

Historic Perspective of Wheat Characterization

Compiled by Lon Andrew

Beginnings of Wheat Characterization

The following was excerpted from USDA Bulletin No. 1074, "Classification of American Wheat Varieties", authored by J. Allen Clark and others published in 1922.

The existence of many different varieties of wheat has been recognized for more than 2,300 years.

Theophrastus, a pupil of Plato, in his "Enquiry into Plants", had written about 300 B.C. E., states:

There are many kinds of wheat which take their names simply from the places where they grow, as Libyan, Pontic, Thracian, Assyrian, Egyptian, Sicilian. They show differences in color, size, form, and individual character, and also as regards their capacities in general and especially their value as food.

Theophrastus mentioned many of the differences between those kinds of wheat. In the writings of Varro, Pliny, and Columella, in the first century B.C. E. and the first century C.E., the observations of Theophrastus were repeated, rearranged, and amplified. Columella, who wrote about 55 C.E., presented those previous observations and his own, as follows:

Triticum, common bare wheat which has little husk upon it, was, according to Varro, a name given formerly to all sorts of grain beaten or bruised out of ears by trituration or thrashing; but afterwards, it was given to a peculiar species of grain, of which there are many sorts, which take their name from the places where they grow, African, Pontic, Assyrian, Thracian, Egyptian, Sicilian, etc., and which differ from one another in color, bigness, and other properties too tedious to relate. One sort has its ears without beards and is either of winter or summer. Another sort is armed with long beards and grows up sometimes with one, sometimes with more ears. Of these the grains are of different sorts: some of them are white; some reddish; some round; others oblong; some large; others small. Some sorts are early ripe; others late in ripening; some yield a great increase; some are hungry and yield little; some put forth a great ear; others a small. One sort stays long in the hose; another frees itself very soon out of it. Some have small stalk or straw; others have a thick one as the African. Some are clothed with few coats; some with many, as the Thracian. Some grains put forth only one stalk; some many stalks. Some require more, some less time to bring them to maturity. For which reason some are called trimestrian, some bimestrian; and they say that in Euboea there is a sort which may be brought to perfection in 40 days; but, most of these sorts which ripen in a short time are light, unfruitful, and yield very little, though they are sweet and agreeable to the taste and of easy digestion.

In the early Roman literature mentioned reference is found to two groups of wheat: namely, *Triticum* and *adoreum*, or *far*. Columella referred to the *far* as bearded wheat. The grain of *triticum* was separated from the chaff in thrashing, while that of the *far* was not, indicating that the former consisted of true wheats, while the latter was emmer or spelt.

Many centuries later, during the mid 1700's, Linnaeus divided the common wheat, *Triticum vulgare*, into two species, *Triticum aestivum* (awned spring) and *Triticum hybernum* (awnless winter), apparently believing that all spring wheats were awned and all winter wheats awnless.

Clark, in 1922, offered the following summary: the making of botanic species of wheat was carried to great lengths by the botanists of 100 to 200 years ago where 50 or 60 supposed species of wheat had been described. They did not recognize that the characters sufficient to separate species of wild plants were sufficient to separate only agronomic and horticultural varieties of domesticated plants.

Destontaines, in 1800, established the species *Triticum durum* for the group of wheats having long awns and long vitreous kernels.

Host, in 1805, described and named the species *Triticum compactum* to include the club wheats and in addition recognized 10 other species of the genus *Triticum*.

Hueze, in 1872, grouped the wheats into 7 species. He listed 700 varietal names of wheat, 602 of which belonged to the species *Triticum sativum*, which included both common and club wheats. He described 47 varieties in this species, while the remaining 555 names were considered as synonyms.

History of Several American-Grown Wheat Varieties

Descriptions of wheats were compiled by Lon Anderson using breeder and grower information and extractions from a publication entitled "Classification of American Wheat Varieties", November 8, 1922, by J. Allen Clark, John H. Martin and Carleton R. Ball. Dr. David Smith, Beltsville, MD, and Dr. Harold Bockelman, Aberdeen, ID, were invaluable in their participation by providing seed for more than 200 historic varieties that were ultimately grown in conjunction with contemporary cultivars. The quality information was derived from the USDA Soft Wheat Quality Laboratory.

Armor 3235

The test weight for Armor 3235 will be about 1 pound higher than the reference cultivars found in the normalized test weight tables. Kernel weight was about average and the milling quality was very good. The break flour yield indicated the cultivar to be slightly below average in flour granulation. Gluten strength appeared to be above average.

Aubrey

Aubrey is a white cultivar that will likely be about .4 pound higher in test weight than Chelsea and about .4 pound lower than Frankenmuth. Kernel weight was slightly smaller than average. Aubrey had very good milling quality and the flour granularity was softer than the average for soft wheat. Cookie spread was on the smaller side but within the range of good soft wheat. The gluten strength was slightly above average with an Allis-Chalmers lactic acid SRC of 97%.

Aurora

This white cultivar has the same test weight characteristics as Aubrey, but the kernel weight will be above average. Aurora has good milling quality and average softness. The cookie spread was very large and would place among the top of all soft wheat cultivars. The gluten strength was low as revealed by a lactic acid SRC of 81%.

Bascom

Steyer Seeds marketed this cultivar and will be about 1.3 pounds higher in test weight than the zero-standard cultivars. Bascom had superior milling quality similar to Pioneer 25R47, Caledonia and FI 302. It has excellent cookie spread. The cultivar has weak gluten strength.

Beck 102

Beck 102 has many good quality traits. It will be about 2 pounds greater in normalized test weight similar to Coker 9803, Elkhart and Kaskaskia. It has good milling properties, possesses very fine flour granulation, good cookie spread and has weak gluten.

Beck 110

This soft red cultivar has a 2.5 normalized test weight and would be similar to AGS 2000, Coker 9474 and Geneva. Beck 110 produced good cookie spread and was weak in gluten strength.

Bowerman

Bowerman was introduced by Steyer Seeds and possesses a number of good quality traits. The average normalized test weight was 2.4 pounds higher than the reference cultivars. The kernel weight was large at 38.8 grams and the milling quality was superior. Bowerman would be similar in milling performance to Cardinal, Superior (SWW) and Pearl (SWW). The granularity was very soft and has good cookie spread. The gluten strength was determined to be weak-medium.

Brazen

Brazen was released by Gries Seeds and has very soft flour characteristics, good cookie spread and was weak in gluten strength.

Bravo

'Bravo' is an awnletted, tan-chaffed cultivar with a dark green plant color at boot stage. Bravo's phenol reaction is "dark brown" Stems are hollow with 4 nodes and show a slight waxy bloom under normal growing conditions.

Spikes are inclined, oblong in shape and middense, averaging 7.8 cm in length. The last rachis internode is glabrous. Glumes are tan, medium in length and width, glabrous with acute beaks and square shoulders. Kernels are elliptical in shape with rounded cheeks. The crease is narrow and mid-deep. The brush is medium and non-collared. Kernels average 7.3 mm in length and 3.9 mm in width. Seed weight is 41 mg. Bravo appears similar to 'Freedom' (a Title V protected cultivar – PVP Certificate # 9200253). Bravo is similar in height to Freedom and is also similar to Freedom in straw strength as measured by resistance to lodging. However, at maturity, Freedom has a distinct yellow chaff color while Bravo is best described as tan. Bravo also averaged 6 d earlier in maturity than Freedom. In yield trials planted at Wooster, Ohio in 1997, 1998 and 1999, the average yield of Bravo was 739 Kg ha⁻¹ greater than Freedom.

The USDA Soft Wheat Quality Lab at Wooster, Ohio evaluated Bravo in 1995 and 1996. It was shown to have both excellent milling and excellent baking quality. Baking quality was similar to Freedom in 1995 but milling quality exceeded Freedom in both 1995 and 1996. Straight grade flour yield is similar to Freedom. Tests for softness showed Bravo to be similar to Freedom in 1995 but in 1996, Bravo had a higher softness equivalence score than Freedom.

Bravo

PVPA 1994 – Title V- May be sold only as a class of Certified Seed. BRAVO is an exclusive release to Central Ohio Seed Testing as a proprietary, Certified cultivar.

Bravo is a very early heading cultivar, averaging 5 days earlier than Hopewell or Freedom. It has excellent test weight averaging about 2 lbs/bu above Hopewell. It is a beardless, white chaffed cultivar most closely resembling Freedom among current cultivars, but taller and much earlier. Bravo has shown good resistance to leaf rust and excellent resistance to powdery mildew. It appears highly resistant to soilborne mosaic virus and wheat spindle mosaic virus. Bravo has no resistance to Hessian fly. Milling and baking quality scores for this variety have been excellent. No seed stock sales are permitted to non-licensed companies or to international firms without the permission of the owner of the variety. A license is required to produce seed of this variety.

Caledonia Resel-L (Dropped from release)

Pedigree: Tall off-type with a less dense spike selected out of Caledonia. Over 4 years, this line is slightly higher in grain yield than Caledonia, Richland, and Jensen. Four year means are 75, 74, 73, 72 b/a for CaledoniaResel-L, Richland, Caledonia, and Jensen, respectively. CaledoniaResel-L has excellent test weight averaging 57.7 lbs/bu over 2 years versus 56.3 lbs/bu for Caledonia and 57.1 for Richland.

Winter survival is similar to current varieties. CaledoniaResel-L is slightly less lodging resistant compared to Richland or Caledonia. CaledoniaResel-L is more resistant than current varieties to Fusarium Head Blight (scab). It is resistant to Wheat Spindle Streak Mosaic Virus and susceptible to Wheat Soil Borne Mosaic Virus. The powdery mildew resistance is better than most other current varieties except Richland and Jensen. Seedling tests at Virginia Tech show that CaledoniaResel-L is resistant to a powdery mildew composite with virulence for resistance genes Pm1,2,3,3a,3c,3f,4a,4b,5,6,7. CaledoniaResel-L is moderately susceptible to leaf rust race TNRJ. Reaction to other diseases is unknown.

CaledoniaResel-L has been evaluated for milling and baking quality over four years and produced satisfactory milling and baking scores slightly below Caledonia and Richland but acceptable. It is moderately susceptible to preharvest sprouting with a sprouting score higher than Jensen but lower than other current varieties.

Plant height is about 103 cm compared to 87 cm for Caledonia and 101 for Richland. This line is awnless and has white chaff color. Heading date about 2 days earlier than Caledonia or Richland.

Status of Breeder Seed: Breeder seed increases were produced in 2006 and 2007, however 3-5% red kernels were observed in the seed lots produced. NYSIP sent 20 Bu to the Engineering Research Unit at the USDA ARS Grain Marketing and Production Research Center in Manhattan, KS for kernel sorting. They sent back 13.2 bu that had an average of 0.6% red in the sorted sample.

China

There were several differing histories of the origin of China wheat that were recorded in literature, but the following was thought to be the correct history of the variety. In 1851 the Rural New Yorker gave the following account of the origin of China wheat, which appeared for the first time in the Niagara Democrat:
 “The kernels from which they (specimens) grew were originally brought from China some six years ago (1845). The seed was handed to Mr. Caverns by O. Turner, the popular local historian, who obtained them from the then lately returned Minister to China, Honorable Caleb Cushing. From a small quantity received by Mr. Caverns for experiment, an amount sufficient to give it extensive and permanent culture has been received”.

In 1919, China was grown on 63,900 acres in Illinois, Indiana, Kentucky, Maryland, New Jersey, Pennsylvania, Virginia and West Virginia. China occupied about 4,800 acres in 1939 and there was no reported acreage by 1949.

A five-gram sample of China was acquired in the late 1980's from the National Collection. Thousand-kernel weight was very large at 39.5 grams. China had marginal milling properties with a mill score of 53.6. The range in mill score for all cultivars was 97.8 to 17.9. China had typical soft wheat softness, low AWRC and low flour protein, but produced a small cookie spread. Cultivars that have low milling quality usually yield reduced cookie spread. Gluten strength was medium weak.

China was also known as Bluestem, Lebanon Valley, Mortgage Lifter and Pennsylvania Bluestem.

Bluestem and **Pennsylvania Bluestem** were names widely used for China in the various States where it was grown. A.H. Hoffman, seedsman, of Landisville, Pennsylvania, had distributed the variety in that state under the name ‘Pennsylvania Bluestem.’

Lebanon Valley was the name under which a sample of China was obtained from R. Chester Ross, of Honey Brook, Pennsylvania, who stated that the variety “Originated in Lebanon Valley, Pennsylvania.”

Mortgage Lifter was the name under which a sample of China was obtained from the Cornell University station in 1912.

Dawson

Dawson, a soft white winter variety, was originated in 1881 by Robert Dawson, of Paris, Ontario, Canada. According to Mr. Dawson, "it was selected in a field of Seneca or Clawson, in which he found one plant quite distinct and much superior to the rest of the crop. Mr. Dawson sowed the grain from this plant and has continued to grow this wheat since. It was practically unknown over Ontario until tested at the experimental station along with many old and new varieties and the comparative results published. It has ranked first in yield from the beginning".

