

VII. MAIZE GENETICS COOPERATION STOCK CENTER



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USDA/ARS/MWA - Soybean/Maize Germplasm, Pathology & Genetics Research Unit

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University of Illinois at Urbana/Champaign - Department of Crop Sciences

S-123 Turner Hall
1102 South Goodwin Avenue
Urbana, IL 61801-4730

(217) 333-6631 [phone]
(217) 333-6064 [fax]
maize@uiuc.edu [e-mail]
<http://www.uiuc.edu/ph/www/maize> [URL]

3,795 seed samples have been supplied in response to 287 requests, as of December 18, for 2007. A total of 86 requests were received from 22 foreign countries. Popular stock requests include the IBM RIL mapping populations, Hi-II lines, *ig1* lines, Stock 6 haploid-inhibiting lines, male sterile cytoplasm, transposable element lines, Maize Inflorescence Project EMS lines, and Chromatin stocks.

Approximately 6.2 acres of nursery were grown this summer at the Crop Sciences Research & Education Center located at the University of Illinois. Favorable weather in the early spring allowed the timely planting of our first crossing nursery. Like last year, redwing blackbirds started feeding on our second crossing nursery. As soon as we noticed this, we irrigated our second field, which seemed to reduce feeding, probably due to it making the kernels more difficult to pull out of the damp compacted soil. Subsequent rainfall seemed to solve the problem and only a few rows were lost. Warm spring weather resulted in rapid germination and plant growth, and we had an earlier than normal pollination season. However, mild drought conditions necessitated supplemental irrigation prior to pollination. Moderate temperatures and low plant stress during and following pollination resulted in excellent yields.

Special plantings were made of several categories of stocks:

1. Plantings were made of donated stocks from the collections of Joe Colasanti (*id1-m1*), Jerry Kermicle (various *r1* alleles), Major Goodman (rare isozyme lines), Frank Hochholdinger (*rtcs1*), Robert Lambert (*orange endosperm1*), Rob Martienssen (MTM material), Damon Lisch (*Mu-killer*), Gerry Neuffer (recent EMS-induced mutants), the North Central Regional Plant Introduction Station (*Lfy1*), Ron Phillips (mutants in various inbred backgrounds), Pat Schnable (*rth1*), Margaret Smith (male sterile cytoplasm lines), and others. We expect to receive additional accessions of stocks from maize geneticists within the upcoming year.

2. We conducted allelism tests of several categories of mutants with similar phenotype or chromosome location. We identified additional alleles of *albescens1*, *Factor Cuna (Fcu)*, *waxy1*, *shrunk2*, *viviparous5*, and *pale yellow9*. In 2008, we plan to test additional members of the *viviparous*, spotted leaf, and pale endosperm classes of mutants. In this manner, we hope to incorporate more stocks from our vast collection of unplaced uncharacterized mutants into the main collection.

3. Occasionally, requestors bring to our attention stocks that do not carry the traits they are purported to carry. We devote field space each year to analyzing these stocks, fixing or enhancing those we can, and soliciting replacements from researchers for those we can't. In those rare instances in which a particular variation or combination of variations cannot be recovered, we modify our catalog to reflect this.

4. We further characterized the *Fcu* system of *r1* aleurone color enhancers. We are working on linkage stocks to refine the map position of *Fcu* alleles using visible kernel and seedling markers on Chromosome 2, and we continued a series of crosses to transposon tag *Fcu* using one of Tom Brutnell's transposed *Ac* lines. We are collecting and characterizing additional alleles of *Fcu* and other *r1* aleurone color enhancers and inhibitors.

5. In the 'Phenotype Only' collection, we have made available an additional 48 new stocks since November 2006. Most of these are from the Primary Neuffer Collection sent to us by Gerry Neuffer in 1996 and 1997. This brings us down to 119 stocks we are still trying to recover from the original sources. Of the 234 stocks in this collection we had been unable to recover from Dr. Neuffer's sources, we received new sources for 20 of them in 2007 from the collection of Ed Coe.

6. Two acres were devoted to the propagation of the large collection of cytological variants, including A-A translocation stocks and inversions. Additional translocations received from W. R. Findley and Don Robertson marked with *wx1*, *y1*, *su1* and *o2* were added to our collection. For those marked with *wx1* we conducted linkage tests to confirm the chromosome arms involved. We were also able to recover several old translocations thought to be lost. These were recovered from E. G. Anderson sources and listed in MaizeGDB in 2007.

7. Stocks produced from the NSF project "Regulation of Maize Inflorescence Architecture" (see: <https://www.fastlane.nsf.gov/servlet/showaward?award=0110189>) were grown this summer. Approximately 2300 kernels of M1 families that were produced in 2006 were grown to produce M2 lines and for the observation of dominant mutations. From these plants, 800 M2 generation ears were produced and 5 adult plant dominant mutations were observed and pollinated. These 800 families will be planted for observation of recessive plant phenotypes in 2008.

