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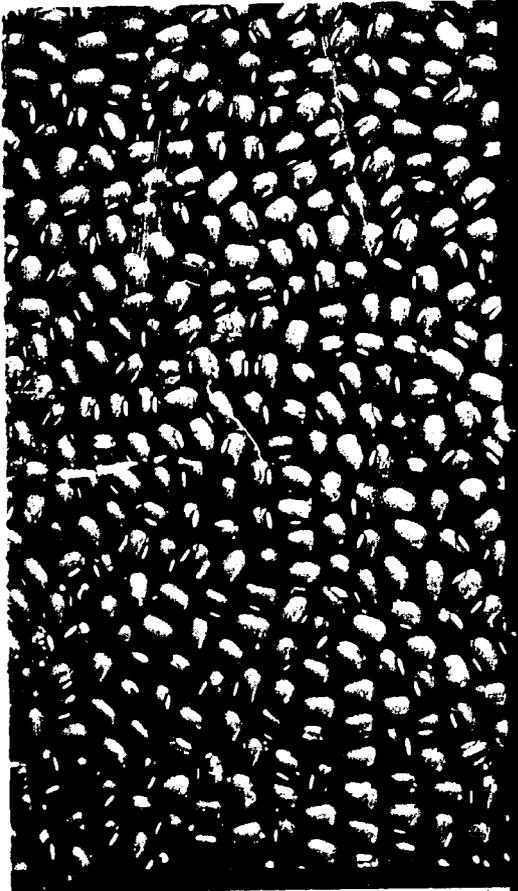
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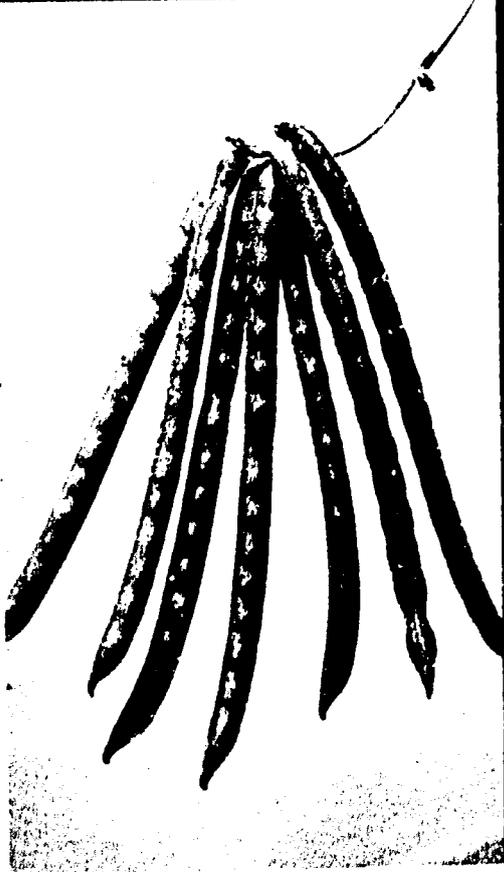
This is a report on performance of the Third International Mungbean Nursery program. Mungbeans were grown in 24 test locations in 11 countries. Two new entries, M1133 from Oklahoma and M333 from India, ranked highest in yield. Strain M317, which ranked second overall, and M350, which ranked first overall, ranked third and fourth in yield, respectively. Thus the high yield potential and wide adaptation of M350 and M317 continues to be demonstrated. M4 from India and M408 from Canada were earliest to flower. M317 and M374 (MG50-10A) had highest 1000-seed weight. M411, M412, and M409 had low disease scores. The International Mungbean Nursery was organized to provide information on (a) the range of adaptation of the mungbean species; (b) the range of adaptation of specific cultivars; and (c) characteristics of the mungbean plant influencing adaptation. The IMN also serves as a means of disseminating superior cultivars to mungbean research workers in many countries.

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# Performance of the Third International Mungbean Nursery

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## SUMMARY

This is a report on performance of the Third International Mungbean Nursery which was grown in 24 test locations in 11 countries. Two new entries, M1133 from Oklahoma and M333 from India, ranked highest in yield. Strain M317, which ranked second, and M350, which ranked first, over the first two IMN's, ranked third and fourth in yield, respectively. Thus the high yield potential and wide adaptation of M350 and M317 continues to be demonstrated. M4 from India and M408 from Canada were earliest to flower. M317 and M374 (MG50-10A) had highest 1000-seed weight. M411, M412, and M409 had low disease scores.

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# Performance of the Third International Mungbean Nursery<sup>1</sup>

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and Vas Dev Aggarwal<sup>3</sup>.

## INTRODUCTION

Data from the Third International Mungbean Nursery (Third IMN) grown in 1974-75 have been received from 24 test locations<sup>1</sup> in 11 countries. The Third IMN contained 28 strains of mungbeans (*Vigna radiata* (L.) Wilczek) selected for range in maturity, diversity in plant type and geographic origin, and performance in previous International Mungbean nurseries. The International Mungbean Nursery was organized to provide information on (a) the range of adaptation of the mungbean species, (b) the range of adaptation of specific cultivars, and (c) characteristics of the mungbean plant influencing adaptation. The nursery also serves as a means of disseminating superior cultivars to mungbean research workers in many countries.

## FIRST AND SECOND INTERNATIONAL MUNGBEAN NURSERIES

The First International Mungbean Nursery (First IMN) was grown in 1972-73 and data were reported by 10 cooperators in seven countries. The Second International Mungbean Nursery (Second IMN) was grown in 1973-74 and data were reported by 18 cooperators in 11 countries. Results of the First IMN and the Second IMN were published in Missouri Agricultural Experiment Station Special Reports 158<sup>5</sup> and 171<sup>6</sup> respectively. A summary of data collected in these two nurseries show:

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<sup>1</sup>This research was funded by a grant from the U.S. Agency for International Development. Mungbean strains included in this nursery came originally from the U.S. Department of Agriculture, Oklahoma Agricultural Experiment Station; Crops Experiment Station, Suwon, Korea; Punjab Agricultural University, India; University of Philippines, Los Baños, and other sources.

<sup>2</sup>Professor of Agronomy and <sup>3</sup>Research Assistant in Agronomy, University of Missouri-Columbia.

<sup>4</sup>Grateful acknowledgement is given to the cooperators who grew the nurseries and collected the data. They are listed in Tables 2 through 25.

<sup>5</sup>Poehlman, J. M., Dale T. Sechler, John M. Yohe, Earl E. Watt, Richard E. Swindell, and Mohab M. H. Bashant. 1974. *Performance of the First International Mungbean Nursery*. Missouri Agricultural Experiment Station Special Report 158.

<sup>6</sup>Poehlman, J. M., Dale T. Sechler, John M. Yohe, Earl E. Watt, Richard E. Swindell, and Ellis Benham. 1974. *Performance of the Second International Mungbean Nursery*. Missouri Agricultural Experiment Station Special Report 171.

(a) Strains M350 from Korea and M317 from China ranked 1 and 2, respectively, for yield indicating wide adaptability and large yield potential for these strains.

(b) Strains M140 and M299 were earliest to flower. Both ranked low in yield. Overall, the highest yielding strains were moderately early in flowering.

(c) Strains M101 and M317 had the largest seeds. Both had dull seeds as well as M350, the highest yielding strain.

(d) Viral diseases, mildew and cercospora leaf spot were the diseases reported to be present most frequently. The specific viral disease was generally unidentified.

(e) Strains differed in their sensitivity to photoperiod. All strains tended to flower early at low latitudes (short photoperiods), with flowering being delayed in many strains at the high latitudes (long photoperiods).

## MATERIALS AND METHODS

### Mungbean Strains

The 28 mungbean strains grown in the Third IMN are listed in Table 1. The entries include 21 strains grown in the Second IMN and seven new strains. The new strains are M333 from India, M339 from Korea, and M1132, M1133, M1134, M1135, M1136 from the Oklahoma Agricultural Experiment Station, USA.

### Seed Distribution and Nursery Plans

Except for the five entries from Oklahoma, seeds of all entries were grown at Columbia, Missouri. Seeds of the Oklahoma entries were received from the Oklahoma Agricultural Experiment Station, Stillwater. The seeds were treated with the fungicide Thiram (tetramethylthiuramdisulfide) before distribution. The overall plan for the nursery was the same as for the 1st and 2nd IMN's. Cooperators were sent seed for planting 1-3 replications as requested. Most cooperators used a plot size of 4x.75m in a randomized block design, although plot size and design were modified by other cooperators to fit their specific needs.

### Nursery Sites

Seeds for planting the Third IMN were sent to cooperators requesting seed insofar as seed supplies were available. A wide range in latitude was desired in order to evaluate response to varying photoperiods. This was accomplished since nursery sites from which data have been received vary from 3° to 52° N latitude and 7m to 1560m elevation (Figure 1). The specific sites are as follows:

- Canada - Research Station, Morden, Manitoba
- Canada - U. of Saskatchewan, Saskatoon
- Columbia - ICA, Palmira
- Ethiopia - Inst. Agri. Research, Adama/Nazareth
- Ethiopia - Agri. Research Station, Kobbo Wollo
- India - Punjab Agri. Univ., Ludhiana, Punjab
- India - Pulse Research Station, Nayagarh, Orissa
- India - G. P. Pant Univ., Pantnager, U.P.
- Iran - U. of Teheran, Karaj
- Korea - Gyeong-sang Nat. Univ. Kyung-nam

Table 1. LIST OF MUNGBEAN STRAINS INCLUDED IN THE THIRD INTERNATIONAL MUNGBEAN NURSERY, 1974-75.

Entry number	Missouri <sup>a</sup> accession number	USDA <sup>b</sup> P. I. number	AVRDC <sup>c</sup> number	Name	Country in which strain originated
1	M4	368268	3372	Shining Moong 1	India
2	M14	368278	3373	Jalagaon 781	India
3	M15	368279	3374		Taiwan
4	M76		1968	Oklahoma 12	USA
5	M90	223711	1969		India
6	M118	180311	1978		India
7	M174	164775	1114		India
8	M194	180313	1992		India
9	M232	212907	2001		India
10	M317	298915	2010		China
11	M333 <sup>d</sup>	374146	3092		India
12	M339 <sup>d</sup>	362327	3096	Myungnokdu	Korea
13	M350	362322	2984	Kyungkijaerae 5	Korea
14	M374	369768	1381	MG 50-10A	Philippines
15	M408	378022	3375	Morden 39	Canada
16	M409	378023	3376		Peru
17	M411	370637	2248	Hybrid 45	India
18	M412	370638	2040	T-2	India
19	M416	371816	3378	Tua Tawny	Thailand
20	M475 <sup>d</sup>	385295	3161	Kanke Multipurpose	India
21	M531 <sup>d</sup>	385301	3180	48-971-10961	Iran
22	M533	377902	2268	MI-1	India
23	M543	377916	3182	An Glang	Vietnam
24	M1132 <sup>d</sup>		3387	Lincoln	USA
25	M1133 <sup>d</sup>		3388	OSU <sup>e</sup> M-966-71-10	USA
26	M1134 <sup>d</sup>		3389	OSU M-967-71-15	USA
27	M1135 <sup>d</sup>		3390	OSU M-967-71-22	USA
28	M1136 <sup>d</sup>		3391	OSU M-968-71-1	USA
29	Local				
30	Local				

<sup>a</sup>Accession number of the Missouri Agricultural Experiment Station, Columbia, Missouri.