Dawson was synonymously known as American Banner, Dawson Golden Chaff, Golden Bronze, Golden Chaff, Improved Amber and White Winter in 1919.

American Banner was acquired from the National Small Grains Collection and was grown in Wooster, Ohio. American Banner had a similar appearance to that of Dawson, but it had different quality characteristics from those of Dawson.

Golden Bronze was simply the name under which a strain of this variety was being grown at the Cornell University Agricultural Experiment Station.

Golden Chaff was a shortening of the name Dawson Golden Chaff.

Improved Amber was the name under which a sample of Dawson was obtained from the Wisconsin station.

White Winter was a local description name used for Dawson by farmers.

Dawson was grown in Illinois, Indiana, Kentucky, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and Wisconsin at that time (1919). It was grown on 125,500 acres. By 1944, Dawson was grown on 461,000 acres; but, decreased greatly ten years later to the level of 2,960 acres in 1954.

Dawson was obtained from the National Small Grains Collection in the late 1980's by the SWQL. It was grown for a number of years in Wooster, Ohio, along with other historic varieties and today's contemporary cultivars. Dawson had excellent field yield which equaled the yield of many cultivars that were introduced as late as the 1960's. Dawson had about 75% of the yield of cultivars from the 1990's. Dawson had very good milling properties and had typical softness. It seemed to have genetically high test weight, normal flour protein (as compared to modern cultivars), good cookie spread and had low gluten strength.

AgriPro released a soft red winter cultivar about 2001 named Dawson, which is different from the historical variety Dawson.

Douglas

Douglas was released by AgriPro as a soft red winter wheat. The cultivar displayed very good milling properties and possesses low gluten strength, which may be desirable for formulations requiring high liquid levels.

Feck

Feck was released by Steyer Seeds and appeared to be about 1.3 pounds greater in test weight than the reference cultivars in the test weight data base. Kernel weight was average. Milling quality was good and flour granularity was normal. Cookie spread was good and flour protein may be a slightly elevated. Gluten strength was strong and had similar lactic acid SRC to Pioneer 25R26.

Flint

The origin of Flint wheat was undetermined. It was known to be an old wheat of the eastern U. S. The early names for the variety and the literature concerning them were very confusing. A White Flint, claimed to have been introduced from Spain in 1814, which became widely grown in the Eastern States from 1830 to 1850, was described by Harmon as awnless, with white glumes and hard white kernels. There was no winter wheat of that description grown in the early 1900's, and the Flint wheat that was in cultivation in the early 1900's had red kernels and was similar to wheat known as Little Red May, Early May and Rappahannock. These were all old names in American wheat literature.

Little Red May was brought into Tennessee by Joseph Jacobs from Missouri, no doubt having been taken there from Kentucky or Virginia. In some sectors of Missouri, Little Red May had become a very popular variety. Early May was listed as a variety grown in Iowa as early as 1852 which later became an important variety in that state. At least some of the wheat grown under that name was Flint. The same was true for Rappahannock, which also was synonymous with Red May and in 1875 was recorded as synonymous with Michigan Amber.

Rappahannock and Red May were reported by J. J. Collins, Spartanburg, South Carolina, as synonymous names for a wheat similar to Flint which had been grown for 25 years in that vicinity. Rappahannock was also reported from Oregon County, Missouri.

J. Allen Clark reported in 1919 that Flint was also known as Early May, Little May, Little Red, Little Red May, May, Rappahannock, Red Davie and Red May. The name Early May had long been used for Flint wheat. It was reported under that name in Alabama, Arkansas, Illinois and South Carolina. Little May was reported from Platte County, Missouri, and Little Red from Arkansas, Georgia, North Carolina, Tennessee and Virginia. Little Red May and May were occasionally used for Flint wheat. Red Davie was a local name for Flint in Surry and Wilkes Counties, North Carolina. According to J.B. Fells, Red Davie had been grown for 50 years in the vicinity of Elkin, North Carolina.

Flint was grown on 97,200 acres of the east-central United States in 1919. It was distributed in Alabama, Arkansas, Georgia, Illinois, Missouri, North Carolina, Ohio, South Carolina, Tennessee, Virginia and West Virginia. Flint was grown on 3,185 acres in 1959. Flint was acquired from the National Small Grains Collection in 1986. A separate sample was received from North Carolina in 1991 (presumably obtained from the National Collection). Those samples of Flint were grown several years in Wooster, Ohio, where the yields were 50% lower than the yields of the contemporary cultivars.

Flint had very good milling properties. 1000-kernel weight averaged 34 grams. The baking quality (sugar snap cookie) was not very good. Protein content was about 2 percentage points higher than the modern cultivars which may have contributed to the reduced cookie spread. Flour granularity was a little coarser than most contemporary cultivars and corresponded to that of Arthur, Delta Queen and FFR 566W. Gluten strength was about medium.

FS 530

FS 530 was released by the Illinois Crop Improvement Association. Test weight may be about 1.5 pounds above the reference wheats. Kernel weight and cookie spread were average. Milling quality was very good having a mill score of 75. Flour granularity was extremely fine placing FS 530 in a group with other super-fine granulating cultivars possessing a trait that has been very uncommon. Gluten strength was about medium.

Fulcaster

Fulcaster was one of the most popular and widely grown varieties of soft red winter wheat in the United States. According to Carleton, "Fulcaster was produced in 1886 by S. M. Schindel, of Hagerstown, Maryland, and is a hybrid between Fultz and Lancaster," the latter being a synonym for the Mediterranean variety.

Fulcaster was grown on 2,600,000 acres in 1919 under the name of Fulcaster or as one of its many synonyms in Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Maryland, Mississippi, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia and West Virginia. By 1959, Fulcaster occupied 59,000 acres. Numerous synonyms for Fulcaster were identified in 1919 as Acme, Acme Bred, Bearded Bluestem, Bearded Purplestraw, Blankenship, Blue Ridge, Bluestem, Canadian, Champion, Corn, Cumberland Valley, Dietz, Dietz Longberry, Dietz Longberry Red, Ebersole, Eversole, Egyptian Amber, Farmers Friend, Georgia Red, Golden Chaff, Golden King, Greening, Improved Acme, Ironclad, Kansas Mortgage Lifter, Kentucky Giant, Lancaster, Lancaster-Fulcaster, Lincoln, Martha Washington, Michigan Red Line, Moore's Prolific, Number 10, Price's Wonder, Red Wonder, Turkish Amber, Tuscan Island and Winter King.

Stoner was a variety introduced under suspicious circumstances. Because extravagant claims were made about it, there apparently was a desire from many to acquire Stoner and rename it; it became known under many different names. Stoner was identified in 1919 as being Fulcaster. An interesting historical account of Stoner follows near the end of brief descriptions concerning other synonyms. Stoner was also known as Eden, Famine, Forty-to-One, Goose, Half Bushel, Kentucky Wonder, Marvelous, Millennium, Millennium Dawn, Miracle, Multiplier, Multiplying, New Light, New Marvel, Peck, Russellite, Russell's Wonder, Stooling, Two Peck, Three Peck and Wonderful.

Acme and **Acme Bred** were names applied to strains of Fulcaster by S. M. Schindel, seedsman, of Hagerstown, Maryland, about 1911.

Bearded Bluestem, **Bluestem** and **Bearded Purplestraw** were names used for Fulcaster because the variety had purple stems.

Blankenship was reported in Missouri to be "very hardy", almost fly-proof, branched well and laid close to the ground in winter.

Corn was used for Fulcaster in Cumberland Valley, Pennsylvania. Corn wheat, however, usually referred to Polish wheat.

Dietz Longberry was reported to have been originated by George A. Dietz, of Chambersburg, Pennsylvania. The earliest record of the wheat was under the name "Dietz" and was included in variety experiments at the Ohio Agricultural Experiment Station in 1884. Dietz was later called Dietz Longberry and subsequently as **Dietz Longberry Red**. The true origin of Dietz and Fulcaster was somewhat obscure. The former had the earlier published history. However, according to N. Schmitz, formerly of the Maryland AES, Mr. Schindel claimed that Mr. Dietz merely gave the name Dietz Longberry to his Fulcaster wheat. Some wheat reported as Dietz was Mediterranean.

Georgia Red was the name under which Fulcaster wheat was distributed by H. G. Hastings & Co., seedsmen, of Atlanta, Georgia.

Lancaster was a name often wrongly applied to Fulcaster wheat. Lancaster-Fulcaster was a name of Pennsylvania origin applied by A. H. Hoffman, seedsman, of Landisville, Pennsylvania, to Fulcaster wheat grown in Lancaster County, Pennsylvania.

Price's Wonder was the name of a wheat identical to Fulcaster which was distributed for the first time in 1913 by A. H. Hoffman, of Landisville, Pennsylvania. Mr. Hoffman gave the following account of its origin: "Price's Wonder was originated by Prof. R. H. Price, of Virginia, who worked with it five years, during which it yielded one-third more wheat than other kinds of wheat growing under like conditions."

Red Wonder was the name under which Fulcaster wheat had been distributed by T. W. Wood & Sons, seedsmen, of Richmond, Virginia, since about 1903. The name Red Wonder, however, was recorded for a wheat of unknown character as early as 1892.

Stoner could not be distinguished from Fulcaster by any character. The history of Stoner was recorded by Ball and Leighty as follows: "Stoner originated on the farm of Mr. K. B. Stoner, of Fincastle, near Roanoke, Virginia. It was brought to the attention of the USDA through a letter from Mr. Stoner, dated June 8, 1906. In the spring of 1904 Mr. Stoner noticed a large bunch of grass in his garden; when headed, it proved to be wheat. It had 142 stems, or tillers, and he became impressed with the idea that it was a very wonderful wheat. Just how the kernel of wheat became sown in the garden or from just what variety it came Mr. Stoner does not know. The Fulcaster variety was commonly grown in that section of Virginia, however, and the Bearded Purplestraw less commonly. It is reasonable to suppose, therefore, that the Stoner wheat is a pure line from one of these varieties."

Mr. Stoner increased his seed during the two years, 1905 and 1906, and distributed it in 1907, usually under the name "**Miracle**". Many extravagant claims were made for it by Mr. Stoner and agents who handled the seed. Because of those claims it afterwards became known under many other names. During 1911 and 1912 the variety was advertised and sold at \$1 a pound by the Watch Tower Bible and Tract Society of Brooklyn, New York, under the leadership of "Pastor" Russell. The names **Eden, Famine, Millennium, Millennium Dawn, New Light, Russellite** and **Russell's Wonder** were the result of the advertising and distribution by "Pastor" Russell, who claimed the wheat to be a creation in fulfillment of Biblical prophecy which would replenish the earth.

The name **Eden** was used to imply that the wheat came from the Garden of Eden. **Forty-to-One** was the name that became applied to Stoner wheat with the inference that that was the ratio of its increase from the seed sown. The names **Half Bushel, Multiplier, Multiplying, Peck, Stooling, Two Peck** and **Three Peck** became widely applied to the Stoner variety on account of the claims made by Mr. Stoner that the wheat had such remarkable tillering or stooling powers that only a small quantity of seed was necessary to sow an acre.

Marvelous was a name used for Stoner wheat by J. A. Everitt (O. K. Seed Co.), Indianapolis, Indiana, in 1908 and later. **Wonderful** was the name used for Stoner in Kansas.

Fulcaster was obtained from the National Small Grains Collection, Beltsville, Maryland, in 1987. Fulcaster yielded about 62% of the yield of the contemporary cultivars with which it was grown in 1999. Its genetic test weight would be about 2 pounds greater than the zero-reference cultivars listed in the normalized test weight tables. The one-thousand kernel weight was large with 37.5 grams. Fulcaster had very good milling properties and average softness. The flour protein was high at 11.4%, but baked sugar snap cookies were of descent spread. The gluten strength for Fulcaster was weak.

Fultzo-Mediterranean

The origin of Fultzo-Mediterranean was not definitely known. Many synonyms were used for the variety, one of which may be the original name. The variety was first distributed as Fultzo-Mediterranean by Everitt's O. K. Seed Store, Indianapolis, Indiana, in 1898. The variety was evidently named by that firm, and it was claimed by them to have originated from a cross between Fultz and Mediterranean. The following statement concerning its origin was made in their catalogue in 1899:

“Married.—Two Noble Old Families Joined in Wedlock—Mr. Fultz to Miss Mediterranean. Their first-born is well named, Fultzo-Mediterranean, and is a worthy offspring from Noble Stock.”

Fultzo-Mediterranean showed no indication of having been derived from Mediterranean, although it had many of the characters of Fultz. Fultzo-Mediterranean was very distinct from Fultz in having very strong stems and erect, dense, clavate spikes. Neither of the alleged parents had the clavate spike of the Fultzo-Mediterranean.

Fultzo-Mediterranean was grown on 287,900 acres in 1919. In 1949, it occupied 2,010 acres and ten years later was not reported by growers. In 1919, the variety was grown in Delaware, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Missouri, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia.

