

The Rice Paper

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The Rice-Paper is the electronic newsletter of the CGRF. Published periodically, it collects the most recent findings in the botany, cultivation, material culture, culinary preparation, and history of Carolina Gold Rice and associated heritage grains. Contributions and editorial correspondence should be directed to Dr. David S. Shields at the University of South Carolina: dshields@gwm.sc.edu. The information published here appears as a public service. CGRF encourages republication of The Rice-Paper's contents provided there is no alteration of the substance of the material being reproduced, that the reproducer does not profit from the republication, and that a clear and full credit is given to author and source of the material.

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Charleston Gold Rice: Making the Old New Again

By Glenn Roberts, President, the Carolina Gold Rice Foundation

There is a little known movement with a quiet but insistent and growing voice in our planet's scientific community. This shift is most noticeable in those scientists whose disciplines create, study and release foods with better nutrition and higher natural yields into third world agriculture where famine looms as a continual threat. Recently, the best of these scientists have begun additional, voluntary, unfunded research to create better foods for the first world as well. If it weren't for their dedication, years of post-doctoral research and lack of motives for personal gain, these new first world research projects could be labeled "hobby" projects, but the fact that their work is on par with the best worldwide seed development corporations dispels that notion with certainty. In the following paragraphs we explore the challenges and rewards of one such collaboration and discover how important this new movement is for the future of American agriculture and American cuisine.

Dr. Gurdev Khush and Dr. Merle Shepard reside on opposite coasts and pursue complimentary but vastly different fields of research. Dr. Khush is a leading plant breeder on faculty at UC Davis and Dr. Shepard is professor of entomology at Clemson University's Coastal Research and Education Center in Charleston, South Carolina. Both scientists are recognized worldwide for decades of research programs in Southeast Asia and both are emeritus from the International Rice Research Institute in the Philippines. But the fact that they are close friends is the best explanation for their unexpected collaboration on an historic rice breeding effort in the Philippines, South Carolina and Texas since 1998. Both scientists

engage in this research and development unfunded to be able to deliver this rice to the American public and beyond with no proprietary constraints. For those unfamiliar with the rigor of new rice variety introduction in the American rice industry, it would be an understatement to say Khush and Shepard's unfunded collaboration is a rare.

The understanding of rice farming, cultural history and breeding research Dr. Shepard and Dr. Khush draw upon to create their new rice variety is also unique in our rice industry and critically important to the future of rice horticulture in the Americas. For their new rice, Dr. Khush combined heirloom Carolina Gold rice traits with quality, disease resistance and productive strengths from many rice varieties into one new variety that combines the best traits of its parents. Imagine juggling dozens of balls while running at top speed while reciting a Shakespeare sonnet while dodging bullets ... this is the conceptual idea of Dr. Khush's plant breeding talent as art. To provide a cultural and historic foundation for Khush's art, Dr. Shepard, Indiana Jones style, mined data from antique farm journals, scoured heirloom rice seed banks worldwide, evaluated traditional third world rice farming methods and collected for study rare indigenous rice varieties from fields in the far corners of our planet. Khush and Shepard took a final verification step by employing genetic marker analysis to authenticate the results of their collection and breeding. By joining their research strengths, both scientists hold an exceptional awareness of the arc of rice development worldwide over the last few centuries. This merger of disciplines makes possible their new American rice derived from America's oldest rice.

America's oldest rice emanates from the time of our revolution in the rice fields around Charleston, South Carolina. Prior to that time, we grew rice in Virginia, Carolina and Georgia (wildly popular and known generically in Europe as "Carolina Rice") from seed grown for centuries around the Mediterranean, coastal Africa, Indonesia and the Far East.

During our revolution, British forces destroyed cereal grain seed stock throughout the colonies. This tactic was especially severe in the South where rice production and export played a major role in economic stability. After our revolution, scientist farmers throughout the Southern states launched unprecedented development efforts in marketing, technology and seed breeding to revive the Southern rice export industry. Drayton, in his "A View of South Carolina" published in 1803, states there were over one hundred rice varieties used for breeding new rice for production shortly after our revolution. The highest quality and most successful rice was given the name "Carolina Gold" for its hull color in the field and lovely subtle gold patina when milled correctly and observed in sunlight.

