Whole Grain Connection

A California non-profit corporation, 501 (c) 3

P O Box 696
Los Altos
California 94023 - 0696

Telephone: 650 938 2865
www.sustainablegrains.org
e-mail: barmbaker@aol.com

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.

Catalog of Wheat Seeds, Books & Barm 2008-2009

The goal of our wheat seed program is to provide organic farmers with enough seed of locally appropriate wheat varieties, to be able to use their large scale equipment i.e. 25 – 100 pounds. After that, farmers can grow the wheat and trade the seed. None of the varieties of wheat in this catalog are proprietary. Currently, most of the listed varieties are available from other sources, but only in very small quantities suitable for test plots.

The wheat varieties listed in this catalog are intended for cultivation in California, although they can be grown in other states. Most varieties come to fruition in 4-5 months, and their season is short enough to be planted in the spring and harvested in the fall. In California they are planted in the fall to take advantage of the rainy winter season, and to head up into the dry hot summer season. White wheat varieties are somewhat drought tolerant and tend to sprout prematurely before harvesting if there are summer rains. The red wheat varieties need somewhat more moisture for a successful harvest and do not sprout so easily in summer humidity. Thus the California climate of a mild rainy winter in combination with a hot dry summer, favors the white wheat varieties.

We would like to encourage *Whole Grain Connection* seed programs in other states. There are thousands of wheat varieties that have been collected from other countries, with climates matching practically every region of the United States. Please let us know of your interest and we will try to help you select varieties appropriate for your local climate. The USDA bulletins listed in this catalog dating from 1900 and 1922, and the book by John Percival published in 1921, give much information to help begin the search for old-time varieties appropriate to every region in the USA. Our starting and trial quantity seed source has usually been the USDA Small Grains Collection in Aberdeen, Idaho, under Dr Harold Bockelman, telephone: 208 397 4162 ext 112. This is the most authoritative and complete collection that we know. Information on every variety in this collection can be obtained from the accession list (www.ars-grin.gov/npgs) and the region from which each accession was collected is always given. Other starting and trial quantity wheat seed resources include Seed Savers *(*www.seedsavers.org*),* Heritage Wheat Conservancy *(www.growseed.org*) and Bountiful Gardens *(www.bountifulgardens.org).*

Support for the Whole Grain Connection

If you are a farmer currently growing one of the varieties selected and propagated by the *Whole Grain Connection*, may we suggest an annual donation in proportion to your crop, of up to $5 per acre planted? Your donations will help us pay for farm research, and propagation to quantities suitable for full-scale acreage and equipment, of locally useful varieties.

Thank you for past support

This wheat seed project began as a result of listening to the comments of several organic vegetable farmers in California, who wanted wheat as a profitable rotation crop. These farmers could only buy modern short varieties bred primarily for conventional agriculture and refined flour milling. These organic farmers found that often they could not sell their wheat crop for a fair price to the refined flour millers and could only obtain a low price as feed; usually they simply ploughed it under.

Since then we have offered seed from wheat varieties historically grown in California before the green (conventional) revolution of the 1960s. A few more years have elapsed since our beginnings in 1992, and our previous catalog of 2004, during which we have continued some varieties historically grown in California. Now all the selections listed have been shown resistant to the current stripe rust fungus. All of this could not have happened without the encouragement and practical help of so many of you that I know that I will be accidentally leaving someone important out of any list. The most outstanding recently have been Paul Mueller, Sally Fox, Kent Brittan and Lee Jackson. In the early days Dave Cooke, Andy Scott, Patrick Brennan, Dale Coke, Stuart Dickson, Robert Ramming, Jim George, John Bayer, Charles Belford, Alan Scott, Frank Maack, Degge Hays, Steve Decater, George Fohner, Jonathan Murphy, Steve Payne, Tom Kearney, Jennifer Greene, Frank Busch, Ida Bowers, Jered Lawson, Adam Wilson, Bob Adams, David Hoffman, Margaret Koski-Kent, Nan Rohan, Carol Cox, were willing to grow the seed even though we barely knew to whom we could market the wheat. More recently Lou Preston, Dan Primerano and Gene Richeson have joined in, to grow wheat especially for their locals. There are several farmers also in other states and in Canada, who have contributed to our progress: Clyde Goering, Randy Brence, Dan Jason, Beth Rasgorshek, Lahde Fesler, Kevin Park. Thank you all.