Synonyms for Fultzo-Mediterranean in 1919 were; Burrhead, Club, Club Head, Columbia, Double Head, Duck Bill, Early Ontario, Economy, Farmers Pride, Flat Top, Four-Row Fultz, Harper, New Columbia, Scott’s Squarehead, Square Head, Square Top, and Stud Head. Of these, the names Burrhead, Club, Club Head, Double Head, Duck Bill, Flat Top, Square Head, Square Top, and Stud Head were names used for Fultzo-Mediterranean in several of the Eastern States, particularly North Carolina, Virginia, and West Virginia. In that section it was often wrongly referred to as Club wheat.

The names Columbia and New Columbia were known to be old names for the variety. In fact, New Columbia was used for the variety by Everitt in the same year he first distributed it as Fultzo-Mediterranean and evidently also before that time, as the following quotation was from the same catalogue as the quotation about the Noble Families:

“An Illinois production and first made public the year of the great World’s Fair. Too much cannot be said in its praise for hardiness, vigorous growth, and productiveness. In short, it has great merit and is entitled to be called our national wheat, as it bears our national name. Smooth head, white chaff, plump red grains. Wherever sown it makes friends.”

New Columbia was reported grown in Illinois, Indiana, Kentucky, Missouri, North Carolina, Ohio, and Tennessee.

Early Ontario was the name under which wheat similar to Fultzo-Mediterranean was obtained from the Ohio Agricultural Experiment Station in 1916. A wheat of unknown characters was obtained under that name by the United States Department of Agriculture in 1902 from William Rennie, seedsman, of Toronto, Canada. Early Ontario was not reported in the varietal survey of 1919.

Four-Row Fultz was a name under which Fultzo-Mediterranean was advertised and sold by A. H. Hoffman, seedsman, of Landisville, Pennsylvania, and was reported grown in that state. A sample of Four-Row Fultz was obtained from that source in 1913.

Scott's Squarehead was the name under which a sample of wheat similar to Fultzo-Mediterranean was obtained from the Kansas Agricultural Experiment Station in 1916. Its further history was undetermined and it was not reported in the survey.

In 1987, a 5-gram sample of Fultzo-Mediterranean (CI # 4811) was acquired from David Smith, curator of the National Small Grains Collection. The variety was grown in Wooster, Ohio, over six seasons. In conjunction with a private industrial research organization, Fultzo-Mediterranean was selected as one of 88 varieties/cultivars, because of specific quality traits, and was grown in three States for the 2003 harvest. The project will continue for at least two more years.

Fultzo-Mediterranean had fair milling properties similar to the milling quality of Ernie, Hoffman 14, Hopewell and Pioneer 25R18. The 1000-kernel weight averaged 36.6 grams. Flour granularity was typical for soft wheat and similar to that of Coker 9152, Foster and Mallard. Flour protein was about 1 percentage point higher than contemporary cultivars. Sugar snap cookie spread was about 1 cm smaller than most modern soft wheats. Flour protein was not great enough to account for the very small cookies, but there is a tendency for cookie spreads to be smaller as milling quality lowers. AWRC was higher than most soft wheat cultivars, which may, in addition to the lower milling quality, contribute to the small cookie diameter. The variety displayed medium gluten strength.

Gipsy

The origin of Gipsy wheat was undetermined. It was grown in Missouri as early as 1877 and at the Ohio Agricultural Experiment Station by 1888. There was a tradition that the name was given the variety because it was first obtained from a gipsy (British variant).

Gipsy was grown on 122,500 acres in 1919 and only occupied 1,255 acres by 1949. Gipsy was distributed in 1919 in Arkansas, Delaware, Illinois, Indiana, Kansas, Kentucky, Michigan, Missouri, New Jersey, Ohio, Pennsylvania, Virginia and West Virginia.

Synonyms for Gipsy were Defiance, Egyptian, Farmers Friend, Golden Straw, Grains o'Gold, Gipsy Queen, Lebanon, Niagara and Reliable.

Defiance was the name under which a wheat practically identical with Gipsy was obtained from the Missouri Agricultural Experiment Station in 1913. Defiance probably was wrongly applied to the acquired wheat as the writers were not able to find any other record of such application. Grains o'Gold was a name applied to a mixed lot of wheat by the J. A. Everitt Seed Co. (O. K. Seed Store), Indianapolis, Indiana, that was distributed about 1912. They stated it was originated by E. K. Adams, of Allendale, Illinois. The samples contained a considerable proportion of Gipsy with admixtures of Fulcaster, Fultz and Fultzo-Mediterranean.

Lebanon was similar to Gipsy though it appeared to have a slightly harder kernel. Its origin was undetermined but had been grown by the Ohio Agricultural Experiment Station since about 1893.

Reliable was a wheat of undetermined origin, practically identical with Gipsy. It was grown by the Ohio Station as early as 1888.

Gipsy was acquired from the National Small Grains Collection, Beltsville, MD, in 1987 and was grown a few different years with contemporary cultivars of the 1990's. Gipsy had unusually high test weight averaging about 4 pounds higher than the reference cultivars found in the normalized test weight table. The kernel size was fairly small with 32 grams per thousand kernels. It had very good milling quality with average softness. The cookie spread was respectable considering the average flour protein of 10.4%. Gipsy had weak gluten strength.

Gladden

In the publication "Ohio Farmer", in 1920, Professor C. G. Williams of the Ohio Agricultural Experiment Station stated that Gladden wheat originated from a single head of wheat selected from a field of Gipsy wheat in 1905, and was first grown in 1906 under the number 6100. 6100 was grown in head rows along with Gipsy, Fultz, Poole and other varieties. Head selection 6100 had many of the characteristics of Gipsy wheat, being bearded, having a white chaff and red kernels. Professor Williams consulted the old notebooks from 14 years earlier and found that 6100 was described as "very erect" in growth, the words were underscored, and given the highest rank for stiffness of straw of any of the Gipsy rows, and as high a rank as any row in the test. Williams indicated that photographs were taken in 1907, 1910, and 1915 which showed more than ordinary stiffness of straw. In-so-far as yield was concerned, Williams stated that it had to stand high from the start or be cast aside. A vast majority of the heads tested were weeded out each year due to ordinary yield.

In milling and baking tests in 1915 the Gladden showed superior qualities. (The milling test was likely carried out at the Ohio Experiment Station since they had purchased two Allis-Chalmers roll stands in 1909. Milling data gleaned from lab reports from the early 1940's of the Soft Wheat Quality Laboratory confirmed that Gladden was one of the best milling soft wheat varieties in the United States.)

Williams added that the variety passed along under the name 6100, until 1915, when it was thought best to give it a real name in order to prevent confusion, since it had been distributed quite a little over Ohio. It was named for Washington Gladden, a man who was not associated with agriculture particularly, but he was the most useful citizen Ohio had for many years.

In 1919, Gladden was grown on about 7,700 acres in Ohio. Gladden had reached its peak by 1924, but was an insignificant variety. By 1949, it was essentially gone from production while Gipsy was still being grown on about 1,255 acres in 1949.

Gladden was acquired from the National Small Grains Collection in 1986, but did not survive the Ohio winter when grown even though protected. It may be that due to favorable climatic circumstances in the early 1900's Gladden was not identified as being insufficient for winter hardiness and that may be the reason it did not become a more popular variety. Another request from the National Collection for Gladden in the late 1980's was not successful since there was limited seed. However, after a recent inquiry, Dr. Harold Bockelman was able to provide a 5-gram sample of Gladden for 2004 fall multiplication.

Goens

The Goens variety, under the names Red Chaff and Red Chaff Bearded, had long been known in the United States. According to John Klippart, who wrote in 1857 an essay on the origin, growth, diseases and varieties of the wheat plant, Goens was "cultivated in Clermont County, Ohio, for upwards of 50 years." He further stated that the origin of the name Goens was undetermined. Wheat under the name Goens was first obtained by the United States Department of Agriculture in 1912 from Indiana Agricultural Experiment Station through Cornell University.

Goens was said to have been introduced into Muskingum County, Ohio, by John Dent in 1808. The Red Chaff wheat mentioned earlier, however, may have actually been the Mediterranean variety as Goens had been said to be a cross between Mediterranean and Gipsy made by a man named Goens in Ohio and afterwards developed by his son.

The authors apparently wrote to Russell G. East who was the Shelby County agent located in Shelbyville, Indiana, concerning the introduction of the Goens variety (but synonymously named Shelby Red Chaff) into Shelby County, where it was the leading variety. Russell G. East responded: "Answering your inquiry regarding Shelby Red Chaff wheat. In 1887, a man named Hall (J.M.Hall) living at Fountaintown, in this county, purchased a carload of seed wheat in Paulding County, Ohio.

From this start this variety has become the common variety grown throughout the county and has been known locally as Hall, Red Hall, Red Chaff, and Red Chaff Bearded." Goens has purple straw and the spikes tend to shatter more easily.

In 1919, Goens was grown on 132,600 acres in Indiana, Michigan and Ohio, and under names of synonyms in Illinois and Pennsylvania. Goens was still being grown on more than 110,000 acres in 1949. By 1959, nearly 150 years after its beginnings, Goens was occupying about 7,000 acres.

Goens, around 1919, was also known as Baldwin, Cummings, Dunlap, Dunlop, Going, Hall, Miller's Pride, Owen, Red Chaff, Red Chaff Bearded, Red Hall and Shelby Red Chaff. The name Baldwin was used locally for Goens wheat in Madison, Pickaway and Union Counties in Ohio.

Cummings was the name of a wheat apparently identical with Goens which had been grown for two years in the vicinity of Tippecanoe City, Miami County, Ohio, and constituted 50 per cent of the wheat of that vicinity, according to C. A. Studebaker, of that place.

Dunlap was the name under which a sample of wheat identical with Goens was obtained from the Indiana Agricultural Experiment Station in 1913. Dunlap or Dunlop was also grown under that synonym for Goens in Indiana, Ohio, and Pennsylvania. In Fayette and Rush Counties, Indiana, Dunlap was extensively grown.

The names Going and Owens were commonly used on Ohio farms for Goens.

Hall and Red Hall were names used for a wheat identical with Goens in Indiana, particularly in Hancock and Shelby Counties, where it was extensively grown and had been grown for 10 to 15 years. According to J. E. Barrett, of Fortville, Indiana, the variety was named Hall for J. M. Hall, the man who first took the wheat into Hancock County.

Miller's Pride was identical with Goens and was grown in Berks County, Pennsylvania. A sample of Miller's Pride was first obtained by the United States Department of Agriculture in 1912 from Cornell University, which in turn obtained it from the Indiana station.

Red Chaff and Red Chaff Bearded are old names and were most commonly used for Goens wheat in Indiana, Illinois and Ohio in the early 1900's. Red Chaff had been reported from several other States, but as that name was used for other varieties, the distribution of Goens wheat as Red Chaff could not be definitely determined.

Shelby Red Chaff was the name adopted by the farm bureau executive board of Shelby County, Indiana. Goens (CI # 4857) was acquired in 1986 from the National Small Grains Collection when it was located at Beltsville, Maryland. Goens was grown in Wooster four different years with a few hundred contemporary cultivars. The yield was about 60% of the modern cultivars. The 1000-kernel weight was quite typical at 35.6 grams. Test weight seemed to be similar to AGS 2000, Century II, Coker 9663 and Pioneer 26R24.

Goens displayed superior milling properties similar to Beck 108, Daisy, Southern States 520 and Pioneer 25R23. Flour granularity was similar to the cultivars AGS 2000, MacKinnon, McCormick and Roane. Flour protein appeared to be very typical in comparison to modern cultivars even though the field yield was lower. AWRC values were also typical for soft wheat and Goens produced sugar snap cookies with spread diameters that were very large.

Gold Drop

Gold Drop was apparently the old English variety usually referred to as Golden Drop. Koernicke and Werner stated that that variety was bred in 1834 by a Mr. Gorrie, at Annat Garden in Great Britain. It had been grown in the United States for many years, being mentioned by Rawson Harmon, of Wheatland, Monroe County, NY, in 1843.

The wheat was obtained for testing sometime prior to 1919 from IZard County, AR, where farmers stated that it had been grown for at least 25 years. An improved strain of Golden Drop, called Hallet's Pedigree Golden Drop, was used by Cyrus G. Pringle as one of the parents of Defiance.

Gold Drop was still being grown in 1919 on about 1,600 acres, nearly 80 years after its introduction to the United States. It was distributed in Arkansas, Missouri and Pennsylvania.

The only other names for Gold Drop were Golden Drop and Littleton. Littleton was found only in Humphreys County, Tennessee. A bearded spring wheat called Gold Drop was reported in Iowa.

Gold Drop was acquired from Dr. David Smith, curator, National Small Grains Collection, in 1986. In comparison to contemporary cultivars from the late 1990's, Gold Drop yielded slightly less than 50%. The normalized test weight placed it in the same category as Roane. It had good milling properties but produced coarse granulating flour. The cookie spread was small likely due to the coarse flour granulation and high average flour protein of 11.1%. Gold Drop had very low gluten strength.

