EVALUATION OF MUNGBEAN (*VIGNA RADIATA* (L.) WILCZEK) STRAINS AT COLUMBIA, MISSOURI, IN 1973

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EVALUATION OF MUNGBEAN (VIGNA RADIATA (L.) WILCZEK)[1]

STRAINS AT COLUMBIA, MISSOURI, IN 1973[2]

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Evaluation trials of mungbean strains at Columbia, Missouri in 1970, 1971, and 1972 have been reported previously. (UMC, Department of Agronomy Miscellaneous Publications 71-4, 72-9, and 73-6). In this report data from the evaluation of 473 strains grown in 1973 are presented. Of these, 184 strains were grown in replicated plots and 289 in single row plots. The strains originated from many sources and, mostly, have been grown as received without purification. Data are listed on plant and seed characteristics as in the 1970, 1971, and 1972 reports. These experimental trials are a continuation of our efforts to evaluate the genetic potential within the mungbean species.

STRAINS GROWN IN 1973

The 473 mungbean strains grown in 1973 are listed in Table 1 with the Mo. (University of Missouri, Columbia) accession number, the U.S. Department of Agriculture P.I. (Plant Introduction) number, name or other identification of the strain where available, and the country of origin. In the succeeding tables only the M number is used for brevity. The importance of the P. I. number is stressed since that is the number by which the strains are identified and maintained in the germ plasm collection of the U.S. Department of Agriculture, Plant Introduction Station, Experiment, Georgia.

The 117 strains with accession numbers M2 through M416 had been grown at Columbia in previous years and performance data for those years were included in previous reports. The 356 strains with accession number above M416 were new. Strains M417 through M487 and M528 through M558 were received by the authors from various sources. Strains M488 through M527 and M559 through M778 were received from the USDA Plant Introduction Station, Experiment, Georgia. The latter group M559 through M778, are a part of the collection of mungbean strains sent to the USDA from Iran when the Regional Pulse Improvement Project at Teheran, Iran, was terminated in 1972. M1062 is a

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[1]Several scientific names have been used with the mungbean. In the 1970 and 1971 reports we used Phaesolus aureus Roxb. In the 1972 report and in this aeport we are using Vigna radiata (L.) Wilczek (See Verdcourt, Kew Bul. 24: 556-558, 1970). Vigna radiata is recognized as the name for the mungbean by the U.S. Department of Agriculture (See Gunn, Crop Sci. 13:496, 1973).

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selection from a hybrid population and M1063 and M1064 are reselections of older strains.

METHODS USED IN GROWING THE CROP

One hundred and eighty-four strains were grown in replicated plots and 289 in single row plots on the University of Missouri, Bradford Farm, Columbia, Missouri, in 1973. A plot consisted of a single row 15 feet in length with a three foot spacing between rows. Sixty seeds were planted in each plot but due to variations in germination and emergence actual plant spacing varied somewhat. A randomized block design was used for the replicated plots with 167 strains planted in three replications and 17 strains planted in two replications only as seed supply of the latter group was short. The mungbeans were planted in areas on which mungbeans had been grown in 1970 and 1971, so the seed was not inoculated with a Rhizobium culture. It was treated with thiram (tetramethylthiuram disulfide). In order to bring the soil up to a high fertility level as measured by a soil test, fertilizer was applied to the plots ahead of planting at the rate of 200 lbs/acre (224 kg/ha) of 6-24-6 and 200 lbs/acre (244 kg/ha) of 0-45-0. An herbicide, chloramben (3-amino-2, 5-dichlorobenzoic acid), was applied at time of planting at a rate of 3 lbs/acre (337 kg/ha).

Replication 1 was planted on June 1. A heavy rain that evening crusted the soil and reduced emergence so that stands were not uniform in this replication. Due to wet soil conditions planting of replications 2 and 3 was delayed until June 8. Excellent stands were obtained in the two latter replications.

Harvesting of early flowering strains was started in September but most strains were not ready for harvest until October. Harvesting was facilitated by spraying with a defoliant while the leaves were still green and after most of the pods were ripe so that the seeds could be threshed out readily. Precipitation was extremely heavy during September and early October. This interfered with harvesting and resulted in a high percentage of stained and damaged seeds, especially in the strains with a prostrate or spreading growth type where many pods could come into contact with the soil. The plants were cut with a sickle and threshed on a raspbar nursery thresher. After threshing, the seed was dried in ovens maintained at approximately 90-95 degrees Fahrenheit (33-35 degrees Centigrade). The drying was necessary because portions of green or wet leaf fragments remained with the seed.

The Bradford Farm is located approximately 39 degrees north latitude, 92.5 degrees west longitude and 750 feet (228 meters) altitude. The mean monthly temperature and precipitation for the period June through October, 1973, follows:

Temperature and Precipitation Data from the Bradford Farm, Columbia, Missouri, in 1973.

Month	Temperature Mean Maximum F	C	Mean Minimum F	C	Average F	C	Number Days with Maximum Temperature of 90°F (32.2°C) or Above	Precipitation in.	cm	Normal in.	cm
June	83	28	63	17	73	23	2	2.79	7.06	4.34	11.0
July	88	31	67	19	77	25	11	5.20	13.21	3.41	8.6
August	88	31	65	18	76	24	13	0.77	1.96	3.81	9.6
September	78	26	60	16	69	21	2	7.73	19.63	3.88	9.8
October	71	22	51	11	61	16	0	5.43	13.79	3.12	7.9

The 1973 season was characterized by cool temperatures and, except for August, precipitation above normal. The maximum temperature reached 90 degrees Fahrenheit only on two days in June, 11 days in July, and 13 days in August. Precipitation exceeded the normal in June, July, September, and October. The heavy precipitation in September and October interfered with harvesting and resulted in considerable staining and damage to the seed.

AGRONOMIC DATA AND HOW IT WAS OBTAINED

The agronomic data for the 473 strains grown in 1973 are reported in Table 2. Data of strains not marked with reference to a footnote are means for three replications, except for yield data which are means for replications two and three only. Strains marked with the footnote reference number 2 were grown in replications one and two only and the average is reported for these two replications. Strains marked by the reference to footnote number 1 were grown in one replication only. Procedures for collecting data and recording notes are as follows:

Yield: Yields are recorded in kilograms/hectare.

Plant Type: Plant type is a visual rating of 1 to 5 as follows:

1=prostrate, 2-semiprostrate, 3-intermediate, 4=semierect, 5-erect.

Leaf Size: Mature leaves were classified 1 to 8 for size by comparison with charts of leaf outlines varying in area. The leaf size classes and approximate area of each are as follows:

1=6 sq. cm.	4=26. sq. cm.	7=70 sq. cm.
2=12 sq. cm.	5=34 sq. cm.	8=145 sq. cm.
3=18 sq. cm.	6=55 sq. cm.	

Days to Flower: Number of days from planting to first open flower.

Days to Ripe: Number of days from planting to first ripe pod.

Plant Height: Average height in cm of the main axis of two randomly selected plants in each replication.

Branch Length: Average length in cm of the first lateral branch from two randomly selected plants in each replication.

Pods/Plant: Average number of pods at time of harvest on two randomly selected plants in each replication.

Seeds/Pod: Average number of seeds in five randomly selected pods in each replication.

1000-Seed Weight: Weight in grams of 100 randomly selected seeds from each replication multiplied by ten so data can be presented in whole numbers.

Virus Score: Visual estimation of the proportion of the total plot showing viral symptoms, as identified by rugose leaf or leaf puckering, plant stunting, and flower abortion expressed on a scale of 1 to 100. Identification of the specific virus (or viruses) present was not made.

Mildew Score: Visual rating for mildew infection on leaves at maturity based on a score of 1 (resistant) to 5 (susceptible).

DISCUSSION OF RESULTS

Yield

The yields of the mungbean strains grown at Columbia in 1973 are reported in Table 2 with the strains listed in order of the accession number. Yields are reported for 307 strains, only. The 166 remaining strains were not harvested due to nonflowering, late flowering so that the pods did not ripen before frost, or low production due to excessive viral injury, or for other reasons.

Yields, overall, were lower than in previous years. The mean yield for the 307 strains was 575 kg/ha as compared to 1273 kg/ha for 70 strains in 1972, 924 kg/ha for 201 strains in 1971, and 777 kg/ha for 321 strains in 1970. The lower mean yield in 1973 was due both to a less favorable environment in 1973 and to low inherent productivity and viral susceptibility in the 356 new strains. The

highest yield, 1853 kg/ha was produced by strain M333. This compares with maximum yields of 2708 kg/ha for M118 in 1970, 2548 kg/ha for M90 in 1971, and 1966 kg/ha for M4 in 1973. M90 has the highest average yields over the 4-year period with a mean yield of 2046 kg/ha.

Yields and other data for 72 (15%) highest yielding strains grown in 1973 are listed in Table 3. The mean yield of the 24 (5%) highest yielding strains was 1540 kg/ha. The 10 highest yielding strains are M333, M410, M101, M90, M135, M235, M349, M339, M232, and M348.

Plant Type

As observed in previous years many of the higher yielding strains tended to have a low, prostrate or semiprostrate type of growth with short central stems and long lateral branches. This plant type has distinct disadvantages as the pods may touch the ground reducing seed quality. Damage may be especially severe in seasons with high precipitation during the pod ripening period such as the 1973 season at Columbia. This type of plant is less desirable for machine harvesting, also. We have been classifying strains into five plant types, 1 (prostrate) to 5 (erect) by visual observation. On this basis 43 strain (9%) grown in 1973 were classified as semierect to erect with plant type scores of 4 or higher. Six of these strains (1.2%) were classified from 4.2 to 4.5. The six strains with plant type scores above 4 were M277, M379, M411, M529 (with scores of 4.2), M445 (4.3) and M375 (4.5). Only two of the 43 strains yielded over 650 kg/ha (M411, 1206 kg/ha and M466, 1066 kg/ha). Twenty of the 43 strains were not harvested for yield due to apparent low productivity. Viral incidence was high in the semierect strains with virus scores of the 43 strains averaging 26.3. Exceptions were M411 and M466, each of which had a virus score of 6.7. By contrast, 38 semiprostrate strains with plant type scores of 2 or less produced an average yield of 1170 kg/ha and an average virus score of 6.6.