There have been so many interesting enquiries and questions that we are able to recognize real enthusiasm and encouragement for this project. Money always helps of course, but the will to keep on going with this project has been strongly helped by your enthusiastic and encouraging practical response.

Now we need to consider the next big challenge in earnest, while we continue to build our seed stock. The next big challenge is to encourage the formation of localized organic wheat handling infrastructure. By this we mean local organic cleaning, bagging, storage, and perhaps also the whole grain stone milling of the wheat, as well as the marketing and distribution. This sequence of activities can be supported by farmer cooperatives, or by investors in the local organic economy, or by individual farmers who grow wheat as a major crop on a large scale. Financial times are difficult, but somehow all this must be done so that we have a complete and healthy local food supply that adds interest to our daily fare, could give us local specialty products, and could sustain us if ever we were isolated from those too few distant grain and whole grain flour supply centers.

Again thank you all,

Monica Spiller

Introduction

The *Whole Grain Connection* continually develops seed programs for growing wheat organically. The *Whole Grain Connection* also researches the whole wheat baking and cooking uses for each variety, so that the farmer can advise customers on pleasing ways to use their wheat. Please send your questions by telephone or e-mail.

The overall goal of our seed program is to supply locally appropriate wheat variety seeds to organic farmers, in amounts sufficient for the use of full scale planting and harvesting equipment (25 to100 pounds). In practice locally appropriate varieties are relatively tall landrace varieties, and they are non-proprietary. The expectation is that after a farmer has chosen a variety for their farm, they will be able to save their own seed and keep successfully propagating the same variety for many years. Hopefully our screening will eliminate those varieties that would be disease prone, under the local conditions. Most usually a farmer will grow only a single variety of wheat so that there is no on-farm mixing of seed varieties. Where a farmer grows more than one wheat variety, special care is necessary to keep the varieties well separated. This is essential for the maintenance of the seed value, whether it will be for food use or as seed. A truly appropriate and well-established variety on a farm is unlikely to need replacement. This situation is perceived as advantageous to the farmer who can steadily learn to produce high quality (high protein) wheat by judicious fertilization, rotation or co-cropping with legumes, and other organic techniques over many years.

The *Whole Grain Connection* seed program is divided into three stages:

I. Experimental seed selection:
- Obtaining small amounts of seed for varieties of interest because of their history, their success in a comparable climate or for some serendipitous reason, and growing them in small plots. Seed is grown each year in increasing amount until approximately 10 pounds is harvested. All the work is by hand, except perhaps the threshing and rough cleaning of the seed. During this time unsuccessful varieties in our conditions will have been eliminated.

II. Propagation of select seed:
- Growing the select seed from stage I, until reaching quantities of 100 pounds or more, and at the same time recognizing any problems with disease. Less hand work is involved at this stage but instead we have been able to use small scale farm equipment loaned and run by the owners.

III. Available seed (25# and more) through catalog sales

Farmer responsibilities in the Whole Grain Connection seed program

Our wheat seed is intended primarily for Californian farmers who are already certified organic producers and also those farmers transitioning their land towards organic certification. Farmers are invited to enter any of the three stages of our program if they have the requisite land, planting, harvesting and grain cleaning equipment, and storage facilities.
Our seed is in short supply, so farmers should always set on one side 100 pounds (or an appropriate proportion of their crop) of clean dry seed from their harvest of *Whole Grain Connection* seed. This seed stock should be stored in a sealed, rodent and insect-proof container, in a dry shady place; and it should be stored separately from the seed intended for the following year's planting.

Agricultural notes

Agriculturally all the varieties listed (except spelt, see later note) have been shown to grow well in the conditions of the Sacramento Valley of California, without irrigation. They have all been selected because they have been demonstrated to resist stripe rust disease, and also to yield reasonably well in this region. They are generally planted as late as possible in the fall, just before the second or third substantial rain of the winter season, usually between late November and mid-January. Planting should be before the ground is waterlogged so that equipment damage to the soil is minimized. Disking just before planting will minimize weed competition.