We continue to grow a winter nursery of 0.5 acres at the Illinois Crop Improvement Association's facilities in Juana Díaz, Puerto Rico. We had a reduced winter crop last year due to spray damage, but received an adequate increase of most lines. This situation was brought

to the field manager's attention, and all indications are that we will have a good crop this year. We plan to continue growing our winter nurseries at this location.

We have received 265 additional EMS lines from various inbred backgrounds produced by Dr. Gerry Neuffer (Regulation of Inflorescence Architecture in Maize project). There are sufficient seed for all of these for distribution. We have also received an additional seven lines from the Functional Genomics of Maize Chromatin project (see: <https://www.fastlane.nsf.gov/servlet/showaward?award=0421619>) from Karen McGinnis. The 510 'Phenotype Only' Stocks from the UniforMu project received from Don McCarty/Mark Settles in 2004 and 2005 have been assigned stock numbers and permanent drawer locations. In addition, there are 27 new Sequence Indexed stocks from Mark Settles available, and 2,072 Maize TILLING stocks produced by Cliff Weil and Rita Monde.

The 265 lines from Gerry Neuffer's EMS material were screened for ear and kernel mutations in the lab, but were not planted in observation fields on the University of Illinois Crop Science Research facility. These lines, in addition to the 800 produced in Illinois in 2007, will be planted for phenotypic observation in 2008.

Our IT specialist has continued to make updates and improvements to our curation tools, which are used to maintain data for our collection. These tools input our public stock data directly into MaizeGDB to give maize scientists access to up-to-date information about our collection. They are also used for our internal database (e.g., inventory, pedigrees, requests). A new tool for pedigree data entry is in the final stage of development and should greatly cut down the amount of time required to enter pedigree data. Work towards easier and faster generation of field notes and harvest tags is ongoing. Our web site has also been updated (<http://www.uiuc.edu/ph/www/maize>).

Additional samples of stocks will be sent this winter to the National Center for Genetic Resources Preservation in Fort Collins, Colorado for backup. These represent stocks that had not been previously backed up. Our new inventory system has made selecting ears to be sent and producing a packing list to accompany them a much more efficient procedure.

The new greenhouse space in Urbana has been completed and is being used for our second winter crop. The space has proven to be excellent for growing material that doesn't do well under our field conditions. Our new seed storage space (which doubles our capacity) was completed in March 2007. We presently have 476 seed storage drawers of the 1,584 the room will eventually hold (pending funding).

Marty Sachs
Director

Philip Stinard
Curator

Janet Day Jackson
Biol Res Tech (Plants)

Shane Zimmerman
Agric Sci Res Tech (Plants)

Josh Tolbert
Information Tech Specialist

ADDITIONS TO OUR CATALOG OF STOCKS SINCE MNL81
(For a complete list of our stocks, see: <http://maizegdb.org/cgi-bin/stockcatalog.cgi>)

CHROMOSOME 1 MARKERS 115A rth1-1 131G id1-CSH::Ds2 131H rts1-1	X08K vp10-4 X12F DfK10(C) R1 X12G DfK10(F) R1 X12H DfK10(H) R1 X12J DfK10(K) R1 X12K DfK10-II(M) r1 X12L DfK10-II(Q) r1 X12M High Loss with B Chromosomes; R1 K10-I X15A r1 Hopi1-Brink; P11	STOCKS CHARACTERIZED ONLY BY PHENOTYPE anthocyanin 3611E atc*-N2350 colorless floury 3604A clf*-N758D dwarf plant 4407C d*-N2373B golden plant 6008C g*-PI262475 miniature kernel 438-14 mn*-MTM12286 638-56 mn*-MTM22805 narrow leaf 3911K nl*-N812A necrotic leaf 4104P nec*-N2267	opaque endosperm 3906F o*-N1288 pigmy plant 4408C py*-N2270 small kernel 4002G smk*-N1066 torn leaf 4107U tm*-N2298 white striped seedling 6004B str*-56-3012-10 yellow green leaf 4309K yg*-N2373C yellow streak leaf 3812R ysk*-N2417 yellow stripe leaf 3812N ys*-N2379
CHROMOSOME 3 MARKERS 301B d1-4 301G Lfy1 305B K3L; High Loss; B chromosomes absent 305C tac2-116; bz2-m	MULTIPLE GENES M541Q phyB1-563 PhyB2 M541R PhyB1 phyB2-F2 M541S phyB1-563 phyB2-F2 M541T PhyB1 PhyB2		
CHROMOSOME 5 MARKERS 505G vp15-DR1126 505H vp15-MJ7546 505I vp15-umu1	TOOLKIT T0318AK cms-T; ig1 R1-nj T3301-56 bti03545::Ac T3301-57 bti03702::Ac T3301-58 bti04066::Ac T3301-59 mon00030::Ac T3301-60 mon00108::Ac T3301-61 mon00218::Ac		
CHROMOSOME 7 MARKERS 703CA o2-m(r)			
CHROMOSOME 9 MARKERS 901F DfK9S(33166) C1			
CHROMOSOME 10 MARKERS X08J vp10-mu2			

Additionally, we received 2,072 stocks from the Maize TILLING project and additional stocks from other maize genome projects.