Leaf Size

It has been observed in the past that high yielding strains tended to have larger leaves which is assumed to be an expression of plant vigor. To evaluate the leaf size strains were classified on a scale of 1 to 8. The 473 strains varied from a score of 2.0 to 7.7 with an overall mean of 5.6. Forty-one strains (8.7%) were classified 7.0 or above. All except 14 of these strains had yields above the mean and 19 of the strains were in the 72 (15%) highest yielding strains. The strains with largest leaf size were M206 (7.7), M195 (7.5), and M439, M349, M235, M90 (7.2).

Days to Flower

The mungbean strains ranged from 35 to 106 days to first flower at Columbia, Missouri, in 1973 with a mean of 58 days. Four strains (M320, M325, M431, and M558) did not flower. Two of these strains (M320 and M325) had been grown at Columbia in 1970 and had failed to flower in that season. The two earliest strains were M678 and M689 which flowered in 35 days after planting. M299 and M672 flowered in

36 days. M299 had been the earliest strain to flower in the three previous seasons. Twenty strains (4.2%) flowered within 40 days of planting and 146 (30.8%) flowered within 50 days. Sixty varieties (12.9%) required 70 or more days to flower. The mean number of days to flower for the ten highest yielding strains was 53. These data confirm observations made in previous years that moderately early flowering strains are favored for highest yield at Columbia, Missouri. The earliest strains to flower are not the highest yielding because they have small plants, mature early and do not utilize the full season. The late maturing strains do not have time to mature a large set of pods before being killed by frost. Many of the late flowering strains had high virus scores, also. In some of these strains flowering may have been delayed due to the effects of the virus.

Days to Ripe

The days to first ripe pod ranged from 52 to 109 days with a mean of 77 days. Strains flowering after 85 days did not generally produce ripe pods before frost. Overall, the mean days from first flower to first ripe pod was 19 days as compared to 21 days in 1972. This difference probably reflects the lack of precipitation during August which resulted in faster pod ripening.

Height of Plant

Height ranged from 20 to 97 cm with a mean of 56 cm. This compares with a mean of 75 cm for the 10 highest yielding strains. The 20 earliest maturing strains averaged 47 cm in height and 317 kg/ha in yield. This confirms earlier observations that the early maturing strains tend to be short and low in productivity and that large plant size is associated with high yield.

Branch Length

The 473 strains grown in 1973 ranged from 5 to 88 cm in length of the lowest lateral branch with a mean of 40 cm. The 10 highest yielding strains averaged 63 cm for branch length. Branch length combined with height is a measure of size of plants and, in general, a large plant is needed to hang a large number of pods to obtain a high yield. However, long branches are undesirable if they droop and permit the pods to lay on the ground. Plants with short erect branches would be more desirable if they would support a large yield of pods. Contrasting types with regard to height and branch length are M203, which had a height/branch length ratio of .84, and M374 which has a height/branch length ratio of 1.25

Pods per Plant

Pods per plant is one of the components of yield. The utility of large plant size to hold a large yield of pods has already been stressed Number of pods per plant were counted on 399 strains and varied from 2 to 246 with a mean of 41. Sixteen strains had no ripe pods due to

nonflowering, late flowering or virus damage. Pods were not counted on 58 strains due to apparent unproductivity which in many cases resulted from high viral infectivity. Pods per plant is an extremely variable character being influenced by soil fertility, soil moisture, plant spacing, date of first flowering, disease, and other factors both environmental and inherent. Pods per plans may be the most important yield component affecting productivity. In this environment plants were widely spaced which favors a high number of pods per plant. Data is needed also on pods per plant with close spacing and high plant populations.

Seeds per Pod

Seeds per pod is a second component of yield. Data were obtained on 455 strains. The number of seeds per pod varied from 5 to 15 with a mean of 10.4. The ten highest yielding strains varied from 11 to 13 seeds per pod with a mean of 12. Three strains, M132, M650, and M721 had 15 seeds per pod. None of these were in the 15% group of high yielding strains. Fourteen strains had 14 seeds per pod. Eight of these (M530, M340, M4, M619, M317, M103, M590, and M547) were in the 15% group of highest yielding strains.

1000-Seed Weight

Seed weight is a third component of yield. 1000-seed weight was obtained on 406 strains and varied from 14 to 70 gm with a mean of 38. The strains with the largest 1000-seed weight are M396 and M403 (70gm); M395 and M400 (68 gm); M389, M391, M398, and M406 (67 gm); M101, M394, M397, M405, and M455 (66 gm). In the three previous years M101 had ranked one or two for seed weight, but we had not grown it in comparison with any of the other strains listed above, all of which originated in the Philippines. Since M101 has a dull seed coat color, some of the new strains may be a better source of genes for improvement of seed size than M101 as all of them have bright green seeds except M405, which has yellow seeds.

Virus Score

Viral symptoms similar to those observed in previous years rugose or puckered leaf, plant stunting, flower abortion, reduced pod set, deformed pods were widespread and heavier than observed in previous years. The particular virus, or viruses causing these symptoms were not identified. Virus scores were obtained on the 473 strains. The range in scores was zero to 90 (on basis of 1 to 100) with an overall mean of 36.2. Twenty one strains received scores of zero, one strain a score of 0.7, seven additional strains scores of 1.7, and one strain a score of 2.0. Eighty nine strains (18.8%) received scores of 10 or below. On the other end of the scale, 134 strains (28.3%) received scores of 60 or above. The average yield of 29 strains with virus scores of 2.0 or below was 1412 kg/ha (one strain with a score of zero did not flower). Only three of the 134 strains with virus scores of 60 or above yielded above 500 kg/ha, the highest yield being 672.1 kg/ha (for M687). Seventy nine strains

in the latter group were not even harvested due to apparent low productivity.

The heavy viral infections in 1973 were in contrast to the light infections observed in 1972. The exact reasons for the variation in level of infection in the different years is not known but the presence of insect vectors is suggested. In 1973 there was more rainfall than in 1972 and this may have favored a higher population of vectors in 1973 than in 1972.

Mildew Score

Mildew became widespread in the latter part of the season. This was similar to the development of the mildew disease epidemics observed in previous years. Mildew scores ranged from zero to 5. The strain given the zero score, M320, was also given a zero score for virus. This strain produces a viny plant and did not flower. M320 was observed to be resistant to mildew in 1970, the only other year it has been grown. Eight strains were given mildew scores under 2. They are M90, M91, M213, M232, M238, M409, M472, and M475. Fourteen additional strains were given mildew scores of 2.0. Two hundred and thirteen strains were given scores of 3.5 or higher, 103 strains were given scores of 4 or higher, and 7 strains were given scores of 5. Except for M213, all strains with mildew scores below 2.0 also had low virus scores.

Table 1

List of 443 Mungbean Strains Grown at Columbia, Missouri in 1973

Mo, (Missouri) Acc. No.	USDA P.I. No.	Name	Origin
M2	368266	Baisakhi	India
M4	368268	Shining Moong 1	"
M14	368278	Jalagaon 781	"
M15	368279	(from Health Food Store, St. Louis)	Taiwan
M20	368283	Jharsuguda 4-8	Orissa, India
M21	368284	Jhain Mung 1-4	"
M22	368285	" 5-1	"
M23	368286	" 3-1	"
M25	368288	Bhatili 3-4	"
M27	368290	" 2-7	"
M28	368291	" 2-3-7	"
M29	368292	Kendrapada 1-2	"
M36	368297	Kusumi 1-7	"
M38	368299	" 1-10	"
M40	368301	Banpur 1-4	"
M47	368307	Angul 3-6	"
M73	368329	Baisakhi	India
M76		Oklahoma 12	USA
M79		Texas Jumbo	USA
M81		EB 6	USA
M90	223711		India
M91	223802		"
M101	271401		"
M103	271406		"
M111	288586		
M112	274402		
M118	180311		India
M121		OAEM 58-62	USA
M127	374140		Korea
M130	374142	(from Mkt. Hong Kong)	Hong Kong
M132	368330	Khargaon	India
M135	31080		USA
M137	31287	Parto	"
M138	31288		"
M140	31290		"
M155	31710		"
M174	164775		India