Heading up is from the end of April onwards and is into the hotter dry summer season. The varieties with the shortest season are *Sonora, Wit Wolkoring*, and the pasta (*T. turgidum ssp durum*) varieties *Blue Beard* and *Durum Iraq*; these are also the varieties with the greatest drought tolerance. The longest season is shown by *Foisy*, which is therefore recommended for the somewhat wetter regions of the Sacramento valley, or where the soil has the greatest water holding capacity.

The problem of lodging occurs when the stand of wheat is too dense for wind to blow through, or the initially heavy heads bow the wheat in a wall that cannot be righted because there is insufficient space between plants. The amount of seed to plant depends on the soil condition and whether the crop will be grazed or mowed to encourage tillers. A rich fertile soil and grazing or mowing before the crop heads up, will cause a dense stand of wheat that may lodge. Therefore under these projected conditions, the suggested planting rate is 50 pounds per acre. This is a lower seeding rate for wheat than is usual for modern wheat varieties. An automatic wheat setting on a mechanical planter may plant seed at the rate commonly used for modern short wheat varieties and this would be too dense for these landrace wheat varieties. When sparser growth is expected because the soil drains quickly, no mowing or grazing is planned, and the soil is less fertile, then the planting rate recommended is 50 – 100 pounds per acre. It is better to plant sparsely than to risk lodging, and the sparser planting will also maximize the grain protein. Lodged wheat is difficult to harvest cleanly and free from weed seeds, grit and mud balls. One of the main advantages of these taller old-fashioned wheat varieties for organic farming is that they outgrow most weeds, and can be harvested with the combine harvester sickle bar set high. The tallest of all the varieties listed are the pasta (*T. turgidum ssp durum*) wheat varieties *Blue Beard* and *Durum Iraq* and poulard (*T. turgidum ssp turgidum*) wheat varieties *Akmolinka* and *Maparcha*, which can grow up to 5 feet in height. The shortest are *Ethiopian Blue Tinge* and *Chiddam Blanc de Mars* and these are usually at least 2-3 feet tall.

The main condition that favors both high yield and high protein in the grain is adequate soil nitrogen content. The quality of the protein in terms of nutrition and breadmaking is further optimized when there is plenty of available sulfur in the soil, presumably because the sulfur containing amino acids can then be properly produced by the wheat. When a high quality wheat grain is desired, the soil mineral content should not be deficient in any of the known major plant nutrients. We would like to encourage experimentation with crop rotation, and co-cropping with legumes, taking care to avoid varieties with seeds that are the same size as wheat, or that have tenacious tendrils that would bring the wheat plants to the ground. Sulfur supplementation is usually as calcium sulfate in the form of gypsum.

Marketing Notes

Market needs are such that wheat varieties can be sold individually, and any of the white (pale yellow) seeded *T.aestivum ssp aestivum* varieties can be sold together as "white wheat". Usually the grains are hard enough to be graded as "hard white wheat". *Ethiopean Blue Tinge* would classify as "hard red wheat" in most seasons, and as "soft red wheat" in a particularly cool and wet season. The *T. turgidum ssp durum* varieties can be sold as individual varieties or combined they would sell as "durum wheat". Maparcha and Akmolinka are *T.turgidum ssp turgidum* and currently they are not of a type recognized as a commodity. Currently they can be sold as specialty varieties of poulard wheat, with unique character. Similarly spelt is best sold as the specialty "spelt wheat".

Specialty wheat whole grain product development

From time to time new recipes and methods for using whole wheat will be posted on *www.sustainablegrains.org*. We are now selling the barm starter kit through the *Whole Grain Connection* and it is listed at the end of this catalog. If you have questions or suggestions concerning whole wheat product development, we shall be glad to cooperate. Please write to *barmbaker @aol.com*.

