

USDA SOYBEAN GERMPLASM COLLECTION REPORT -- 2007

February 2008

In 2007, we distributed 21,402 seed lots from 11,155 accessions from the USDA Soybean Germplasm Collection in response to 585 requests from 292 individuals. There were 513 domestic requests (88% of the total) with a total of 19,160 seed packets representing 10,061 accessions sent to 239 researchers from 34 states. Domestically, public scientists made 368 requests and scientists with commercial companies made 138 requests. There were 2,242 seed packets of 2,173 accessions in 72 orders sent to 53 scientists in 16 countries. The entire *Glycine max* collection was requested by EMBRAPA, Brazil, and a private Brazilian plant breeding company. The accessions in maturity groups V through IX were sent in 2007 and additional accessions will be sent in 2008. Nineteen requests were made for 142 seed packets of 110 perennial *Glycine* accessions. We also sent backup seeds of 1,167 accessions to the National Center for Genetic Resources Preservation and 513 accessions for storage in the Svalbard Arctic Seed Vault.

Since 1995 when our seed distribution process was computerized, every accession in our collection has been requested at least once, 90% of the accessions have been requested 5 or more times, and 15% of the accessions have been requested more than 20 times. On average, approximately 60% of the collection is distributed annually. During this period, we have had nearly 5,700 requests and distributed almost 300,000 seed samples. The USDA Soybean Germplasm Collection represents 4% of the accessions of the National Plant Germplasm System but since 1995 we have accounted for 11% of the distributions from the system. We have sent seeds to 116 colleges and universities in 47 states and to 132 different commercial companies. Internationally we have supplied seeds to 199 public agencies in 78 countries and 55 commercial companies in 21 countries.

We planted 1,972 plots of *G. max* for seed replacement in the Collection. These plots were planted at three locations: 1,174 plots at Urbana, 563 plots at Stoneville, and 235 plots in Costa Rica. Plots for pure lining new accessions were planted in Urbana, Stoneville, and Costa Rica. Five new pure line accessions from China and Vietnam were added to the Collection.

We received seeds of 4 domestic cultivars and 5 germplasm releases.

Dr. Ted Hymowitz donated all of the perennial *Glycine* seed that he had been keeping in storage. Some of these were not viable due to poor storage conditions, but there were approximately 100 new accessions that are now being increased in the greenhouse.

There are approximately 1,600 accessions not yet tested for resistance to any race of soybean cyst nematode (SCN), and many accessions have only tested for one or two races. Dr. Prakash R. Arelli has begun screening these accessions.

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.

Richard Stevens, who had the primary responsibility for germplasm maintenance at Urbana, retired in January, 2008. A new full time germplasm technician will be hired to replace him this spring.

Progress is being made on finalizing a core collection for *Glycine max* using a combination of descriptive, quantitative and origin data.

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.

As of December 31, 2007, the Collection contained the following entries:

USDA Soybean Germplasm Collection Inventory

Annual subcollection	Entries	Perennial species	Entries	Core
Introduced <i>G. max</i>	16795	<i>G. arenaria</i>	3	3
<i>G. soja</i>	1116	<i>G. argyrea</i>	12	3
Germplasm releases	191	<i>G. canescens</i>	119	20
Modern cultivars	513	<i>G. clandestina</i>	83	16
Old cultivars	208	<i>G. curvata</i>	6	4
Private cultivars	60	<i>G. cyrtoloba</i>	44	5
All isolines	640	<i>G. falcata</i>	26	5
<u>Genetic types</u>	<u>196</u>	<i>G. latifolia</i>	43	8
Annual sub-total	19719	<i>G. latrobeana</i>	6	6
		<i>G. microphylla</i>	32	9
		<i>G. pescadrensis</i>	71	2
		<i>G. pindanica</i>	1	0
		<i>G. rubiginosa</i>	33	2
		<i>G. stenophita</i>	25	0
		<i>G. tabacina</i>	138	13
		<i>G. tomentella</i>	278	21
		<i>G. sp.</i>	1	0
		Perennial subtotal	921	117

Collection total 20640

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

Perennial <i>Glycine</i>		
Type	Descriptor	Accessions screened
CHEMICAL	Bowman-Birk Inhibitor	542

<i>Glycine soja</i>			
Type	Descriptor	Qualifier	Accessions screened
CHEMICAL	human allergen P34		1116
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		13248
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		659
DISEASE	Phytophthora Rot		646
DISEASE	Phytophthora Rot		629
DISEASE	Phytophthora Rot	Race 1	9988
DISEASE	Phytophthora Rot	Race 17	2235
DISEASE	Phytophthora Rot	Race 2	433
DISEASE	Phytophthora Rot	Race 25	2844
DISEASE	Phytophthora Rot	Race 3	2823
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	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	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

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