<sup>b</sup>P. I. number is the "Plant Introduction" number of the United States Department of Agriculture. A permanent collection of varieties with P. I. numbers is maintained at the Regional Plant Introduction Station, Experiment, Georgia 30212.

<sup>c</sup>Accession number of the Asian Vegetable Research and Development Center, Shanhua, Tainan, Taiwan.

<sup>d</sup>New Entries.

<sup>e</sup>Oklahoma State University, Stillwater, Oklahoma 74074.



Korea	- Crops Experiment Station, Suwon
Pakistan	- Tech. Services Assoc., Lahore
Pakistan	- Punjab Agri. Res. Inst., Lyallpur
Pakistan	- Univ. of Agriculture, Lyallpur
Philippines	- IRRI, Los Baños
Philippines	- BPI Economic Garden, Los Baños
Taiwan	- AVRDC, Shanhua, Tainan
Thailand	- Rice Expt. Station, Suphanburi
Thailand	- Mae-Hia Expt. Station, Chieng Mai
Thailand	- Mae-Jo Expt. Station, Chieng Mai
USA	- Ala. A and M Univ., Normal, Alabama
USA	- Okla. State Univ., Stillwater, Oklahoma
USA	- Univ. of Missouri, Columbia, MO

### Planting Dates

Most nurseries were planted during the months of June and July, 1974 (Figure 1). However, nurseries were also planted in April, May, August, and September (1974), and in January and March 1975. At latitudes below 20°, temperatures are favorable, except in the higher elevations, for planting in any month during the year. Successive plantings were made at the BPI Economic Garden at Los Baños in July and January. At Chieng Mai, Thailand, plantings were made in May and August. Precipitation patterns also affect the planting date at the lower latitudes. Throughout Southeast Asia precipitation is most abundant in the months of June through September and generally mungbeans cannot be grown in other months unless irrigation is available. Reports were received of mungbean plants being broken and damaged by excessive rain and high wind at several locations when the nurseries had been planted during the rainy season. At latitudes of around 34° and higher the growing season is restricted to the months of June to September by temperature. In 1974, growth of mungbean plants was stopped by early frosts at Normal, Alabama; Columbia, Missouri; Morden Manitoba; and Saskatoon, Saskatchewan.

### Reporting Data

Procedures for recording notes and reporting data were sent to cooperators in order to obtain uniformity needed for efficient data summarization. The cooperators are commended for following the suggestions closely. Data on the following observations were reported from four or more of the stations where the nurseries were grown:

*Yield:* Yield in kg/ha of clean harvested seed.

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

*Height:* Measured in cm from ground level to tip of the main stem

*Pods per plant:* Number of pods with mature seed from a random sample of five plants.

*Seeds per pod:* Average number of seeds per pod from a random sample of 10 or more pods.

*1000-seed weight:* Weight in grams of a random sample of 100 or more seeds, expressed on a 1000-seed weight basis to permit use of whole numbers.

*Disease Score:* Disease reaction scored on a scale of 1 (resistant) to 5 (susceptible).

A score of 1 represents a high level of resistance and a score of 5 represents susceptibility.

*Days to 1st ripe pod* was reported from three locations and *branch length* from one location.

## RESULTS AND DISCUSSION

Performance data for the 28 uniform strains in the Third IMN are recorded for specific test locations in Tables 2 through 25. Data for local checks are included in the means. A summary over all locations is given in Table 26. Data from Morden, Canada; Saskatoon, Canada; Ludhiana, India; Nayagarh, India; and Normal, Alabama are not included in the summary because data were not complete for all strains at those locations. The 'Coefficient of Variation' and 'Least Significant Difference' are reported where replicated data were available.

### *Yield*

Yields are summarized from 17 locations. The highest mean yields over all strains were reported from the Mae-Jo Station, Chiang Mai, Thailand (1580.7 kg/ha); Rice Experiment Station, Suphanburi, Thailand (1188.9 kg/ha); University of Teheran, Karaj, Iran (1059.5 kg/ha); and the Crops Experiment Station, Suwon, Korea (991.0 kg/ha). Mean yields over all strains were below 500 kg/ha at five locations (Kobbo Wollo, Ethiopia; Nayagarh, India; Pantnager, India; Lyallpur, Pakistan; and the BPI Economic Garden, Los Banos). The mean yield over all strains and locations was 715.3 kg/ha, below the 752.0 kg/ha reported for the Second IMN. The overall low yields reflect the need for intensive research to improve cultural practices of mungbeans.

M1133 ranked highest in yield over all locations (937.6 kg/ha) followed by M333 (891.8 kg/ha), M317 (863.9 kg/ha), M350 (846.6 kg/ha) and M1132 (828.3 kg/ha). M1133 and M1132 are new entries in the IMN from the Oklahoma State University, Stillwater, and M333, which ranked second in yield, is a new entry, also. Seed of M333 was obtained originally from a market in Calcutta, India, and further identity of this strain is unknown. M317, which ranked third in yield, ranked second in the First IMN and 4th in the Second IMN. M350 which ranked fourth in yield, ranked first in both the First IMN and the Second IMN. M317, whose origin is listed as China, was received originally from the U.S. Department of Agriculture and M350 was received from the Crops Experiment Station, Suwon, Korea. The high mean yields of M350 and M317 in the first three IMN's demonstrates high yield potential and wide adaptability for these two strains. Strains M409 from Peru, M411 (Hybrid 45) from India, and M374 (MG 50-10A) from the Philippines, which ranked second, third and fifth, respectively, in the Second IMN, ranked eighteenth, sixteenth, and twentieth, respectively in the Third IMN.

The leading strain M1133 was first in yield at two locations and second in yield at three locations. M333 ranked first at only one location, and M317 ranked first at two locations. M350 did not rank first at any location. Local check varieties ranked first in yield at five locations and second at four locations. It would be useful for the cooperators to enter these local strains in the next IMN.

### *Days to First Flower*

The mean days to first flower for the 28 strains averaged over 17 locations was 44.3 days. Earliest flowering was at Suphanburi, Thailand, with a mean of 31.5

days, and at Chiang Mai, Thailand, (August planting date) with a mean of 32 days. Latest flowering was at Saskatoon and Morden, Canada. At Saskatoon only six of 28 strains flowered before being killed by frost and at Morden only 17 of 30 strains flowered before frost. The mean number of days to flower for the six strains at Saskatoon was 74 days and for the 17 strains at Morden was 71 days.

The earliest strains to flower were M4 and M408 each with a mean of 40.2 days, M531 with a mean of 40.6 days, and M333 with 41.1 days. The latest strains to flower were M412 (46.7 days), M1134 (50.4 days) and M409 (51.7 days). M408 was one of the earliest strains to flower and M409 was the latest strain to flower in the Second IMN.

### ***Height***

Height of plants, reported from 19 locations, averaged 44.9 cm over all strains. M408 was the shortest strain and M409 the tallest strain. M408, which was also the earliest strain, has a short central stem and long sidebranches. M409 was the latest strain to flower and the tallest strain in the Second IMN.

### ***Pods per Plant***

Pods per plant were reported from 12 locations. Highest number of pods per plant was reported for M411 (40) followed by M533 (38), M412 (33), M333 (28) and M350 (26). Pods per plant is a component of yield, however, of the above strains only M333 and M350 were among the five highest yielding strains. M411 ranked first and M533 ranked second for pods per plant in the Second IMN.

### ***Seeds per Pod***

Number of seeds per pod, a second component of yield, were reported from 17 locations. The five strains with the largest number of seeds per pod were M1132 (12.2), M1135 (11.9), M15 (11.8), and M317 (11.5). Among these strains M1132 ranked fifth in yield and M317 ranked third in yield. M317 ranked first and M15 ranked second for number of seeds per pod in the Second IMN.

### ***1000-Seed Weight***

Seed weight is a third component of yield and large seeds are a desired feature of mungbean seeds in the marketplace. Seed weight was reported from 17 locations with highest 1000-seed weight recorded for M317 (60.9g), M374 (60.4g), M1136 (58.2g), M15 (57.5g), and M1135 (56.5g). In the Second IMN, M374 ranked first, M317 ranked third, and M15 ranked fifth in 1000-seed weight. Strains M411 and M533 which were highest in 'pods per plant' had the smallest 1000-seed weight with 35.3 and 34.8g, respectively. The two highest yielding strains, M1133 and M333, had 1000-seed weights of 50.7 and 40.4g, respectively.

### ***Disease Scores***

Observations were reported on one or more diseases from 13 locations. Virus (unidentified) was reported from nine locations, mungbean yellow mosaic virus from six locations, mildew from four locations, and cercospora leaf spot from eight locations. These are the diseases that have been reported most frequently in previous IMN's.

Although a viral disease was reported from nine locations, the specific virus, or virus complex, has not been identified and it is not known whether the same viral disease is being observed at the different locations. The symptoms most commonly observed are a leaf crinkling or rugose appearance, dwarfing, and flower abortion. Data summarized over seven locations show a mean viral score of 2.0 (scale 1-5). Lowest scores were for strains M333 and M1134 (each with score of 1.1), M409 (1.4), M1133 (1.5), M531 (1.6), and M4 and M339 (each with score of 1.7). Highest mean scores were for strains M317 (2.8) and M543 (3.2).

Mungbean yellow mosaic virus scores were summarized over four locations. Strains with lowest MYMV scores were M412 (0.8), M411 (0.9) and M416 (0.9). Highest scores were recorded for M90 (2.8), M475 (2.8), and M232 (3.0). Strain M411 had the lowest MYMV score in the Second IMN and M475 and M174 were among the strains with highest scores.

Mildew scores are summarized from four locations. Strains M15, M412, and M1136 had the lowest scores (each with a score of 1.9). Strain M333 had the highest score (3.5). Strains M76 and M531 each had scores of 3.1.

Cercospora leaf spot scores are summarized from seven locations. Lowest score was recorded for M411, M412, and M533, each with a score of 1.8. Five strains had scores of 3 or higher, M531 (3.2), M90 (3.1), M232 (3.0), M333 (3.0), and M1132 (3.0). M533 had one of the lowest scores for cercospora leaf spot in the Second IMN.

As in previous years disease scores reported for the IMN often are difficult to assess, particularly when all scores are low. It is not always clear whether this should be interpreted to mean resistance, or, more probably, escape reactions due to light disease development.

#### *Seed Color and Luster*

All strains of mungbeans in the Third IMN have green seed coats except for M416 which has a yellow seed coat. Two strains, M317 and M350, have a dull rather than a shiny luster.

### **SUMMARY OF THE SECOND AND THIRD INTERNATIONAL MUNGBEAN NURSERIES**

Nineteen strains were grown in both the Second and the Third IMN's. A summary of agronomic and disease data for the 19 strains over 37 test locations in the Second and Third IMN's is reported in Table 27. Strain M350 ranked first in yield over all locations, with strain M317 ranking second, M411 ranking third, and M409 fourth. M408, M4, M374, M76, and M350 were the earliest to flower. M374 and M317 had highest 1000-seed weight. M411, and M412 had the lowest disease scores. Except for cercospora leaf spot, disease scores of M409 were low, also.

### **SUMMARY OF THE FIRST, SECOND, AND THIRD INTERNATIONAL MUNGBEAN NURSERIES**

Ten strains from the First IMN were included in the Second and Third IMN's, and data for these ten strains have been summarized in Table 28 over a total of 46 test locations. M350 and M317 were highest in yield, again demonstrating the high potential for yield and wide adaptation possessed in these strains. Among

the ten strains, M4 was earliest to flower and M317 had the largest 1000-seed weight. All of the strains had relatively low virus scores. M14 and M76 had the lowest scores for cercospora leaf spot.