But the recent trend toward abbreviation of Carolina Gold rice history and diversity to one export variety from our revolution until it faded from production during the Great Depression is the greatest challenge to its cultural survival. Carolina scientist farmers created numerous rice cultivars from exotic rice varieties originating in Asia, Africa and the Mediterranean Rim. Consequently, more than one variety marketed as CGR attained production success here and subsequently enjoyed marketing success in Europe and the Far East. Dr. David Shields provides an excellent description and history of one new pre-Civil War Carolina rice, "Long Gold", in this newsletter. Dr. Shield's piece is groundbreaking for many reasons but it is particularly important for its confirmation of the continuity of rice improvement efforts in the South from our revolution to modern times.

Continual improvement of CGR forms the genesis of Dr. Shepard's and Dr. Khush's approach to a new rice variety based upon one well documented pure heirloom CGR. Their work underscores CGR's critical importance in American rice history and its future cultural relevance within American cuisine.

Dr. Khush and Dr. Shepard began their project in 1998 by setting their CGR improvement parameters well above modern rice quality and production standards. They chose their end use characteristics carefully to reflect the best traits of CGR while incorporating new rice agronomic and culinary qualities that guarantee market success in the 21st century. Most remarkable, and in addition to modern breeding protocol, Khush and Shepard determined in advance to include natural selection improvement protocol used by Antebellum CGR scientist farmers in the final selection of their new rice. All of Dr. Khush's crosses were grown out by Dr. Shepard beginning in 1999 at the International Rice Research Institute in the Philippines and then transferred in 2004 to research plots at Clemson Coastal Research and Education Center. Dr. Shepard and Dr. Khush eliminated the less desirable offspring over the next three years. By fall harvest in 2007, Dr. Shepard and Dr. Khush selected the final most successful improved CGR strain and made two important decisions: In the spring of 2008, they sent seed to Dr. Anna McClung, rice research project leader, USDA-ARS Beaumont, TX, for replication and study to verify its productive and quality characteristics and insure its introduction to American rice farming as a public variety with a high degree of integrity. They also conducted two quality tasting regimes: a formal food tasting panel evaluation of their new rice supervised by food scientists at Clemson University and an informal tasting trial with selected professional chefs around the USA. The results of both evaluations will be presented in a future CGRF newsletter.

Dr. McClung planted the new rice in the spring of 2008 in research plots at the USDA-ARS research station in Beaumont, Texas, to study characteristics and replication. Dr. McClung also engaged the growers at Texas Rice Improvement Association (TRIA) to grow a small field of the new Khush/Shepard rice for production trial analysis. By late spring, Dr. McClung observed remarkable early vigor and yield development traits in the Khush/Shepard rice. By mid-summer it was obvious that the new Khush/Shepard rice was extraordinarily vigorous and competitive, a prime attribute for successful low input organic horticulture to address naturally occurring weed pressure in rice fields without the use of herbicide. By September 1, field trial yield analysis by TRIA growers in association with Dr. McClung verified that the new Khush/Shepard rice is very high yielding. Their informal projection was between 6000 and 9000 pounds per acre at harvest. Noting a distant threat of a tropical storm system, Dr. McClung invited me to TRIA to review the progress of the research plots and field trial. I flew in on September 2 with now Hurricane IKE threatening the region. Dr. McClung arranged a meeting with Mike Douget, President, and Julio Castillo, Seedsman, TRIA. Mike and Julio immediately stated they thought IKE was a threat to Dr. McClung's Khush/Shepard rice plots and also the field trial of the new rice. Because of their concerns

we immediately departed for the fields to review the state of the Khush/Shepard rice. It was too immature to harvest, sadly. (Julio promised he would try to bring in as much research rice as he could before IKE made landfall. Julio told me later he worked into the night before IKE hit to bring in the 2008 CGR.) On September 8, Julio and Mike found 2 large storage bins destroyed, the roof gone on one seed house and another damaged. The worst damage came from tornados spawned by IKE that ravaged much of the TRIA rice in the fields, including some of our Khush/Shepard rice. Some lodged and some had seed stripped off the heads. But with the support of Mike Douget and Dr. McClung, Julio was able to harvest enough Khush/Shepard rice to plant five acres in 2009.

