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A High Yielding Medium Duration Blackgram (*Vigna mungo* (L) Hepper) - Co. 3 For Tamil Nadu

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A high yielding culture PLS 364 (Pudukottai) selected from germplasm was released as an improved variety of Blackgram CO. 3. This is a determinate type with erect and compact plant stature without tendrils and grows to a height of 50-60 cm. It is a medium duration (85 days) variety which gives an average yield of 1055 kg of grain per hectare under irrigated condition with per day productivity of 12.4 kg and gives 481 kg grain/ha under ranifed condition with per day productivity of 5.7 kg.

Blackgram or Urd (*Vigna mungo* (L.) Hepper) one of the major pulse crops, is grown in an area of 1.6 lakh hectares with the production of 0.43 lakh tonnes of grains. So far three improved varieties of blackgram viz., ADT. 1 (75 days duration suitable for rice fallows) Co 1 (65 days duration, rainfed) and Co. 2 (65 days duration, irrigated) were released in Tamil Nadu. Co. 1, blackgram (rainfed), has very low yield potential viz. 356 kg/ha and its performance is also erratic in yield under rainfed conditions. So, a project for evolving a medium duration (80-85 days), high yielding blackgram variety with drought resistance was taken up during 1972 and the results are presented herein.

MATERIALS AND METHODS

A large number of blackgram types of extra and intra state origin with wide variability for important qualitative and quantitative characters, under germplasm were evaluated. By intensive screening 44 medium duration types with high yielding potential were isolated and studied in yield trials raised under rainfed conditions. The results revealed that one type viz., PLS 364 was the high yielder with 832 kg/ha scoring 78 per cent over check CO. 1 which recorded only 468 kg/ha.

Since the selection PLS. 364 was showing variability for stature habit (determinate and indeterminate) and for presence or absence of tendril, re-selection of single plants with medium height (50 cm), determinate habit and without tendril was made and promising progenies were tested. Lines showing uniformity in growth habit were pooled and subjected to yield trials during 1973-74 at the Pulses Breeding Station, Coimbatore and at the Agricultural Research Stations Aliyarnagar and Bhavanisagar and also evaluated at 53 farmers holdings all over Tamil Nadu

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during 1973-75 both under irrigated and rainfed conditions.

RESULTS AND DISCUSSION

The comparative performance of this new selection PLS. 364 along with recommended varietias viz, CO. 2, T.9 and No. 55 for six seasons under irrigated conditions and four seasons under rainfed conditions during 1972-1974 are furnished in Table I. The results indicated that selection PLS. 364 was superior to other varieties recording an average yield of 1297 kg/ha and 658 kg/ha under irrigated and rainfed conditions respectively. The yield increase ranged from 15 to 87 per cent under irrigated condition and 10 to 85 per cent under rainfed condition.

The mean performance of this selection PLS 364 in farmers fields and comparative yield trials conducted at

TABLE I. Comparative yield trails conducted at Research Stations in Coimbatore, Aliyarnagar and Bhavanisagar