Table 2. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Morden, Manitoba, Canada

Cooperator: Mark D. Stauffer, Research Station, Morden, Manitoba, Canada, R0G 1J0

Entry no	Acc. no	Days to first flower	Ht cm	1,000 seed wt gm	Virus (1-5)	Bacterial disease (1-5)	Fungus (1-5)
1	M4	73	31		1.0	2.0	1.0
2	M14	n	28		3.0	2.0	1.0
3	M15	n	39		2.6	1.0	1.0
4	M76	74	41	50	2.0	2.0	1.0
5	M90	n	31		1.0	2.0	
6	M118	n	35		2.0	3.0	1.0
7	M174	n	33		2.0	1.0	1.0
8	M194	n	21		2.0	1.0	1.0
9	M232	75	29		1.0	3.0	2.0
10	M317	n	41		2.0	1.0	1.0
11	M333	74	37		1.0	2.0	1.0
12	M339	73	26			1.0	
13	M350	73	44		1.0	2.0	1.0
14	M374	71	38	55	3.0	3.0	1.0
15	M408	60	31	65	2.0	3.0	1.0
16	M409	n	31		2.0	2.0	1.0
17	M411	72	37		1.0	2.0	3.0
18	M412	72	46		1.0	2.0	1.0
19	M416	63	50	56	1.0	1.0	1.0
20	M475	n	25	•	2.0	3.0	1.0
21	M531	73	31	37	2.0	2.0	1.0
22	M533	74	42		2.0	2.0	2.0
23	M543	71	47		4.0	2.0	2.0
24	M1132	n	38		2.0	1.0	1.0
25	M1133	70	33		1.0	1.0	
26	M1134	n	34		1.0	2.0	1.0
27	M1135	n	34		2.0	1.0	1.0
28	M1136	n	34		2.0	1.0	1.0
29	M101	72	34	47	1.0	2.0	1.0
30	M137	64	36	56	3.0	1.0	2.0
Mean			35.2		1.8	1.9	1.2

<sup>a</sup>Did not flower

Latitude: 49° 11' N  
 Elevation: 311 m  
 Precipitation during test: 161 mm  
 Irrigation water applied: none  
 Number replications: one

Date Planted: June 1, 1974  
 Date harvested: October 9, 1974  
 Plot size (length x width): 5m x 76cm  
 Plot area: 3.8m<sup>2</sup>  
 Nodulation: medium

Table 3. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Saskatoon, Saskatchewan, Canada

Cooperator: A. E. Slinkard, Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0

Entry No.	Acc. No.	Days to first flower
1	M4	a
2	M14	a
3	M15	a
4	M76	a
5	M90	a
6	M118	a
7	M174	a
8	M194	a
9	M232	a
10	M317	a
11	M333	70
12	M339	64
13	M350	a
14	M374	a
15	M408	70
16	M409	a
17	M411	85
18	M412	85
19	M416	70
20	M475	a
21	M531	a
22	M533	a
23	M543	a
24	M1132	a
25	M1133	a
26	M1134	a
27	M1135	a
28	M1136	a

<sup>a</sup>Did not flower

<sup>a</sup>Did rot flower

Latitude: 52° N  
 Elevati. n. 518 m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: one

Date Planted: June 7, 1974  
 Date harvested:  
 Plot size (length x width):  
 Plot area:  
 Nodulation:

Table 4. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Palmira, Colombia, S.A.

Cooperator: Luis H. Camacho and Edgar Guzman Acuna, Instituto Colombiano Agropecuario, Palmira, Colombia, S.A.

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Days to first ripe pod	Ht cm	Disease Scores		
							Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Cercospora leaf spot (1-5)
1	M4	3	970	40	74	25	2.0	1.0	3.5
2	M14	21	380	40	76	28	2.0	0.0	3.0
3	M15	19	410	43	76	30	1.5	0.0	3.0
4	M76	26	270	45	75	32	2.5	0.0	2.0
5	M90	29	170	41	75	22	2.0	0.0	4.0
6	M118	23	370	40	76	22	2.5	0.0	4.0
7	M174	20	380	40	75	25	1.5	0.0	3.0
8	M194	10	650	41	78	29	1.5	0.0	3.5
9	M232	8	700	41	75	40	1.0	0.0	3.0
10	M317	1	1090	43	74	46	1.0	0.0	2.0
11	M333	2	1000	40	72	43	1.0	2.0	3.0
12	M339	16	470	35	73	28	2.0	0.0	3.0
13	M350	6	770	41	78	48	2.0	0.0	3.5
14	M374	22	370	41	78	33	3.0	0.0	2.0
15	M408	24	310	41	73	24	1.0	0.0	3.0
16	M409	5	770	54	90	60	0.0	0.0	2.0
17	M411	11	600	41	72	37	1.0	0.0	3.0
18	M412	28	220	35	72	28	2.5	0.0	3.0
19	M416	7	700	45	75	43	2.0	0.0	2.0
20	M475	18	410	41	75	35	1.5	0.0	2.0
21	M531	14	510	41	72	26	1.0	0.0	3.0
22	M533	17	440	45	78	41	2.5	0.0	2.0
23	M543	25	280	46	80	39	5.0	0.0	1.0
24	M1132	13	550	41	75	36	1.0	0.0	2.5
25	M1133	12	600	41	75	36	1.0	0.0	2.0
26	M1134	4	854	52	90	49	1.0	0.0	1.0
27	M1135	15	500	41	75	37	1.0	2.0	2.0
28	M1136	27	220	45	78	30	2.0	1.0	2.0
29	Berken	9	680	44	75	30	2.5	1.0	1.0
Mean			539.4	42.2	76.2	34.6	1.7	0.2	2.5

Latitude: 3° 32' N

Elevation: 1000m

Precipitation during test:

Irrigation water applied:

Number replications: one

Date Planted: April 26, 1974

Date harvested: July 26, 1974

Plot size (length x width): 6m x 50cm

Plot area: 3m<sup>2</sup>

Nodulation: good

Table 5. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Adama/Nazareth, Ethiopia

Cooperator: Lars Ohlander, Institute of Agricultural Research, National Horticultural Center, Nazareth, Ethiopia

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores	
									Virus (0-5)	Mildew (0-5)
1	M4	14	734	45	29	27	10	52	4.5	2.8
2	M14	17	692	48	39	21	8	59	3.5	2.8
3	M15	9	850	49	38	26	10	64	3.5	3.0
4	M76	10	850	48	34	31	11	41	3.5	3.8
5	M90	24	542	46	34	24	8	63	4.5	2.8
6	M118	5	950	46	36	30	11	52	3.0	3.8
7	M174	22	592	46	36	25	7	59	4.5	3.5
8	M194	6	933	48	39	28	9	54	3.0	4.0
9	M232	18	683	49	37	26	8	53	3.5	3.8
10	M317	4	1034	47	48	19	13	65	4.0	3.5
11	M333	3	1100	46	40	48	9	40	0.0	4.3
12	M339	23	559	44	26	27	10	42	1.5	3.0
13	M350	7	925	47	40	31	10	44	3.5	3.3
14	M374	21	600	48	35	27	9	61	5.0	3.0
15	M408	27	458	45	24	23	8	52	5.0	2.3
16	M409	1	2016	54	60	57	11	45	0.0	3.3
17	M411	25	533	48	35	37	9	35	2.0	4.3
18	M412	30	325	48	32	37	8	40	3.0	3.3
19	M416	12	742	47	44	29	8	53	4.5	3.5
20	M475	29	400	46	33	31	9	55	3.0	2.5
21	M531	16	692	46	33	17	10	60	2.5	3.3
22	M533	11	767	48	45	48	10	30	3.5	3.5
23	M543	8	875	49	42	34	9	58	4.5	3.8
24	M1132	13	734	48	40	28	11	53	3.5	3.3
25	M1133	15	725	48	40	25	11	52	3.0	3.0
26	M1134	2	1787	57	54	53	11	44	0.5	3.3
27	M1135	28	409	49	42	21	12	60	3.5	3.0
28	M1136	20	667	48	39	28	10	58	3.5	3.0
29	Gode	26	525	61	58	39	9	35	4.0	3.0
30	Dire	19	667	61	62	52	9	34	4.5	3.0
Mean			778.7	48.5	39.6	31.6	9.3	50.1	3.3	3.3
C.V.			23.4	6.2	9.8	18.3	10.7	6.5	-	16.5
L.S.D. (.05)			372.3	6.1	8.0	11.8	2.0	6.6	-	1.1

Latitude: 8° 22' N  
 Elevation: 1,560 m  
 Precipitation during test: 367mm  
 Irrigation water applied: None  
 Number replications: two

Date Planted: July 12, 1974  
 Date harvested: September 25-26, 1974  
 Plot size (length x width): 4m x 75cm  
 Plot area: 3m<sup>2</sup>  
 Nodulation:

**Table 6. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Kobbo-Wollo, Ethiopia**

Cooperator: Ato Mulugeta Tegene, Institute of Agricultural Research, Kobbo-Wollo, Ethiopia, and Lars Ohlander, National Horticultural Center, Nazareth, Ethiopia

Entry no	Acc. no	Yield rank	Yield kg/ha	Days first flower	Days to Ripening	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	White striped blister beetle (0-5)
1	M4	7	421	28	69	22	8	8	42	4
2	M14	9	377	33	77	31	13	7	53	3
3	M15	11	334	28	69	39	8	11	60	3
4	M76	2	582	38	77	41	11	10	40	4
5	M90	14	239	33	77	33	16	11	52	3
6	M118	6	439	38	77	38	6	9	48	3
7	M174	16	218	38	77	26	4	10	52	3
8	M194	17	206	38	77	29	11	8	44	3
9	M232	21	127	28	69	40	4	11	48	3
10	M317	24	94	51	77	30	7	12	58	4
11	M333	19	164	28	69	30	7	8	40	3
12	M339	12	323	28	69	27	6	10	45	4
13	M350	20	161	38	69	23	3	7	44	3
14	M374	28	33	51	69	20	1	6		5
15	M408	15	237	28	74	21	6	5	46	4
16	M409	5	439	56	69	22	3	4	41	3
17	M411	23	98	51	74	18	4	10	40	4
18	M412	26	61	45	74	21	3	8	40	5
19	M416	25	67							-
20	M475	13	309	43	69	24	6	4	52	5
21	M531	18	170	28	80	22	4	5	52	-
22	M533	22	113	43	74	16	6	7	40	-
23	M543	27	44	49	77	21	6	12	48	-
24	M1132	4	459	43	74	31	6	13	54	-
25	M1133	1	760	43	74	25	5	7	48	-
26	M1134	3	561	49	74	31	4	6	51	-
27	M1135	8	383	38	74	36	6	6	62	-
28	M1136	10	352	38	74	33	7	7	68	-
Mean			277.6	39.0	73.2	27.8	6.3	8.2	48.8	
C. V.			66.0	-	-	-	-	-	-	
L. S. D. (.05)			298.7	-	-	-	-	-	-	

Latitude: 12° 12' N

Elevation: 1450 m

Precipitation during test: 527mm

Irrigation water applied: None

Number replications: three

Date Planted: July 6, 1974

Date harvested: September 21, 1974

Plot size (length x width): 4m x 75cm

Plot area: 3m<sup>2</sup>

Nodulation:

**Table 7. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Ludhiana, Punjab, India**

Cooperator: K. S. Gill, Department of Plant Breeding, Punjab Agricultural University, Ludhiana, Punjab, India