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA P.I. No.	Name	Origin
M175	164889		Guatamala
M194	180313		India
M195	180315		"
M203	183136	Gohar	"
M206	183459		"
M213	201868		Iran
M227	211735		Afghanistan
M232	212907		India
M233	212908		"
M235	213015		"
M238	214334		"
M277	246130		Madagascar
M299	271405		India
M304	273487		Korea
M317	298915		China
M320	305072		Thailand
M325	305077		"
M330	374144		Mkt. Patna, India
M333	374146		Mkt. Calcutta, India
M338	362313	Chungnamchaerae	Korea
M339	362327	Myungnokdu	"
M340	362318	Kanguonjaerae 2	"
M341	362328	Nogduja	"
M343	362317	Jaeraejong 3	"
M344	362296	Charaejong 4	"
M346	362298	" 8	"
M348	362320	Kyungkijaerae 1	"
M349	362321	" 3	"
M350	362322	" 5	"
M351	362323	" 8	"
M352	362324	" 10	"
M355	374149	Chungbukjaerae	"
M358	362301	" 4	"
M359	362302	" 5	"
M361	362304	" 7	"
M362	362305	" 9	"
M364	362307	" 12	"
M365	362308	" 13	"
M367	362310	" 17	"
M370	374150	" 18	"
M371	369765	UPCA -3	Philippines
M374	369768	" -176, MG50-10A	"
M375	369769	" -178	"
M377	369771	" -195	"
M379	369773	" -200, CES-14	"
M381	369775	" -202	"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA P.I. No.	Name	Origin
M382	369776	UPCA -203	Philippines
M383	369777	" -204	"
M385	369779	" -213, M-1	"
M386	369780	" -214, M-2	"
M387	369781	" -215, M-3	"
M388	369782	" -288	"
M389	369783	" -359, CES-3	"
M390	369784	" -360, CES-7	"
M391	369785	" -361, CES-17	"
M392	369786	" -362, CES-19	"
M393	369787	" -363, CES-28	"
M394	369788	" -364, CES-55	"
M395	369789	" -365, CES-59	"
M396	369790	" -366, CES-78	"
M397	369791	" -367, CES-187	"
M398	369792	" -368, EGMG-4	"
M399	369793	" -369, EGMG-6D	"
M400	369794	" -370, EGMG-7	"
M401	369795	" -371, EGMC-12	"
M402	369796	" -372, EGMG-13	"
M403	369797	" -373, MD 15-2	"
M404	369798	" -374, EGMG 16	"
M405	369799	" -375, EGMG-17	"
M406	369800	" -376, EG Glabrous	"
M407	369801	" -377	"
M408	378022	Morden 39	Canada
M409	378023	(from Health Food Store, N.Y.C.)	Peru
M410	378024	"	"
M411	370637	Hybrid 45	India
M412	370638	T-2	"
M413	371813	Klawng Jin Da	Thailand
M414	371814	"	"
M415	371815	Ma Led Glang	"
M416	371816	Tua Tawny	"
M417	378026	S-8	India
M418	378027	S-9	"
M420	378028	S-12	"
M421	378029	PS-16	"
M422	378030	PS-7	"
M423	378031	PS-10	"
M424	378025	(from Health Food Store, St. Louis)	India
M425	376846	Ph 6901 Chieng Mai Univ.	Thailand
M426	376847	Ph 6902 "	"
M427	376848	Ph 6903 "	"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA P.I. No.	Name	Origin
M428	376849	Ph 6904 Chieng Mai Univ.	Thailand
M429	376850	Ph 6905 "	"
M430	376851	Ph 6906 "	"
M431	376852	Ph 6907 "	"
M432	376853	Ph 6908 "	"
M433	376854	Ph 6909 "	"
M434	376855	Ph 6910 "	"
M435	376856	Ph 6911 "	"
M436	376857	Ph 6912 "	"
M437	376858	Ph 6913 "	"
M438	376859	Ph 6914 "	"
M439	376860	Ph 6915 "	"
M440	376861	Ph 6916 "	"
M441	376862	Ph 6919 "	"
M442	376863	Ph 6920 "	"
M443	376866	(from Market, Bangkok)	"
M444	376867	Tua Kiaw Klong Jinda (Phi M. Rice Station)	"
M445	376868	Tua Kiaw Pak Klong Talad (Phi M. Rice Station)	"
M446	376869	Tua Kiaw Suphanburi (Phi M. Rice Station)	"
M447	376870	Tua Tawny Na Led Nun (Phi M. Rice Station)	"
M449	376918	(from Market Hong Kong)	Hong Kong
M450	376919	"	"
M451	376920	"	"
M452	376921	(from Market, Calcutta)	India
M453	376922	(from Market, Taipei)	Taiwan
M454	376923	Glabrous No. 3 (Econ. Garden)	Philippines
M455	376924	MD 15-2 (Econ. Garden)	"
M456	376925	Yellow Mungo (Econ. Garden)	"
M457	237669		India
M458	239355		"
M459	251229		Pakistan
M460	378032	Gui-1	India
M461	378033	G-65	"
M462	378034	Madhira	"
M463	378035	305	"
M464	378036	Kheda 10	"
M465	378037	ML 2	"
M466	378038	ML 5	"
M467	378039	ML 6	"
M468	377905	ML 8	"
M469	378041	ML 10	"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.	Name	Origin
M472		Reselection from M118 (PI 180, 311)	USA
M473		SSMI	India
M474		Shela Mung	"
M475		Kanke Multipurpose	"
M476		Barehai	"
M477		D66-26	"
M478		JG-11	"
M479		H70-6	"
M480		H70-16	"
M481		Bolangir Local	"
M482		Krishna 11	"
M483		T-51 4N	"
M484		T-51 4n-Dwarf mutant	"
M485		T-51 4n-Tall mutant	"
M486		Pusa Baisakhi -Dwarf mutant	"
M487		Pusa Baisakhi -Tall mutant	"
M488	164265		"
M489	164431		"
M490	165529		"
M492	167356		Turkey
M494	174297		"
M496	177496		"
M497	179958		India
M498	180310		"
M499	188687		Philippines
M500	199355		Kenya
M501	201875		Iran
M502	209669		S. Africa
M503	219613		Pakistan
M504	227248		Iran
M505	249551		"
M506	249552		"
M507	305070		Thailand
M510	313206		Mexico
M511	321115		Tanzania
M512	323283		Pakistan
M513	323284		"
M514	323285		"
M515	323286		"
M516	323287		"
M517	323288		"
M518	323289		"
M519	323290		"
M520	323291		"
M521	323293		"

Table 1(
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.	Name	Origin.
M522	323321		India
M523	346313		"
M524	346314		"
M525	346315		"
M526	346316		"
M527	346317		"
M528	377756	(Reselection M213, PI 201 868)	USA
M529		Iran Sel. 48-069-11007	Iran
M530		" 10827	"
M531		" 10961	"
M532		" 11167	"
M533	377902	ML-1	India
M534	377903	ML-3	"
M535	377904	ML-4	"
M536	377906	ML-9	"
M537	377907	ML-18	"
M538	377908	ML-24	"
M539	377909	ML-25	"
M540	377910	ML-29	"
M541	377911	ML-37	"
M542	377912	ML-38	"
M543	377916	An Giang	South Vietnam
M544		(market, Khurda, Orissa, India)	India
M545			"
M546			"
M547			"
M548	378884	Bam Mai Somrong	Thailand
M549	378885	Glossy Green	"
M550	378886	M-7-A	"
M551	378887	M-21-E	"
M552	378888	MG-55	"
M553	378889	MG-55-3	"
M554	378890	Local-1 Tan pod	"
M555	378891	Local-2 Black pod	"
M556	378892	(market, Los Banos)	Philippines
M557	254557		Afghanistan
M558	305077		Thailand
M559	376951		India
M560	376952		"
M561	376953	NP-3	Delhi, India
M562	376954	NP-3-1	"
M563	376955	NP-4	"
M564	376956	NP-5-1	"
M565	376957	NP-5-2	"
M566	376958	NP-6	"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.	Name	Origin
M567	376959	NP-7	Delhi, India
M568	376960	NP-8	"
M569	376961	NP-9	"
M570	376962	NP-11	"
M571	376963	NP-14	"
M572	376964	NP-15-1	"
M573	376965	NP-15-2	"
M574	376966	NP-16-1	"
M575	376967	NP-16-2	"
M576	376968	NP-16-3	"
M577	376969	NP-17-1	"
M578	376970	NP-17-2	"
M579	376971	NP-18	"
M580	376972	NP-19	"
M581	376973	NP-20	"
M582	376974	NP-21	"
M583	376975	NP-22	"
M584	376976	NP-23	"
M585	376977	NP-26	"
M586	376978	NP-27	"
M587	376979	NP-28	"
M588	376980	NP-29	"
M589	376981	NP-30	"
M590	376982	NP-31	"
M591	376983	NP-32	"
M592	376984	NP-33	"
M593	376985	NP-34	"
M594	376986	NP-36	"
M595	376987	NP-37	"
M596	376988	NP-38	"
M597	376989	NP-39	"
M598	376990	NP-40	"
M599	376991	Sind-4	Pakistan
M600	376992	Sind-5	"
M601	376993	Moong-6	
M602	376994	Moong-8	
M603	376995	Moong-9	
M604	376996	I-2-52	Bihar, India
M605	376997	I-13-126	"
M606	376998	I-28-15	"
M607	376999	I-40-12	"
M608	377000	I-43-77	"
M609	377001	I-73-4	"
M610	377002	I-83-23	"
M611	377003	I-97-107	"
M612	377004	I-105-30	"
M613	377005	I-111-105	"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.	Name	Origin
M614	377006	I-115-75	Bihar, India
M615	377007	I-121-113	"
M616	377008	I-122-86	"
M617	377009	I-130-77	"
M618	377010	II-52-105	"
M619	377011	II-71-68	"
M620	377012	II-184-42	"
M621	377013	II-249-57	"
M622	377014	II-277-97	"
M623	377015	China-49	China
M624	377016	EC 16563	
M625	377017	BRI	Bihar, India
M626	377018	Local	"
M627	377019	EC 16562	
M628	377020	15001	USA
M629	377021	15003	"
M630	377022	15004	"
M631	377023	15007	"
M632	377024	15008	"
M633	377025	15009	"
M634	377026	15010	"
M635	377027	15011	"
M636	377028	15013	"
M637	377029	15016	"
M638	377030	15017	"
M639	377031	15018	"
M640	377032	15019	"
M641	377033	15020	"
M642	377034	15021	"
M643	377035	15023	"
M644	377036	15024	Brazil
M645	377037	15025	India
M646	377038	15026	"
M647	377039	15027	"
M648	377040	15028	"
M649	377041	15030	"
M650	377042	15033	"
M651	377043	15035	"
M652	377044	15036	"
M653	377045	15040	"
M654	377046	15041	"
M655	377047	15042	"
M656	377048	15043	Turkey
M657	377049	15044	"
M658	377050	15046	India
M659	377051	15049	"
M660	377052	15050	"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.		Name	Origin
M661	377053	15052		Turkey
M662	377054	15055		India
M663	377055	15056		"
M664	377056	15057		"
M665	377057	15058		"
M666	377058	15059		"
M667	377059	15060		"
M668	377060	15062		"
M669	377061	15063		"
M670	377062	15064		"
M671	377063	15065		"
M672	377064	15067		"
M673	377065	15070		"
M674	377066	15071		"
M675	377067	15072		"
M676	377068	15075		"
M677	377069	15077		"
M678	377070	15081		"
M679	277071	15082		"
M680	377072	15084		Burma
M681	377073	15085		Iran
M682	377074	15089		"
M683	377075	15090		"
M684	377076	15091		"
M685	377077	15093		Afghanistan
M686	377078	15095		"
M687	377079	15096		"
M688	377080	15097		"
M689	377081	15100		"
M690	377082	15101		"
M691	377083	15123		"
M692	377084	15129		India
M693	377085	15130		"
M694	377086	15132		"
M695	377087	15133		"
M696	377088	15134		"
M697	377089	15140		Pakistan
M698	377090	15146		Afghanistan
M699	377091	15149		"
M700	377092	15151		"
M701	377093	15152		"
M702	377094	15154		"
M703	377095	15157		"
M704	377096	15161		"
M705	377097	15163		India
M706	377098	15164		"
M707	377099	15170		Guatemala