	Yield kg/ha									
	Irrigated					Rainfed				
	PLS. 364 (85)*	CO. 2 (65)*	T. 9 (70)*	No. 55 (85)*	CO. 1 (100)*	PLS. 364 (85)*	CO. 2 (65)*	T. 9 (70)*	No. 55 (85)*	CO. 1 (100)*
Main - 1972 (July - Sep.)	1208	1020	499	536	468	—	—	—	—	—
Monsoon - 1972 (Aug. - October)	1468	1360	1242	1300	565	—	—	—	—	—
Monsoon - 1972 (Sep. - Nov.)	—	—	—	—	—	832	703	625	536	468
Main - 1973 (July - Sep.)	794	649	—	—	—	—	—	—	—	—
Monsoon - 1973 (Sep. - Nov.)	1454	1254	1268	1195	880	—	—	—	—	—
Winter - 1973 (Oct. - Dec.)	1291	1254	900	854	572	500	613	474	486	475
Main - 1974 (July - Sep.)	1563	1238	1205	1440	989	—	—	—	—	—
Monsoon - 1974 (Sep. - Nov.)**	—	—	—	—	—	750	400	428	670	317
Monsoon - 1974 (Sep. - Nov.)***	—	—	—	—	—	548	198	176	498	165
Mean	1297	1129	1002	1065	695	658	478	425	548	356
Per cent on Co. 2	114.8	100.8	88.7	94.3	61.5	137.6	100.0	88.9	114.6	74.7
Per cent on T. 9	129.4	112.6	100.0	106.2	69.3	154.8	112.4	100.0	128.9	83.7
Per cent on No. 55	121.7	106.0	94.0	100.0	69.3	120.0	87.2	77.5	100.0	64.9
Per cent on Co. 1	186.6	162.4	144.1	153.2	100.0	184.8	184.2	119.3	153.9	100.0
Per day productivity (kg/ha)	15.3	17.3	13.1	12.5	7.0	7.74	7.35	6.25	6.56	3.56
Cost benefit ratio	1:3.1	1:2.9	1:2.4	1:2.5	1:1.6	1:2.3	1:1.7	1:1.5	1:1.9	1:1.2

* Duration
** Aliyarnagar
*** Bhavanisagar

TABLE II. Mean performance of PLS. 364 as compared to CO. 2 at Research Stations and Farmers' holdings

	Mean yield in kg/ha							
	Irrigated trails				Rainfed trials			
	No. of trials	PLS 364	CO. 2	Percent on CO. 2	No. of trails	PLS 364	CO. 2	Per cent on CO. 2
Research Station Trials (1972 -74)	6	1297	1129	115	4	658	478	138
District Trials 1973	14	1175	1019	115	16	485	398	121
District Trials 1974	11	846	704	120	3	302	185	183
District Trials 1975	9	903	694	130	—	—	—	—
Mean	—	1055	887	119	—	481	354	136
Per day productivity (kg/ha)	—	12.4	13.6	—	—	5.7	5.4	—
Cost benefit ratio	—	1:2.53	1:2.13	—	—	1:1.74	1:1.27	—

TABLE III. The Important characteristic features of the Culture PLS. 364 as compared to (CO. 2 and CO. 1)

Characters	PLS. 364	CO. 2	CO. 1
Plant height (cm)	50 - 60	20 - 25	60 - 70
Branches	4 - 5	2 - 3	3 - 4
Clusters/plant	8 - 10	8 - 10	6 - 8
Pods/cluster	3 - 4	3 - 4	3 - 4
Seeds/pod	6 - 7	5 - 6	6 - 7
Pods	Hairy in nature	Non-hairy	Hairy in nature
100 grain weight (g)	5.4	5.0	5.3
Length of pod (cm)	5.5	4.5	5.4

the research station are presented in Table II. A scrutiny of overall comparative performance of this new culture in all these 63 trials revealed that selection PLS. 364 has recorded the maximum mean yield of 1055 kg/ha and 481 kg/ha as compared to a mean yield of 887 and 354 kg/ha of Co. 2 both under irrigated and rainfed conditions respectively. The culture has also registered a per day productivity of 5.7 kg as againest 5.4 kg recordedly CO. 2 under rainfed conditions.

On comparison with CO. 1 blackgram under dry farming areas of Tamil Nadu, the selection PLS 364 has recorded 84 8 per cent increase in grain yield (Table I). The per day productivity worked out on the basis of research station trials was 7.74 kg for PLS. 364 and 3.56 for CO. 1 under rainfed condition with a cost benefit ratio of 1:2.3 for PLS 364 and 1:1.2 for CO. 1. Based on the superior performance and higher yield under rainfed conditions PLS 364 was released by Tamil Nadu Agricultural University during January, 1976 as strain CO. 3, suitable for rainfed cultivation in Tamil Nadu.