Dr. McClung will include the Khush/Shepard rice in its second year of a five state yield trial this summer. In addition, Dr. McClung will place the rice in a comparative study with other modern aromatic rices and CGR and also in an N response study.

Dr. McClung selected panicles of the Khush/Shepard rice from what was grown in 2008 and sent them to the USDA-ARS Puerto Rico nursery for grow out. Dr. McClung expects to harvest there in late April and plans to return with several hundred "true to type" panicles that will be planted in Beaumont, TX, as headrow. Headrow seed will be harvested in the fall and will be used to register the variety and submit it as a voucher sample to the ARS world collection. The headrow seed that Dr. McClung produces in this year can be provided to TRIA or others for foundation seed production of the new Khush/Shepard rice in 2010.

Here are the findings to date:

The Khush/Shepard rice is at least equivalent in production yield with modern rice and it may be exceptionally productive. It is very early to emerge and very vigorous in early growth. It has excellent agronomic characteristics. It has remarkable yield potential. Informal physiological, morphological and DNA analysis of the Khush/Shepard rice shows it is similar to Jasmine 85, a widely popular modern production rice. Dr. McClung and Mike Douget suggest one more year of formal evaluation for food and agronomic study. Dr. Bastos, a Brazilian rice geneticist expressed interest in the Khush/Shepard rice for his country after observing it in the field at TRIA in July 2008.

Dr. Khush and Dr. Shepard have created an exceptional rice. It is an elegant aromatic long grain Japonica dwarf of pure Carolina Gold Rice with a very promising future and the hallmark distinction of golden seeds. It mills beautifully with a high percentage of whole grain, has lovely aromatic attributes and very appealing texture when cooked. The Khush/Shepard rice has attracted support for non-proprietary development from the American rice milling industry and is garnering close scrutiny from respected rice growers in Texas and South Carolina. In terms of contemporary development,

the new Khush/Shepard rice is a run away success. To give tribute to their new rice's heritage, Dr. Shepard has chosen the name "Charleston Gold" for this new rice which will be released in 2009 by Dr. Shepard, Dr. Khush and Dr. McClung. These rice scientists are truly making history.

POST NOTE: An unexpected result of Dr. Shepard's research in rice farming history reveals the heretofore-unrecognized possibility that our rice seed banks around the world today may contain diverse heirloom CGRs bred in the Carolinas continuously during the half-century prior to our Civil War. To explore this, he asked Dr. Anna McClung for DNA marker analysis and authentication support beginning in 2004. Dr. Shepard and Dr. McClung are now engaged in a worldwide DNA database survey of seed bank rices that include CGR genetic profile. This research will be the subject of an article in a future CGRF newsletter.

Search for the Lost "Long Gold" Rice

The Carolina Gold grown in the Lowcountry in the the 21st century has the size and configuration of the Gold Seed rice introduced to Carolina in the 1780s—"oblong grain 3/8ths of an inch in length, slightly flattened on two sides, of a deep yellow or golden color, awn short; when the husk and inner coat are removed, the grain presents a beautiful pearly-white appearance." Yet there once existed another form of Gold Rice—larger, finer, and more valuable in the world markets—than the familiar form sown in our fields. With grains measuring between 5/12ths to half an inch in length, long Gold rice became the most highly and widely esteemed American rice of the antebellum period. Despite its immense repute, it was under cultivation for less than twenty years, being commercially available from 1843 to 1861. The Civil War disrupted the complicated seed management that kept the variety viable. Long Gold would be the foremost agricultural casualty of the Civil War.