List of available seeds

Common wheat varieties* (hexaploid, free threshing)
Triticum aestivum ssp aestivum

Variety (WGC catalog number) USDA accession number	*Bearded or beardless*	*Historical notes (year collected by USDA or other)*	*Seed color (white or red)*	*Spring (short season) or winter (long season) type*
Sonora (012) CItr 3036	beardless	Cultivar from landrace in Durango, Mexico. Perhaps the first successful wheat in Mexico from 1500. (1907)	Pale yellow (white)	Spring (shortest season)
Wit Wolkoring (013) PI 479660	beardless	Cultivar from South Africa. Presumed from landrace, but may be a cross.(1983)	Pale yellow (white)	Spring (shortest season)
Chiddam Blanc de Mars (032) CItr 7327; PI 58556	Bearded	Cultivar from Ville de Paris, France. Selected from English landrace. (1924)	Pale yellow (white)	Spring (short season)
India Jammu (044) CItr 7289; PI 57906	beardless	Landrace from Jammu and Kashmir, India. (1923)	Pale yellow (white)	Spring
Foisy (041) CItr 5246	beardless	Cultivar, selected by Mr Foisy in Oregon in 1865. (1916)	Pale yellow (white)	Spring (longer season)
Ethiopian Blue Tinge (069)	bearded	From Ethiopia by Dan Jason (1990s)	Purple (red)	Spring

**Notes*:
Common wheat varieties (hexaploid, free threshing) *Triticum aestivum ssp aestivum*

The common wheat varieties are generally used for making a wide range of wheat foods: bread, cookies, cakes and pastries, as well as breakfast cereals. The varieties possessing a pale yellow colored seed produce a whole wheat flour with unobtrusive bran coloration. This is in contrast with the whole wheat flour from the purple seeded *Ethiopian Blue Tinge* the bran of which colors the whole wheat flour and darkens and flavors the baked goods made from it. For good breadmaking character the wheat grain needs to be 15% protein, or at the very least 13% protein, on a 12% moisture basis. When the protein content is lower, the whole wheat flour can be supplemented with extra protein from vital wheat gluten. Because vital wheat gluten is 75% protein, and is in the form of a flour, the amount needed as a supplement does not appreciably

dilute the whole wheat flour. Less than 8% vital wheat gluten is all that is required, whole wheat flour:VWG, 92:8.

Sonora wheat

Sonora wheat especially, has been well tried in 5-10 acre fields, here in California during the last six years. Yields vary from barely 20 to 40 bushels per acre, according to the soil fertility and drainage, extent of fertilization and the winter rainfall. So far the seed has been kept satisfactorily pure, despite some mixing at times when farmers were growing more than one variety of wheat on their farms. We continue to work with the farmers on the quality control and identity preservation of our seed.

This year we have a relatively large stock of *Sonora* seed and we encourage farmers to grow it organically in larger acreage, because the market for it is wide open. Joseph Vanderliet at Certified Foods in Woodland, *www.certifiedfoods.com* miller of organic whole wheat flour, has buyers for the *Sonora* whole wheat flour far above the amount that we can yet supply. Glenn Roberts at Anson Mills, in North Carolina, *www.ansonmills.com* has already contracted for some 2009 crop, *Sonora* wheat. The market is also open for direct marketing by growers at local farmers markets, through community supported agriculture projects, wholesale to grocery markets, and directly to miller-bakers of whole wheat breads.

Sonora wheat has a history here in the South Western United States, because it is a variety grown early by the agricultural Native Americans in Mexico. They used it to make their whole wheat tortillas, and apparently liked the way it could be ground to a whole wheat flour on their metate. *Sonora* wheat might be the very first wheat successfully introduced onto the American continent soon after Columbus's famous journey of discovery in 1492. It was grown in the South West continuously until about 1960, and it was revived again from USDA seed stock beginning in the 1990s.

The very light color of the whole wheat flour makes it ideal for all kinds of baked goods that have for over 125 years, been acceptable only when made with refined flour. Farmers are encouraged to work for the optimal protein level of 15% because the breads made will be extraordinarily desirable, and bakers should expect to pay a significant premium for such wheat. The *Sonora* wheat dough, and final bread texture is refreshingly different to that experienced with hard red wheat varieties. A pleasing open bread cell structure is achievable, but with a shortness of crust that is welcomed by the eater. Bakers are invited to use the formulation for whole wheat barm bread 2008, available on the website: *www.sustainablegrains.org*. This formulation can be made with *Sonora* wheat into baguettes, pocket bread, cottage loaves, country loaves, pizza and more. A starter for barm bread is available through this catalog, on page 15.

Wit Wolkoring

Wit Wolkoring (white woolly wheat) was selected as an alternative "white wheat" to *Sonora* wheat, from a similar climate region in South Africa, and has proved to be quite similar to the *Sonora*. The difference is most readily seen in the field. The heads of *Wit Wolkoring* are cream colored like the straw, whereas those of the *Sonora* are bronze but like the *Sonora* the heads are also woolly, or velvety, in appearance.