Sometime during the 1990's, a Canadian museum curator, who was responsible for restoration of early to mid 1800's paintings, approached the SWQL concerning the unlikely possibility of acquiring historic wheat varieties that would have been grown during the early to mid 1800's. They had already exhausted their search in Great Britain and Canada. Flour of that era was utilized in making artists' paint. The museum had hoped, although they had not expected, to find varieties that were common to the era. Gold Drop was one of the varieties given to the museum by the SWQL. Locating those historic varieties enabled them to formulate paint for "authentic" restoration purposes.

Goldcoin

Goldcoin was probably a descendant from the Redchaff or Redchaff Bald wheat mentioned in early agricultural literature. Redchaff was also known as Genesee Redchaff. Genesee Redchaff was a bald, white wheat, first cultivated in the Genesee Valley region in 1798, and for a long time, was the decided favorite. After 1820, however, it was reported to have been very subject to rust and blast, but when circumstances were favorable it was found to be highly productive. Its transfer to other localities was thought to be attended with great success.

Soules was an early name applied to Goldcoin. Soules was described in the first edition of the New Genesee Farmer in 1840 as being discovered in a field of White Flint by Jonathan Soule, of Perrington (Monroe County), New York. The wheat became well established in New York in the late 1840's and by 1857 was an important variety in Ohio. About 1897 that wheat or a selection from it became known as New Soules. Soules and New Soules were reported in 1919 from Michigan.

Clawson, or White Clawson, had been found to be identical with Goldcoin, but the name had a much earlier origin. In 1900, according to Carleton, Clawson was said to have originated in Seneca County, New York, in 1865 through the selection of certain superior heads from a field of Fultz by Garrett Clawson. On planting the grain from the selected heads, both a white-and red-grained sort resulted. A pint of the white wheat produced 39 pounds the following season. Three years later 254 bushels were harvested and distributed to other farmers. In 1871 that variety took first premium at the Seneca County Fair. Though judged inferior by millers at times, this variety had become a very popular one.

The Goldcoin variety itself was reported by Carlson (1900) to have been produced by Ira M. Green, at Avon, New York, about 1890 in the following manner: "Mr. Green grew a field of Diehl Mediterranean, a bearded, red-grained wheat, and while passing through the field one day found a bald head possessing white grains. Planting every grain of this head, he found as a result next season that he had heads with very long beards, some with short beards, and others with none at all. The grain also was mixed, some red and some white. He desired the bald wheat—hence, only the grains from the bald heads were again planted. From this as a beginning, a practically new variety resulted. Various names had been given to it by different seedsmen, but it is best known by the name Gold Coin."

By 1919, Goldcoin occupied 947,000 acres in California, Colorado, Connecticut, Idaho, Illinois, Indiana, Kentucky, Michigan, Montana, Nevada, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Utah, Virginia, Washington, West Virginia, Wisconsin and Wyoming. Goldcoin was grown on 892,371 acres in 1929. In 1984, Goldcoin was still being grown on 2,248 acres in Oregon.

Goldcoin was a popular and widely adapted variety. By 1919, Goldcoin was identified as Abundance, American Banner, Clawson, Eldorado, Fortyfold, Golden Chaff, Gold Bullion, Gold Medal, Goldmine, Improved No. 6, International No. 6, Junior No. 6, Klondike, New American Banner, New Soules, Niagara, Number 6, Oregon Goldmine, Plymouth Rock, Prizetaker, Prizewinner, Rochester No. 6, Soules, Superlative, Twentieth Century, White Century, White Clawson, White Eldorado, White Rock, White Russian, White Soules, White Surprise and Winter King.

Abundance was a variety apparently identical with Goldcoin, which was introduced by L. P. Gunson & Co., Rochester, New York, about 1894. The variety had been purchased from A. N. Jones.

American Banner and New American Banner were names under which Goldcoin was best known in Canada. American Banner was identified by J. Allen Clark as being synonymous with Goldcoin.

American Banner (CI # 6943), Dawson (CI # 3342) and Goldcoin (CI # 4156) were grown together in the Soft Wheat Quality Laboratory plots. American Banner was very large-kernelled in contrast to Goldcoin and Dawson. The tip awns of American Banner were quite long while the tip awns for Goldcoin were very short. Goldcoin exhibited a clavate spike but American Banner did not.

Fortyfold was the name under which Goldcoin was distributed by Peter Henderson & Co., seedsmen, of New York City, as early as 1899. Klondike was the name under which the same wheat was distributed by J. M. Thorburn & Co., New York City, in 1908. No. 6 was applied to this wheat by Hickox-Rumsey Seed & Co., Batavia, New York. It was claimed by Mr. Rumsey that the name No. 6 antedated Goldcoin. International No. 6, Rochester No. 6, and possibly Improved No. 6, are names under which the variety was distributed by the International Seed Co., of Rochester, New York. The distribution of the variety under these names seems to date from about 1908. The Junior No. 6 was said to be an improved strain of No.6, but was identical with Goldcoin. It was named and distributed by the Hickox-Rumsey Seed Co. Prizetaker was the name used for the variety by the John A. Salzer Seed Co., of La Crosse, Wisconsin, as early as 1897, and possibly prior to that time.

Goldcoin was acquired in 1986 and eventually grown with contemporary cultivars in Wooster, Ohio, over several years and was also grown one year by Dr. Mark Sorrells at Cornell University. It was a very good-milling and -baking variety of medium size grain according to 1000-kernel weight. The granularity seemed to be similar to Pioneer 26R46, Mountain AC, AGS 2000, Century II and Sisson. Flour protein was about 1.5 percentage points higher than contemporary cultivars. Even though the flour protein tended to be somewhat high, the sugar snap cookie spread diameter was very large. The gluten strength was very weak.

Grandprize (St. Louis Grand Prize)

Grandprize was originated by A. N. Jones, of Le Roy, New York, between the years 1900 and 1908. It was distributed by Peter Henderson & Company, seedsmen, of New York City, in 1910. The wheat derived its name from the fact that Mr. Jones received a grand prize for his cereal exhibit at the St. Louis Exposition in 1904. Grandprize was said to have strong stems and had an unusual characteristic in having pubescent glumes.

The variety was grown on 34,100 acres in 1919 in Georgia, Illinois, Indiana, Kentucky, Michigan, New York, Ohio and Pennsylvania. There were about 7,300 acres in 1939 and no reported acreage by 1949.

Synonyms for Grandprize were Bull Moose, Golden Chaff, New Genesee and Velvet Head.

Bull Moose was a name used only in Crawford County, Illinois.

Golden Chaff was a name used for Grandprize in Indiana. New Genesee was the name under which a wheat similar to Grandprize was obtained from the Wisconsin Agricultural Experiment Station, Madison, Wisconsin in 1917. Its origin was not known and was not pure. New Genesee was not known to be commercially grown. Velvet Head was a name used for Grandprize in Kentucky.

A sample of Grandprize was acquired from the National Small Grains Collection and multiplied. Milling quality was very good and similar to Caldwell, Douglas, Sisson and Stine 454. Grandprize had very soft kernel texture, low protein, low AWRC and good cookie spread. The gluten strength was not able to be ascertained on the mixograph since flour protein was low.

Greeson

The history of the soft white variety Greeson had been recorded by J. T. Wagoner, county agent of Guilford County, North Carolina. It stated that George Greeson of that county found a plant of wheat growing beside an old stump in his apple orchid in 1896. He increased the seed and distributed it under the name Wild Goose. After Mr. Greeson's death in 1899, the variety was called Greeson.

Another account by W. H. McLean, of Whitsett, North Carolina, stated the variety originated by a man whose name was Greeson, and had been grown in Guilford County for a number of years and was very popular. He reported that it constituted 40 per cent of the wheat grown near Whitsett, Guilford County, North Carolina, in 1919. Greeson, in 1919, was grown in Chatham, Randolph and Guilford Counties, North Carolina on about 5,100 acres. Its peak was between 1924 and 1944 likely averaging around 10,000 acres each year. In 1959, Greeson was grown on about 300 acres.

Synonyms for Greeson were Greensboro and Gleason. Seed of Greeson was obtained at a fair held at Greensboro, North Carolina, and therefore became known as Greensboro. Greensboro became widely grown in Randolph County, North Carolina.

No information could be found concerning Gleason but was likely a mispronunciation of Greeson.

In the late 1980's, Greeson was acquired from the National Small Grains Collection. It was very large-kernelled at 40.6 grams. Mean quality data for two crop years indicated that Greeson had superior milling properties.

Greeson was rather coarse in granulation and had flour protein of 10.1%. Nearly always, superior milling cultivars/varieties produce large cookie spread even though flour protein may be elevated. However, Greeson yielded small sugar snap cookies. AWRC was typical for soft wheat. Gluten strength was medium weak.

Hanover

This cultivar would seem to be a hard red winter wheat after milling evaluation at the Soft Wheat Quality Laboratory. Hanover has outstanding milling characteristics and appeared to be about medium-strong in gluten strength based on lactic acid evaluation. Hanover was about 2 percentage points higher in protein than the reference cultivars.

Hopewell

HOPEWELL is a soft red winter wheat variety developed by the Ohio Agricultural Research and Development Center. It was released in 1994 because of its high yields, diverse genetics, disease tolerance, standability and medium maturity. Hopewell is beardless and has red chaff at maturity. It is moderately resistant to *Septoria nodorum*, but carries no Hessian Fly resistance gene.

HS222R

This soft red cultivar was from Harrington Seeds. Genetic test weight will likely be about 1.0 pound above the reference cultivars. Kernel weight was above average and milling quality was excellent having a mill score of 78. Caledonia, Coker 9375, Renwood 3706 and Southern States 8404 were cultivars that had similar milling quality. Flour granularity was extremely high at 38.4%. Very few cultivars had that kind of softness. The average soft wheat Allis-Chalmers break-flour would be about 32%. Cookie spread was very good and gluten strength was slightly above medium.

HS243R

This Harrington Seeds cultivar had a test weight that would be similar to those cultivars in the 61.0 pound normalized group. Kernel weight and cookie spread were about average while break-flour yield was coarse at 27.9%. Milling quality was excellent and nearly paralleled HS 222R, Coker and Renwood 3706. Gluten strength was medium-strong and was similar to Coker 9553, Pioneer 25R54 and Roane.

Husky

Husky, a soft red winter wheat, has high test weight genetically that will average about 1.8 pounds above the reference cultivars. This cultivar was about medium in gluten strength.

INW 0101

INW 0101 was released into Indiana and has a normalized test weight of 2.3 pounds and would be similar to AGS 2000, Ariss and Featherstone 520. The gluten strength was medium.

INW 0123

This cultivar was small kernelled at 30.4 grams and has medium gluten strength.

Illini Chief

Illini Chief was reported to be similar in appearance to Red May having brown glumes but being slightly taller and later. Illini Chief was said to be very resistant to Hessian fly injury. Illini Chief was first distributed in the fall of 1915, by E. L. Gillham, Edwardsville, Illinois. He advertised the variety as resistant to Hessian fly, stating “that it does practically resist Hessian fly attack.” Further history of Illini Chief wheat recorded that Ed Gillham, who was the first man to grow the wheat, bought the seed in 1906 from a neighbor by the name of Finley, and it was still known as Finley wheat in Madison County. However, a second article in the Prairie Farmer by Dr. S. A. Forbes, State Entomologist of Illinois, stated “Mr. Gillham has traced his original stock to an Ohio farmer, who called it Early Carlyle.”

Illini Chief, in 1919, was grown on about 21,300 acres in Illinois, Kansas, Missouri and Ohio. Very little acreage was reported in 1924. Illini Chief was known as Finley in 1919 and historically as Early Carlyle.

Finley was reported in 1919 from Kansas, Missouri and Ohio. The name Finley had been in use in the early 1880's for an awnless variety with white glumes and red kernels. That particular wheat had disappeared from cultivation by 1919.

Early Carlyle was not able to be acquired in 1919 and it was presumed to be out of production.

Illini Chief was obtained from the National Collection, multiplied with contemporary cultivars and its quality traits determined. Milling quality was not very good. Additionally, flour granulation was very coarse so one would have expected the sugar snap cookie spread to be poor. Flour protein was relatively high at 11.2% which would also limit cookie spread. However, the cookie spread was not that small.

Jones Fife (Jones Winter Fife)

Jones Fife was originated by A. N. Jones, of Newark, Wayne County, New York, in 1889. According to Carleton, in 1916, “it descended from Fultz, Mediterranean, and Russian Velvet.” Jones Fife was said to make comparatively weak flour for bread making.

The variety was grown as Fife, Jones Fife, or Jones Winter Fife on 476,100 acres in 1919, in Idaho, Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, Montana, Ohio, Pennsylvania, Utah, Virginia, Washington, and West Virginia. It was grown as Silver King and under other names in Colorado and Wyoming. Jones Fife had occupied 20,064 acres in 1949. By 1959, it was grown on only 2,059 acres. Jones Fife, in 1919, was also known as Burbank's Super, Canadian Hybrid, Crail Fife, Fife, Fishhead, Silver King, Super, Velvet Chaff, and Winter Fife.