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.		Name	Origin
M708	377100	15171		USA
M709	377101	15173		"
M710	377102	15174		India
M711	377103	15175		"
M712	377104	15178		Madagassar
M713	377105	15179		"
M714	377106	15185		Afghanistan
M715	377107	15188		"
M716	377108	15192		Pakistan
M717	377109	15194		"
M718	377110	15199		India
M719	377111	15200		"
M720	377112	15202		"
M721	377113	15204		"
M722	377114	15205		"
M723	377115	15206		"
M724	377116	15208		"
M725	377117	15210		Korea
M726	377118	15211		India
M727	377119	15212		"
M728	377120	15213		"
M729	377121	15214		"
M730	377122	15216		Ivory Coast
M731	377123	15219		"
M732	377124	15220		"
M733	377125	15221		"
M734	377126	15223		"
M735	377127	15224		"
M736	377128	15226		Pakistan
M737	377129	15227		Iran
M738	377130	15229		"
M739	377131	15230		"
M740	377132	15231		"
M741	377133	15232		"
M742	377134	15233		"
M743	377135	15236		"
M744	377136	15238		"
M745	377137	15240		"
M746	377138	15242		"
M747	377139	15243		"
M748	377140	15245		"
M749	377141	15248		"
M750	377142	15250		"
M751	377143	15252		"
M752	377144	15255		"
M753	377145	15256		"
M754	377146	15257		"

Table 1
(continued)

Mo. (Missouri) Acc. No.	USDA Acc. No.	Name	Origin
M755	377147	15258	Iran
M756	377148	M.S. 9720/1	India
M757	377149	M.S. 9723	"
M758	377150	M.S. 9721	"
M759	377151	1732/2	"
M760	377152	N.A. 5	"
M761	377153	1790/1	"
M762	377154	Hyderabad	"
M763	377155	1791	"
M764	377156	M.S. 9719	"
M765	377157	1725/2	"
M766	377158	M.S. 9724	"
M767	377159	M.S. 9720/2	"
M768	377160	1535/2	"
M769	377161	1734/1	"
M770	377162	M.S. 9784	"
M771	377163	M.S. 9809	"
M772	377164	M.S. 9386	"
M773	377165	OSU M-325	USA
M774	377166	M-1-101	"
M775	377167	OSU M-3	"
M776	377168	OSU M-1	"
M777	377169		Orissa, India
M778	377170		"
M1062		Sel. from cross M304 x M277	USA
M1063		Selection from M358	"
M1064		Selection from M453	"

Table 2

Agronomic Data on 473 Mungbean Strains
Grown in Yield Trials at Columbia, Missouri, in 1973

Mo. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M2[1]	224.8	3.0	5.0	47	66	34	18	70	12	36	5	4.5
M4	1154.1	1.5	5.0	57	74	73	63	72	14	47	0.7	2.8
M14	1101.5	2.3	6.9	56	81	63	51	71	9	59	7	2.3
M15	900.6	1.7	7.0	53	73	68	45	37	10	62	18	2.2
M20[1]		2.5	5.0	65	83	45	39		10		15	4.0
M21	720.0	2.8	4.7	59	81	59	47	56	11	22	22	3.3
M22	272.7	3.2	4.5	54	73	49	38	37	10	23	30	3.7
M23	68.2	3.2	4.8	66	86	41	32	14	10	22	33	2.8
M25	229.6	2.8	4.2	54	72	53	44	55	7	22	47	4.0
M27[1]	289.4	2.0	5.0	50	70	42	37	148	13	39	15	4.5
M28	38.3	3.3	5.2	63	80	34	24	20	9	24	55	3.3
M29[1]		2.0	4.5	67	85	27	13		9		40	4.0
M36[1]		2.5	4.0	66	84	38	24		9		50	4.0
M38	136.3	3.2	4.3	52	70	52	42	30	10	26	62	4.2
M40[1]		2.5	4.0	54	88	26	24		12		15	4.0
M47	117.2	3.2	5.2	57	75	41	40	10	10	22	65	3.5
M73	843.2	2.5	6.2	44	63	53	52	78	11	40	10	3.3
M76	1162.5	2.5	6.2	46	66	58	44	63	12	36	17	4.0
M79[1]		3.0	6.0	52	70	71	60		10		10	5.0
M81	1234.3	2.2	6.9	62	87	66	51	57	11	58	3	2.5
M90	1779.6	2.0	7.2	58	76	71	45	81	11	61	0	1.8
M91	1093.1	2.0	7.0	63	82	51	59	78	11	60	0	1.7
M101	1827.5	1.0	6.1	51	70	66	62	84	12	66	0	2.3
M103	936.5	2.3	6.3	52	72	66	60	40	14	41	12	3.0
M111	736.7	1.8	6.2	55	75	61	41	76	12	33	7	3.0
M112[1]	404.2	3.5	4.5	71	91	42	31		8	44	50	4.5
M118	1304.8	1.8	6.9	64	84	43	59	54	11	59	2	2.0
M121	552.5	3.[illegible]	6.0	45	64	59	45	52	11	36	6	3.7
M127[1]		3.0	6.5	62	78	47	38		11		20	4.0
M130[1]		3.5	6.7	66	89	58	49		12		20	3.5
M132[1]	853.9	2.0	7.0	59	78	56	57		15	39	10	4.5
M135	1752.1	2.0	5.7	47	67	58	53	98	12	39	0	3.8
M137	1241.4	1.8	5.7	44	66	47	35	103	12	39	3	3.8
M138	1229.5	1.8	6.7	47	68	61	63	55	12	42	7	3.3
M140	1456.7	2.0	6.7	44	65	54	43	97	12	41	0	2.2
M155	916.1	3.5	6.0	48	67	65	51	72	10	59	28	3.7
M174	910.1	2.5	6.8	66	86	58	49	50	11	59	2	2.0
M175[1]	459.3	2.5	5.5	50	68	47	40	14	11	44	35	3.0
M194	1184.0	1.8	7.1	57	83	60	52	57	11	60	0	2.0
M195[1]	1030.9	2.0	7.5	47	66	92	70	39	13	59	5	2.5

[1] Data reported is for one replication only
[2] Data reported is for two replications (1 and 2) only

Table 2
(continued)

No. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
P203	1553.6	2.0	7.1	61	80	55	65	112	10	56	2	2.2
P206[1]	966.4	2.0	7.7	61	81	76	55	24	13	57	5	2.0
P213[1]	648.2	3.0	5.5	65	83	66	58	32	12	27	20	1.5
P227[1]		3.0	5.5	72	102	35	35		6		60	2.5
P232	1623.0	1.7	7.1	55	72	69	66	81	11	59	0	1.8
P233	1266.5	2.3	6.8	60	78	70	66	111	12	60	3	2.5
P235	1674.4	2.2	7.2	65	84	72	65	53	11	61	0	2.0
P253	1429.2	2.0	6.9	63	83	66	56	59	12	55	0	1.7
P277	180.6	4.2	4.8	38	58	56	29	15	11	39	53	3.5
P299	438.9	3.3	5.0	36	54	39	29	57	10	34	27	4.7
P304	250.0	3.2	6.1	50	70	60	47	26	12	56	33	4.0
M317	1091.9	3.0	6.3	52	73	71	52	73	14	62	13	3.8
M320[1]		2.0	6.0			56	54				0	0.0
M325[2]		4.0	6.5			55	45				23	3.8
M330	1401.7	2.0	6.7	64	84	54	40	54	11	57	2	2.3
M333	1852.6	1.7	5.8	46	64	83	71	157	13	40	0	3.5
M336	825.2	3.2	6.3	56	72	81	54	23	11	44	35	3.0
M339	1638.5	1.7	6.0	47	66	60	58	123	13	37	0	4.5
P340	1276.1	2.5	6.4	51	71	66	55	49	14	46	8	3.2
P341	804.9	2.7	6.2	61	80	60	50	42	13	33	15	2.8
P343	1202.0	2.0	6.2	47	66	74	56	48	13	41	8	3.5
P344	651.8	3.0	5.7	44	65	63	33	55	11	56	23	4.5
M346	575.3	3.0	5.5	50	69	51	37	34	12	49	30	4.2
P348	1572.7	2.2	7.0	51	73	87	75	92	13	49	0	2.2
P349	1645.1	3.0	7.2	50	73	81	65	70	12	41	2	2.8
P350	868.3	3.2	6.7	47	65	78	65	60	13	39	6	2.8
P351	1396.9	2.5	7.1	58	77	65	51	51	13	48	0	2.8
P352	1168.5	3.0	6.0	48	67	75	54	76	11	39	27	4.3
P355	1106.3	3.0	6.5	46	65	76	30	51	13	40	15	4.2
M358	1197.2	1.8	6.9	50	70	72	63	71	13	38	0	2.5
M359	1133.3	1.5	6.9	52	71	61	49	74	13	39	0	2.3
P361	783.4	2.3	6.0	47	66	79	64	44	12	33	7	4.0
P362	1155.3	3.5	6.7	54	72	70	33	54	13	38	10	3.5
P364	498.7	3.5	5.3	45	64	50	33	39	11	43	43	4.3
M365	784.6	3.5	6.5	50	68	60	31	65	11	43	15	3.8
P367	947.2	3.2	5.7	48	66	65	43	61	12	37	7	3.7
P370	1284.5	3.5	5.8	64	82	59	36	59	11	33	2	2.2
P371	305.0	3.7	5.8	58	78	68	53	39	11	46	50	4.0
M374	1029.7	3.0	5.7	44	65	58	44	55	11	63	27	4.0
P375[1]	165.0	4.5	7.0	75	95	60	88	18	9	46	15	3.0
P377	749.9	3.0	6.0	54	73	79	59	52	10	42	25	3.5
P379	246.4	4.2	5.8	64	82	66	41	8	10	64	28	3.0
M381	327.7	3.3	5.2	49	68	57	42	51	9	46	27	3.8
P382	455.7	3.3	5.2	46	66	60	49	39	10	45	43	4.7
P383	614.7	3.5	6.0	47	67	54	42	53	10	58	40	4.2
M385	396.6	3.3	5.7	63	83	68	46	24	9	49	37	3.0

Table 2
(continued)

No. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
N386	124.4	3.8	4.5	60	84	69	44	15	8	39	42	3.2
N387	345.6	3.8	5.7	60	85	64	40	42	9	38	30	3.0
N388	624.3	3.0	6.7	53	74	61	36	62	12	61	17	3.7
N389	606.4	3.5	5.3	47	70	71	40	35	11	67	22	3.8
N390	595.6	3.3	5.8	47	66	77	58	31	9	56	20	3.7
N391	416.2	3.3	5.5	56	78	72	47	20	11	67	32	3.2
N392	401.9	3.5	5.3	60	82	67	45	31	9	64	42	3.2
N393	277.5	3.7	5.7	61	78	74	54	50	10	64	35	3.2
N394	443.7	3.3	5.0	53	72	61	56	49	11	66	25	3.0
N395	684.1	3.3	6.5	53	72	76	50	35	11	66	28	3.7
N396	184.2	3.3	6.3	56	75	77	48	32	6	70	23	3.2
N397	680.5	3.8	6.2	48	67	69	43	49	12	66	13	3.5
N398	022.1	3.2	7.0	51	71	71	36	72	10	67	12	4.0
N399	676.9	3.2	6.2	48	68	66	51	33	12	56	10	3.8
N400	580.1	3.7	6.2	50	70	66	23	29	10	68	13	3.7
N401	473.6	3.5	6.2	49	69	70	37	40	11	57	16	3.3
N402	644.6	3.2	6.4	46	66	66	46	22	11	62	27	3.7
N403	200.9	4.0	6.0	51	79	79	46	15	6	70	25	3.2
N404	495.9	3.5	6.3	47	68	65	33	47	11	57	28	3.8
N405	437.7	3.0	6.3	46	66	53	30	29	10	66	12	3.3
N406	430.6	3.5	6.3	51	71	67	28	30	11	67	20	3.3
N407	128.0	3.3	4.3	58	80	64	47	20	8	40	50	3.7
N408	1182.8	1.5	6.7	44	65	44	41	49	12	47	7	3.7
N409	669.8	2.3	7.0	62	82	77	50	27	12	48	3	1.5
N410	1835.8	2.0	7.1	60	80	79	66	73	12	47	0	2.2
N411	1205.6	4.2	6.9	63	81	64	52	174	12	36	7	2.8
N412	619.5	4.0	6.2	61	78	58	38	101	11	36	12	2.5
N413	107.6	3.5	5.2	63	85	65	41	35	11	49	38	3.0
N414	334.9	4.0	5.8	66	84	64	47	35	10	47	27	3.2
N415	171.4	4.0	5.8	58	82	61	35	31	12	53	27	3.3
N416	697.3	3.5	5.2	46	65	63	42	38	11	51	28	4.0
N417	456.9	3.5	6.0	45	65	65	46	53	10	34	28	2.8
N418	462.8	2.8	5.7	44	64	62	51	67	12	32	33	3.2
N420	252.4	3.5	5.2	41	61	56	41	40	10	39	33	3.8
N421	291.8	3.5	4.5	37	55	38	23	48	10	39	22	4.7
N422	417.4	3.7	5.5	37	57	34	14	41	11	46	5	4.7
N423	516.7	3.3	5.0	40	60	47	23	51	10	40	25	5.0
N424	154.0	3.2	5.2	63	82	54	41	22	10	32	50	3.2
N425		3.5	5.2	93	94	29	44		7	20	43	2.7
N426		3.5	5.5	56	77	41	36		10		40	2.5
N427		3.5	4.0	91		44	40				60	2.5
N428	559.7	3.3	6.0	38	58	49	36	53	11	35	27	4.7
N429	543.0	3.0	6.2	43	62	48	42	54	11	35	17	4.5
N430		3.7	5.0	95		45	25			43	50	3.2
N431		3.5	6.5			50	40				35	2.0
N432		3.8	5.8	82	94	49	29		10	62	47	2.5

Table 2
(continued)

Ib. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M433	129.2	4.0	6.3	61	80	69	45	18	13	62	23	2.8
M434[2]	836.0	3.5	6.3	46	67	58	38	32	11	58	5	3.5
M435[2]	944.8	3.0	6.3	44	65	68	53	50	11	46	8	4.0
M436[1]		3.5	7.0	56	81	62	47	10	12	60	10	3.0
M437[2]	1146.9	3.0	6.5	49	68	76	57	35	11	48	12	3.0
M438[2]	1324.7	2.8	6.5	44	62	66	56	46	11	59	6	3.5
M439[1]		4.0	7.2	59	81	91	63		11		7	3.5
M440[1]		4.0	6.5	60	80	69	61		13		15	3.0
M441[1]		4.0	6.5	59	78	65	60	15	10	45	20	2.5
M442[1]	153.1	3.8	6.5	60	76	76	61	7	9	40	21	2.8
M443	241.6	3.5	5.8	62	80	56	38	20	11	39	33	2.8
M444	114.8	3.8	5.2	61	80	63	38	24	9	44	40	3.3
M445	339.7	4.3	5.7	59	76	61	34	28	11	45	37	3.5
M446	316.5	3.3	6.0	64	82	64	31	18	9	54	23	3.3
M447	995.1	3.3	5.8	47	65	61	30	32	11	59	20	4.2
M449	154.3	4.0	6.3	64	87	67	33	16	9	59	22	3.2
M450	137.5	3.7	5.5	61	81	63	30	24	10	55	38	3.3
M451	157.9	3.5	5.7	58	77	65	36	14	9	60	35	3.5
M452	325.3	3.3	5.3	60	77	60	29	42	9	35	33	5.0
M453	309.8	3.5	5.8	53	73	67	42	47	10	34	43	4.0
M454[2]	906.6	3.5	6.6	50	70	53	40	23	12	54	10	4.0
M455	151.9	3.8	6.4	60	81	65	34	13	9	66	31	3.2
M456[2]	632.7	3.0	6.3	47	67	54	23	22	10	62	15	4.3
M457	355.2	3.5	4.2	37	56	33	17	49	11	32	9	4.7
M458		3.7	6.2	106		41	30				33	2.0
M459	147.1	3.0	5.8	73	107	43	35	8	7	28	20	2.5
M460	131.6	3.3	4.8	62	82	58	31	14	7	35	42	3.8
M461	339.9	3.3	5.7	38	57	39	14	60	10	32	23	4.0
M462	189.0	3.3	5.7	48	68	61	48	17	11	40	33	3.7
M463	239.2	3.2	6.1	59	76	49	43	20	9	32	32	3.3
M464	613.5	3.2	6.2	47	66	69	54	46	12	47	15	3.8
M465	754.7	3.3	5.7	53	69	73	53	58	12	31	5	3.2
M466	1065.6	4.0	6.3	68	89	67	59	56	11	30	7	2.3
M467	534.6	3.3	5.3	54	73	59	37	49	11	26	13	4.2
M468	767.4	3.5	5.7	63	81	54	37	38	11	30	35	3.3
M469	311.0	3.8	5.7	61	81	51	33	31	11	35	27	2.0
M472	1530.9	2.3	7.1	66	85	50	52	129	12	51	0	1.7
M473	233.2	3.0	4.7	37	57	32	27	52	11	33	18	4.2
M474	177.0	3.2	4.3	63	82	40	35	41	9	40	28	3.5
M475	1290.5	2.2	6.8	56	76	47	47	124	10	59	3	1.3
M476[1]		3.0	4.0	57	77	40	28		6		60	4.5
M477	657.8	3.3	5.5	45	63	64	43	81	11	44	23	3.5
M478		4.0	5.2	74	94	54	28		8		58	3.2
M479	393.5	3.3	4.3	39	57	33	23	39	10	31	13	4.0
M480	797.7	3.2	6.2	45	66	51	36	48	11	61	20	3.8

Table 2
(continued)

No. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M481		3.2	4.0	88		40	28				42	3.5
M482	582.4	2.3	4.8	57	76	54	37	100	8	37	38	3.5
M483[2]	667.4	3.0	6.0	57	79	59	35	42	12	31	45	4.8
M484[2]	169.8	3.0	5.5	52	70	37	24	28	7	40	40	4.3
M485[2]	564.5	2.8	5.8	55	73	68	39	77	13	26	33	4.5
M486[1]	124.4	3.5	6.0	56	75	74	12	23	10	34	40	5.0
M487[1]		3.0	5.0	67	84	45	39		11		50	5.0
M488	33.5	3.5	5.0	90	102	47	38	29	10	20	38	2.8
M489[2]	311.0	3.3	4.5	60	78	53	32	36	10	27	45	3.8
M490[1]		4.0	5.0	81	109	38	36		11		30	3.0
M492	318.1	3.3	6.0	71	89	60	47	56	12	25	13	2.8
M494[1]		3.0	5.0	75	96	40	31		10		50	2.0
M496[1]		3.0	2.0	70	96	38	32		6		80	5.0
M497[1]		3.5	6.0	70	96	56	46		9		25	4.0
M498[1]		3.0	6.0	61	82	58	47		5		40	3.5
M499[1]	229.6	4.0	6.0	55	75	64	19	32	10	33	5	4.0
M500[1]	38.3	3.5	4.0	51	68	38	22	19	12	40	60	4.0
M501[2]	318.1	3.0	4.5	69	87	45	39	19	10	35	43	3.0
M502[1]	62.2	3.0	6.0	56	75	43	23	45	9	38	10	4.0
M503[2]		3.5	5.0	79		58	43				33	3.5
M504	327.7	2.2	5.2	66	93	53	51	31	9	31	42	2.8
M505		2.5	5.3	74	96	44	40	4	10	27	40	2.8
M506	1142.2	2.7	7.0	65	82	60	45	110	12	34	3	2.8
M507[2]		4.0	6.0	80	102	46	31				35	3.0
M510[1]	995.1	2.0	7.0	46	67	62	50	69	13	40	2	3.5
M511[1]		3.5	6.0	79	102	38	25				50	3.5
M512[1]		3.5	7.0	76	96	51	37		7		35	4.0
M513[1]		3.5	6.0	90		38	29		8		40	4.0
M514[1]		3.5	7.0	84	105	40	30		9		35	4.0
M515[1]		3.5	7.0	84		45	38				15	4.0
M516[1]		3.5	7.0	66	88	46	42		6		15	3.5
M517[1]		3.5	7.0	90		47	39				15	3.5
M518[1]		3.5	6.0	87		45	40		10		30	4.0
M519[1]		3.5	6.0	89		50	41				45	4.0
M520[1]		3.5	6.0	51	69	44	42		12		35	4.0
M521[1]		3.5	6.0	79	96	50	30		10		25	4.0
M522[1]		3.0	4.0	73	89	31	14		12		60	3.5
M523[1]	172.2	3.0	5.0	55	75	55	36	246	7	30	30	4.5
M524[1]	71.8	3.0	5.0	41	59	20	5	47	8	26	5	4.0
M525[1]	270.3	3.0	6.0	41	59	43	24	24	11	52	20	4.0
M526[1]	260.7	3.0	5.0	50	68	57	33	33	11	30	25	4.0
M527[1]	389.9	4.0	7.0	55	75	42	23	33	9	26	10	4.0
M528[1]	700.8	3.5	7.0	49	69	50	38	40	12	34	0	3.5
M529	385.1	4.2	5.8	63	82	69	28	15	9	51	32	3.8
M530	1487.8	1.8	6.9	57	78	73	66	54	14	47	2	2.2
M531	1550.0	1.7	6.1	45	65	65	45	68	11	53	7	3.3