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores	
									Mungbean yellow mosaic virus (1-5)	Cercospora leaf spot (1-5)
1	M4									
2	M14									
3	M15									
4	M76									
5	M90	16	437	49	58	16	9	38	4.5	1.0
6	M118	15	575	47	53	30	11	37	5.0	1.5
7	M174	17	434	48	54	17	11	35	5.0	1.0
8	M194	13	645	48	57	27	9	42	5.0	1.0
9	M232	18	395	46	57	25	9	38	5.0	1.0
10	M317	20	363	38	53	9	10	45	4.0	1.0
11	M333	5	1044	34	56	46	11	33	3.5	0.5
12	M339	9	761	46	42	23	11	32	4.5	0.5
13	M350	10	708	35	49	29	9	33	4.5	1.5
14	M374	12	662	33	44	17	9	50	4.5	1.0
15	M408	6	1005	39	38	42	10	41	4.5	1.0
16	M409	25	177	49	62	15	9	42	4.0	1.0
17	M411	4	1282	51	75	48	10	28	3.0	0.5
18	M412	7	872	51	61	32	9	28	3.0	1.5
19	M416	11	667	41	55	22	10	50	0.5	1.0
20	M475	21	348	42	50	16	9	42	5.0	0.5
21	M531	14	617	34	38	25	9	39	4.5	1.0
22	M533	3	1869	39	57	57	12	35	1.0	0.5
23	M543	19	382	46	52	17	10	41	4.5	1.5
24	M1132	22	289	46	42	12	9	41	4.0	1.0
25	M1133	8	764	45	49	30	10	48	4.5	1.0
26	M1134	24	201	46	46	14	10	36	5.0	1.0
27	M1135	26	129	47	36	7	10	47	4.5	0.0
28	M1136	23	256	43	40	8	11	48	4.5	2.0
29	ML3	1	3095	42	65	55	13	31	2.0	1.0
30	ML5	2	3057	43	67	59	13	28	1.5	0.0
Mean			809.0	43.4	52.2	26.9	10.1	38.8	3.9	0.9
C. V.			53.5	5.7	11.3	30.9	12.6	10.7	15.3	40.0
L. S. D. (.05)			708.4	4.1	9.7	13.8	2.4	6.8	1.2	0.8

Latitude: 30° 56' N  
 Elevation: 154m  
 Precipitation during test: 357mm  
 Irrigation water applied: Twice  
 Number replications: three

Date Planted: July 11, 1974  
 Date harvested: 1st week of October  
 Plot size (length x width): 2.70m x 45 cm  
 Plot area: 1.215m<sup>2</sup>  
 Nodulation: medium

Table 8. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Nayagarh, Orissa, India

Cooperator: R. C. Misra, Pulse Research Station, Nayagarh, Orissa, India

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores	
									Virus (1-5)	Mungbean yellow mosaic virus (1-5)
1	M4	16	265	30	38	12	12	35	3.3	4.7
2	M14	22	239	37	46	14	11	38	4.0	4.7
3	M15	20	252	31	41	7	12	49	3.7	5.0
4	M76	8	336	32	40	13	12	30	3.0	3.7
5	M90	19	252	39	40	16	9	42	3.0	5.0
6	M118	3	455	34	42	18	11	37	3.0	5.0
7	M174	14	276	37	42	12	11	44	4.0	5.0
8	M194	25	185	37	38	11	11	37	3.8	4.7
9	M232	17	260	33	42	15	11	35	4.0	4.3
10	M317	26	157	35	46	7	12	14	3.8	5.0
11	M333	23	230	30	48	15	11	35	3.7	3.3
12	M339	7	337	34	34	17	11	30	3.7	3.7
13	M350	24	205	31	47	11	12	31	4.2	5.0
14	M374	9	330	31	41	14	11	46	3.0	4.3
15	M408	13	278	30	34	13	10	40	4.0	4.0
16	M409	27	-	44	-	-	10	-	3.0	5.0
17	M411	12	280	38	55	24	12	26	3.7	4.7
18	M412	15	267	37	53	19	12	28	3.3	4.3
19	M416	4	383	33	52	13	11	49	4.3	3.7
20	M475	10	330	36	44	13	11	45	3.8	4.7
21	M531	21	252	27	33	9	10	48	3.3	3.3
22	M533	1	521	33	63	22	11	29	2.0	3.7
23	M543	6	340	34	52	12	10	52	4.0	4.7
24	M1132	18	252	34	43	10	13	47	3.7	4.7
25	M1133	11	217	35	47	12	11	49	3.3	4.7
26	M1134	-	-	-	-	-	-	-	-	-
27	M1135	-	-	-	-	-	-	-	-	-
28	M1136	-	-	-	-	-	-	-	-	-
29	Basnkhi	2	456	31	41	19	11	31	3.0	3.0
30	Kopergaon	5	343	33	42	16	11	38	4.3	3.7
Mean			296.1	33.9	44.0	14.0	11.0	39.0	3.6	4.3
C. V.			36.5	4.5	13.3	35.3	7.9	10.7	18.5	18.7
L. S. D. (.05)			171.9	2.5	9.5	8.1	1.5	6.8	1.1	1.3

Latitude: 20° 10' N  
 Elevation: 91 m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: three

Date Planted: July 7, 1974  
 Date harvested:  
 Plot size (length x width): 3.60m x 45cm  
 Plot area: 1.62 m<sup>2</sup>  
 Nodulation:

Table 9. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Pantnagar, Uttar Pradesh, India

Cooperator: S.P.S. Beniwal, Department of Plant Pathology, G. B. Pant University of Agriculture and Technology, Pantnagar, Uttar Pradesh, India

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores		
									Rugose Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Cercospora leaf spot (1-5)
1	M4	22	283	43	62	10	11	37	0.4	5.0	2.3
2	M14	28	200	45	69	12	10	45	2.0	4.7	2.3
3	M15	27	211	45	61	9	10	50	2.3	3.0	3.3
4	M76	8	504	42	68	19	11	30	0.4	3.3	3.7
5	M90	11	394	45	55	11	10	47	1.7	4.3	3.0
6	M118	10	421	45	63	19	11	38	2.0	4.3	2.0
7	M174	26	216	47	54	7	11	47	2.3	5.0	2.7
8	M194	21	283	47	61	14	10	37	2.7	4.3	2.7
9	M232	13	382	43	64	14	11	40	2.7	4.7	3.0
10	M317	24	261	41	64	7	9	50	2.0	2.0	1.0
11	M333	6	538	37	68	24	10	37	0.7	2.3	2.7
12	M339	7	510	43	59	16	12	37	3.0	4.0	1.3
13	M350	15	355	41	67	30	13	35	0.4	3.3	2.3
14	M374	25	238	37	61	11	9	50	0.7	2.0	0.7
15	M408	14	360	42	53	16	10	40	0.7	3.3	1.7
16	M409	30	177	51	63	5	9	33	0.7	3.7	3.3
17	M411	3	842	51	74	42	12	30	0.4	2.0	1.3
18	M412	4	704	49	78	33	12	30	0.1	2.0	0.7
19	M416	23	266	42	69	13	8	45	0.1	2.0	1.3
20	M475	12	394	43	71	13	10	43	0.7	4.3	2.0
21	M531	16	349	39	62	13	9	43	1.0	3.3	3.7
22	M533	2	964	41	77	50	11	30	0.7	2.0	1.3
23	M543	18	299	42	62	18	9	55	1.7	4.0	2.0
24	M1132	19	288	41	57	9	11	43	1.4	2.3	3.3
25	M1133	9	460	43	62	16	10	40	1.0	2.7	2.7
26	M1134	17	327	51	58	9	12	35	0.7	3.7	4.0
27	M1135	20	288	44	60	15	9	47	1.7	2.0	3.3
28	M1136	29	188	44	64	11	9	43	2.0	3.0	3.3
29	T-44	5	587	34	58	21	9	28	0.7	1.0	3.0
30	ML-1	1	1009	40	93	33	11	30	1.7	1.7	1.3
Mean			409.9	43.3	64.6	17.3	10.3	39.8	1.3	3.2	2.4
C.V.			36.1	5.0	13.1	44.6	17.2	10.4	67.5	33.7	29.2
L.S.D. (.05)			241.9	3.5	13.9	12.7	2.9	6.7	1.4	1.8	1.1

Latitude: 29° N

Elevation: 244m

Precipitation during test:

Irrigation water applied:

Number replications: three

Date Planted: July 5, 1974

Date harvested: October 2, 1974

Plot size (length x width): 4m x 75cm

Plot area: 3m<sup>2</sup>

Nodulation: good

Table 10. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Karaj, Iran

Cooperator: M. C. Amirshahi, Karaj Agricultural College, University of Teheran, Karaj, Iran

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm
1	M4	6	1350	52	36	37	12	15
2	M14	11	1217	62	47	20	11	55
3	M15	25	750	51	19	25	13	63
4	M76	28	617	51	35	29	10	38
5	M90	20	958	63	43	20	11	56
6	M118	12	1200	57	38	28	11	51
7	M174	8	1275	63	40	24	11	61
8	M194	9	1218	64	48	27	11	54
9	M232	4	1442	58	42	35	10	51
10	M317	5	1433	56	45	17	12	67
11	M333	17	1050	53	36	23	11	41
12	M339	22	833	51	26	31	12	40
13	M350	21	862	53	36	25	12	46
14	M374	24	767	51	34	21	10	68
15	M408	16	1055	42	21	18	10	49
16	M409	2	1623	65	43	39	11	16
17	M411	19	1022	56	41	35	10	34
18	M412	30	383	60	38	23	11	37
19	M416	26	742	53	39	27	11	57
20	M475	14	1090	59	44	22	11	61
21	M531	10	1217	52	36	28	10	56
22	M533	27	642	56	44	22	10	33
23	M543	23	812	54	41	25	11	58
24	M1132	3	1552	60	46	30	13	53
25	M1133	7	1327	65	43	22	13	51
26	M1134	13	1113	62	41	29	10	44
27	M1135	15	1068	64	38	33	13	58
28	M1136	29	393	66	39	21	14	61
29	Local	1	1748	55	39	8	12	48
30	Local	18	1027	53	37	22	12	50
Mean			1059.5	57.0	39.4	25.5	11.3	51.0
C. V.			33.8	6.4	14.3	44.4	13.2	1.3
L. S. D. (.05)			585.8	6.0	9.2	18.5	2.4	1.1

Latitude: 35° 8'  
 Elevation: 1300 m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: three

Date Planted: May 28, 1974  
 Date harvested: October 7, 1974  
 Plot size (length x width): 4m x 50 cm  
 Plot area: 2m<sup>2</sup>  
 Nodulation: none

Table 11. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Jinju, Kyung-nam, Korea

Cooperator: Mi-suk Ko, Department of Agronomy, Gyeong-sang National University, Kyung-nam, Korea