Long Gold appeared suddenly, a genetic sport of regular Gold Seed rice, spotted as a lone panicle lying on the ground after the 1837 harvest by Mr. Thompson, the overseer of Brookgreen Plantation. Brookgreen's owner, Joshua John Ward, was the most ambitious and scientific, of Carolina's antebellum planters. He took up Thompson's discovery and carefully developed the strain, planting it in newly cleared marsh lands, soil free of red rice contamination and blessed with maximum fertility. From 1838 to 1843 he nurtured the grain, giving pure seed to his circle of planters working north of the Santee River. In 1843, Ward and his circle grew sufficient quantities of Long Gold to make it available commercially. Its qualities immediately commanded the wallets of rice buyers, who paid "15 to 20 per centum more" for it than regular Carolina Gold of prime grade. [R. W. Allston, "On the Cultivation of Rice," *Southern Agriculturalist* 3, 7 (July

1843), p. 245.] In 1844 Ward placed Long Gold seed rice on the market, making it available to anyone who wished to undertake cultivation. Yet the rigor that keeping seed rice for Long Gold pure proved so great, that only Ward himself supplied it for much of the time it remained on the market.

The difficulties of maintaining seed integrity were not the sole problems that Long Gold's growers faced. The larger grains caused problems with the commercial rice processing mills, requiring recalibration of the grinding surfaces to keep the rice from breaking apart when having the bran removed. Joshua John Ward died in 1853, turning his rice empire over to son, Joshua Ward, who maintained Long Gold's seed stock as a testimony to his father's memory. According to the R. Habersham, the Savannah, GA, grain broker, Joshua Ward's own mills processed most of the Long Gold produced on the eve of the Civil War. The war disrupted the planting schedule, stopping seed production for Long Gold. By 1865 the variety was lost in the Waccamaw region. In 1869 Joshua Ward died, and the will of his father went into litigation that would lead to the plantation's break-up. While Long Gold had been crossed with other varieties during its two decades of production, engendering long grain raise in other places, it only lived in the cherished memories of southern cooks and agriculturists as the twentieth century dawned.

The Carolina Gold Rice Foundation in its fall 2008 meeting formed the goal of restoring the lost long version of the grain. It discussed undertaking seed archaeology at Brookgreen and other sites known to have grown the grain, and also discussed using modern breeding methods to recreate the form.

CGR in the News

The Charleston News & Courier in a well-written story in its September 28, 2008, edition introduced South Carolina to the newest cultivators of Carolina Gold, Richard Stoney of Kensington Plantation and his friend and associate, Batt Humphreys. Though the property is old rice land, Kensington had not seen a commercial crop for over a century. Now, with seed provided by the Carolina Gold Rice Foundation, Stoney and Humphreys have revived the grain, choosing to cultivate 14 acres of grain organically. The story recounts the travails of raising rice according to the old sustainable agriculture methods: the problem with weeds, rice-gobbling animals, snakes, and working in soggy fields. Yet Stoney and Humphreys voiced both pride and hope in their enterprise, which will supply Stoney's chain of restaurants and sell milled rice directly to the public through a website. While the rice is not currently being offered, when it is, it will be vended on the Boathouse Restaurant's products website: <http://www.simplysouthernproducts.com/>



Report from Turnbridge Plantation

In the story of the repatriation of Gold Seed to its homeland in the watercourses of South Carolina and Georgia, no family is more important than the Schulzes of Turnbridge Plantation. Richard Schulze, Sr., the patriarch of Carolina Gold Rice Planters, revived both the grain and its fame in the 1980s. For the last thirteen years, his son, Richard Schulze, Jr., has presided over the plantings at Turnbridge. In autumn 2008, the *Rice Paper* thought it time to catch up with Richard Jr. to learn the latest about the longest continuously planted fields in the Lowcountry: "In 2007, I rested the fields. My father had started planting rice in 1985; I moved to Turnbridge in 1995, and rice was planted every year through 2006. I felt that it was time for rotation, so we planted corn in the fields in 2007. This year we planted only one 6 acre field and harvested this week about 130 bushels of rice (5 to 6 thousand pounds). I'll send it to Campbell Coxe to have it processed for seed, reserving a small amount to mill ourselves. Our yield was poor because 30% of the rice lodged during a tropical storm. We didn't have too much trouble with birds this year, although I understand that other folks did. Re soil replenishment, we periodically have the soil tested and in the past have had to lime the fields. Typically we use fertilizers and nitrogen. Two years ago we planted one field of organic rice using organic manure from a specialty shop in (I think) Tennessee. We grew a large field of organic weeds." Despite the setbacks of this fallow year, Richard Schulze, Jr., regards his work at Turnbridge successful and gratifying. He takes pride in having increased crop productivity and solving the problem of harvesting efficiently. "I'm proud to say that in the years I've been planting the rice we have had our best yields ever and have solved our harvesting problems by purchasing a combine." On the horizon, he worries about the costs of transporting crop to Campbell Coxe's mill, particularly if gas prices rise to the levels of August 2008.