Table 2
(continued)

No. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M532	1230.7	3.7	6.5	59	77	62	44	103	12	39	7	3.2
M533	621.9	3.5	6.0	49	68	54	41	63	11	32	20	3.3
M534	479.6	3.7	6.0	60	76	51	45	45	10	32	18	3.0
M535	715.2	3.5	6.6	65	83	61	46	78	10	33	7	2.3
M536	394.7	3.5	5.8	53	72	47	45	46	10	30	32	3.3
M537	843.2	3.3	5.8	47	66	69	40	23	12	32	9	3.3
M538	416.2	3.8	4.8	59	77	59	40	59	10	34	18	3.2
M539	295.4	3.5	5.8	57	76	57	37	38	11	34	37	3.0
M540	720.0	3.5	6.3	54	72	60	44	55	11	31	8	2.3
M541	784.6	3.0	5.7	66	81	67	50	88	11	48	21	3.3
M542	230.8	3.5	5.7	64	83	46	34	66	11	30	32	3.0
M543	675.7	3.3	5.5	56	75	62	32	35	9	60	42	3.7
M544	122.0	3.2	4.0	63	80	37	28	23	10	25	57	3.2
M545	208.1	3.3	4.7	60	77	40	28	17	11	59	35	3.0
M546[2]	1382.6	2.0	7.0	69	88	48	43	70	12	57	5	2.3
M547[2]	888.6	3.3	6.6	57	76	60	48	45	14	54	10	2.6
M548[1]		3.0	5.0	61	82	52	19	39	9	39	30	3.5
M549[1]	301.4	3.0	6.0	55	75	56	60	26	11	50	20	4.0
M550[1]	217.7	4.0	6.0	51	70	65	40	9	11	60	30	4.0
M551[1]	64.6	4.0	6.5	73	89	57	39	13	10	49	20	3.5
M552[1]	200.9	3.5	5.0	49	69	60	43	19	10	55	20	4.5
M553[1]	193.7	3.0	5.0	50	69	56	49	40	11	52	25	4.0
M554[1]		4.0	6.5	71	90	56	30	20	9	38	30	3.5
M555[1]		4.0	6.0	69	91	50	36	40	7	47	20	3.5
M556[1]		3.0	5.5	54	81	38	21	3	11	40	30	2.5
M557[1]		3.0	4.5	75	96	37	30	113	9	32	35	3.0
M558[1]		3.5	6.0			43	20				25	3.0
M559[1]	52.6	3.5	4.0	44	63	40	24	26	10	28	90	4.0
M560[1]	129.2	3.5	5.0	39	58	42	28	65	11	21	80	3.0
M561[1]	131.6	3.5	5.5	39	59	52	25	5	12	32	75	3.0
M562[1]	26.3	3.5	4.5	58	74	62	35	3	11	14	70	3.0
M563[1]	110.0	3.5	4.5	49	68	62	36	5	10	26	70	3.0
M564[1]		3.5	5.0	43	62	59	45	6	12	29	70	3.0
M565[1]		3.5	5.0	69	88	58	37	12		21	50	3.0
M566[1]		3.5	5.5	74	105	59	37	17		24	55	3.0
M567[1]	181.8	4.0	5.5	52	74	42	36	16	10	29	50	3.5
M568[1]	191.4	3.5	3.5	47	65	64	59	14	9	34	60	4.6
M569[1]	973.5	3.0	7.0	51	72	80	67	37	12	40	10	3.5
M570[1]		3.0	4.0	51	69	60	53	62	10	21	80	3.5
M571[1]		3.0	5.5	42	60	54	44	19	8	37	75	3.5
M572[1]	478.4	3.0	5.5	38	57	69	34	45	11	33	70	4.0
M573[1]		3.0	4.5	60	82	39	28	11	9	26	70	2.5
M574[1]		3.5	4.5	51	72	57	44	39	5	28	80	3.5
M575[1]		3.5	4.5	50	72	62	38	24	6	29	65	3.5
M576[1]		3.5	4.5	58	78	54	36	33	9	31	75	3.5
M577[1]	181.8	3.5	4.5	43	65	55	42	13	7	31	75	4.0

Table 2
(continued)

No. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
1578[1]	172.2	3.5	4.0	50	68	50	32	9	7	25	80	4.0
1579[1]	45.4	3.5	2.5	42	59	42	22		10	26	90	4.0
1580[1]		3.5	5.0	46	65	51	23	36	7	28	60	3.5
1581[1]		3.5	5.0	44	65	51	39	11	10	28	60	3.5
1582[1]		3.0	5.5	45	66	66	62	10	10	30	60	3.5
1583[1]		3.0	5.5	51	72	61	51	27	9	39	60	3.5
1584[1]		2.5	5.5	44	66	60	34	46	13	40	70	3.5
1585[1]		3.5	4.5	56	76	56	14	22	11	29	70	4.0
1586[1]		3.0	4.5	52	77	66	45	42	11	30	75	3.0
1587[1]	155.5	3.0	4.5	44	62	54	39	40	10	24	80	4.0
1588[1]	174.6	3.0	4.0	44	63	45	28	104	10	23	75	4.0
1589[1]	64.6	3.5	4.5	46	66	53	41	32	11	25	75	4.0
1590[1]	908.9	3.0	6.5	50	71	82	16	26	14	45	20	4.5
1591[1]	552.5	2.5	6.0	44	65	77	52	19	11	36	30	3.5
1592[1]	47.8	3.0	4.5	60	80	55	47	26	11	25	70	2.5
1593[1]	93.3	3.0	4.5	66	86	43	33			34	70	2.5
1594[1]	38.3	3.0	4.5	58	77	70	52	39	6	25	75	2.5
1595[1]		3.0	4.0	59	80	51	58	15	10	25	70	3.0
1596[1]	177.0	3.0	3.5	45	65	55	41	89	10	26	70	4.0
1597[1]	196.1	3.0	3.5	44	64	43	26	93	12	27	75	3.5
1598[1]		3.0	3.5	54	78	47	24	23	6	22	75	3.5
1599[1]	272.7	3.0	4.0	47	70	57	50	38	9	24	75	4.0
1600[1]	413.8	3.0	3.0	49	66	54	40	97	9	25	75	4.0
1601[1]		3.0	4.0	50	68	51	11	11	10	25	75	4.0
1602[1]		3.0	4.0	50	65	36	27	8	8	20	75	3.5
1603[1]	129.2	3.0	4.5	50	66	52	38	20	8	25	75	3.5
1604[1]	95.7	3.0	5.5	49	68	52	30	38	12	23	10	3.5
1605[1]	110.0	3.0	4.0	44	65	39	47	10	11	27	65	3.5
1606[1]	90.9	3.0	5.0	64	86	64	52	15	10	25	60	3.0
1607[1]	69.4	3.0	5.5	61	80	55	8	3	10	25	60	3.0
1608[1]	122.0	3.0	5.5	48	65	59	36	14	8	23	50	3.0
1609[1]	7.2	3.0	5.0	45	66	64	41	43	9		50	3.0
1610[1]	200.9	2.5	5.0	54	70	70	39	31	11	31	60	3.0
1611[1]	43.1	3.0	5.5	60	81	53	49	9	8	26	70	3.0
1612[1]	251.2	3.0	5.5	57	81	66	57	21	10	32	60	3.0
1613[1]	267.9	3.0	5.0	50	74	71	60	30	12	32	60	3.5
1614[1]	114.8	3.0	5.5	58	81	67	70	25	6	26	45	3.5
1615[1]	507.1	3.0	5.5	57	74	84	64	19	12	30	40	3.5
1616[1]		3.0	5.5	64	88	80	41	4	8	27	40	3.0
1617[1]	229.6	3.0	5.5	54	79	56	44	16	7	25	40	3.0
1618[1]	260.7	3.0	5.5	50	70	64	58	2	8	26	50	3.0
1619[1]	1151.4	3.0	6.0	47	69	89	61	28	14	40	0	4.0
1620[1]	279.9	3.0	5.5	39	56	67	46	93	11	31	50	3.5
1621[1]	193.7	3.5	4.5	46	71	57	41	42	7	29	60	3.5
1622[1]	217.7	3.0	5.0	46	63	40	32	93	8	26	60	4.0
1623[1]		3.0	5.0	39	57	73	40	39	12	20	50	3.5

Table 2
(continued)