Burbank's Super, or Super wheat, was distributed by Luther Burbank, of Santa Rosa, California, in the fall of 1917. The following was Mr. Burbank's first statement regarding that variety, published in August, 1917, in his catalogue under the title The New Burbank Wheat:

"It is with unusual satisfaction that I now offer for the first time a limited quantity of my new wheat; the best result of 10 years of most careful and expensive experiments. It has been tested alongside of 68 of the best wheats of the world, and has excelled them all in yield, uniformity, and other desirable characteristics; the growth is strong, 4 feet on good ordinary soil, tillers unusually well, and on ordinary valley soil, without special cultivation, care, or fertilizing, this summer produced at the rate of forty-nine and 88-100 bushels per acre, every plant and every kernel uniform, as this wheat was originally all grown from one single kernel.

Even at present prices of ordinary wheat for milling purposes, it will be readily seen that the crop of each acre would purchase an acre of the best wheat land. The small field of this new wheat has been the wonder and surprise of thousands who have seen it, nothing like it in uniformity and beauty ever having been seen before. The cut shows the exact size and appearance of the long, smooth, white, well-filled heads.

Every kernel is guaranteed uniform and correct to type. This, like all other wheats grown in California, is a winter wheat and should probably be generally treated as such, and will, no doubt, thrive better in new localities after it becomes acclimated by one or two seasons' growth.....The best successes of my customers are also my own, and the whole wheat crop of America will soon be enormously increased if this new "Burbank" wheat is generally sown."

Mr. Burbank further advertised and distributed the wheat as Super wheat in 1917 and 1918. Apparently most of his wheat stock was purchased and resold by the State Seed & Nursery Co., of Helena, Montana, at the price of \$5.00 per pound. They advertised it as a wheat adapted for both spring and fall sowing. It was then distributed in many sections where it was not adapted. East of the Rocky Mountains, Burbank wheat generally winterkilled when fall sown and remained prostrate on the ground throughout the growing season when spring sown, thus resulting in failure.

Burbank was not reported in the varietal survey of 1919. Luther Burbank's Super wheat was found to be identical with Jones Fife in all taxonomic characters, as well as in yield and in milling and baking quality.

Jones Fife (Jones Winter Fife) (cont'd)
Canadian Hybrid was similar to Jones Fife, except that it sometimes had a slightly longer and laxer spike. It was listed by John A. Salzer, seedsman, of La Crosse, Wisconsin, as early as 1895. John Salzer stated that it originated in Canada, on the farm of Clark Parker. Mr. Parker claimed to have the best crops of winter wheat in his section for a long time. He would acquire the best specimens of different sorts, and plant them together, and, thus, continuously improve his yield. He stated that he could not call any of those sorts pure, but could call the Canadian Hybrid enormously productive. It was reported grown in Illinois, Indiana, Michigan and Missouri.

Crail Fife was a local name applied to Jones Fife wheat in Montana. Frank Crail of Bozeman, Montana, was the name of the farmer who grew and distributed the variety under that name.

Fishhead was a wheat similar to Jones Fife. Samples were obtained from the Cornell University Agricultural Experiment Station.

Silver King was a name used for Jones Fife in Colorado and Wyoming. According to J. B. Hill, of Westridge, Colorado, it had been grown in that vicinity for 16 or 18 years.

Winter Fife, a part of the original name, often was used by growers to distinguish it from the well-known spring wheat called Fife.

Jones Fife (CI# 4468), was acquired from the National Small Grains Collection in 1986, from Beltsville, Maryland. The field yield was one of the better ones of the older varieties at about 67% of the field yield of the contemporary cultivars.

The 1000-kernel weight was about 35.0 grams. Jones Fife had excellent milling quality, but had granularity similar to a hard red winter wheat. Flour protein was approximately 1.0 percentage point above the modern cultivars. AWRC was very high for a soft wheat at 61%, but, not as high as a HRW wheat would be. The sugar snap cookie diameter (x 2) was 2 cm smaller (15.8cm) than the typical soft wheat. The slightly elevated flour protein was not high enough to account for the reduced cookie spread. In 1919, it was stated that Jones Fife was weak for bread baking. SWQL analysis of Jones Fife for gluten strength indicated that it was one of the weakest ever evaluated.

Kelley

The semi-hard white cultivar Kelley has slightly higher test weight than the reference cultivars. It has excellent milling quality and very coarse flour granulation. Flour protein was similar to typical soft wheat and the flour water absorption was low. Gluten strength was about average.

Leap (Leap's Prolific)

Leap was reported to have originated from a single plant found in a field of Mediterranean by the oldest son of J. S. Leap, of Virginia. From the five heads gathered in 1901, Mr. Leap increased the wheat until 1905, when he thrashed 190 bushels grown from 10 bushels of seed. T. W. Wood & Sons, seedsmen, of Richmond, Virginia, first distributed the variety as Leap's Prolific. General distribution of the wheat started about 1907 and became very popular.

Leap was grown on 513,000 acres in 1919 and reached its peak around 1929 with 673,000 acres. By 1959, Leap was still grown on 21,000 acres. The variety was distributed in Alabama, Connecticut, Delaware, Georgia, Illinois, Indiana, Kentucky, Maryland, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia and West Virginia.

Other names for Leap were Hastings Prolific, Woods Prolific and Woolf.

Hastings Prolific was a name used for Leap wheat in Alabama, Georgia and South Carolina.

Woods Prolific was used for the variety in Tennessee and Virginia. (Hastings Prolific and Woods Prolific were probably derived from the names of the seed firms selling it.)

Woolf was a name used for the Leap variety in Muhlenberg County, Kentucky.

Leap "selection" was obtained as a five-gram sample from the National Small Grains Collection in 1989 and another sample of Leap was acquired from North Carolina State University in 1992. Eventually, both samples were grown together where they seemed to be the same appearance-wise in the field and yielded the same quantity of wheat. The field yield was about 50% of the modern cultivars that were available in the 1990's. The quality data from both plots also seemed to be the same. Leap had moderately sized grain with 37 grams per thousand kernels. It had good milling quality with slightly below-average softness. Cookie quality was good considering the high flour protein. Gluten strength was below average.

MacMillian

Steyer Seeds of Ohio introduced this cultivar that will likely be about 1.5 pounds above the 60 pound category in the test weight tables. Kernel size may be slightly below average and break-flour yield was slightly above average. Cookie quality may be on the smaller side and gluten strength was slightly above medium.

Mediterranean

Reference to the Mediterranean variety in American literature began in 1842, when the variety was widely grown, with the statement that it had been introduced some years before. One writer said it was introduced into Maryland from the Mediterranean Sea region in 1837. However, in 1863 it was recorded that it was introduced in 1819 from Genoa, Italy, by John Gordon of Wilmington, Delaware. It came into prominence in New York between 1845 and 1855, from which time its culture spread rapidly westward.

Its early popularity, apparently, was gained because it was more resistant to Hessian fly damage than other varieties. It was found also to be several days earlier than the commonly grown wheats, such as the Flint, Bluestem, Red Bluestem, Golden Straw and other wheats grown at that time. It was called rust resistant probably because of its earliness, and was commended as a high yielder of especially heavy grain and adapted to poorer soils than most varieties.

White wheats being the standard, it was vigorously criticized, especially by millers, because its red kernels yielded a dark flour and because of the thickness of the bran. This disapproval persisted for at least 25 years, but after the introduction of roller mills it became recognized as a good milling wheat.

In the earlier years it became known under many different names, as Bearded Mediterranean, Red Mediterranean, and Red Chaff Mediterranean, to distinguish it from other and different varieties to which the name Mediterranean became attached. Other synonyms were Columbian and Quaker in Pennsylvania and German in Maryland. By 1919, those names apparently had gone out of use. That early confusion in names probably was the result of repeated introductions.

In 1919, nearly 100 years after its introduction from Italy, Mediterranean was grown on 2,558,900 acres in Alabama, Arkansas, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Mississippi, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Virginia and West Virginia. Mediterranean was grown on 46,329 acres in 1959.

Mediterranean, in 1919, was also known as Acme, Bluestem, Farmers Trust, Great Western, Key's Prolific, Lancaster Red, Lehigh, Miller, Miller's Pride, Missouri Bluestem, Mortgage Lifter, Red Chaff, Red Sea, Red Top, Rocky Mountain, Standby and Swamp.

Bluestem was a name commonly used by farmers in the eastern United States for Mediterranean, as well as for many other wheat varieties.

Farmers Trust was a name used in the central United States for Mediterranean wheat beginning about 1900.

Lehigh was used for Mediterranean from about 1900 to 1920. The name was abruptly dropped by growers around After about 1920 only experiment stations continued to use the name Lehigh

Lancaster Red was reported by Dietz in 1869 as "a variety of the Red Chaff Bearded Mediterranean". It was obtained by selecting from the field in Lancaster County, Pennsylvania.

Red Sea was a name long used for Mediterranean wheat. How and when its use became established was not known.

Rocky Mountain was a wheat identical to Mediterranean. Rocky Mountain was grown at the Federal and State Experiment Stations at Arlington Farm, Virginia, and College Park, Maryland, beginning in 1908. The original sample had originated in Maryland about 1900.

Swamp was a name commonly used for Mediterranean primarily in Indiana. It was advertised by J. A. Everitt's Seed Store, of Indianapolis, Indiana, in their fall catalogue of 1899, and was likely distributed for several years prior to 1899. In 1919 it was reported grown in Illinois, Indiana, Kentucky, Ohio, Tennessee, and West Virginia.

Comparison to Contemporary Cultivars

A sample of Mediterranean (CI # 5303) was acquired from the National Small Grains Collection in 1986 and was multiplied with contemporary cultivars.

Mediterranean was similar in kernel weight to Coker 9803, Foster, Goldfield, Kaskaskia and Pioneer 25W33.

Its milling quality was similar to Ramrod, Howell, Cayuga and Coker 9474, while it displayed rather coarse flour granulation being much like Arthur, Delta Queen, FFR 566W and USG 3209.

Flour protein averaged about 3 percentage points higher than contemporary cultivars. Mediterranean produced very small sugar-snap cookies. Those were likely due to high flour protein. Alkaline water retention capacity (AWRC) was low, which suggested that Mediterranean had genetically good soft wheat baking potential. (There has not been a correlation between flour protein and AWRC.) The gluten strength was about medium-weak.

Purplestraw

The origin of Purplestraw wheat was undetermined. It was, however, one of the earlier varieties of wheat grown in the United States. Concerning its early culture, Edmund Ruffin recorded in 1851 that from 1822 until the present time the same kind of wheat had been cultivated, first known as Mountain Purplestraw and more lately designated Early Purplestraw. Alternate information suggested that Mountain Bluestem was the name under which the variety was first grown. That name was still being used in some sections in the early 1900's, although the prefix "Mountain" had generally been dropped many years before. J. Allen Clark wrote in 1919 that the variety had continued to be an important wheat in the southeastern United States for about 100 years.

In 1919, Purplestraw was grown on 273,800 acres in Alabama, Arkansas, Connecticut, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia. Purplestraw continued to be grown on 11,796 acres in 1959.

By 1919, Purplestraw was synonymously known as Alabama Bluestem, Bluestem, Early Purplestraw, Georgia Bluestem, Georgia Red, Mountain Purplestraw and Ripley.

Alabama Bluestem was a name commonly used for Purplestraw wheat in Alabama.

Bluestem was the general name used as a synonym for Purplestraw by many growers of the variety in the Southeastern States.

Early Purplestraw was used for the variety, but by the early 1900's, the word "Early" had been dropped.

Georgia Bluestem and Georgia Red were names commonly used by growers of Purplestraw wheat in Georgia.

Ripley was a local name used for Purplestraw in York County, South Carolina.

Purplestraw possesses facultative characteristics. Since it does not require vernalization, it can be grown as a spring wheat; or, because of its winter hardiness, can be fall sown even in the northern soft wheat states. Its principle advantage over other varieties in the early 1900's was its early maturity, which was said to be due in part to its spring habit. Purplestraw will produce intensely reddish or purple stems that will disappear if wet weather conditions occur at harvest time.

A five-gram sample of Purplestraw (CI # 1915) was obtained in 1986 and was grown several years in Wooster, Ohio. It was multiplied one year by Dr. Mark Sorrells at Cornell University and was also grown one year by Dr. Jerry Johnson in Georgia. The 1000-kernel weight averaged 37 grams. Milling quality was good and was comparable to Delta Queen, Patton and Dyna Gro 411. Granularity was similar to Foster, Pioneer 25R49 and Superior. AWRC values were very low which indicated that it had good soft wheat flour characteristics. However, the flour protein averaged about 3 percentage points higher than practically all of the contemporary cultivars; thus, the cookie spread was very small. Purplestraw was characterized by weak gluten strength.

Quantum 9723

This cultivar was released some time ago and has average test weight with small kernel size. Milling quality was good and had above average break flour yield. Cookie spread was slightly smaller than the average soft wheat and the gluten strength would be slightly above average.