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores			
									Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Mildew (1-5)	Cercospora leaf spot (1-5)
1	M4	27	515	47	44	8	10	47		2.0		
2	M14	14	893	56	32	12	11	58	2.0			
3	M15	17	817	46	38	10	10	58				1.0
4	M76	10	983	44	40	10	11	36				1.0
5	M90	2	1213	55	55	10	10	55		4.0		4.0
6	M118	5	1134	52	59	11	12	47				3.0
7	M174	16	828	55	41	16	9	58		4.0		4.0
8	M194	23	652	49	49	8	9	50				2.0
9	M232	8	1022	48	59	12	9	46		4.0		4.0
10	M317	6	1127	42	42	7	12	63				4.0
11	M333	13	907	46	30	11	10	36			4.0	
12	M339	15	860	50	28	17	13	41	2.0			
13	M350	21	687	46	40	10	11	45				3.0
14	M374	29	421	44	22	6	10	56				3.0
15	M408	26	518	44	14	4	9	52				4.0
16	M409	28	511	46	52	4	12	44	3.0			
17	M411	11	944	56	53	30	11	34	3.0			
18	M412	12	936	58	50	32	11	36	3.0			
19	M416	24	551	46	53	7	8	56				2.0
20	M475	25	540	46	60	15	11	59				
21	M531	19	713	46	56	4	10	58		3.0		
22	M533	4	1165	46	22	24	12	31		3.0		
23	M543	1	1278	46	22	11	10	60	2.0			
24	M1132	3	1188	47	36	21	14	56				4.0
25	M1133	22	670	52	39	12	11	55				4.0
26	M1134	20	702	53	34	15	10	45				4.0
27	M1135	30	349	50	31	9	13	61				
28	M1136	18	720	42	46	11	14	61		2.0		2.0
29	Jin-Ju #1	7	1080	42	59	8	13	31				3.0
30	Jin-Ju #2	9	1011	44	47	12	9	33				1.0
Mean			831.2	48.1	41.8	12.2	10.8	48.0	2.5	3.1	4.0	2.9
Latitude: 35° 11' N Elevation: 25m Precipitation during test: Irrigation water applied: Number replications: one									Date Planted: June 24, 1974 Date harvested: Aug. 24-Oct. 24, 1974 Plot size (length x width): 4.5m x 60cm Plot area: 2.7m <sup>2</sup> Nodulation: medium			

Table 12. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Sawon, Korea

Cooperator: Hyun Ok Choi and Keun Yong Park, Crops Experiment Station, Office of Rural Development, Sawon, Korea

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Seeds per pod no	Disease Scores	
							1,000 seed wt gm	Mildew (1-5)
1	M4	2	1550	56	77	13	17	2.7
2	M14	1	1780	65	83	19	17	1.7
3	M15	11	1220	57	71	12	15	1.0
4	M76	17	1020	53	72	11	36	1.0
5	M90	13	1147	65	82	9	41	2.0
6	M118	8	1340	66	88	11	18	3.3
7	M174	18	957	65	108	11	46	2.9
8	M194	23	780	64	89	10	46	2.7
9	M232	24	733	55	102	11	17	2.3
10	M317	5	1383	54	90	14	65	3.0
11	M333	6	1377	51	99	12	52	1.0
12	M339	14	1103	60	81	13	39	1.0
13	M350	4	1487	53	94	12	16	2.3
14	M374	9	1267	52	62	11	55	3.0
15	M408	16	1067	54	77	11	12	3.7
16	M409	28	267	66	94	10	14	2.3
17	M411	26	390	68	87	10	17	0.0
18	M412	29	157	69	83	11	37	0.0
19	M416	30	100	55	72	9	59	3.3
20	M475	3	1527	53	71	10	18	3.0
21	M531	21	830	51	83	12	55	1.3
22	M533	25	180	52	80	12	39	1.0
23	M543	20	883	58	74	10	51	1.0
24	M1132	7	1360	55	79	13	45	2.3
25	M1133	19	897	60	76	11	52	3.7
26	M1134	15	1090	60	91	12	49	3.0
27	M1135	10	1267	56	72	12	54	1.3
28	M1136	22	793	55	85	13	58	1.0
29	Chu-Nokdu	12	1167	49	81	11	56	2.7
30	Jaerae 1	27	313	59	75	11	49	2.3
Mean			991.0	57.7	82.7	11.3	48.2	2.1
C. V.			13.7		14.8	11.1	9.3	33.0
L. S. D. (.05)			222.0		20.0	2.0	7.3	1.3

Latitude: 37° 15' N  
 Elevation: 37 m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: three

Date Planted: June 21, 1971  
 Date harvested: October 10, 1971  
 Plot size (length x width): 1m x 60cm  
 Plot area: 2.4m<sup>2</sup>  
 Nodulation: medium

Table 13. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Lahore, Pakistan

Cooperator: J. Richard Lockman, Technical Services Association, Lahore, Pakistan

Entry no	Acc. no	Yield rank	Yield kg/ha	Ht cm	Disease Scores			
					Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Mildew (1-5)	Cercospora leaf spot (1-5)
1	M4	4	1071	34	2.0	2.5	1.0	2.0
2	M14	8	772	58	2.0	2.0	1.0	1.3
3	M15	20	434	52	3.0	2.0	1.0	2.0
4	M76	9	613	42	1.5	3.0	1.0	1.0
5	M90	27	232	39	2.3	3.7	1.0	2.7
6	M118	7	783	48	1.5	3.5	1.0	2.0
7	M174	25	289	39	1.7	2.7	1.0	1.7
8	M194	12	542	54	2.3	2.7	1.0	2.0
9	M232	19	435	45	1.7	3.3	1.0	2.0
10	M317	24	293	56	4.0	2.5	1.5	2.5
11	M333	2	1338	41	1.3	1.3	1.3	2.3
12	M339	22	397	23	1.0	1.5	1.0	2.5
13	M350	3	1203	50	2.0	1.3	1.0	2.7
14	M374	29	214	47	3.0	2.0	1.0	2.0
15	M408	6	807	24	3.5	1.5	2.0	2.5
16	M409	11	542	65	1.0	1.3	1.0	1.7
17	M411	21	408	61	1.3	1.7	1.0	1.7
18	M412	28	222	44	1.5	1.0	1.0	1.5
19	M416	16	490	59	3.7	1.7	1.0	1.7
20	M475	14	497	53	2.0	3.0	1.0	1.3
21	M531	15	491	41	1.3	1.0	1.0	2.3
22	M533	10	576	62	2.3	1.3	1.0	1.3
23	M543	17	476	59	2.7	2.3	1.0	1.3
24	M1132	26	274	49	2.0	2.7	1.0	1.7
25	M1133	1	1864	57	1.3	1.0	1.0	1.7
26	M1134	18	461	50	1.0	1.3	1.0	1.3
27	M1135	30	208	45	2.0	2.0	1.0	2.0
28	M1136	23	327	47	1.7	2.0	1.0	1.3
29	Local	13	513	66	2.7	1.3	1.0	1.3
30	Local	5	1008	51	2.0	1.0	1.0	1.5
Mean			592.7	48.6	2.0	2.0	1.1	1.8
C.V.			66.4					
L.S.D. (.05)			643.3					

Latitude: 31° 30' N

Elevation: 225m

Precipitation during test: 90.8mm

Irrigation water applied: 250mm

Number replications: Three

Date Planted: March 5, 1975

Date harvested: June 3-23, 1975

Plot size (length x width): 3.9mx30cm

Plot area: 1.17m<sup>2</sup>

Nodulation: None

Table 14. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Lyallpur, Pakistan

Cooperator: Mohammad Iqbal Khan, Punjab Agricultural Research Institute, Lyallpur, Pakistan

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores
									Mungbean yellow mosaic virus (1-5)
1	M4	19	300	55	19	25	9	51	2.3
2	M14	11	417	58	27	21	7	70	1.7
3	M15	14	376	62	33	26	11	44	1.0
4	M76	7	518	56	26	25	9	42	0.7
5	M90	12	410	63	30	24	9	73	2.0
6	M118	5	604	55	30	37	10	48	2.3
7	M174	10	443	55	26	25	7	61	1.7
8	M194	1	814	60	32	29	8	63	1.7
9	M232	8	461	61	31	27	8	58	3.0
10	M317	6	578	55	35	28	9	71	2.0
11	M333	4	654	55	30	44	9	45	0.7
12	M339	18	306	54	21	24	9	51	0.7
13	M350	20	282	58	28	34	8	44	1.0
14	M374	22	268	57	32	22	7	76	1.3
15	M408	16	344	63	16	21	8	57	0
16	M409	15	376	74	41	20	9	51	2.7
17	M411	17	310	63	22	32	9	40	0
18	M412	30	121	54	24	26	9	45	0
19	M416	26	174	74	39	26	7	57	0
20	M475	28	161	63	28	19	8	68	3.7
21	M531	9	459	63	26	35	9	60	1.3
22	M533	13	397	64	36	50	8	37	0
23	M543	21	276	69	33	24	4	48	3.0
24	M1132	23	261	69	30	20	8	66	2.3
25	M1133	2	743	67	30	44	8	56	2.0
26	M1134	27	174	75	32	13	8	52	3.0
27	M1135	25	194	62	33	19	8	50	3.3
28	M1136	29	149	62	32	25	10	72	2.7
29	Local	24	242	62	37	29	8	40	0
30	Local	3	720	58	39	42	9	37	0
Mean			384.4	61.5	29.9	28.2	8.4	54.4	1.5
C.V.			52.8	1.7	12.9	40.2	18.5	14.4	
L.S.D. (.05)			331.5	1.7	6.3	18.5	2.5	12.8	n.s.

Latitude: 31° 25' N

Elevation: 182m

Precipitation during test: 76mm

Irrigation water applied: 150mm

Number replications: Three

Date Planted: March 1, 1975

Date harvested: June 6, 1975

Plot size (length x width): 3.3mx60cm

Plot area: 1.98m<sup>2</sup>

Nodulation: Poor

Table 15. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Layallpur, Pakistan

Cooperator: Mohammad Aslam, University of Agriculture, Lyallpur, Pakistan

Entry no	Acc. no	Yield rank	Yield <sup>a</sup> gm/plt.	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Virus <sup>b</sup>	Disease Scores	
									Mungbean <sup>b</sup> yellow mosaic virus	Cercos- <sup>b</sup> pora leaf spot
1	M4	1	70.7	33	26	9	48	L	H	
2	M14	28	10.8	46	11	6	56	L	H	L
3	M15	29	8.7	50	7	8	58		H	L
4	M76	26	22.0	38	15	9	40		M	L
5	M90	11	26.8	46	13	10	57		H	
6	M118	22	23.3	40	17	9	39		H	
7	M174	21	23.9	44	11	10	53		H	
8	M194	10	31.4	41	17	12	57		H	
9	M232	27	17.7	44	12	8	35	L	L	M
10	M317	10	24.7	44	13	8	58		L	
11	M333	3	55.9	44	24	7	39		L	
12	M339	20	24.1	21	12	8	38	L	M	
13	M350	8	33.7	45	16	8	37		L	
14	M374	16	26.3	34	10	8	58		M	
15	M408	12	28.1	20	9	7	51	M	H	
16	M409	30	5.8	53	5	9	32		L	
17	M411	6	36.3	44	21	6	29		L	
18	M412	18	24.9	33	13	7	37	L	L	
19	M416	15	26.5	44	8	7	63		H	
20	M475	13	27.6	39	4	10	58		H	
21	M531	9	32.2	39	8	8	52		L	
22	M533	4	49.9	53	32	10	33		M	M
23	M543	23	23.2	45	4	8	60		L	
24	M1132	11	31.2	46	10	8	53		L	
25	M1133	2	60.3	47	16	10	52	L	L	
26	M1134	24	22.8	47	13	5	38		L	L
27	M1135	5	43.5	47	11	11	58		L	
28	M1136	7	35.7	47	12	12	56		M	
29	Local	25	22.6	72	33	9	34		M	
30	Local	17	25.1	51	29	8	28		L	

