

# USDA SOYBEAN GERMPLASM COLLECTION REPORT

February 1995

In 1994, a total of 7,803 seedlots were distributed from the USDA Soybean Germplasm Collection in response to 266 requests. This is the lowest number of requests and seedlots distributed in many years.

For seed replacement of *G. max* accessions in 1994, 602 four-row plots were grown at Urbana and 159 four-row plots were grown in Stoneville. General evaluation of germplasm was conducted at four locations this year. At Rosemont, Minn. in cooperation with Jim Orf, we tested 340 accessions in maturity groups I and earlier. At Urbana, we evaluated 1031 accessions in maturity groups I through IV. Most of the lines in this test were from the accessions received from central China in 1992. At Stoneville, 854 accessions in maturity groups VII and VIII were evaluated. We are planning to repeat all of these test in 1995. During the summer at Isabela, Puerto Rico were grew 1563 single rows to complete the purelining of all of the group IX accessions. We harvested 546 group IX pureline accessions. At the same time as we are purelining accessions in Puerto Rico we are also collecting data on plant and seed characteristics similar to other evaluations except no yield data are taken. Not all of these are accessions are available for distribution because of low seed supply. We are learning by trial and error which accessions can be grown in winter or summer in Puerto Rico. After the winter of 1995-96, we intend to publish data on the groups IX and X germplasm in a USDA technical bulletin.

Of the 1092 pureline and comparison plant rows grown in 1994, 542 were grown at Stoneville and 550 were grown at Urbana. We compared many Japanese cultivars, obtained by Tommy Carter in an effort to acquire the 87 public cultivars released since 1945, to accessions with the same or similar name already in the Collection. Most of the cultivars already existed in the Collection but similar cultivar names do not always mean similar genotypes. The final number of introductions added to the Collection after the 1994 harvest has not been finalized but will be approximately 100 from Urbana and 75 from Stoneville. These accessions are from China, Russia, Vietnam, Argentina and Japan.

In 1994, the 592 accessions that were grown for the first time originated from China, Japan, Russia, and India. Of these, 500 *G. max* accessions were obtained from southern China and grown in Stoneville as part of the second germplasm exchange with the Chinese Academy of Agricultural Sciences. These accessions come from Anhui, Fujian, Guangdong, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, and Zhejiang. Accessions were not received from Guangxi, Guizhou, and Yunan. These three provinces have just recently been collected and the seed from them is not available for distribution at this time. This exchange was the result of an agreement signed between the USDA and Chinese Ministry of Agriculture and supported financially by the Illinois Agricultural Experiment Station, the Illinois Soybean Program Operating Board, the Iowa Agriculture and Home Economics Experiment Station, the Iowa Soybean Promotion Board, and USDA-Agricultural Research Service. Another 44 accessions were obtained during a trip to China last spring. Forty of these lines were modern cultivars specifically requested because of the diversity of their pedigrees.

Thirty-four new accessions of *G. soja* were added to the Collection this fall. These had been donated by the Far Eastern Experiment Station, All-Russian Institute of Plants, Vladivostok, Russia, and the Lenin All-Union Academy of Agricultural Sciences, Far East Department, All-Russian Institute of Plants, Blagoveshchensk, Russia. This germplasm was obtained by T.A. Lumkin, Washington State University. Fourteen *G. soja* accessions were grown for seed increase.

Unpublished data for accessions in maturity groups less than V which were introduced before 1963 and had been available previously as locally produced bulletins were submitted for publication in a USDA Technical Bulletin in December 1993. At this point we still have no estimated publication date nor has a technical bulletin number been assigned. In 1993, the field data for the general evaluation of 812 accessions of maturity group VI was completed at Stoneville. Data on seed characteristics has not been completed. When the data collection is completed, it will be summarized and published in a USDA technical bulletin.

Peng Yihua, the visiting scholar from China currently working with the germplasm project, is from the Oil Crops Research Institute in Wuhan, Hubei. It is part of the Chinese Academy of Agricultural Sciences. He is using RAPD's to look for genetic markers linked to SMV resistance, leaf-feeding insect resistance, phytophthora resistance and seed size.

In May 1994, Claudia Coble resigned as assistant curator of the Collection. Because of a USDA hiring freeze the position was not opened until November 1993. Interviews of candidates were conducted in January and February 1994 and an offer has been made. We expect to have a new assistant curator on the job in early March.

In September, a temporary computer specialist was hired to design, develop and implement an integration computer-based management system for the USDA Soybean Germplasm Collection. We were very fortunate to find a computer programmer with a M.S. degree in computer science and 20 years of experience working with and designing databases who was willing to take the job. We are now in the final stages of implementing the system based on Microsoft Access. We have been using the new order processing system approximately two months. It provides greatly improved flexibility for both entering data into orders, checking the accuracy of strain designations, and printing invoices and labels. Highly automated links with GRIN 3 are being developed. This is critical because GRIN 3 requires all foreign orders to be in GRIN before they are processing through the Plant Quarantine Office. Our new system will provide record keeping for tracking new introductions through the two year process of purelining and final entry in the collection. It will also produce the specialized field books that we need for new introductions, purelining, maintenance and evaluation. This management system will provide us with a single entity for entering, managing, storing, selecting, formatting and distributing in a variety of forms all of the data connected with the Collection. Currently in our database will have the following inventory:

<b>Subcollection</b>	<b>Entries</b>
Introduced <i>G. max</i>	12,731
<i>G. soja</i>	1,033
Germplasm releases	116
Modern cultivars	353
Old cultivars	208
Williams isolines	62
Clark isolines	275
Harosoy isolines	119
Other isolines	37
Genetic types	<u>154</u>
<b>Total</b>	<b>15,088</b>

These numbers do not include anything that has been added to the collection since the 1994 harvest so the total here is more than 600 accessions below the actual numbers for the Collection. One of the first jobs for the new assistant curator will be update the database and the corresponding records in GRIN.

The following information was taken from the annual report of the specific cooperative agreement "Management of the USDA perennial *Glycine* Germplasm Collection" by Theodore Hymowitz. The current inventory of the USDA Perennial *Glycine* Germplasm Collection consists of 895 accessions of 16 species. Of these accessions, 745 in 14 species are available for distribution and 643 in 12 species are stored at the National Seed Storage Laboratory in Ft. Collins. Fifty seeds of 108 accessions were sent to the National Seed Storage Laboratory and an additional set containing 10 seeds per packet was sent to the USDA Soybean Germplasm Collection in 1994. During 1994, 1225 seed packets were sent in response to 24 requests from 13 states and 3 foreign countries. Most packets shipped had 5 to 10 seeds per packet.

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