Chiddam Blanc de Mars

The variety *Chiddam Blanc de Mars* from Ville de Paris in France was chosen originally because the French have such a wonderful reputation for good bread - thinking of Poilane's

whole wheat country loaf. It is often more prolific than *Sonora* wheat. We have continued to propagate *Chiddam Blanc de Mars* even though it is relatively short in stature, because we expect that it will yield well in areas further north in California, and where there is a higher rainfall, or on soils with good water retention.

India Jammu

This *India Jammu* variety was selected to be another alternative to *Sonora* wheat, both from the agricultural and from the end use viewpoint.

Foisy

Foisy is a historical West Coast wheat variety that was selected originally in Oregon, in 1865. *Foisy* heads up and ripens nearly a month later, in California, than the other varieties of white wheat listed here. Perhaps because of this, it is relatively high yielding and the protein value is generally higher than for the other varieties, under the same circumstances. *Foisy* is recommended for planting in slower draining soil and in the wetter regions of California.

Ethiopian Blue Tinge

The grain color of *Ethiopian Blue Tinge* is an intriguing dark purple brown, it has a tea like aroma and it is prolific. The variety was continued for these reasons, even though it is somewhat short in stature and threshing is sometimes incomplete through a normal thresher. The shorter stature may be due to intolerance to drought, so this variety is recommended for planting in slower draining soil or wetter regions in California, and to supply those who enjoy dark richly flavored whole wheat breads.

Pasta wheat varieties** (tetraploid, free threshing)
Triticum turgidum ssp durum

Variety (WGC catalog number) USDA accession number	*Bearded or beardless*	*Historical notes (year collected by USDA or other)*	*Seed color*	*Spring (short season) or winter (long season) type*
Durum Iraq (062) P I 481581	bearded	Landrace from Iraq. (1983)	Pale yellow	Spring
Blue Beard (063)	bearded	Unknown. Possibly landrace from Iran, via UC Davis and Jim George. (1990s)	Pale yellow	Spring

**Notes on pasta wheat varieties

Among farmers in California there is an unwritten rule that durum wheat varieties should not be grown north of the San Joachin Valley. The reason is that they tend to develop a blackening of the germ. However the two varieties of durum wheat selected grow well in the Sacramento Valley and offer the possibility of a supply for whole wheat pasta makers as well as

bakers who know how to make pleasing whole durum wheat breads, as they do in Apulia in Italy and Sicily. The durum grain is the hardest of all wheat varieties.

These varieties grow to five feet when rainfall is good, but they also are highly drought tolerant and still grow to a good height for combine harvesting when rainfall is low. Planting should be at a time that will favor a good rain for germination. These varieties have the reputation of being capable of growing to full fruition after a single inundation when planted. Both varieties are appealing to wheat weavers and straw artists, as well as florists.

Blue Beard has a spectacular dark blue head, and always attracts attention in the field.

Durum Iraq has proved to be a suitable variety for the Sacramento conditions and produces well, even in the region not normally expected to support durum wheat. The long black beard gives this wheat a typical durum wheat appearance.

Poulard wheat*** (tetraploid, free threshing)
Triticum turgidum ssp turgidum

Variety (WGC catalog number) USDA accession number	*Bearded or beardless*	*Historical notes (year collected by USDA or other)*	*Seed color*	*Spring (short season) or winter (long season) type*
Maparcha (048) PI 125343	bearded	Landrace from Laghman, Afghanistan (1937)	Pale yellow	Spring
Akmolinka (049) PI 438971	bearded	Cultivar from landrace North Kazakhstan. (1980)	Pale yellow	Spring

***Notes: The poulard wheat varieties are closely related to durum wheat, the main distinction being that the grain of poulard wheat is much softer in texture. It is this softness that most likely caused their near extinction, because the bran and endosperm are not so easily separated in the roller milling system developed in the 1880s. Until that time poulard wheat varieties were important in England, France, Italy, and all the countries bordering the Mediterranean. Now that whole wheat products are appreciated for their health benefits it is time to grow these varieties again, for whole wheat milling in a stone mill. For the farmer this is a great opportunity because poulard wheat varieties are the most prolific of all, and produce long strong straw. Pasta and breads, cookies and crackers from poulard wheat will have a taste and texture that few of us have ever experienced. We can look forward to some historical as well as some highly original and exciting whole grain products from these poulard wheat varieties.