Mean 43.3 14.4 8.5 46.9

<sup>a</sup>Yield is reported in grams per 100 plants

<sup>b</sup>L low, M medium, H high

Latitude: 31° 25' N

Elevation: 182m

Precipitation during test: 75.9mm

Irrigation water applied: 225mm

Number replications: One

Date Planted: March 19, 1975

Date harvested: June 25, 1975

Plot size (length x width): 6m x 30cm

Plot area: 1.8m<sup>2</sup>

Nodulation: Poor

Table 16. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Los Baños, Philippines

Cooperator: Richard H. Harwood, International Rice Research Institute, Los Baños, Laguna, Philippines

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Days to first ripe pod	Ht cm	Branch length cm	Seeds per pod no	1,000 seed wt gm	Disease Scores	
										Virug (1-5)	Cerec spot (1-5)
1	M4	17	910	31	64	50	45	12	42	1.0	3.0
2	M14	16	910	32	65	64	54	11	51	1.0	4.3
3	M15	13	960	33	65	62	30	16	56	1.0	4.0
4	M76	5	1240	34	63	69	50	11	35	1.0	4.0
5	M90	10	960	34	64	58	50	11	54	1.0	4.6
6	M118	14	950	34	62	64	63	11	43	1.0	4.0
7	M174	22	840	34	65	61	63	12	51	1.0	4.6
8	M194	12	960	35	65	62	64	11	49	1.0	4.0
9	M232	9	990	34	64	63	51	12	44	1.0	4.3
10	M317	23	830	35	66	75	49	13	60	1.7	4.3
11	M333	8	1160	34	64	66	50	11	36	1.0	5.0
12	M339	11	960	34	60	48	35	12	36	1.0	5.0
13	M350	6	1180	33	64	68	42	12	39	1.0	5.0
14	M374	20	900	34	64	56	37	12	58	1.7	4.6
15	M408	26	670	30	64	38	28	11	47	1.5	5.0
16	M409	30	30	50	77	142	94	12	-	1.3	5.0
17	M411	3	1260	36	66	84	52	12	30	1.0	3.0
18	M412	7	1160	35	69	71	47	11	31	1.7	2.6
19	M416	18	910	35	62	76	39	12	51	1.0	4.0
20	M475	21	860	34	64	68	53	11	51	1.0	4.3
21	M531	27	650	30	63	45	25	12	50	1.0	5.0
22	M533	15	910	35	66	71	51	11	27	1.0	2.6
23	M543	28	590	36	65	76	54	12	53	2.0	3.4
24	M1132	19	900	35	63	63	41	15	46	1.0	4.6
25	M1133	4	1250	34	62	64	32	12	49	1.0	6.0
26	M1134	29	190	50	77	89	56	12	34	1.7	4.6
27	M1135	25	680	35	63	60	35	15	55	1.3	4.6
28	M1136	24	740	35	64	60	40	16	57	1.0	4.3
29	MG50-10A	1	1460	34	60	74	21	12	55	1.0	5.0
30	MG50-10A-Y	2	1430	35	60	65	22	12	66	1.0	5.0
Mean			914.7	35.0	64.7	67.1	45.8	12.2	46.8	1.2	4.4

Latitude: 14° 20' N

Elevation: 15m

Precipitation during test: 654 mm

Irrigation water applied: twice

Number replications: Three

Date Planted: May 24, 1974

Date harvested: August 20, 1974

Plot size (length x width): 6m x 100cm

Plot area: 6m<sup>2</sup>

Nodulation:

Table 17. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Los Baños, Philippines

Cooperator: Benjamin M. Legaspi, Elena Catipon, B.P.I. Economic Garden, Los Baños, Laguna, Philippines

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Seeds per pod no	1,000 seed wt gm	Disease Scores	
								Virus (1-5)	Cercospora leaf spot (1-5)
1	M4	18	135	37	34	11	48	1.0	3.5
2	M14	16	160	39	41	10	48	1.0	3.0
3	M15	28	53	39	37	13	51	5.0	4.5
4	M76	29	25	39	27	10	33	5.0	4.5
5	M90	20	131	39	38	11	51	1.0	2.5
6	M118	6	276	37	42	10	45	2.0	3.0
7	M174	5	300	37	49	11	48	1.0	3.5
8	M194	8	235	37	52	10	48	1.0	4.0
9	M232	10	220	39	50	11	40	3.0	4.0
10	M317	24	76	37	43	12	45	4.0	3.5
11	M333	1	513	36	52	9	25	1.0	4.0
12	M339	3	336	39	30	12	27	2.0	3.5
13	M350	4	318	37	53	12	29	2.0	3.0
14	M374	9	226	37	38	9	45	1.0	3.5
15	M408	26	69	39	17	10	38	2.0	2.5
16	M409	13	-	50	31	-	-	3.0	3.0
17	M411	17	157	37	35	11	32	1.0	1.0
18	M412	27	59	39	26	8	28	1.0	1.0
19	M416	25	73	40	50	11	40	3.0	3.5
20	M475	15	168	37	46	11	47	2.0	4.0
21	M531	11	218	35	29	12	54	2.0	4.5
22	M533	21	128	37	47	9	28	2.0	2.0
23	M543	19	135	40	50	11	46	3.0	3.0
24	M1132	7	247	39	48	13	32	1.0	3.5
25	M1133	12	185	39	49	10	33	1.0	4.0
26	M1134	30	15	40	50	11	32	1.0	4.0
27	M1135	23	90	39	43	13	43	1.0	3.0
28	M1136	22	97	40	42	12	41	1.0	3.5
29	MD15-2	14	179	39	77	12	50	2.0	4.0
30	MG50-10A	2	448	35	60	10	57	2.0	4.5
Mean			181.8	38.5	42.9	10.9	40.8	1.9	3.4

Latitude: 14° 20' N  
 Elevation: 15m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: one

Date Planted: June 20, 1974  
 Date harvested: August 16-24, 1974  
 Plot size (length x width): 6m x 60cm  
 Plot area: 3.6m<sup>2</sup>  
 Nodulation: poor

Table 18. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Los Baños, Philippines

Cooperator: Benjamin M. Legaspi and Elena Catipon, B.P.I. Economic Garden, Los Baños, Laguna, Philippines.

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm
1	M4	17	157	35	20	7	9	58
2	M14	13	168	36	20	9	8	70
3	M15	27	74	37	21	6	13	77
4	M76	28	49	37	18	10	10	42
5	M90	15	158	35	21	8	10	52
6	M118	25	114	37	18	8	10	61
7	M174	12	172	37	21	8	10	60
8	M194	19	156	35	23	7	9	56
9	M232	22	146	35	27	8	9	50
10	M317	7	205	37	36	7	11	65
11	M333	4	226	37	24	9	10	48
12	M339	23	146	36	19	8	11	41
13	M350	10	185	37	31	9	11	47
14	M374	5	224	35	26	9	10	67
15	M408	26	110	35	20	7	11	53
16	M409							
17	M411	9	201	35	21	10	10	36
18	M412	21	147	35	24	8	10	43
19	M416	20	153	40	27	9	11	63
20	M475	18	157	36	24	7	10	61
21	M531	24	137	37	28	8	11	58
22	M533	8	202	35	26	10	10	35
23	M543	1	341	40	35	7	12	71
24	M1132	6	215	37	26	8	12	52
25	M1133	16	158	35	44	8	11	57
26	M1134	29	29	40	25	6	11	55
27	M1135	11	179	39	25	7	12	62
28	M1136	14	168	37	28	7	13	67
29	Glab. #3	2	330	37	31	8	12	80
30	MD15-2	3	270	40	50	8	13	95
Mean			168.5	33.2	26.2	7.9	10.7	58.0

Latitude: 14° 20' N  
 Elevation: 15m  
 Precipitation during test: 5mm  
 Irrigation water applied:  
 Number replications:

Date Planted: January 9, 1975  
 Date harvested: March 12 to 31, 1975  
 Plot size (length x width): 6m x 60cm  
 Plot area: 3.6m<sup>2</sup>  
 Nodulation: Very Poor

Table 19. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Shanhua, Tainan, Taiwan

Cooperator: Hyo-Guen Park and N. D. Chen, Asian Vegetable Research and Development Center Shanhua, Tainan 741, Taiwan, Republic of China

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores
									Mildew (1-5)
1	M4	26	663	32	35	20	11	43	2.8
2	M14	22	742	36	38	24	11	51	3.0
3	M15	10	898	36	46	19	13	58	2.5
4	M76	7	985	37	49	28	11	37	3.5
5	M90	12	874	35	39	24	11	56	3.0
6	M118	14	793	36	44	27	11	42	3.3
7	M174	15	779	35	42	22	11	52	3.0
8	M194	13	848	35	37	24	11	50	3.5
9	M232	25	706	34	44	24	12	45	3.0
10	M317	1	1261	41	58	16	13	65	3.5
11	M333	16	773	35	43	20	12	42	3.8
12	M339	24	711	36	38	23	12	29	3.8
13	M350	6	1018	36	50	20	12	41	3.5
14	M374	5	1166	38	45	20	11	72	3.0
15	M408	29	596	34	31	21	10	45	3.3
16	M409	23	733	42	86	31	13	49	2.3
17	M411	18	760	38	41	32	12	30	3.5
18	M412	8	976	37	39	34	12	33	3.3
19	M416	9	938	39	58	19	12	52	3.0
20	M475	20	747	36	34	21	12	44	3.5
21	M531	30	534	32	31	12	12	54	3.8
22	M533	21	743	37	50	39	11	28	3.8
23	M543	4	1175	38	54	24	12	59	3.5
24	M1132	11	898	37	47	24	13	54	3.5
25	M1133	19	752	37	40	23	11	47	3.3
26	M1134	28	609	41	47	32	13	38	3.0
27	M1135	27	621	37	38	18	13	54	3.0
28	M1136	17	771	39	42	23	14	55	2.5
29	Local	2	1239	41	65	25	13	44	3.3
30	Local	3	1231	40	60	19	16	53	3.5
Mean			851.2	36.7	45.6	23.5	11.9	47.3	3.2
C.V.			25.4	5.5	13.2	21.5	6.0	11.5	18.5
L.S.D. (.05)			304.0	2.8	8.4	7.1	1.0	7.7	0.8

Latitude: 23° 6' N

Elevation: 9 m

Precipitation during test:

Irrigation water applied:

Number replications: 4

Date Planted: September 20, 1974

Date harvested: November 29 & December 10, 1974

Plot size (length x width): 4m x 75cm

Plot area: 3m<sup>2</sup>

Nodulation: good

Table 20. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Suphanburi, Thailand

Cooperator: Suphachai Bangliang, Vichien Sasiprapa and Charalit Kongyuthulchai, Suphanburi Rice Experiment Station, Suphanburi, Thailand

