

USDA SOYBEAN GERMPLASM COLLECTION REPORT

February 1992

In 1991, a total of 7,870 seedlots were distributed from the USDA Soybean Germplasm Collection in response to 323 requests from 38 states and 27 foreign countries. Seed orders were placed by 265 U.S. requestors for 5,623 seedlots and by 58 foreign requestors for the remaining 2,247. Numerous publications were sent in response to 19 requests for information about the collection. Additionally, 749 accessions have been packeted to send to the National Seed Storage Laboratory at Ft. Collins, Colorado as back-up samples for the collection. This is part of an ongoing project to increase the seed sample size to 1,500 seeds for all accessions at the National Seed Storage Laboratory. At the request of the staff at NSSL, this seed will not be shipped until construction of the new facilities at Ft. Collins is completed this spring.

Of the approximately 13,600 *Glycine max* strains in the Collection in 1991, 730 were grown in 4-row plots in Stoneville and 1,462 were grown in 4-row plots in Urbana for seed replacement. After being purelined in 1991, approximately 127 new *G. max* lines were added to the collection and are now available for distribution.

These additions are from the USSR, China, Nepal, Japan, and Taiwan. The 165 group X accessions are currently being purelined at the Tropical Agricultural Research Station, Isabela, Puerto Rico with the assistance of Salvio Torres and Nabor Mendoza. Seeds were planted in September 1991 and single plants harvested in January 1992. These seeds will be planted in April and the selected purelines harvested in August. We will be collecting basic evaluation data on these accessions while they are being grown in Puerto Rico with the major exception of yield data. In October 1992 we will plant the 153 group IX accessions plus approximately 200 new introductions received in 1991 from Tom Rulkin, Malang Research Institute for Food Crops, East Java, Indonesia with the assistance of Ted Hymowitz, University of Illinois.

Evaluation data has been summarized for PI 490.765 through PI 507.573 (groups 000 to IV) and the manuscript for a USDA Technical Bulletin has been submitted for publication. It is anticipated that this bulletin will be ready for distribution this spring. This year we will be beginning a general evaluation of all accessions in groups V through VIII at Stoneville. In 1992-93, approximately 800 accessions in group VI will be evaluated. During and immediately after these evaluations extra seed will be available for other research projects. If anyone would like access to this seed please contact either Tom Kilen at Stoneville or Randall Nelson or Claudia Coble at Urbana. The data from L.D. Young's soybean cyst nematode screening study, L. Lambert's soybean looper study and T.C. Eldon's Mexican bean beetle study will be added to the GRIN database this spring, when the evaluation record type is converted from multiple to single observation type.

Forty-eight germplasm maintenance plots of *Glycine soja* were grown in 1991. Of the 100 new lines added to the wild soybean collection 1991, 30 were from China and remainder from the USSR. The current inventory of the USDA Wild Soybean Germplasm Collection now exceeds 1000 accessions. Two new accessions of wild soybean from China were grown for the first time in 1991. The *Glycine soja* at Urbana are all grown inside aphid-proof cages. This allows for greater seed production, better expression of morphological characters and should significantly reduce the virus infection of the seed.

In 1991, 154 new accessions were grown for the first time. These originated from the USSR and Japan, but mostly from China. The following institutions donated germplasm to our collection this year: Botanical Gardens, Department of Genetics, Voronezh State University, Voronezh, Russia; National Institute of Agrobiological Resources, Tsukuba, Ibaraki, Japan; Department of Agriculture, Animal Husbandry and Fishery, Heilongjiang Province, China; Asian Vegetable Research and Development Center, Taiwan; Institute of Crop Germplasm Resources, Chinese Academy of Agricultural Sciences, Beijing, China; Heilongjiang Academy of Agricultural Sciences, Harbin, Heilongjiang China; Soybean Research Institute, and Nanjing Agricultural University, Nanjing, Jiangsu, China. The following U.S. scientists helped to obtain accessions, and their assistance is greatly appreciated: M. Rangappa, Virginia State University; T. Carter, USDA-ARS, North Carolina State University, and J. Konovsky, Washington State University.

New *G. max* accessions received to date that will be planted in 1992 include accessions from Japan, China, Vietnam, and the USSR. The most recent negotiations with the Chinese Ministry of Agriculture concerning soybean germplasm and cooperative research have been very active since August 1991. A tentative agreement has been reached and it is likely that a scientist from the Institute of Crop Germplasm Resources,

Chinese Academy of Agricultural Sciences, Beijing will arrive in Urbana this spring with 500 germplasm accessions from the following provinces: Shandong, Shanxi, Hebei, Henan, Shaanxi, Ningxia, Gansu, and northern Jiangsu and Anhui. If the current agreement is maintained, 500 more accessions will be received from the provinces of southern China in two years. Support is being provided to the Chinese for additional collection and characterization of their germplasm collection. Currently in the collection, the distribution of accessions from China, by province, is as follows:

Anhui	2	Henan	8	SE China	3	Unknown	445
Beijing	49	Hubei	1	Shaanxi	13	Xinjiang	23
Central China		Hunan	1	Shandong	20	Yunnan	1
	1	Jiangsu	55	Shanghai	23	Zhejiang	23
Fujian	9	Jilin	392	Shanxi	4		
Guangdong	13	Liaoning	126	Sichuan	5		
Hebei	70	NE China	804	Tianjin	3		
Heilongjiang	449						

Those listed as coming from NE China probably came from either Heilongjiang, Jilin or Liaoning. Nearly 80% of those in the unknown category have maturity groups that strongly suggest that they also come from those same three provinces. In summary, over 80% of the accessions that we have from China come from only three provinces. If we do receive the anticipated accessions it will be a very significant addition to the collection.

The current inventory of the USDA Perennial Glycine Germplasm Collection consists of 849 accessions representing 15 species. During the year, 6 accessions were received from CSIRO in Canberra, Australia. All of these accessions were collected in Australia. Seed multiplication was accomplished in the greenhouse during the winter, and just outside the greenhouse during the summer. Fifty seeds of 84 accessions were sent to the National Seed Storage Laboratory during 1991. Fifteen accessions which have been particularly difficult to increase were successfully multiplied in Puerto Rico. Of the 849 accessions, 304 currently have sufficient seed for distribution and a 50 seed packet is stored at the National Seed Storage Laboratory for 474 accessions. During 1991, 258 seed packets were sent in response to 9 requests from 5 states and 3 foreign countries. Voucher herbarium specimens were maintained for all accessions grown. This collection is maintained through a cooperative agreement with Ted Hymowitz, University of Illinois.

The USDA Southern and Northern Soybean Germplasm collections were consolidated into a single collection in February 1991. With the help of Tom Kilen and his research group this transition has gone very smoothly.

PI numbers have been assigned to all of the accessions in the collection, including cultivars, types and isolines. This was done to make our record keeping more compatible with the GRIN database. We still suggest that the primary identifier used for requesting domestic accessions including the old named cultivars, be the cultivar name, T number, or experimental designation.

We will be working closely with the Soybean Genome Project to ensure that the genome database and the GRIN3 database will be compatible.

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