Maparcha and *Akmolinka* have been grown successfully when planted in late November through early December, in the Sacramento Valley. However they seem to have been most successful in wetter years, which suggests that planting should not be delayed beyond December, the soil should not drain too rapidly, and the rainfall needed for success may be somewhat greater than is needed for the durum wheat varieties. Our experience is limited with poulard wheat and we look forward to learning more with the farmers who decide to grow it.

Stage II Propagation of select seeds - spelt

We invite you to plant plots of these spelt varieties in appropriate regions so that they can be propagated sufficiently for full-scale farming. In California, the regions where spelt would grow as a preferred variety, are wetter regions near the coast, and at higher elevations where a snowy winter is experienced.

Spelt is the wheat type that found great favor in Hungary and much of Eastern Europe and Germany, and also in the agricultural Alpine regions, for many centuries, but which was supplanted by hard red winter wheat when roller milling to refined flour became widespread after 1880. The advantageous agricultural properties of spelt are winter hardiness, disease resistance, and toughness of chaff that discourages attack by birds and insects. Spelt also is unlikely to sprout in the ear during a rainy summer. A long season of growth is required for spelt, and it is therefore regarded as a winter variety; it should be planted during October through early November, or just before the first major rain of the season. Ideally, the un-hulled spikelets are planted. If a suitable planter is not available then the grain can be carefully hulled, so not to damage the germ, with a rice or oat huller and used as seed in a regular planter. The grain has thin red bran, and a relatively soft endosperm that gives interesting and characteristic whole grain flour. Rye is often grown in the same places as spelt. The regional bakers in the South Tyrolean Alps, for example, make some very inspiring mixed spelt and rye breads, and crackers, flavored with their native blue flowered fenugreek, fennel, anise and cumin.

In order to fully process spelt for the whole grain miller, an intermediate step is required following combine harvesting. This is the process of de-hulling the spelt spikelets. Rice or oat hullers can be used, but it is advisable to consult with other growers of spelt in the USA, and there are just a few, before purchasing de-hulling equipment.

Spelt wheat (hexaploid, not free threshing)
Triticum aestivum ssp spelta

Variety (WGC catalog number) USDA accession number	*Bearded or beardless*	*Historical notes (year collected by USDA or other)*	*Seed color*	*Spring (short season) or winter (long season) type*
Spanish Spelt (009/0058) PI 348428	bearded	Landrace from Oviedo, Spain. (1970)	Russet red	Winter
Swiss Spelt (042) PI 347864	beardless	Landrace from Bern, Switzerland. (1970)	Russet red	Winter

Purchasing seed

Variety choice

Try to choose a variety most appropriate to your area rather than for a particular style of baking. Bakers and chefs are versatile, and should be encouraged to be inventive. After all they were the inventors of localized foods from localized grains, through the centuries. The best local bakers and chefs will look for high quality in the grain, which is only attainable when a variety is properly suited to its environment.

Seeding amounts

The recommended seeding amount is 50-100 pounds per acre.
Use 50 pounds wheat seed per acre when the soil is richly fertile and has good water retention, and also if the plan is to graze or mow the crop before it heads up. Whenever there is concern that the wheat might lodge because the growth could be too dense, then the seeding rate should be close to 50 pounds per acre.

Use 100 pounds per acre when the soil is fast draining and less fertile.

Optimizing protein content of wheat grain

Protein content of wheat is favorably influenced by sparse planting, high soil nitrogen, medium fast draining soil, rain-watering without additional irrigation, variety selection to head up just as the rainy season is ending, growing wheat where the summer is hot and dry…..

Ground preparation

Ideally wheat should follow a legume crop and the soil should have at least a normal concentration of nutrients. To ensure optimal protein levels in the grain, nitrogen should be present at higher than average recommended levels.
Light disking of the soil before planting will reduce weed pressure.

When to plant

The best planting time is as late as possible in the fall before the ground becomes waterlogged, just before a significant rainfall is forecast. In some years it is possible to wait for a drier, brighter time in January.