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores
									Cercospora leaf spot (1-5)
1	M4	18	1149	27	40	48	12	40	0.7
2	M14	28	839	32	53	36	11	53	0.7
3	M15	6	1418	32	58	40	15	49	0.7
4	M76	14	1210	32	62	53	12	33	0.3
5	M90	21	1123	30	48	39	11	53	1.0
6	M118	16	1196	31	47	52	11	43	2.3
7	M174	20	1135	30	46	38	11	54	0.0
8	M194	9	1273	31	50	46	11	52	0.7
9	M232	17	1153	29	52	49	11	42	1.0
10	M317	25	1003	33	62	25	13	62	2.0
11	M333	11	1264	30	61	62	12	36	1.0
12	M339	13	1221	30	45	50	12	36	0.0
13	M350	2	1511	31	65	62	12	43	0.7
14	M374	3	1494	32	58	51	12	61	2.7
15	M408	15	1207	27	43	45	11	47	1.3
16	M409	29	748	41	90	32	12	31	2.3
17	M411	4	1487	33	61	82	12	30	0.7
18	M412	12	1239	32	60	68	11	32	1.7
19	M416	1	1641	33	75	52	12	49	2.0
20	M475	8	1337	30	56	51	12	54	1.0
21	M531	27	884	27	41	30	11	51	0.7
22	M533	26	979	34	71	60	11	31	1.7
23	M543	19	1145	33	64	43	12	54	0.7
24	M1132	22	1112	32	48	34	15	49	1.3
25	M1133	24	1030	29	50	44	12	48	0.7
26	M1134	30	686	39	62	23	12	34	1.7
27	M1135	23	1032	31	52	27	16	51	1.3
28	M1136	10	1264	32	55	33	15	58	1.3
29	Local	7	1403	32	57	45	11	57	3.0
30	Local	5	1487	33	73	54	12	50	0.3
Mean			1188.9	31.5	56.9	45.7	12.1	46.1	1.2
C.V.			15.7	3.9	10.1	19.5	5.4	7.9	84.2
L.S.D. (.05)			306.1	2.0	9.4	14.6	1.1	5.9	1.6

Latitude: 14° 31' N  
 Elevation: 7m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: three

Date Planted: September 6, 1974  
 Date harvested: November 2 & 18, 1974  
 Plot size (length x width): 4m x 75cm  
 Plot area: 3m<sup>2</sup>  
 Nodulation:

Table 21. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Chieng Mai, Thailand

Cooperator: Unchana Sirikul, N.A.D.C., Mae-Hia Field Station, Chieng Mai, Thailand, and Arwooth Nalampang, Oilseed Crop Section, Department of Agriculture, Bangkok, Thailand

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm
1	M4	8	1220	32	37	18	12	39
2	M14	1	1720	31	33	29	19	67
3	M15	3	1500	35	38	25	13	59
4	M76	24	775	32	36	25	12	51
5	M90	4	1475	31	26	48	13	63
6	M118	20	840	31	14	32	13	39
7	M174	27	460	32	31	35	14	57
8	M194	28	423	35	38	25	13	59
9	M232	11	1075	31	24	21	14	72
10	M317	5	1400	32	41	15	10	40
11	M333	23	800	32	28	17	13	36
12	M339	6	1318	32	12	20	12	51
13	M350	9	1140	34	23	28	10	69
14	M374	14	980	32	30	22	11	53
15	M408	29	340	32	17	27		52
16	M409	10	1120	33	47	21	13	34
17	M411	15	980	34	26	33	12	36
18	M412	26	480	29	27	34	11	57
19	M416	22	800	34	30	18	10	64
20	M475	21	840	32	35	18	11	54
21	M531	12	1053	29	27	34	11	33
22	M533	25	600	34	60	15	12	62
23	M543	13	1032	32	36	21	11	50
24	M1132	7	1240		32	20	14	54
25	M1133	2	1520	29	30	16	12	53
26	M1134	17	860	34	53	16	15	63
27	M1135	16	860	39	33	31	14	61
28	M1136	18	860	35	26	24	12	68
29	Local	19	856	31	26	24	12	68
Mean			955.5	32.0	31.6	24.6	12.5	54.1

Latitude: 18° 14' N  
 Elevation: 320m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: one

Date Planted: August 16, 1974  
 Date harvested: October 16 & November 4, 1974  
 Plot size (length x width): 5m x 50cm  
 Plot area: 2.5m<sup>2</sup>  
 Nodulation:

Table 22. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Chieng Mai, Thailand

Cooperator: Vanchai Sroi-Intrakul, Mae-Jo Experiment Station, Chieng Mai, Thailand, and Arwooth Nalampang, Oilseed Crops Section, Department of Agriculture, Bangkok, Thailand

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm
1	M4	19	1422	37	45	35	13	53
2	M14	20	1400	38	60	38	8	57
3	M15	7	1911	38	59	35	11	60
4	M76	13	1700	39	48	43	9	43
5	M90	10	1767	38	51	41	9	61
6	M118	24	1311	35	69	32	10	56
7	M174	23	1322	39	59	27	8	59
8	M194	14	1578	39	55	56	9	57
9	M232	22	1367	39	54	43	9	50
10	M317	6	2011	39	64	34	11	67
11	M333	8	1867	38	60	51	10	48
12	M339	17	1467	39	49	34	9	49
13	M350	11	1767	39	49	39	11	53
14	M374	12	1733	40	46	43	11	62
15	M408	29	956	36	35	27	10	57
16	M409	30	611	45	99	46	10	50
17	M411	16	1522	46	82	118	11	40
18	M412	26	1244	41	77	90	10	45
19	M416	18	1422	42	60	44	12	72
20	M475	9	1867	39	58	49	14	59
21	M531	21	1389	38	54	39	11	53
22	M533	15	1545	39	78	102	11	39
23	M543	3	2200	42	63	50	11	62
24	M1132	4	2133	40	59	53	11	50
25	M1133	5	2133	43	60	51	10	57
26	M1134	28	989	46	70	59	10	48
27	M1135	27	1033	45	57	33	14	61
28	M1136	25	1300	43	60	48	11	62
29	CES-87	1	2233	41	71	42	13	63
30	Black Pod	2	2222	43	65	38	13	69
Mean			1580.7	40.2	60.6	48.0	10.7	55.3
C.V.			25.2	1.9	16.2	34.9	14.5	9.8
L.S.D. (.05)			649.9	1.3	10.1	27.4	2.5	8.6

Latitude: 18° 14' N  
 Elevation: 320m  
 Precipitation during test:  
 Irrigation water applied:  
 Number replications: three

Date Planted: May 1, 1974  
 Date harvested: July 9-August 5, 1974  
 Plot size (length x width): 4m x 75cm  
 Plot area: 3m<sup>2</sup>  
 Nodulation:

**Table 23. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Normal, Alabama**

Cooperator: V. T. Sapiro and J. L. Hughes, Alabama Agricultural and Mechanical University, Normal, Alabama, USA

Entry no	Acc. no	Ht. cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm
1	M4	-	-	-	-
2	M14	28	3	-	-
3	M15	51	7	11	70
4	M76	29	5	11	40
5	M90	71	9	10	56
6	M118	49	4	11	45
7	M174	67	6	11	51
8	M194	59	3	12	48
9	M232	75	4	12	45
10	M317	59	5	10	60
11	M333	51	7	11	38
12	M339	27	3	11	39
13	M350	63	9	10	39
14	M374	42	7	11	63
15	M408	37	4	11	43
16	M409	90	8	11	44
17	M411	88	4	12	37
18	M412	72	14	10	29
19	M416	57	8	10	55
20	M475	77	6	11	48
21	M531	55	7	11	51
22	M535	73	6	11	29
23	M543	78	13	9	57
24	M1132	72	14	13	54
25	M1133	69	15	11	49
26	M1134	47	13	12	50
27	M1135	28	-	-	-
28	M1136	-	-	-	-
Mean		58.2	7.4	11.0	47.5

Latitude: 34° 39' N  
 Elevation: 196 m  
 Precipitation during test:  
 Irrigation water applied:  
 Number of replications: one

Date Planted:  
 Date harvested:  
 Plot size (length x width):  
 Plot area:  
 Nodulation:

Table 24. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Stillwater, Oklahoma, U. S. A.

Cooperator: R. S. Matlock, J. S. Kirby, and Charles Galeotti, Department of Agronomy, Oklahoma State University, Stillwater, Oklahoma, U. S. A.

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Seeds per pod no	1,000 seed wt gm
1	M4	9	759	36	37	11	57
2	M14	27	516	51	41	9	69
3	M15	12	739	43	37	10	77
4	M76	28	509	41	28	9	45
5	M90	17	665	51	37	9	67
6	M118	4	888	44	39	9	65
7	M174	19	655	45	43	9	71
8	M194	22	645	51	37	10	67
9	M232	20	653	46	38	10	61
10	M317	14	684	45	44	11	80
11	M333	25	539	44	41	9	46
12	M339	11	753	40	30	10	50
13	M350	21	651	38	40	10	47
14	M374	26	525	38	34	8	75
15	M408	16	676	36	36	9	59
16	M409	5	805	44	39	10	65
17	M411	15	677	43	62	10	41
18	M412	24	611	52	60	9	45
19	M416	29	388	36	44	8	62
20	M475	18	656	43	34	10	72
21	M531	8	769	42	32	12	64
22	M533	23	619	40	43	10	43
23	M543	30	346	43	47	8	73
24	M1132	10	755	44	41	12	72
25	M1133	2	981	50	37	10	70
26	M1134	1	1015	50	34	11	57
27	M1135	3	936	45	41	13	81
28	M1136	7	779	44	42	11	79
29	Berken	13	731	40	41	8	69
30	M969-71-17	6	790	49	51	11	75
Mean			690.4	43.8	40.3	9.8	63.1
C.V.			12.4	-	14.9	14.2	7.2
L.S.D. (.05)			139.6	-	9.8	2.3	7.5

Latitude: 36° 2' N

Elevation: 274m

Precipitation during test:

Irrigation water applied: None

Number replications: three

Date Planted: May 28, 1974

Date harvested: September 13, 1974

Plot size (length x width): 4.39m x 1m

Plot area: 4.39m<sup>2</sup>

Nodulation: medium

Table 25. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Columbia, Missouri, U. S. A.

Cooperator: Earl E. Watt, Richard E. Swindell, and Vas D. Aggarwal, Department of Agronomy, University of Missouri, Columbia, Missouri, U. S. A.

Entry no	Acc. no	Days to first flower	Ht cm	Seeds per pod no	1,000 seed wt gm	Disease Scores
						Virus (1-5)
1	M4	51	52	14	48	1.3
2	M14	68	38	10	41	1.7
3	M15	72	27	11	48	2.7
4	M76	48	43	12	33	2.0
5	M90	59	43	11	51	1.3
6	M118	62	49	10	48	1.7
7	M174	65	33	10	50	2.3
8	M194	62	28	9	48	2.3
9	M232	59	41	10	44	2.0
10	M317	54	49	13	54	2.7
11	M333	56	42	10	39	3.0
12	M339	53	39	13	40	1.0
13	M350	51	46	13	35	2.7
14	M374	53	47	10	50	4.0
15	M408	55	35	10	44	3.0
16	M409	56	58	12	38	2.0
17	M411	51	38	11	36	4.3
18	M412	76	24	11	37	4.7
19	M416	66	24	11	36	4.0
20	M475	64	29	8	41	2.3
21	M531	55	32	11	49	2.3
22	M533	58	32	11	26	4.0
23	M543	62	39	9	40	4.7
24	M1132	65	31	12	33	3.7
25	M1133	64	32	10	42	2.3
26	M1134	58	54	13	34	2.0
27	M1135	64	35	9	43	3.7
28	M1136	62	31	8	25	3.7
Mean		59.6	38.2	10.7	41.2	2.8
C.V.		6.8	21.8	10.5	12.3	24.3
L.S.D. (.05)		6.6	13.6	1.8	8.3	1.1

Latitude: 38° 49' N  
 Elevation: 228m  
 Precipitation during test: 423mm  
 Irrigation water applied:  
 Number replications: three

Date Planted: June 20, 1974  
 Date harvested: October 1-15, 1974  
 Plot size (length x width): 4.5m x 90cm  
 Plot area: 4.05m<sup>2</sup>  
 Nodulation: fair

