. To the organic farmer and thinking person, there is nothing new in my commentary, but somehow this kind of thinking and observation has not penetrated the perception of the United Nations, for example. I read recently that the United Nations see genetically modified crop plants as a means of relieving hunger in third world countries. (United Nation's Human Development Report, quoted by Carey Gillam, Kansas City, Reuters, September 19, 2001). Surely the better way to relieve hunger would be to re-establish crops, locally developed over millenia, and already known to be sustainable. The work to recognize some of these crops, has already been done by the National Research Council, and published by the National Academy Press: *Lost Crops of the Incas*, 1989, and *Lost Crops of Africa*, 1996.

Sunspots and weather forecasting for 2002
My projection for this coming wheat year from this fall until next Summer of 2002, is that it will be at least as dry and warm as this year, of 2000 - 2001. It most likely will be even drier, but possibly could be just a little wetter and cooler! Actually, I'm no expert on California weather, although I try to listen for relevant major developments. There has been no mention of *El Niño* or *La Niña* lately, both of which seemed to bring wetter winters to California. *El Niño* brought the extreme of wet winters in early 1998. This year instead the talk has been about sunspots, that are observed to be at a maximum every eleven years. When sunspots are at a maximum as they have been this year, then the year seems to be exceptionally hot and dry, as indeed it has been. Practically zero rain in much of California, from April onwards this year was ideal for wheat that headed up at the end of April or early in May. It provided heat and dryness just at the right moment to maximize the protein content, rather than yield. Dare we predict a similar set of conditions for next year? Well, when looking back on my own experience of California weather, the changes from year to year are indeed gradual, with back to back years generally having a similarity. At the moment we seem to be having a similar weather pattern to the one prevalent when I first began growing wheat in the early 1990's, when lower rainfall, and hotter summers prevailed.
Of course if I really delve into the depths of climatology I become hopelessly confused by the array of overlaying effects that compound our weather. But it's fun sometimes to be simplistic, and to think that we can have some idea of what the next season may hold.

Barm Bread 2001

A whole grain barm bread book would be nice to have, I thought, filled with background information and stories on ingredients, nutrition, equipment, agricultural insight for organic wheat farmers, as well as innovative whole grain bread recipes. Well, it seems that I still need to learn how to find and please a publisher with my writing, because I have just experienced another rejection of my manuscript. This time though, I was ready with an alternate plan, and that is to produce and publish the book myself. Also instead of waiting for the book to be published, I have decided to publish a basic barm bread recipe right now, enclosed with this newsletter. I hope that you will try this bread for yourself if you are a baker. If you buy bread I would like to encourage you to take this recipe to a commercial baker, and make a special request that they make this bread for you and other customers who need 100% whole grain bread, prepared with a natural leaven of yeast and lactic bacteria. I hope you will enjoy it as a truly gourmet food, in that it pleases you both while you are eating it, and while it gives you the healthful benefits that you should expect from bread. I'll gladly answer bakers' questions about Barm Bread 2001(Monica Spiller, telephone: 650 941 8288); I want bakers everywhere to succeed with this bread. We need to be able to buy 100% whole wheat bread, that is preferably naturally leavened, as an alternative to refined wheat flour bread.

About Wheat

Poulard wheat, (Triticum turgidum ssp. turgidum) is truly a neglected group of wheats that perhaps we should be seriously reconsidering. Poulard wheats are altogether large, and spectacular, as are most of the tetraploid *Triticum turgidum* sub-species. For example durum wheat (*ssp durum*), Kamut (*ssp. turanicum* or *ssp. polonicum*, according to your opinion), and the variety Mauri (*ssp. turanicum*)are all spectacularly bearded in the field, and have large light colored grains; the grains are extra long in the case of the varieties Kamut, and Mauri.

Poulard wheats have the reputation for being taller than any other wheat; the straw is thick walled, pithy and stiff, and so generally remains upright. Yields can be higher than for any other wheat type especially when the growing season is long and the soil favorable. A few varieties have enormous branched heads; one example is the variety Akmolinka. In modern terminology, the distinctions between the *subspecies durum* and *turgidum* are evident only for extreme examples. Taken as a whole there is a gradually changing spectrum of characteristics, between *ssp durum* and *ssp turgidum.*

The extreme characteristics for *ssp durum* wheats are that they generally have very hard, glassy textured, medium long, light colored grains, that are high in protein; and they are usually grown at their best in a season when frost is absent, or very light, rainfall is minimal, and the temperatures high, and humidity low during maturation after heading up. So *ssp durum* wheats do well in Mediterranean climatic regions, when grown through the late winter, and into the summer, or in Continental climatic regions when grown through the spring, to late summer.

The poulard wheat extreme characteristics are seen in extra wide leaves, and grains that are often short and almost rounded, as well as being quite soft in some cases and only medium high in protein. Some of these differences match the ability of some poulard wheats, to withstand higher rainfall and humidity, and to produce useful grain, even if the heat on heading up is less intense. Some varieties even exhibit a spreading winter habit. Some poulard wheats are therefore useful, in temperate climates or where the continental summer is less extremely hot and dry.

The valuable agricultural characteristics shared by all the tetraploid wheats, including the poulard wheats, are a resistance to orange leaf rust fungi, the need for relatively

low rainfall together with drought resistance, and the protective effect of the long beard against birds and animals. The conditions to avoid for poulard wheats, are long periods of rain, or frost.

End products for Poulard wheat include pasta from the harder grained varieties. The softer grained varieties have in the past been used to mix with strong wheat flours, especially for French style breadmaking.

Poulard varieties that we are trying and expanding for the *Whole Grain Connection*, include Mauri (Afghanistan) and Akmolinka(Kazakhstan), which are both mentioned above, and Maparcha (Afghanistan). All of these are shorter season varieties. We are planning to try some of the winter varieties which may prove valuable in coastal California regions.

Common names for *Triticum turgidum ssp turgidum* include poulard (USA, France), pollard (UK), petanielle (French), bauchiger Weizen (Germany), rivet (UK), cone (UK), English (Germany). Rivet seems to be applied mostly to winter varieties that were for some time grown in England.

References:
(1) John Percival. The *Wheat Plant*, E. P Dutton & Company, New York, 1921.
(2) M. A. Carleton, *The Basis for the Improvement of American Wheats*, USDA Bulletin number 24, 1900.

Advertisements

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% organic whole wheat millers, and bakers who would like to buy organic wheat.

Photo ready copy can be submitted, or we can design a simple advertisement 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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