Raven (SWQL designated #2)

Raven was introduced by Ebberts Field Seeds of Ohio. There was a Raven (SWQL designated #1) from Illinois (2000) but the two did not appear to be identical. Raven (#2) had test weight that will be about 1 pound above the 60 pound test weight of the reference cultivars. Kernel weight was large being 41 grams. Break-flour was somewhat below the average of all soft wheat of 32% and cookie spread was about average. Gluten strength was fairly strong having an adjusted lactic acid SRC of 113%. Elkhart, Pioneer 2643, Rachel and Warwick had gluten strength similar to Raven (#2).

Red May

Red May was believed to be identical with or descended from the Red or Yellow Lammas. Several writers suggested the identity. S. M. Tracy, in 1881, mentioned Yellow Lammas as being a synonym of Red May. The Lammas was mentioned by Friedrich Koernicke and Hugo Werner, in 1885, as being a very old English wheat grown previously to 1699. Both the Red and Yellow Lammas were grown in Virginia many years before the Revolutionary War. A White May wheat of a latter period, according to N. F. Cabell in his publication "Early History of Agriculture in Virginia", was grown in that state as early as 1764. A more recent history of Red May indicated that it was originated by General Rawson Harmon from the Virginia May (a white-kerneled wheat) about 1830. That wheat had been grown quite widely under the name Red May since 1845.

By 1919, Red May occupied 1,165,900 acres in Alabama, Arkansas, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, North Carolina, Tennessee, Texas, and Virginia, and was grown under many synonyms in Connecticut, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, West Virginia, and Wisconsin. Red May occupied 1,922 acres in 1959.

Red May, in 1919, was also known as Beechwood (in part), Canadian Hybrid, Early Harvest, Early May, Early Ripe, Enterprise, Jones Longberry, May, Michigan Amber, Michigan Wonder, Orange, Pride of Indiana, Red Amber, Red Cross, Red Republic and Republican Red. Other synonyms were used but their use had been discontinued by the first part of the 1900's. Those synonyms were Whig, Kentucky Red, Carolina and Rappahannock.

Beechwood usually was a mixed wheat containing some Red May. Beechwood was a synonym for the Poole variety.

Early May was commonly used as a synonym for both Red May and White May from 1843 to 1857. In 1854 a different White May was claimed to have been originated by Charles H. Boughton, Essex County, Virginia. That variety was also known as Boughton and Tappahannock, but was not Red May.

Early Ripe was recorded as having been introduced into Darke County, Ohio, in 1840. During the next 18 years, it became distributed over the State as Whig, Kentucky Red, and Carolina.

Samples obtained from the Ohio and Missouri Agricultural Experiment Stations were identical with Red May.

Jones Longberry was wrongly applied to Red May since the two varieties of Longberry put out by A. N. Jones, of New York, were awned varieties, and Red May was awnless.

Orange wheat was reported as having been introduced into Monroe County, New York, from Virginia in 1845. In 1857 Klippart reported Orange wheat to be a beardless, white-grained winter wheat grown in Ohio. The Orange variety in the early 1900's had red kernels and was identical to Red May. Orange (Red May) was one of the excellent-yielding beardless varieties of wheat for Missouri in 1910.

The name Red Cross was sometimes wrongly applied to Red May wheat. In the early 1900's the John A. Salzer Seed Co., seedsman, of La Crosse, Wisconsin, reported that they had been selling a wheat under the name Red Cross since 1893. It was identical with Red May. They bought the seed from a J. J. Barron, who claimed to have originated it. J. J. Barron stated that it was done by crossing three varieties. There was no evidence given to prove that the crosses were made.

Pride of Indiana was acquired from the Indiana and Missouri Agricultural Experiment Stations and was the same as Red May. It may have been a name used for wheat through error, as it was a name of an important variety of corn in Indiana.

In 1986, Red May (CI # 5336) was acquired from the National Small Grains Collection and, once multiplied, was grown with hundreds of contemporary cultivars. The field yield was about 50% of the more recent cultivars. The kernel weight of Red May seemed to be similar to Armor 4045, Coker 9474, Julie IV and Penmore.

Milling evaluation placed it with Goldfield, Mackinnon, Patterson and Wakefield. All were good milling cultivars. Flour granularity was similar to that of Mediterranean. Contemporary cultivars with similar softness included Arthur, Delta Queen, FFR 566W and USG 3209. Flour protein appeared to be about 2.5 percentage points higher than the modern cultivars. The cookie spread baking test revealed Red May to be very small. That could be attributed to the high flour protein since the AWRC was one of the lowest of all soft wheat varieties. Gluten strength was about medium.

Russian Red

Russian Red usually was grown under the name "Red Russian", but there were other distinct varieties that were also called Red Russian that were grown primarily in the Pacific Northwest. Those Red Russian and associated synonym varieties had clavate spikes while Russian Red did not. It was decided that the two similar names would remain intact.

E. H. Collins offered the seed for sale in 1898 and reported the history of Russian Red: "In answers to questions, allow me to say that the Red Russian (Russian Red) wheat I advertise in the Farmer was selected by an agent sent by the American Seed Co., of Rochester, New York, to Russia to secure their best wheat. It was introduced in this section by a prominent mill in Indianapolis at \$1.50 a bushel. They paid 1 cent extra for a few years to encourage its more general introduction. It has of late years sold at the seed stores at a 2-cent premium and does this year. It is hardy, smooth, medium hard, and very productive. The only fault I found in growing it 12 years is that it shatters when cut dead ripe, so that I often grow half of my crop Fultz, which can wait. Lately, however, I grow all Russian." Red Russian (Russian Red) was grown by the Ohio Agricultural Experiment Station as early as 1888. It was distributed widely by Peter Henderson & Co., seedsmen, of New York City, and J. A. Everitt & Co., seedsmen, of Indianapolis, Indiana, in the early 1890's. In 1919, Russian Red occupied 172,100 acres in Illinois, Indiana, Kentucky, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, Virginia, and West Virginia. Russian Red was grown on 3,408 acres in 1954. Russian Red was only known by one other name in the eastern part of the United States, Red Russian.

In the late 1980's a sample of Russian Red was acquired from the National Collection and multiplied several years. The 1000-kernel weight was one of the largest in comparison with all other soft wheats at 43.8 grams. It had fair milling properties similar to those of Clark, Ernie, INW 9824 and Pioneer 2545. Flour granularity was quite typical for soft wheat. Flour protein was about .5% higher than most soft wheat while AWRC was normal. Cookie spread (sugar snap diameter x 2) was very small averaging about 1 cm less on diameter than the average soft wheat. Russian

SG 1560

Shur Grow 1560 has a high genetic test weight at 2.7 pounds and would be similar to AGS 2000 and Geneva. It has superior milling quality similar to FL 302. SG 1560 had good cookie spread and the gluten strength was medium.

Smoke

This soft white wheat appeared to have good test weight. The milling quality was very good and possessing very soft flour granulation. Cookie spread was above normal for soft wheat and the gluten strength was below average.

Watford

This soft white wheat was from Hyland Seeds, Canada, and was small in kernel size at 30.6 grams. Preliminary testing suggested that the flour protein may be moderately elevated. The gluten strength was about medium.

Wilson

Steyer Seeds markets this soft red cultivar that has test weight about 1 pound higher than the reference cultivars. Wilson has extremely soft flour granulation capabilities and may be very useful for cake baking purposes. Cookie spread was very good and the lactic acid SRC of 111% would be indicative of medium-strong gluten strength.

Recent Cultivars Developed for the Eastern US

Characterized by the SWQL
Descriptions by Lon Anderson

AG 2012

This Ag Alumni soft red wheat had test weight that will average about .5# higher than the reference cultivars and would be similar to Douglas, Patton and Pioneer 25W33. AG 2012 may be higher in protein compared to most cultivars. Gluten strength was medium-strong.

AGI 201

AGI 201, from Advanced Genetics, had a very high normalized test weight of 3 pounds greater than the reference cultivars. Cultivars similar to AGI 201 in normalized test weight would be Coker 9184, Roane and Pioneer 26R61. The cultivar has good milling properties and weak gluten strength.

AGI 538

This cultivar will be about 1 pound higher in test weight compared to the reference cultivars. AGI 538 produced excellent sugar snap cookie size. Gluten strength was average.

AGS 2485

This cultivar was developed jointly by the University of Georgia and the University of Florida and will be available through the Georgia Seed Development Commission. AGS 2485 appeared to have genetically related test weight slightly lower than the high test weight cultivar Roane. Kernel weight will likely be about average. The cultivar had very good milling properties. Flour granularity will be typical for soft wheat and the sugar snap cookie quality was below average in spread. Gluten strength was slightly above average.

BECK 122

BECK 122 is an exciting yield leader at a medium-early maturity. This variety has had tremendous performance topping originator trials and Beck's strip trials and continuing its great performance in Beck's customer's fields. BECK 122 also earns excellent premiums in Kraft's Quality Premium Program. For excellent grain and straw yields, plant BECK 122. (See attached Beck's description sheet.)

Benton

The AgriPro cultivar had a large kernel size of 38.0 grams and had very weak gluten strength.

Beretta

AgriPro produced this soft red cultivar and has test weight that would be similar to the reference cultivars. Reference cultivars would be about 60.0 pounds normalized test weight; Beretta would be about 60.3 pounds normalized. Beretta produced very large sugar snap cookies and the lactic acid SRC (110%) indicated the cultivar may be medium-strong in gluten strength. Additional analysis on other Berettas should be performed since there was no standard cultivar associated with the sample we evaluated.

Beretta is a soft red winter wheat bred and developed by AgriPro Wheat. Beretta is medium-short height wheat with mid-season maturity and strong straw strength. Beretta has shown resistance-to-moderate resistance to the current prevalent races of leaf rust and stripe rust. Beretta has shown moderate susceptibility to the southeastern races of powdery mildew.

Beretta appears to be primarily adapted to Arkansas and the northern half of Mississippi. Beretta's area of secondary adaptation will likely include extreme northern Louisiana, western Tennessee and Kentucky, southeastern Missouri, northern Alabama, southern Illinois and the southern tip of Indiana, and western North Carolina.

Juvenile growth habit is semierect. Plant color is blue-green at boot stage. The flag leaf is erect and twisted. Anther color is yellow. Auricle anthocyanin and auricle hairs are present. Waxy bloom is present on the stem, flag leaf sheath and head. The head is tapering, middense and apically awnletted. The glume at maturity is medium in length and wide in width. Shoulder shape on the glume is square with an obtuse beak. Seed shape is ovate. Brush length is medium and occupies a large area of the seed tip. Seed crease width is narrow and depth is shallow.

Besecker

Steyer Seeds released this soft red that will probably average about 1.3 pounds higher in test weight than the 60-pound reference cultivars. Besecker has smaller than average kernel weight and had very good milling quality. Break flour yield was average and cookie spread was good. The lactic acid SRC of 107% was indicative of medium-strong gluten strength.

Bess

Bess was released by the University of Missouri and has test weight that would be about 1.8 pounds greater than the reference cultivars. Daisy, Ernie and Pioneer 25R26 would be examples of reference wheats. Bess has average kernel weight and good milling properties. Break flour yield was average and cookie spread was typical for soft wheat. The lactic acid SRC of 86% would indicate lower than average gluten strength.

Branson

Soft red winter wheat

A medium early, high yielding beardless wheat. Very Good test weight, good standability, very good quality and drydown. It has excellent disease resistance. Disease Data: Scab (MS) Soil Virus (MS), Head Bloch, (M), Leaf Rust (MR), Leaf Bloch (MR), Mildew (MR), Stripe Rust (MR). Branson is a very good no-till variety that replaces Clark for early harvest and has much better yield. Branson is very consistent in multiple environments.

Carlisle

C & M Seeds, Canada, released this semi-hard red cultivar. Carlisle has very high test weight that will likely be about 3.5 pounds higher than the reference cultivars which average about 60.0 pounds. Carlisle has extremely large kernel size around 45.1 grams per thousand. Milling quality was superior with an ESI of 7.2%. Very few cultivars of the 767 evaluated by the SWQL will fall into that category. The flour granularity was very coarse and produced small cookie spread. Flour protein may be about 1 percentage point greater than the typical soft wheat. Gluten strength was strong as indicated by the 115% lactic acid SRC. Flour water absorption (57%) was higher than soft wheats.

Cecil

Ohio State University introduced this cultivar that has many good quality traits. Cecil has genetically been about 1.1 pounds higher in test weight when compared to the reference cultivars. The kernel weight was very large at 40.0 grams. Cecil has good milling quality; good cookie spread and was about medium in gluten strength.

Choptank

The University of Maryland released Choptank and this cultivar likely will be about 1.3 pounds high in normalized test weight. The cultivar has good cookie spread factor and weak gluten. Preliminary testing indicated that Choptank may be slightly elevated in protein.

Coker 9312

This cultivar would be similar in test weight to Choptank, Cecil and Coker 9663. Coker 9312 has good milling quality and weak gluten. This cultivar may be slightly higher in protein when compared to most cultivars.

Coker 9375

Coker 9375 has a normalized test weight similar to the reference standards. The cultivar has a very large kernel weight of 40 grams. It has very good milling quality and weak gluten.