Table 26. SUMMARY OF AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN IN 24 TEST LOCATIONS IN 1974-75

Entry no	Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores			
									Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Mildew (1-5)	Control leaf spot (1-5)
			(17) <sup>a</sup>	(17)	(19)	(12)	(17)	(17)	(7)	(4)	(4)	(5)
25	M1133	1	937.6	46	45	24	10.5	51	1.5	1.4	2.8	2.9
11	M333	2	891.8	41	46	28	10.1	40	1.1	1.6	2.5	3.0
10	M317	3	863.9	44	51	16	11.5	61	2.8	1.6	2.9	2.8
13	M350	4	846.6	42	47	26	10.8	44	1.9	1.4	2.5	2.8
24	M1132	5	828.3	44	45	22	12.2	51	1.9	1.8	2.5	3.0
1	M4	6	795.4	40	39	22	11.0	47	1.7	2.6	2.4	2.8
6	M118	7	795.3	44	45	25	10.5	48	2.0	2.5	2.8	2.9
2	M14	8	770.4	45	45	21	9.8	56	1.9	2.1	2.1	2.4
3	M15	9	756.8	44	45	20	11.8	58	2.7	1.5	1.9	2.7
5	M90	10	727.5	45	42	23	10.2	56	2.0	2.8	2.2	3.1
4	M76	11	725.6	42	43	25	10.5	39	2.3	1.8	3.1	2.1
9	M232	12	717.8	43	47	23	10.2	49	2.1	3.0	2.5	3.0
12	M339	13	716.7	41	34	22	11.2	41	1.7	1.5	2.9	2.5
23	M543	14	713.7	46	48	22	10.1	56	3.2	2.4	2.3	1.9
8	M194	15	712.1	45	45	25	10.0	52	2.0	2.2	2.8	2.7
17	M411	16	710.2	46	49	40	10.5	35	1.8	0.9	2.2	1.8
20	M475	17	698.8	44	44	21	10.1	54	1.8	2.8	2.3	2.4
16	M409	18	684.2	52	64	24	10.5	43	1.4	1.9	2.2	2.7
26	M1134	19	673.1	50	51	23	10.7	44	1.1	2.0	2.6	2.9
14	M374	20	667.2	42	40	20	9.6	60	2.6	1.3	2.5	2.6
22	M533	21	658.0	44	50	38	10.3	35	2.3	1.3	2.3	1.8
21	M531	22	647.2	41	39	19	10.4	53	1.6	1.7	3.1	3.2
7	M174	23	634.3	45	43	20	10.1	55	2.0	2.7	2.4	2.8
27	M1135	24	596.1	46	43	19	11.9	57	2.0	2.3	2.1	2.7
19	M416	25	592.5	45	50	23	9.8	55	2.6	0.9	2.7	2.4
28	M1136	26	571.7	45	45	21	11.8	58	2.1	2.1	1.9	2.5
15	M408	27	571.5	40	30	19	9.4	49	2.4	1.2	2.8	2.9
18	M412	28	525.7	47	44	33	10.0	38	2.2	0.8	1.9	1.8
Mean			715.3	44.3	44.9	23.7	10.6	49.5	2.0	1.9	2.5	2.6
S.V. %			36.7	8.8	18.1	36.3	12.6	11.5	15.0	39.9	25.5	29.0
S.D. (.05)			176.5	2.63	5.16	6.99	0.84	2.90	0.89	0.95	0.81	0.90

<sup>a</sup>Numbers in parenthesis are number of test locations from which data were reported.

Table 27. SUMMARY OF AGRONOMIC AND DISEASE DATA FOR THE SECOND AND THIRD INTERNATIONAL MUNGBEAN NURSERIES GROWN IN 37 TEST LOCATIONS.<sup>a</sup>

Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores			
								Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Mildew (1-5)	Cercospora leaf spot (1-5)
		<sup>b</sup> (32)	(32)	(36)	(16)	(25)	(29)	(16)	(9)	(8)	(8)
M350	1	922.0	43.7	50.9	25.0	10.6	43.0	2.0	1.5	2.6	2.5
M347	2	889.8	46.2	53.6	19.1	11.7	60.4	2.2	1.5	2.7	2.3
M411	3	809.0	48.3	53.1	44.7	10.5	35.2	1.4	0.9	2.3	1.6
M409	4	804.4	54.6	67.0	22.3	10.4	43.8	1.5	1.8	2.2	2.3
M4	5	797.9	43.1	40.7	23.5	11.0	46.6	1.7	2.0	2.8	2.3
M118	6	795.4	46.3	45.8	24.9	10.5	47.7	1.8	2.3	2.7	2.7
M90	7	769.9	47.7	45.1	24.2	10.1	55.4	1.8	2.2	2.5	2.9
M76	8	756.4	43.7	44.4	26.3	10.4	37.8	2.1	2.0	3.1	2.1
M374	9	752.4	43.4	42.4	20.3	9.9	61.0	2.4	1.6	2.6	2.3
M14	10	746.3	47.5	48.5	22.3	9.8	55.0	1.8	2.0	2.3	2.2
M15	11	739.9	45.9	47.7	20.0	11.6	56.9	2.2	1.7	2.4	2.3
M543	12	727.4	47.0	54.0	21.4	9.9	56.8	2.7	1.9	2.6	1.5
M232	13	723.8	45.2	48.5	24.4	10.3	49.1	1.9	2.2	2.6	2.8
M533	14	704.6	45.7	55.6	39.4	10.4	33.4	1.9	1.3	2.5	1.5
M194	15	704.1	47.5	45.2	24.4	10.0	53.3	2.0	2.0	2.6	2.6
M174	16	685.5	47.5	45.3	20.3	10.1	54.4	1.9	2.5	2.4	2.7
M416	17	677.6	45.7	52.8	22.2	9.7	55.2	2.5	1.2	2.6	2.1
M408	18	634.9	42.0	33.0	19.6	9.5	48.6	2.1	1.6	2.9	2.7
M412	19	604.8	49.1	49.8	35.3	10.0	37.4	1.7	1.0	2.1	1.6
Mean		749.8	46.3	48.6	25.2	10.3	49.0	2.0	1.8	2.6	2.3
C.V. %		39.2	11.6	20.9	44.1	12.2	10.7	46.6	37.7	26.1	33.7
L.S.D. (.05)		144.1	2.67	4.8	7.7	0.70	2.71	0.62	0.62	0.66	0.71

<sup>a</sup>Eighteen locations in the 2nd IMN, and 19 locations in the 3rd IMN.

<sup>b</sup>Numbers in parentheses are number of locations from which data were reported.

Table 28. SUMMARY OF AGRONOMIC AND DISEASE DATA FOR THE FIRST, SECOND AND THIRD INTERNATIONAL MUNGBEAN NURSERIES GROWN IN 46 TEST LOCATIONS.<sup>a</sup>

Acc. no	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no	Seeds per pod no	1,000 seed wt gm	Disease Scores			
								Virus (1-5)	Mungbean yellow mosaic virus (1-5)	Mildew (1-5)	Cercospora leaf spot (1-5)
		(40) <sup>b</sup>	(41)	(45)	(16)	(31)	(35)	(21)	(10)	(10)	(9)
M350	1	962.0	44.0	51.5	25.0	10.6	42.9	1.8	1.4	3.0	2.4
M317	2	932.9	46.9	54.4	19.1	11.7	60.5	1.9	1.4	2.8	2.2
M4	3	837.7	43.4	40.9	23.5	11.1	46.4	1.1	2.2	2.9	2.2
M118	4	833.8	47.6	46.2	24.9	10.5	48.0	1.5	2.3	2.8	2.4
M76	5	821.3	44.3	44.6	26.3	10.5	38.3	2.0	1.9	3.3	2.0
M15	6	812.4	46.3	48.4	20.0	11.7	57.2	2.1	1.8	2.5	2.2
M90	7	792.7	48.3	46.2	24.2	10.1	55.8	1.6	2.1	2.6	2.7
M14	8	775.4	48.7	48.5	22.3	9.8	55.7	1.6	1.9	2.5	2.0
M174	9	760.5	48.5	46.0	20.3	10.1	54.5	1.6	2.4	2.6	2.5
M194	10	755.5	47.9	46.0	24.4	10.0	53.2	1.8	1.9	2.8	2.4
Mean		828.4	46.4	47.3	23.0	10.6	51.2	1.7	1.9	2.8	2.3
C.V. %		29.9	12.5	17.2	27.4	11.3	9.9	40.2	34.9	23.1	32.6
L.S.D. (.05)		110.0	2.58	3.50	1.37	0.60	2.38	0.41	0.57	0.57	0.67

<sup>a</sup>Nine locations in the 1st IMN, 18 locations in the 2nd IMN, and 19 locations in the 3rd IMN.

<sup>b</sup>Numbers in parenthesis are number of locations from which data were reported.

(DATA FROM THIS LOCATION RECEIVED TOO LATE TO BE INCLUDED IN SUMMARIES)

Table 29. AGRONOMIC AND DISEASE DATA FOR THE THIRD INTERNATIONAL MUNGBEAN NURSERY GROWN AT Tando Jam, Pakistan

Cooperator: A. H. Chaudhry, M. A. Jaleel, and N. Ahamed, Agricultural Research Institute, Tando Jam, (Sind) Pakistan

Entry no.	Acc. no.	Yield rank	Yield kg/ha	Days to first flower	Ht cm	Pods per plant no.	Seeds per pod no.	1,000 seed wt gm
1	M4	28	143	40	22	16	8	51
2	M14	20	237	41	29	15	7	50
3	M15	23	220	45	32	23	7	60
4	M76	8	349	43	28	22	8	50
5	M90	24	218	39	26	17	7	57
6	M118	26	193	40	24	22	7	49
7	M174	25	203	39	27	18	7	61
8	M194	22	223	40	26	27	7	62
9	M232	16	256	39	28	16	7	55
10	M317	12	316	41	34	16	8	67
11	M333	21	237	40	28	20	7	42
12	M339	30	120	39	20	17	7	45
13	M350	9	338	40	30	30	8	46
14	M374	19	239	41	27	17	8	53
15	M408	29	127	37	15	14	7	52
16	M409	18	244	48	37	28	9	55
17	M411	5	385	40	31	31	9	36
18	M412	13	308	39	32	36	8	32
19	M416	11	316	44	41	39	8	67
20	M475	15	268	38	32	21	8	59
21	M531	10	326	39	25	19	7	60
22	M533	2	499	42	35	29	8	42
23	M543	14	280	43	38	29	7	79
24	M1132	6	361	43	31	22	9	56
25	M1133	7	359	42	28	29	8	63
26	M1134	4	391	49	33	23	9	53
27	M1135	27	193	41	33	16	9	69
28	M1136	17	251	45	32	20	9	69
29	Local	1	604	43	39	28	9	41
30	Local	3	479	43	42	36	9	34
Mean			289.5	41.4	30.1	23.2	7.8	53.9
C. V.			34.7	4.2	12.1	30.8	11.3	16.5
L. S. D. (.05)			164.5	2.9	6.0	11.7	1.4	14.5

Latitude: 25° 2' N  
 Elevation: 63 m  
 Precipitation during test:  
 Irrigation water applied: 6 irrigations  
 Number replications: three

Date Planted: March 17, 1975  
 Date harvested: May 23 and June 18, 1975  
 Plot size (length x width): 4m x 75cm  
 Plot area: 3m<sup>2</sup>  
 Nodulation: none