Mo. Acc. NO.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M624[1]		3.5	5.0	51	70	49	8	7	8	40	70	3.5
M625[1]	129.2	3.5	5.5	37	67	61	46	16	10	32	70	3.5
M626[1]		3.0	4.5	40	59	48	25	8	10	25	60	3.0
M627[1]	102.9	3.0	4.5	50	73	50	28	9	9	31	60	3.0
M628[1]		2.5	5.0	74	102	49	44	26	12	35	25	2.0
M629[1]	676.9	3.0	6.0	45	65	88	50		10	42	40	3.5
M630[1]	698.5	3.0	6.0	47	65	97	80	53	13	39	20	3.0
M631[1]		3.0	5.0	62	102	47	35	11	9	26	60	3.0
M632[1]		3.0	5.0	69	102	50	42	22	10	31	60	2.5
M633[1]		3.0	5.0	69	88	43	35	25	8	30	60	2.5
M634[1]		3.0	5.0	69	91	38	28	31	11	31	60	2.5
M635[1]		3.0	5.0	68	104	39	32	8	11	27	60	2.5
M636[1]		3.0	5.5	74	102	40	24	19	8	33	60	2.5
M637[1]		3.0	5.5	72	102	36	22	23	11	24	60	2.5
M638[1]		3.0	5.5	67	86	41	31	48	9	29	60	2.5
M639[1]		3.0	5.5	53	73	36	28	6	7	26	55	2.5
M640[1]		3.0	5.5	65	87	40	42	24	11	27	30	2.5
M641[1]		3.0	5.5	64	91	53	40	56	10	27	50	2.5
M642[1]		3.0	5.0	68	86	49	24	19	11	30	60	2.5
M643[1]		3.0	5.5	72	91	49	39	28	10	29	50	3.0
M644[1]		3.0	5.5	60	81	47	40	17	8	23	60	3.0
M645[1]		3.0	5.8	70	106	51	41	29	10	28	60	3.0
M646[1]		3.0	5.5	68	88	36	34	9	8	36	60	3.0
M647[1]	208.1	3.0	5.0	52	79	59	36	70	7	31	75	3.5
M648[1]		3.0	5.5	66	86	45	29	46	9	28	75	2.5
M649[1]		3.0	5.5	60	81	70	75	68	10	32	60	3.5
M650[1]	590.8	3.0	6.0	42	71	87	43	35	15	42	60	3.5
M651[1]		2.0	5.0	68	86	53	50	53	9	33	60	2.0
M652[1]	545.4	2.5	5.5	45	64	56	39	48	8	30	60	3.0
M653[1]	189.0	3.0	5.5	48	67	51	43	74	8	25	60	4.0
M654[1]		3.0	5.0	64	86	45	34	27	8	27	60	3.0
M655[1]	241.6	3.0	5.5	66	86	60	50	27	12	32	60	3.0
M656[1]	904.2	3.5	5.8	50	69	60	55	80	12	41	5	3.5
M657[1]		3.0	5.5	72	96	42	29	25	8	29	60	2.5
M658[1]	229.6	4.0	5.8	53	72	60	34	17	10	40	40	3.5
M659[1]		3.0	5.5	60	79	40	32	21	7	29	60	2.5
M660[1]		3.0	5.5	74	102	38	31	19	9	30	60	2.5
M661[1]	169.8	3.0	5.0	45	64	45	31	4	10	25	60	3.0
M662[1]		3.0	5.0	79	108	43	30	32	9	31	65	3.0
M663[1]	409.0	3.0	5.8	64	85	45	32	115	14	32	50	3.0
M664[1]	421.0	3.5	5.8	68	88	58	38	67	9	28	35	3.0
M665[1]	260.7	3.5	5.8	53	69	54	41		11	29	40	3.5
M666[1]		3.0	5.0	73	96	38	30	38	11	27	50	2.5
M667[1]		3.0	5.0	63	82	36	27	7	11	26	60	3.0
M668[1]		3.0	5.0	80	102	37	32	15	9	30	60	2.5
M669[1]		3.0	5.0	58	73	41	33	33	9	31	60	3.0

Table 2
(continued)

No. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M670[1]	361.2	3.0	5.5	56	72	49	34	23	13	31	70	3.5
M671[1]	389.9	3.0	5.5	59	79	40	38	15	12	32	60	3.0
M672[1]	124.4	3.0	5.5	36	55	40	36	50	8	25	40	3.5
M673[1]		3.0	5.0	72	96	41	27	45	9	29	50	2.5
M674[1]		3.0	5.0	64	86	44	30	35	11	32	40	2.5
M675[1]	413.8	3.0	5.0	63	81	48	32	29	12	30	70	3.0
M676[1]	511.9	2.5	5.0	45	67	58	41	29	10	31	60	3.5
M677[1]	557.3	3.0	5.5	62	79	50	37	34	12	28	40	2.5
M678[1]		3.0	5.5	35	55	43	28	74	11		5	3.0
M679[1]	507.1	3.0	5.5	52	72	56	48	26	8	31	50	2.5
M680[1]	655.4	3.5	5.7	48	68	52	41	39	13	35	50	3.5
M681[1]		3.0	5.0	63	79	46	36	16	10	27	60	2.5
M682[1]	466.4	3.0	5.5	54	71	45	29	54	11	31	60	2.5
M683[1]		3.0	5.0	63	79	39	20	55	12	28	60	2.5
M684[1]		3.0	5.0	64	96	46	26	54	9	32	60	2.5
M685[1]		3.0	5.0	62	86	38	27	59	7	29	60	3.0
M686[1]		3.0	5.0	61	86	44	23	49	10	31	60	3.0
M687[1]	672.1	3.0	5.5	64	86	52	45	37	10	30	60	3.0
M688[1]	679.3	3.0	5.5	50	67	71	60	75	13	39	20	3.5
M689[1]	339.7	3.0	5.0	35	52	43	45	56	10	30	70	4.0
M690[1]		3.0	5.0	48	65	40	32	78	12	32	60	3.0
M691[1]		3.0	5.5	64	82	49	49	48	9	33	60	2.5
M692[1]		3.0	5.0	65	81	38	31	24	11	26	60	3.0
M693[1]	1396.9	2.0	7.0	58	79	67	52	151	12	54	0	2.0
M694[1]		3.0	5.5	63	81	48	40	59	13	32	60	2.5
M695[1]		3.0	5.5	59	79	48	30	54	10	24	60	3.0
M696[1]		3.0	5.5	62	82	54	44	28	11	30	60	3.0
M697[1]	583.6	3.0	5.0	50	69	57	38	79	11	47	50	3.0
M698[1]		3.0	4.5	62	80	40	29	27	10	33	60	3.0
M699[1]	528.6	3.0	5.0	63	81	57	45	23	8	32	50	3.0
M700[1]		3.0	5.5	64	91	45	38	15	10	30	50	2.5
M701[1]		3.0	5.0	82	102	38	29	45	9	27	60	2.5
M702[1]	1093.1	3.0	6.0	48	66	85	69	45	12	46	15	3.5
M703[1]	394.7	3.0	5.5	60	79	40	27	8	12	31	60	3.0
M704[1]		3.0	5.0	69	91	55	50	39	11	32	60	3.0
M705[1]	71.8	3.0	5.0	62	81	43	42	10	7	29	70	2.5
M706[1]		3.0	5.0	62	81	35	33	28	12	27	60	2.5
M707[1]		3.0	5.0	48	63	54	47	43	9	31	70	2.5
M708[1]	724.8	3.0	5.5	63	81	57	44	35	10	31	70	2.5
M709[1]	270.3	3.0	5.5	52	72	54	31	21	12	32	60	2.5
M710[1]	502.3	3.0	6.0	53	70	54	42	83	14	42	50	3.0
M711[1]	291.8	3.0	5.5	59	79	58	46	31	14	37	60	2.5
M712[1]	306.2	3.0	5.5	62	81	55	38	55	12	55	60	2.5
M713[1]		3.0	5.0	66	86	38	27	21	11	28	60	2.5
M714[1]		3.0	5.0	63	86	37	30	40	13	37	60	2.5
M715[1]		3.0	5.0	74	96	40	30	12	7	26	60	2.5

Table 2
(continued)

Mo. Acc. No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M716[1]		3.0	5.5	61	81	50	49	21	14	28	60	2.5
M717[1]		3.0	5.0	65	86	48	41	40	12	34	40	2.5
M718[1]		3.0	5.0	61	88	50	30	10	11	31	60	2.5
M719[1]		3.0	5.0	63	86	56	45	31	11	36	40	2.5
M720[1]		3.0	5.0	64	85	50	40	19	10	31	60	2.5
M721[1]	751.1	3.0	6.0	55	74	80	51	28	15	42	15	3.0
M722[1]	873.1	3.0	6.0	53	72	75	59	16	13	50	15	3.0
M723[1]		3.0	5.0	65	86	63	53	5	10	32	40	3.0
M724[1]	212.9	3.0	5.5	63	82	47	45	12	12	35	50	3.0
M725[1]	782.2	3.0	6.0	57	74	64	69	42	11	35	10	2.5
M726[1]		3.0	5.5	64	85	51	43	13	11	36	60	2.5
M727[1]	617.1	3.0	6.0	64	81	51	15	67	13	37	25	2.5
M728[1]	554.9	3.0	6.0	61	81	57	38	57	11	42	40	2.5
M729[1]		3.0	5.0	72	102	39	32	8	9	25	60	2.5
M730[1]		3.0	5.0	63	88	45	39	10	7	27	60	2.5
M731[1]	466.4	3.0	5.5	51	67	57	50	62	12	35	50	2.5
M732[1]		3.0	5.0	72	92	40	31	4	10	24	60	2.5
M733[1]		3.0	5.0	61	80	63	53	28	10	33	60	2.5
M734[1]		3.0	5.5	63	86	48	41	7	10	29	60	2.5
M735[1]		3.0	4.0	78	102	43	33		9		60	3.5
M736[1]		3.0	4.0	76	101	49	41		8		50	3.5
M737[1]	93.3	3.0	4.0	69	102	48	30	3	9	29	60	3.5
M738[1]		3.0	5.0	71	102	47	15		9		50	3.0
M739[1]		3.0	5.0	57	80	45	22		5		50	3.5
M740[1]		3.0	4.0	58	78	37	21		10		50	4.0
M741[1]		3.0	5.0	64	85	51	28		6		50	3.5
M742[1]		3.0	5.0	74	105	51	41		9		50	2.5
M743[1]		3.0	5.0	71	102	48	31		10		40	3.0
M744[1]		3.0	5.0	66	85	47	40		9		45	3.5
M745[1]		3.0	4.0	55	101	52	25		9		45	4.0
M746[1]		3.0	4.0	58	78	62	37		10		60	3.5
M747[1]	521.4	3.5	5.0	57	78	72	41	19	9	44	35	4.0
M748[1]	650.6	3.5	7.0	56	72	74	47	23	10	45	30	4.0
M749[1]	724.8	3.0	7.0	57	78	85	55	17	11	48	10	4.5
M750[1]	387.5	3.5	5.5	56	74	64	56	10	14	42	30	4.5
M751[1]	710.4	3.5	6.0	50	73	77	60	40	10	35	30	5.0
M752[1]	557.3	3.0	6.0	53	71	65	43	15	12	46	20	4.0
M753[1]	672.1	2.0	6.0	48	66	78	71	13	12	40	25	3.0
M754[1]	966.4	3.0	6.0	56	71	55	8	33	13	42	10	3.0
M755[1]	954.4	1.5	6.0	44	63	76	46	42	13	40	10	3.0
M756[1]		2.5	4.0	55	73	57	50		13		50	3.0
M757[1]		3.5	5.5	45	64	70	47		11		40	3.0
M758[1]		4.0	5.0	54	101	67	34		10		60	3.0
M759[1]		4.0	6.0	52	72	71	54	35	11	20	20	3.0
M760[1]		4.0	6.0	78		64	30	7	12	19	25	3.0
M761[1]		4.0	6.5	63	96	66	34	16	10	22	20	3.5
M762[1]		4.0	6.5	67	87	70	57	25	10	21	25	3.0