Coker 9436

This cultivar was released by Syngenta Seeds and limited data suggested that the test weight would be similar to the 60-pound reference cultivars. Coker 9436 has superior milling quality and very coarse flour granularity being similar to Coker 9663, Kristy and Spencer. Sugar snap cookie quality was very good even though the flour was very coarse. Very coarse granulating cultivars can produce excellent cookie spread if the milling quality is excellent. The lactic acid SRC of 80% indicated weaker gluten strength.

Coker 9553

Syngenta Seeds produced this very large kernelled soft wheat cultivar. There was not enough information to evaluate the test weight. It will likely be a very soft granulating cultivar similar to Coker 9184, Hopewell and Pioneer 25R47. Cookie spread may be slightly smaller than the average soft wheat but certainly within the soft wheat range. The lactic acid SRC of 105% would suggest medium-strong gluten.

Cooper

This AgriPro cultivar possesses superior milling properties similar to Honey, Pioneer 25R23 and Southern States 520. Cooper has good sugar snap cookie spread and weak gluten.

Coyote

Coyote was released by J. G. Limited and has a normalized test weight of 2.4, which would be similar to Coker 984, INW 0101 and USG 3408. Coyote has good milling and the gluten strength was medium.

Crawford

This soft winter wheat was released by the University of Georgia and has a normalized test weight about 1.3 pounds. The gluten strength was about medium.

Croplan 594W

The sample evaluated had been “weathered” resulting in a reduced test weight and increased break flour yield. Croplan 594W had good milling quality and produced a very large cookie spread, possibly enhanced by the “weathering”. The lactic acid SRC was 90%, indicative of average gluten strength.

Cumberland

This cultivar was developed by the University of Kentucky. There was not enough information in the SWQL test weight data base to accurately assess the test weight, but it may be 2 pounds higher than the 60.0 pound cultivars. The 1000-kernel weight was large at 38.5 grams. Break-flour yield, and cookie spread were normal. Flour protein may be low and the gluten strength appeared to be slightly above average.

Declaration

Declaration was also developed at the University of Kentucky and had normalized test weight that was 2.3 pounds greater than the reference wheats. Kernel weight, break-flour yield and cookie spread appeared to be typical. Declaration may have gluten strength slightly above the average.

Dominion

This Virginia line has not been named yet. It has a 1.7 pound normalized test weight and possesses superior milling properties similar to Pioneer 25R47, Jaypee, Pocahontas and Caledonia. The gluten strength was about medium.

Fatzinger

Fatzinger is a soft red, awnless winter wheat with tall height and medium to late maturity. Fatzinger has an excellent test weight, standability and winter hardiness. Fatzinger has very bright straw and great straw yield. This is a very high yielding variety with excellent milling and baking qualities and good resistance to powdery mildew.

Featherstone 176

This new release from Virginia Polytechnic Institute will be about 1.5 pounds higher in test weight than the reference cultivars. It has good milling quality, good cookie spread and the gluten was about medium in strength.

FFR 558

This cultivar had its beginnings at Virginia Polytechnic Institute. Test weight will likely average about 1.3 pounds greater than the reference standards. Flour granularity was average and cookie spread may be slightly smaller. Gluten strength was very weak and had an Allis-Chalmers lactic acid SRC of 66%. The weakest soft wheats probably won't fall below 60% on average.

Gator

Gator was produced by the Sunbeam Extract Company. The normalized test weight will likely be about 2.2 pounds higher than the reference cultivars. The gluten strength was medium-strong and limited testing revealed that the flour protein may be slightly elevated.

Genesis 9511

This cultivar possesses many good quality traits. The kernel weight was large at 39.5 grams. It had superior milling properties similar to Pat, Foster and USG 3650 and the flour granularity was very fine. The cookie spread was good and the gluten strength was medium.

Genesis 9821

Genesis 9821 was released by Genesis Brand around 1998. Limited test weight data indicated it may be slightly higher in test weight than the reference cultivars. Kernel weight, break-flour yield, sugar-snap cookie spread and gluten strength were equal to the average for soft wheats. Flour protein may be lower than protein for most soft wheats.

Genesis 9959

Genesis 9959 was released from Genesis Brand about 1999. Limited test weight history indicated the cultivar may be genetically 1.5 pounds greater in test weight than the standard cultivars designated as "0" or normalized to 60.0 pound test weight. Kernel weight, flour granularity and cookie spread were on average for soft wheat. Milling quality was excellent with a mill score of 80.0. Only 10% of the 830 soft cultivars had mill scores that were at least 80. Gluten strength was slightly above average with Allis-Chalmers lactic acid SRC of 99%.

Hartman

Hartman was introduced by Steyer Seeds and will likely have test weight that will be about 1.4 pounds greater than the reference cultivars. The kernel weight appeared to slightly larger than average and Croplan 594W has very good milling quality. The flour granularity will be about average and the cookie spread was typical for soft wheat. Gluten strength will probably be medium-strong.

Hondo

Hondo, an AgriPro wheat, has been on the market for a few years but may not be available for general production. It seemed to have high test weight that would place it in the same category as Coker 9184, McCormick and Roane. Hondo has very good milling properties and very coarse flour granulation. Flour protein may be about 1 percentage point higher than soft wheat. Flour water absorption was 62% as measured by the water retention capacity test. Lactic acid SRC was 120% indicating the gluten strength to be strong.

Hopewell

HOPEWELL is a soft red winter wheat variety developed by the Ohio Agricultural Research and Development Center. It was released in 1994 because of its high yields, diverse genetics, disease tolerance, standability and medium maturity. Hopewell is beardless and has red chaff at maturity. It is moderately resistant to Septoria nodorum, but carries no Hessian Fly resistance gene.

INW 0302

This cultivar was released by Purdue University and has test weight similar to Choptank, Coker 9663, Pioneer 26R24, Sisson and Emmit. The kernel weight may be slightly smaller than average. INW 0302 has good milling properties and seemed to be very soft as measured by break flour yield. Cookie quality was normal and the gluten strength may be slightly above average.

INW 0303

This cultivar has some very unique quality traits. Test weight, genetically, may be low. Kernel weight will likely be above average and the milling quality was good. INW 0303 had extremely high break flour yield placing the wheat in a category with only 26 others out of nearly 800 soft cultivars. INW 0303 may be valuable for contract growing because of its very fine granulation, which would suit well for cake baking needs. The cookie spread was good and the lactic acid SRC (101%) was indicative of medium-strength gluten quality.

INW 0304

INW 0304 will likely be about one half pound lower in test weight compared to the reference cultivars. It has very large kernel weight of about 40 grams and has very good milling properties similar to Coker 9184, Geneva and Pioneer 26R15. The gluten strength appeared to be weak.

INW 0315

INW 0315 from Purdue University may have test weight similar to the 60-pound reference cultivars. It has excellent milling quality and produces above average break flour yield. The cookie spread was very large and the gluten strength would likely be below average.

INW 0316

The test weight characteristics would be similar to INW 0315. INW 0316 has good milling properties and average softness. Cookie spread was typical for soft wheat and the gluten strength was low as measured by lactic acid SRC (74%).

INW 0411

INW 0411 possesses excellent milling properties and has medium gluten strength.

INW 0412

This Indiana release has an unusually high normalized test weight of 3.3 pounds. There have been about 700 soft cultivars analyzed by the SWQL for genetically associated test weight. There were only 21 cultivars that would be greater than INW 0412 and 32 cultivars that would be similar in test weight to this cultivar. The gluten strength was medium-strong and preliminary evaluation suggested that the flour protein may be elevated slightly.

Jack

This Gries Seed cultivar appeared to have semi-hard attributes. Jack may be about 2 pounds greater in test weight from the reference cultivars. The very coarse flour granulation produced cookie spread that was below average. Water absorption was 56% in contrast to soft wheat, which would usually be in the low 50% range. Flour protein was not elevated and the lactic acid SRC of 94% would suggest average gluten strength.

Jacob

Jacob will probably be about 1 pound higher in test weight than the 60-pound reference cultivars and has below average kernel size. Jacob has good milling quality and produces very fine granulating flour. Cookie spread was normal for soft wheat and the gluten strength was medium-strong.

Jentes

Jentes, a soft red winter from Steyer Seeds of Ohio, will probably be about 1 pound above the reference cultivars for test weight. Jentes had very good milling properties and break-flour was average. Cookie spread was above average and gluten strength could not be assessed.

Jewel

This soft white cultivar was released from Michigan State University to the Michigan Crop Improvement Association. It was tested under the designation E 1007W. Test weight of Jewel will likely be about 1.3 pounds higher than the reference cultivars. Kernel weight was very large at 41.6 grams. Jewel had excellent milling quality with milling score in excess of 75. Break-flour yield was normal while cookie spread may be a little small. Gluten strength was about average having an Allis-Chalmers lactic acid SRC of 94%.

Magic

Magic will be marketed by John Gerard Limited. This hard wheat cultivar has excellent test weight and very large kernel weight. The milling quality was superior with an ESI of 6.6%. Flour granulation was typically coarse for hard wheat. Flour protein was about 1.5 percentage points greater than the average soft wheat. Water absorption was 59% as measured by the water solvent capacity test. The gluten strength was strong with a lactic acid SRC of 120%.

Magnolia

Magnolia was released by AgriPro in Arkansas. Limited test weight data suggested it would be about 1.5 pounds above the reference standards. The Magnolia sample from Arkansas had very large kernel weight of 42.8 grams per thousand grains. Milling quality was very good. This sample had a rather high flour protein of 10.7% which would have suppressed the cookie spread. Gluten strength may be medium-strong having a lactic acid SRC of 105% adjusted to 9% flour protein. The lactic acid SRC was 117% at 10.7% protein.

Merrell

This was another cultivar from Steyer Seeds and the genetic shrivel-free test weight will be about 1.6 pounds greater than the reference wheats. Kernel weight, break flour, cookie diameter and gluten strength were average. The milling quality was very good. The ability of the middling stock to efficiently reduce to flour size was exceptional.

Monarch

Gries Seeds introduced this cultivar that possesses many good quality attributes. The normalized test weight was about 2.0 pounds higher than the reference cultivars. Monarch had premier milling quality being similar to AGS 2000, Coker 9152, Mountain and Pat. Out of 734 soft wheat cultivars, there were only 19 cultivars that were considered to have better milling quality than Monarch. The cultivar produced fine granulating flour on the break rolls and had large cookie spread. Monarch was about medium in gluten strength.

Natchez

AgriPro released Natchez, which has good test weight, about 1 pound lower than Coker 9184, McCormick and Roane. Break flour yield was average and the gluten strength was about average with lactic acid SRC of 92%.

Oasis (OH 708)

Ohio State University produced this cultivar that has test weight about 1 pound higher than the reference cultivars. The kernel size was large at 39 grams per thousand. It has excellent milling quality and slightly above average flour granulation. Cookie spread was above average and the gluten strength appeared to be average.

Panola

This AgriPro cultivar has above average kernel weight and normal flour granularity. The lactic acid SRC was 97% suggesting medium-strong gluten strength.

Pioneer 25R35

This soft red winter cultivar will likely be about 1 pound higher in test weight than the normalized reference cultivars. The gluten strength appears to be about medium.

Pioneer 25W41

Pioneer 25W41 is a soft white wheat that will average about 2 pounds greater than the 60-pound reference cultivars. Kernel size was average and milling quality was good. It seemed to have very soft flour characteristics and with normal cookie size. The cultivar will likely be about average in gluten strength.

Pioneer 25R54

This cultivar will likely be in the same category as the reference cultivars for test weight. It has excellent milling properties and very fine flour granulation. The cookie spread was larger than the average soft wheat. Gluten strength was medium-strong with lactic acid SRC of 103%.

Pioneer 25R63

Pioneer Hi-Bred International released this soft red cultivar that will likely be about 1.5 pounds greater than the reference cultivars. It had large kernel size of nearly 40 grams per thousand grains. Milling quality was good and break-flour yield was about average. Flour protein may be slightly low and gluten strength will apparently be slightly above medium.

Pioneer 26R12

Pioneer 26R12 is a soft red winter wheat that has very good milling properties. The normalized test weight seems to be about 3 pounds higher than the reference cultivars listed in this report. Examples of cultivars similar to Pioneer 26R12 in test weight are: McCormick, Neuse NC, Pioneer 26R61, Roane and Spencer. There are about 660 cultivars listed in this report that have been evaluated for their genetic test weight relationship and only about 23 contemporary cultivars would exceed Pioneer 26R12. Some of those "23" are the same cultivar with different brand names. This cultivar produced large sugar snap cookies and was about medium in gluten strength.

Pioneer 26R15

This soft red wheat has very good milling quality. It seems to be strong in gluten strength.

Pioneer 26R31

The test weight would mirror the reference cultivars in the normalized test weight tables. Kernel weight was very large. Pioneer 26R31 displayed superior milling properties evidenced by the 7.6% ESI. Very few cultivars will have that type of milling performance. Flour granularity seemed to be about average and cookie spread was good. The gluten strength will probably be slightly above average.