Crop care and harvesting

These wheat varieties are naturally taller than many modern varieties, so they can be harvested with the combine harvester sickle bar set very high. This should reduce the weed seed collected. Cutting down tall weeds in the field immediately before harvesting will also help ensure a clean crop.

Lodging should not be a problem if the seeding amount was chosen to match the farm conditions. If lodging does occur, the lodged section of the field should be harvested separately because the low position of the combine harvester sickle bar will pick up more dirt and weed seed. The lodged crop will not be so easily cleaned and may only be suitable for animal feed.

Seed Price: $1.25 per pound, plus packaging and shipping

Where to place an order for seed, or to make enquiries about the program:
Wheat seed can be ordered through the *Whole Grain Connection* (Telephone: 650 938 2865; e-mail: barmbaker@aol.com).

Books

THE BASIS FOR THE IMPROVEMENT OF AMERICAN WHEATS, Mark Alfred Carleton.
USDA Bulletin No.24, December 10, 1900.
Photocopy, plastic spiral bound, paper cover, 87 pages.
Price: $14.00, includes packaging and postage within the USA

CLASSIFICATION OF AMERICAN WHEAT VARIETIES, J. Allen Clark.
USDA Bulletin No. 1074, November 8, 1922.
Photocopy, plastic spiral bound, paper cover, 238 pages.
Price: $22.00, includes packaging and postage within the USA.

THE WHEAT PLANT, John Percival
E.P Dutton & Company, New York, 1921.
Photocopy, plastic spiral bound, paper cover, in two volumes, total 463 pages.
Price: $45.00, includes packaging and postage within the USA.

WHAT'S WITH FIBER? Gene and Monica Spiller.
All plant foods contain fiber. Here is a description with stories, of the health-giving components that come with the fiber of plant foods: whole grains, fruits, vegetables, legumes, seeds, nuts, mushrooms, seaweeds.
Published by Basic Health Publications, 2005.
Paperback, 230 pages.
Price: $20.0, includes packaging and postage within the USA

POWER OF ANCIENT FOODS Gene A. Spiller and Rowena Hubbard.
Healthful foods from around the world including whole grains; history and recipes.
Book Publishing Company, 2003.
Paperback, 373 pages.
Price: $20.00, includes packaging and postage within the USA.

To order books, please send note listing items requested, your shipping address and telephone number, plus payment by check in US Dollars to:
Whole Grain Connection, PO Box 696, Los Altos, CA 94023 – 0696.

All profits and royalties from books sold through the *Whole Grain Connection* go towards funding *Whole Grain Connection* programs.

Barm for Breads

Barm is the British (Celtic) word for sourdough. The word and the method were neglected after the invention of modern purified yeast in the mid 1800s. *Barm* was used to make whole grain breads before that time. Preparation of a barm was related to making ancient beer. Making both bread and beer involved making a *mash* of the grains and malt. *Mashing* is a way of soaking and treating the grains so that the natural enzymes will release sugars, and generally make good beer or good whole grain bread with an interesting complexity of flavor.

DRIED BARM KIT, recommended for beginners to produce a barm bread starter that can be maintained indefinitely; includes dried barm, sprouted wheat flour (enzyme active wheat malt), acidity testing paper and instructions. Can be used with recipe *Whole Wheat Barm Bread 2008* on website *www.sustainablegrains.org*
Price: $30.00 including postage

ACIDITY TESTING PAPER (pH paper) Color test paper in the range pH 3 to 5.5 is in a single roll dispenser, enough for 120 tests. Refill for Barm Kit.
Price: $12.00 including postage.

BARLEY MALT FLOUR (diastatic) is a useful alternative to sprouted wheat flour (enzyme active wheat malt), for barm breads, and it is available through Bob's Red Mill (*www.bobsredmill.com*).

To order barm products, please send note listing items requested, your shipping address and telephone number, plus payment by check in US Dollars to:
Whole Grain Connection, PO Box 696, Los Altos, CA 94023 – 0696.

Proceeds from all barm product sales go towards the support of the *Whole Grain Connection* programs. Satisfaction guaranteed. If you are not satisfied with an item, please let us know within 30 days of purchase, and we will send a replacement or give you a full refund of the purchase price. Responsibility for the quality of products made using our barm technology rests solely with the user.