

USDA SOYBEAN GERMPLASM COLLECTION REPORT -- 2008

February 2009

In 2008, we distributed 28,414 seed lots from 12,679 accessions from the USDA Soybean Germplasm Collection in response to 600 requests from 303 individuals. There were 520 domestic requests (87% of the total) with a total of 21,131 seed packets representing 12,037 accessions sent to 249 researchers from 38 states. Domestically, public scientists made 376 requests and scientists with commercial companies made 144 requests. There were 7,283 seed packets of 7,211 accessions in 80 orders sent to 54 scientists in 13 countries. The entire *Glycine max* collection was requested by EMBRAPA, Brazil, and a private Brazilian plant breeding company and accessions in maturity groups V through IX were sent in 2007. All of the annual accessions are being sent to Perry Cregan and David Hyten as part of a joint project funded by the United Soybean Board to characterize each accession for 50,000 single nucleotide polymorphisms (SNPs). These are being packeted at the same time as the order for EMBRAPA, starting with 4000 accessions from maturity groups 000 through IV sent in 2008. Twenty-three requests were made for 274 seed packets of 230 perennial *Glycine* accessions. We also sent backup seeds of 1,386 accessions to the National Center for Genetic Resources Preservation and 2,593 accessions for storage in the Svalbard Arctic Seed Vault.

We planted 1,565 plots of *G. max* for seed replacement in the Collection. These plots were planted at three locations: 1,075 plots at Urbana, 411 plots at Stoneville, and 39 plots in Costa Rica. Plots for pure lining new accessions were planted in Urbana, Stoneville, and Costa Rica. 64 new pure line accessions from Brazil, Moldova, North Korea, Russia, Ukraine, Uzbekistan, and Vietnam were added to the Collection.

Accession with uncommon morphological or pigmentation traits in the Urbana plots were photographed. We now have over 7,000 images stored in GRIN as follows: *Glycine max*: 1577 (955 accessions); *Glycine soja*: 2033 (1074 accessions); and Perennial *Glycine*: 2782 (955 accessions).

We received seeds of 209 accessions from Vietnam, 2 domestic cultivars 2 germplasm releases, 1 genetic type, and 15 private varieties. Seven of the *G. clandestina* were reclassified as *G. peratososa*, and five *G. tomentella* as *G. syndetika*, so there are now 19 perennial species in the Collection

We are still working on language that is acceptable to both sides for material transfer agreements with AVRDC in Taiwan and with the Chinese Ministry of Agriculture.

Clint Heimann was hired in June, 2008 as a full time germplasm technician with primary responsibility for germplasm maintenance at Urbana. Ron Beatty was hired as a temporary three year employee with funds from the USB funded SNP project.

A manuscript describing the selection procedure for establishing a core collection for *Glycine max* has been submitted to TAG. Using a combination of descriptive, quantitative, and origin data, a core consisting of 1,696 accessions is proposed.

We are working with the Vietnam Academy of Agricultural Sciences in Hanoi and Can Tho University in Can Tho to collect primitive soybean varieties from both northern and southern Vietnam. Accessions were received from both cooperators in 2008.

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As of December 31, 2008, the Collection contained the following entries:

USDA Soybean Germplasm Collection Inventory

Annual subcollection	Entries	Perennial species	Entries	Core
Introduced <i>G. max</i>	16857	<i>G. arenaria</i>	5	3
<i>G. soja</i>	1117	<i>G. argyrea</i>	14	3
Germplasm releases	189	<i>G. canescens</i>	123	18
Modern cultivars	520	<i>G. clandestina</i>	87	16
Old cultivars	208	<i>G. curvata</i>	8	4
Private cultivars	75	<i>G. cyrtoloba</i>	48	5
All isolines	640	<i>G. dolichocarpa</i>	3	0
<u>Genetic types</u>	<u>197</u>	<i>G. falcata</i>	29	5
Annual sub-total	19803	<i>G. latifolia</i>	43	8
		<i>G. latrobeana</i>	7	5
		<i>G. microphylla</i>	33	10
		<i>G. peratosa</i>	7	0
		<i>G. pescadrensis</i>	71	2
		<i>G. pindanica</i>	4	0
		<i>G. rubiginosa</i>	34	2
		<i>G. stenophita</i>	27	0
		<i>G. syndetika</i>	5	1
		<i>G. tabacina</i>	139	14
		<i>G. tomentella</i>	308	20
		<u><i>G. sp.</i></u>	<u>1</u>	<u>0</u>
		Perennial subtotal	996	116