Rachel

Rachel appeared to have a very high normalized test weight of 3.3 pounds. The data for Rachel was limited but very few cultivars possess test weight of this magnitude. An example of cultivars that have that type of test weight would be Coker 9184, Hoffman 89 and Tribute. Rachel appeared to be very strong in gluten strength (7.5 mixograph number).

Renwood 3260

Renwood 3260 was from the Virginia Polytechnic Institute and State University and has a normalized test weight of 1.6 pounds. It has very good milling quality and has strong gluten strength.

Renwood 3706

This Virginia cultivar has a normalized test weight of 2.0 pounds, possesses excellent milling and has medium-strong gluten characteristics.

RS 931

Rupp Seed 931 will be similar to the reference cultivars in normalized test weight. It has superior milling quality similar to Pioneer 25R23 and Southern States 520. RS 931 has good sugar snap cookie quality and the gluten strength was weak.

RS 947

Rupp Seeds introduced this cultivar that had normalized test weight of about 60.5 pounds. Kernel weight was small. Break-flour yield and cookie spread were average. Flour protein may be slightly low and gluten strength was medium.

RS 949

RS 949 was another Rupp Seeds cultivar and had test weight that would be about 2 pounds greater than the reference cultivars. Flour granularity was average and cookie spread will likely be on the smaller side. Gluten strength was about medium.

Santee

It is not known when Santee was released but likely has been available for a few years and may be considered a semi-hard cultivar. Santee has above average kernel size very coarse flour granulation. Flour protein for this single sample was about 10%, but that may not have been representative. Gluten strength may be about medium-strong.

Savage

The 1000 kernel weight for Savage was 30.6g. This smaller kernelled cultivar would be similar in grain size to: Ag-Alumni 9112, Caldwell and Mitchell. Limited data indicated the test weight of Savage to be very high. The correlation between test weight and 1000 kernel weight for 690 cultivars (shrivel-free) was $r = .09$. Savage may be about medium-strong in gluten strength.

SC 1325

Seed Consultants introduced SC 1325 that will probably be about 2 pounds greater than the 60 pound reference wheats. Kernel size was average. Flour granularity appeared to be coarse and cookie quality was slightly below average. Flour protein may be elevated slightly and gluten strength was a little above medium.

SC 1330

There was not enough test weight data for proper evaluation of this Seed Consultants' soft red wheat. Milling quality was very good having a mill score of 75. Break-flour yield was above average and cookie quality was larger than the average soft wheat. Gluten strength was very weak having an Allis-Chalmers lactic acid SRC of 69%. The lactic acid SRC range for soft wheat from the Allis-Chalmers mill has been about 60% for the white cultivar Genesee to 133% for the soft red cultivar Arise W34 adjusted to 9% flour protein.

SC 1343

SC 1343 was another line from Seed Consultants and had very good milling quality. The 1000-kernel weight was 36 grams. It was softer than the average soft wheat and the cookie spread was slightly below average. Gluten strength was weak-medium having a lactic acid SRC of 86%.

SC 1352

This Seed Consultants cultivar had normalized test weight around 62.0 pounds. The kernel weight was large being 38 grams per thousand grains. The milling quality was very good and the flour granularity was slightly coarser than the average for soft wheat. Cookie quality may be on the smaller side while gluten strength was medium-strong having a lactic acid SRC of 105%.

Soissons

Soissons, semi-hard wheat, was introduced into the United States from France. Soissons seemed to be slightly lower in test weight from the reference cultivars and slightly smaller than average kernel weight. Soissons had one of the highest milling scores of any soft wheat or hard wheat cultivar evaluated at the SWQL. The soft cultivars Argee, Pioneer 26R46 and Severn have had milling scores of 100 for an individual sample. The ESI of 4.9% was unequalled and the friability of 30.9% was most unusual for a very coarse granulating cultivar. The cookie baking potential was similar for good quality soft wheat. Flour protein was similar to the soft wheats and water absorption was low at 54%. The lactic acid SRC of 109% indicated Soissons to be medium-strong in gluten strength.

Southern States 8302

This cultivar has a normalized test weight of 1.5 pounds and large kernel weight of about 39 grams. It has very soft characteristics, good cookie spread and medium gluten strength.

Southern States 8308

Preliminary evaluation indicated that SS 8308 has unusually high genetic test weight at 3.3 pounds (normalized). Out of about 700 cultivars analyzed over many years and numerous locations for genetically associated test weight, there were only about 21 cultivars that would have a higher test weight than SS 8308. It also produced good cookie spread and was medium in gluten quality.

Southern States 8404

This cultivar may have very large kernel weight and had excellent milling quality. The flour granularity will likely be above average and had good cookie diameter. The lactic acid SRC was 83% and would suggest below average gluten strength.

Stine 480

Stine 480 may be a hybrid wheat. Normalized test weight was .7 pounds meaning that it would average about .7 pound higher in test weight than the reference cultivars. It had very good milling quality and appeared to have weak gluten.

Strategy

Strategy seemed to originate at the Virginia Polytechnic Institute and released through a Canadian seed company. There was limited test weight data that suggested the test weight may be about 2.5 pounds greater in test weight than the reference cultivars.

The kernel weight appeared to be fairly large being 39 grams. Break-flour yield, cookie and gluten strength were about average.

Strike 205

Burtch Seed Company introduced Strike 205 and had a normalized shrivel-free test weight of 61.6#. Flour granularity was average and had good cookie baking potential. Gluten strength was slightly above medium.

Terral LA 422

This cultivar originated in Arkansas. Kernel weight was 38 grams per thousand. Milling quality was excellent having a mill score of 81.4. Only 10% of the 830 soft cultivars had mill scores exceeding 80. Flour granularity and sugar-snap cookie spread were average. Gluten strength was weak-medium having a lactic acid SRC of 85%.

TS 4040

Thompson Seeds introduced TS 4040 and it had good normalized test weight of 62.0 pounds. Reference cultivars are 60.0 pounds. Kernel weight was about average and Allis-Chalmers break-flour yield was very coarse. Cookie quality may be slightly smaller than the average soft wheat and gluten strength was weak-medium.

Truman

The University of Missouri released this soft red winter cultivar that has a high level of resistance to Fusarium Head Blight. The test weight will likely be about 1.1 pounds higher than the reference cultivars on a “genetic” basis. The gluten strength appeared to be about medium.

TS 3060

TS 3060 was introduced by Thompson Seed and will likely be similar to the reference cultivars in test weight. It possesses excellent sugar snap cookie spread and was about medium in gluten strength.

USG 3342

USG 3342 (VAN 98W-342) was from the Virginia Polytechnic Institute. Its normalized test weight will be about 1.2 pounds. USG 3342 has large kernel weight of about 39 grams. The flour granularity was softer than most cultivars and produced good cookie spread. The gluten was very weak.

USG 3592

This cultivar is from Unisouth Genetics and has very high test weight. It would be similar to AGS 2000, Coker 9474 and Traveler. The flour granulation was very fine and was an unusual characteristic for a high test weight cultivar. USG 3592 produced good cookie spread and was medium in gluten strength.

USG 3650

This soft red winter cultivar was released from Unisouth Genetics. It possesses very large 1000 kernel weight. The test weight may be about 1.3 pounds greater than the reference cultivars listed in the test weight tables. The one sample evaluated indicated that it has superior milling quality. USG 3650 appeared to be about medium to medium-strong in gluten characteristics.

VA 97W-469

The cultivar will likely be sold for private branding and has test weight that will probably be 1.5 pounds greater than the numerous cultivars found in the normalized reference list. This cultivar has superior milling properties possessing an ESI of 7.7%. Very few cultivars have that type of milling quality. Flour granulation was very soft being similar to Coker 9184, Hopewell and Pioneer 25R47. Cookie spread was quite large. The gluten strength appeared to be medium-strong with lactic acid SRC of 110%.

Venture

Genesis Brand introduced this soft red cultivar that had smaller than average kernel size. Kernel size has not proven to be a factor in milling quality until the kernel weight falls to the mid 20 gram range. Venture had superior milling properties with an ESI of 7.6%. Break flour yield suggests very fine granulating flour with very good cookie spread. Lactic acid SRC was 114% indicative of medium-strong gluten.

Vigoro 9211

This cultivar was introduced by Royster-Clark, Inc., and limited test weight information suggested Vigoro 9211 will be about 1.5 pounds higher than the reference cultivars. Kernel weight was 34 grams per thousand grains. Milling quality was good and flour granularity was about three percentage points below average. Cookie spread may be below average and gluten strength not able to be ascertained.

Vigoro 9212

The cultivar has high test weight similar to Pioneer 2552, Renwood 3706, Richland and Saluda. It has large kernel weight of nearly 40 grams. V 9212 possesses Superior milling quality similar to Caledonia, Daisy and FL 302. The cookie spread was good and has weak gluten strength.

Vigoro 9510

Vigoro 9510 was released by Royster-Clark, Inc. Kernel weight will probably be above average and break-flour yield was about one percentage point softer than average. Cookie baking quality was slightly below average being similar to Gore, Mason and Tribute. Gluten strength may be medium-strong but there was uncertainty due to “weathering”.

Vigoro 9512

This cultivar was another Royster-Clark Inc. introduction and test weight analysis indicated the cultivar will likely be about 1.1 pounds greater than the reference cultivars. Vigoro 9512 had above average kernel-weight size. Break-flour yield was of average softness. Cookie spread may be small and gluten strength was medium.

Vigoro 9222

V 9222 has good test weight with average-size kernels. The flour granulation seemed to be very soft and cookie spread was typical for soft wheat. The gluten strength was strong as measured by the lactic value of 124%.

Vigoro 9412

This cultivar likely will have a normalized test weight that will be about 2 pounds higher than the zero-reference cultivars. The gluten appeared to be of medium strength.

Warwick

Warwick is a soft red winter from C & M Seeds, Canada, and may have a normalized test weight of 1.9 pounds. It appeared to be very soft as revealed by the Allis-Chalmers mill. Warwick had good cookie spread and may be on the strong side for gluten strength.

Weaver

Steyer Seeds will market Weaver which possesses many good quality traits. Its normalized test weight may be about 1.0 pound higher than the reference cultivars and has large kernel weight of about 39 grams. Weaver possesses superior milling properties similar to Caledonia, Pocahontas and FL 302 and has very soft flour granulation. The cookie spread was good and the gluten strength was weak to medium.

Wellman 111

Wellman Seeds, Inc., of Ohio, introduced this cultivar that had normalized test weight that was 2.2 pounds higher than the reference cultivars that equal about 60.0 pounds normalized test weight. Thousand-kernel weight was 35 grams. Flour granularity was very coarse, similar to Kristy. Cookie spread will likely be smaller than typical for soft wheat. Gluten strength was about medium-strong having Allis-Chalmers lactic acid SRC of 104%.

Wellman 120

Introduced by Wellman Seeds. Genetic test weight will probably be about 2.0 pounds above the reference cultivars. Kernel size was slightly below average. Wellman 120 had very soft flour granulation and cookie quality was good. Gluten strength was slightly above medium having lactic acid SRC of 100%.

Wellman 121

Wellman Seeds owns the rights to this new soft red cultivar and the normalized test weight will likely be about 1.3 pounds greater than the 60-pound reference cultivars. Kernel weight was about average and flour granularity was average for soft wheats. Milling quality was good having mill score of 76 and unusually good middling-stock-reduction friability above 30%. Cookie spread will probably be average and gluten strength was about medium having lactic acid SRC of 93%.

Wellman 130

Wellman 130 has very high normalized test weight of 3.9 pounds and practically unparalleled compared to nearly 700 soft cultivars. There are around 10 cultivars that would have higher genetic test weight. Cultivars similar in test weight to Wellman 130 are AGI 540 and Cayuga. Gluten strength was about medium.

Wellman 150

Wellman 150 has a normalized test weight of .8 pounds. The cultivar appeared to be very soft in flour particle size and produced a large sugar snap cookie spread. The gluten strength was medium.

Whitby

Hyland Seeds, Canada, released this soft white cultivar that has test weight that would parallel the reference cultivars. It has very large kernel weight in excess of 40 grams. Break flour yield was slightly below average and cookie spread was typical for soft wheat. The lactic acid SRC was 88% and would suggest average gluten strength.

Wiley

Wiley was introduced by Steyer Seeds and had normalized test weight about 2.2 pounds higher than the reference cultivars. Allis-Chalmers break-flour was coarse and cookie spread will likely be on the smaller side. Gluten strength was slightly above medium having lactic acid SRC of 103%.

Willcross 795

Limited test weight data suggested that this cultivar will be a reference cultivar having normalized test weight of 60.0 pounds. Willcross 795 had good milling quality and slightly above average flour softness. Cookie spread may be on the smaller side and gluten strength was weak-medium (Allis-Chalmers lactic acid SRC 84%).

Wisdom

Hyland Seeds, Canada, released this soft red wheat that had test weight similar to the reference cultivars. Wisdom has very good milling quality and displayed extremely high flour granulation properties. This cultivar could be valuable for contract growing because of its extreme softness and usefulness for cake baking. The cookie spread was very good and the lactic acid SRC of 108% would suggest medium-strong gluten strength similar to Tribute.