Richard Schulze, Jr., touches upon a problem that has deviled rice planters since the early nineteenth century—how to replenish the vitality of rice fields. (See the letter of Joshua John Ward about this subject in the Historical Documents section of the Rice

Paper.) We don't doubt the wisdom of rotating crops on the fields. As early as the 1830s, planters grasped that planting other grains, field peas, or grass in the impoundment fields restored nutrients to the soil. Invariably rotation was accompanied by manuring, and it is on the question of whether to resort to petroleum based chemical manures or green and animal manures that the great divide between industrial and organic agriculture opens wide. Richard Jr.'s pungent report on his experiment with organic rice farming shows unequivocally where he stands on the matter.

It is said, that the proof of the pudding is in the eating. How does the Carolina Gold rice from Turnbridge taste? A bag of current crop rice was provided to the *Rice Paper* for sampling. We prepared it two ways: plain boiled rice with salt and in hoppin' john with some sea island peas and Caw Caw Creek ham for seasoning. Prior to the test we kept the rice in the freezer to preserve its quality. Three traditional Columbia, S.C. rice cooks did the tasting. Observations: out of the bag the Turnbridge rice, though just a shade smaller than the standard 3/8ths inch length of milled Carolina Gold, had the pearly, translucent endosperm of classic CG. It also has the slight malty odor of fresh rice. When boiled,



it absorbed liquid readily, and after sitting, it had good grain separation and the slightly sticky surface that betokens rice that has not gone stale or dry. It was for the most part odorless. Mouth feel was precisely what one looks for, mildly starchy, mellow, and with a lingering taste that faintly echoes hazelnuts. It entirely lacked bitterness, the fruit taste that afflicts some south-Asian aromatic rices, or the bland pastiness that characterizes some commercial long grain white rices milled for long stays on the grocery shelf. The Turnbridge rice displayed its qualities more pronouncedly when married to field peas and pork. It has been said that the great virtue of Carolina Gold is its unrivaled capacity to marry with other flavors in one pot stews, perloos, and pilafs. Turnbridge retains its textual clarity while serving as a background for the sharper tastes of field peas or salty ham. The three tastes gave it a decided thumbs up as a complement to other ingredients. In sum, a fine rice. One understands the hubbub when Richard Schulze, Sr., began distributing the first quantities of Carolina Gold to his friends in the late 1980s.

From the Archive

Soil replenishment and Long Grain Gold Seed Rice
1851

The following letter by Robert F. W. Allston was addressed to the Commissioner of the U.S. Patent Office and appraises him of the current system of cultivation in use among large-scale rice planters, including Joshua John Ward, in the Peedee. It is one of the most informative documents reflecting on the issue of restoring nutritive elements to the soil of impoundment fields.

REPORT OF THE COMMISSIONER OF PATENTS
FOR THE YEAR 1850. Part II: Agriculture

House of Representatives, 13th Congress, 2nd Ses-
sion (Washington, D.C., 1851), pp. 323-25.

Document # 32
Rice Culture

Matanza Plantation on Pee Dee, near Georgetown, SC
6th January, 1851

Sir:--My time has been so much otherwise en-
grossed since the harvest that it has not been in my
power to communicate with you earlier, and now (if
indeed it be not too late for your purpose) I must
write briefly, and generally, in relation to the rice
crop.

Our lands are improving under the grateful influ-
ence of the fallows and rotation practiced by me, as
that of a system, first in 1837-8, and they produce
now rice of better quality than formerly. So much is
this the fact, that there is a class of purchasers rec-
ognized in the Charleston market who will be con-
tent with nothing but the choicest samples, and for
these they are willing to pay an extra price.

This system, extended as it is, and greatly improved,
in the hands of my observant, skilful, and judicious
neighbors of Waccamaw and Sandy Island, by man-
uring with rice-straw, chaff, and even flour, has
been one among the chief means of producing the
beautiful 'long-grain' rice (cultivated now by the
two most successful and experienced planters in this
district, and by not more than two others, as far as I
know) in the highest state of maturity.