Collection total 20799

Number of accessions screened for pests and diseases for which data is entered in GRIN:

Perennial <i>Glycine</i>			
Type	Descriptor	Qualifier	Accessions screened
CHEMICAL	Bowman-Birk Inhibitor		552
NEMATODE	Cyst nematode	Race 3	493

<i>Glycine soja</i>			
Type	Descriptor	Qualifier	Accessions screened
CHEMICAL	human allergen P34		1118
DISEASE	Bean Pod Mottle Virus		117
DISEASE	Soybean mosaic virus		182
INSECT	Beet armyworm		425
INSECT	Soybean Looper		379
INSECT	Velvetbean caterpillar		408
NEMATODE	Cyst nematode	Race 1	1078
NEMATODE	Cyst nematode	Race 3	545
NEMATODE	Cyst nematode	Race 4	1
NEMATODE	Cyst nematode	Race 5	547
STRESS	Chlorosis score		21

<i>Glycine max</i>			
Type	Descriptor	Qualifier	Accessions screened
CHEMICAL	human allergen P34		13305
CHEMICAL	Petiole Ureide		2499
DISEASE	Bacterial pustule		3438
DISEASE	Bean Pod Mottle Virus		427
DISEASE	Brown stem rot		4033
DISEASE	Frogeye C-32 Isolate		1688
DISEASE	Frogeye race 2		2665
DISEASE	Frogeye, unspecified race		115
DISEASE	Peanut Mottle Virus		2150
DISEASE	Phytophthora Rot	Race 1	9988
DISEASE	Phytophthora Rot	Race 2	433
DISEASE	Phytophthora Rot	Race 3	2823
DISEASE	Phytophthora Rot	Race 4	1479
DISEASE	Phytophthora Rot	Race 5	798
DISEASE	Phytophthora Rot	Race 6	139
DISEASE	Phytophthora Rot	Race 7	3002
DISEASE	Phytophthora Rot	Race 8	149
DISEASE	Phytophthora Rot	Race 9	96
DISEASE	Phytophthora Rot	Race 10	629
DISEASE	Phytophthora Rot	Race 12	646
DISEASE	Phytophthora Rot	Race 17	2235
DISEASE	Phytophthora Rot	Race 20	659
DISEASE	Phytophthora Rot	Race 25	2844
DISEASE	Phytophthora Rot	Race 30	115
DISEASE	Phytophthora Rot	Race 30T	263
DISEASE	Phytophthora Rot	Race 31	145
DISEASE	Phytophthora Rot	Race 33	113
DISEASE	Phytophthora Rot	Race 38	65
DISEASE	Pythium ultimum		1290
DISEASE	Soybean mosaic virus		15
DISEASE	Soybean Rust	Mixed	437
DISEASE	Soybean Rust	Red-Brown	103
DISEASE	Soybean Rust	Tan	3099
DISEASE	Soybean Sudden Death Syndrome		6868
DISEASE	Stem canker		1489
INSECT	Beet armyworm		5
INSECT	Corn Ear Worm		27
INSECT	Leaf hopper injury		784
INSECT	Mexican Bean Beetle damage		5056
INSECT	Soybean Aphid Resistance		1961
INSECT	Soybean Looper		2335
INSECT	Velvetbean caterpillar		133
NEMATODE	Cyst nematode	Race 1	119
NEMATODE	Cyst nematode	Race 14	2532
NEMATODE	Cyst nematode	Race 2	117
NEMATODE	Cyst nematode	Race 3	12366
NEMATODE	Cyst nematode	Race 4	7379
NEMATODE	Cyst nematode	Race 5	11481
STRESS	Chlorosis score		4617
STRESS	Salt reaction		564