Table 2
(continued)

Mo. Acc No.	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M763[1]		4.0	5.5	71	102	64	23		10		20	3.5
M764[1]		4.0	5.5	66	102	54	55		8		40	3.5
M765[1]		4.0	5.0	72		62	48		11		30	3.0
M766[1]		4.0	5.5	56		64	37		9		35	3.0
M767[1]	521.4	4.0	7.0	55	69	70	54	21	12	33	30	4.0
M768[1]		4.0	7.0	59	96	58	35		10		25	2.0
M769[1]		4.0	7.0	70	105	59	48		10		25	3.0
M770[1]		4.0	7.0	78	102	69	51		8		25	3.0
M771[1]		3.5	7.0	68	87	61	32		12		20	2.0
M772[1]		3.5	7.0	64	81	54	43		10		35	2.5
M773[1]	782.2	3.5	5.5	54	69	51	29	70	14	36	5	4.0
M774[1]	868.3	3.5	6.0	43	60	53	9	48	12	42	5	4.0
M775[1]	820.4	3.5	5.5	49	68	56	40	25	13	36	15	3.5
M776[1]	578.9	4.0	6.0	51	69	56	25	30	13	42	10	3.5
M777[1]	822.8	3.5	6.0	69	87	49	16			42	20	3.5
M778[1]		3.0	5.5	54	70	48	17		11		15	3.5
M1062[1]	540.6	4.0	5.5	51	70	72	34	32	13		30	2.5
M1063[1]	1160.1	2.0	5.0	68	85	37	54	75	12	44	10	2.5
M1064[1]	260.7	3.5	7.0	54	73	62	21	6	12	60	5	4.5
Mean	573.3	3.1	5.6	57.6	77.3	56.0	40.3	41.1	10.4	38.2	36.2	3.2

Table 3

Performance of 72 (15%) Highest Yielding Strains at Columbia, Missouri, in 1973

No. Acc. No.	Yield Rank	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed Wt gm	Virus score (1-100)	Mildew score (1-5)
M333	1	1853	1.7	5.8	46	64	83	71	157	13	40	0	3.5
M410	2	1836	2.0	7.1	60	80	79	66	73	12	47	0	2.2
M101	3	1828	1.0	6.1	51	70	66	62	84	12	66	0	2.3
M90	4	1780	2.0	7.2	58	76	71	45	81	11	61	0	1.8
M135	5	1752	2.0	5.7	47	67	58	53	98	12	39	0	3.8
M235	6	1674	2.2	7.2	65	34	72	65	53	11	61	0	2.0
M349	7	1648	3.0	7.2	50	73	81	65	70	12	41	2	2.8
M339	8	1639	1.7	6.0	47	66	80	58	123	13	37	0	4.5
M232	9	1623	1.7	7.1	55	72	69	66	81	11	59	0	1.8
M348	10	1573	2.2	7.0	51	73	87	75	92	13	49	0	2.2
M203	11	1554	2.0	7.1	61	80	55	65	112	10	56	2	2.2
M531	12	1550	1.7	6.1	45	65	65	45	68	11	53	7	3.3
M472	13	1531	2.3	7.1	66	85	50	52	129	12	51	0	1.7
M530	14	1488	1.8	6.9	57	78	73	66	54	14	47	2	2.2
M140	15	1457	2.0	6.7	44	65	54	43	97	12	41	0	2.2
M238	16	1429	2.0	6.9	63	83	66	56	59	12	55	0	1.7
M330	17	1402	2.0	6.7	64	84	54	40	54	11	57	2	2.3
M351	18	1397	2.5	7.1	58	77	65	51	51	13	48	0	2.8
M693[1]	19	1397	2.0	7.0	58	79	67	52	151	12	54	0	2.0
M546	20	1383	2.0	7.0	69	88	48	43	70	12	57	5	2.3
M118	21	1305	1.8	6.9	64	84	48	59	54	11	59	2	2.0
M475	22	1291	2.2	6.8	56	76	47	47	124	11	59	3	1.3
M370	23	1285	3.5	5.8	64	82	59	36	59	11	33	2	2.2
M340	24	1276	2.5	6.4	51	71	66	55	49	14	46	8	3.2
M233	25	1267	2.3	6.8	60	78	70	66	111	12	60	3	2.5
M137	26	1241	1.8	5.7	44	66	47	35	103	12	39	3	3.8
M31	27	1234	2.2	6.9	62	87	66	51	57	11	58	3	2.5
M532	28	1231	3.7	6.5	59	77	62	44	102	12	39	7	3.2
M138	29	1230	1.8	6.7	47	68	81	63	55	12	42	7	3.3
M438	30	1225	2.8	6.5	44	62	66	56	46	11	59	6	3.5
M411	31	1206	4.2	6.9	63	81	64	52	174	12	36	7	2.8
M343	32	1202	2.0	6.2	47	66	74	56	48	13	41	8	3.5
M358	33	1197	1.8	6.9	50	70	72	63	71	13	38	0	2.5
M194	34	1184	1.8	7.1	57	83	60	52	57	11	60	0	2.0
M408	35	1183	1.5	6.7	44	65	44	41	49	12	47	7	3.7
M352	36	1169	3.0	6.0	48	67	75	54	76	11	39	27	4.3
M76	37	1163	2.5	6.2	46	66	58	44	63	12	36	17	4.0
M1063[1]	38	1160	2.0	5.0	68	85	37	54	75	12	44	10	2.5
M362	39	1155	3.5	6.7	54	72	70	33	54	13	38	10	3.5
M4	40	1154	1.5	5.0	57	74	73	63	72	14	47	1	2.8

Table 3
(continued)

No. Acc. No.	Yield Rank	Yield kg/ha	Plant type (1-5)	Leaf size (1-8)	Days to Flower	Days to Ripe	Hgt cm	Branch Length cm	Pods per Plant	Seeds per Pod	1000 Seed wt gm	Virus score (1-100)	Mildew score (1-5)
M437	41	1147	3.0	6.5	49	68	76	57	35	11	48	12	3.0
M506	42	1142	2.7	7.0	65	82	60	45	110	12	34	3	2.8
M359	43	1134	1.5	6.9	52	71	61	49	74	13	39	0	2.3
M619	44	1131	3.0	6.0	47	69	89	61	28	14	40	0	4.0
M355	45	1106	3.0	6.5	46	65	76	30	51	13	40	15	4.2
M14	46	1102	2.3	6.9	56	81	63	51	71	9	59	7	2.3
M91	47	1093	2.0	7.0	63	82	51	59	78	11	60	0	1.7
M702[1]	48	1093	3.0	6.0	48	66	85	69	45	12	46	15	3.5
M317	49	1091	3.0	6.3	52	73	71	52	73	14	62	13	3.8
M466	50	1066	4.0	6.3	68	89	67	59	56	11	30	7	2.3
M195[1]	51	1031	2.0	7.5	47	66	92	70	39	13	59	5	2.5
M374	52	1030	3.0	5.7	44	65	58	44	55	11	63	27	4.0
M447	53	995	3.3	5.8	47	65	61	30	32	11	59	20	4.2
M510[1]	54	995	2.0	7.0	46	67	62	50	69	13	40	2	3.5
M569[1]	55	973	3.0	7.0	51	72	80	67	37	12	40	10	3.5
M754[1]	56	966	3.0	6.0	56	71	55	8	33	13	42	10	3.0
M206[1]	57	966	2.0	7.7	61	81	76	55	24	13	57	5	2.0
M755[1]	58	954	1.5	6.0	44	63	76	46	42	13	40	10	3.0
M367	59	947	3.2	5.7	48	66	65	43	61	12	37	7	3.7
M435	60	945	3.0	6.3	44	65	68	53	50	11	46	8	4.0
M103	61	937	2.3	6.3	52	72	66	60	40	14	41	12	3.0
M398	62	922	3.2	7.0	51	71	71	36	72	10	67	12	4.0
M155	63	916	3.5	6.0	48	67	65	51	72	10	50	28	3.7
M174	64	910	2.5	6.8	66	86	58	49	50	11	59	2	2.0
M590[1]	65	909	3.0	6.5	50	71	82	16	26	14	45	20	4.5
M454	66	907	3.5	6.6	50	70	58	40	23	12	54	10	4.0
M656[1]	67	904	3.5	5.8	50	69	60	55	80	12	41	5	3.5
M15	68	901	1.7	7.0	53	73	68	45	37	10	62	18	2.2
M547	69	889	3.3	6.6	57	76	60	48	45	14	54	10	2.6
M722[1]	70	873	3.0	6.0	53	72	75	59	16	13	50	15	3.0
M350	71	868	3.2	6.7	47	65	78	65	60	13	39	6	2.8
M774[1]	72	868	3.5	6.0	43	60	53	9	48	12	42	5	4.0
Mean of 24 (5%) highest yielding strains:		1539.6	2.1	6.7	56	76	65	56	85	11.9	51	1.5	2.4
Mean of 48 (10%) highest yielding strains:		1356.3	2.3	6.6	55	74	65	54	78	12.0	48	4.2	2.8
Mean of 72 (15%) highest yielding strains:		1220.3	2.5	6.5	54	73	66	51	68	12.0	48	6.5	2.9
Mean of 473 strains:		574.9	3.1	5.6	58	77	56	40	41	10.4	38	36.2	3.2

[1]Data based on a single row plot, only.