Rice straw has long been valued as an excellent
manure, when listed in and rotted, for upland corn
and potatoes. It has latterly been used in the same
way as a dressing for rice in the fallow swamp-land,
on Sandy Island, and with favorable results.

Rice chaff, too, which formerly was discharged from
the mill into the "race-way," in order to get rid of it,
since its analysis by Prof. Shepard, for our Agricul-
tural Society, is now used to some extent in renovat-
ing old lands. It is distributed over the surface, some
three inches deep, and ploughed in, stimulating the
production of the soil, and improving the quality of
the grain.

Rice flour, notoriously of value as food for hogs,
cattle, and poultry, and selling readily, when corn is
scarce, at from 12 to 20 cents per bushel, has, with a
very few years past, contributed its share towards
improving in both quality and quantity a particular
crop in Waccamaw.

The crop of last year, (1850-1), affording, as it does, a
good portion of very prime rice, where the salt-
water did not affect it, will prove to be some 10 per
cent. Short, as estimated by us. This diminution is
believed to be owing, chiefly, to the high winds
which passed over the tide-lands about the middle
of August last, when the greater half of the growing
rice-plants were still in bloom.

Rice is essentially a 'swamp-seed' here.

We do not cultivate any on the upland.

Every year, however, it is grown in small patches in
the interior, and tended mostly with the plough.

The best kind of rice for this purpose is, I believe,
the old-fashioned 'white-seed,' which was the only
variety cultivated in the State until late in the last
century, when was introduced among tide-swamp
planters the 'gold-seed rice,' which is now univer-
sally approved. The 'bearded rice,' a variety of
white rice, with a very long awn, was imported
some years ago for this very purpose, (upland plant-
ing) but, I believe, it is now nowhere seen but to be
eradicated.

The 'long-grain' seed alluded to above, some ac-
count of which is given in the proceedings of the
State Agricultural Society of South Carolina, is the
choicest variety now cultivated in this region. Like
the ordinary seed, it requires particular care and
attention throughout the process of culture, to have
it produced of the primest quality. But, when thus
produced, if it be carefully milled and skillfully
preped, the long-grain rice will command in the
winter market from 50 cents to \$1 per 100 lbs. more
than the very best qualities of the ordinary small
grain.

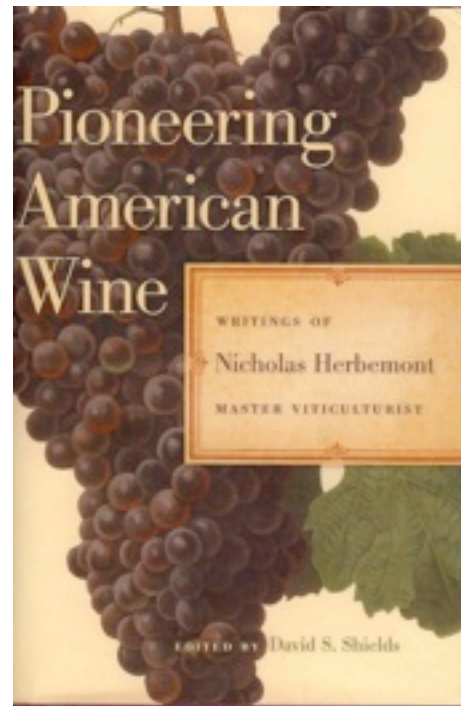
For example, during the month of December just
past, the market in Charleston for small grain has
ranged from \$3 and \$3.25 for prime, to \$3.37 ½ and
\$3.50 per 100 lbs. for choice. Whereas the market for
long grain has been influenced by fancy. Prices have
been obtained for this kind of \$4.25 per 100 lbs.,
\$4.50 also, and even \$5 for a small fancy lot.

These prices are never reported; but, having been
informed that they were actually paid, I feel bound
to mention the fact, when answering your inquiries
as to improvements of the grain.

A specimen of this grain, with the entire plant, in-
cluding the root, has been prepared, and will be sent
to the Great Fair in London,

I have the honor to be, very respectfully,
R. F. W. ALLSTON

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