

Survey to assess the impact of harvesting and threshing methods in blackgram, greengram and redgram

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Abstract: The survey was conducted in Bhavani block of Erode district in Tamil Nadu. The aim of the survey was to assess the impact of harvesting and threshing methods on seed quality of blackgram, greengram and redgram. In the selected area, farmers followed the cutting of blackgram plant when 60 per cent of the pod turn black color, in greengram pod picking method was followed and in redgram harvesting done during the 60 per cent of the pod color turn brown. For separation of seed from the pod or plant, the farmers were followed beating with stick in all the above three crops. The resulted seed materials were collected and analysed the seed quality parameters under laboratory condition. The blackgram, greengram and redgram seed samples germination was positively correlated with root length, shoot length, 100 seed weight, dry matter production, vigour index and negatively correlated with moisture content, electrical conductivity and mechanical damage.

Key words : Blackgram, Greengram, Redgram, Mechanical damage, Germination per cent.

Introduction

The present demand for the pulses in the country is estimated at about 15 million tonnes based on normal prices, while the production hovers between 12 to 14 million tonnes averaging at about 13.5 million tonnes.

The sluggish growth in production in the country is mainly because of failure in evolving good high yielding varieties in the past 36 years and also lack of good quality seed material for planting is a major bottleneck, in improving the productivity. This unavailability could be attributed to the lack of proper care in post harvest operations as farmers do not adopt proper procedures to maintain seed quality (Gunaseena, 1974).

Against this background, a case study is undertaken in Erode district to elicit information on the following aspects.

1. To study the harvesting and threshing methods followed by the pulse seed growing farmers.
2. To study the effect of farmers followed harvesting and threshing methods on seed quality.

Materials and Methods

This case study was conducted in Bhavani block of Erode district of Tamil Nadu during

2001. Purposive sampling method was adopted to select 12 respondents in the different villages of Bhavani block (Table 1). A well structured interview schedule was prepared. The respondents were interviewed personally and data were collected (Lawrance, 2000).

In the selected area, the farmers follow cutting of blackgram plant when 60% of the pods turn black colour, in greengram picking method is followed and in redgram harvesting of plant is done when the 60% of pod colour turn brown. Farmers thresh the harvested produce by beating with stick in all the three crops for seed extraction.

The samples collected from the farmers were used for evaluating seed quality parameters. Seed moisture content, 100 seed weight, germination (ISTA, 1999), root length, shoot length, dry matter production were recorded. Vigour index was calculated by using the following formula (Abdul Baki and Anderson, 1973).

$$\text{Vigour index} = \frac{\text{Germination percentage}}{\text{Seedling length}}$$

The electrical conductivity (Presely, 1958) and mechanical damage (Agrawal, 1998) were also assessed. To find out the relationship between

Table 1. Farmers name and address

Sample No.	Name of the farmer	Address
1.	K. Komarasamy	West Street, Chittar, Bhavani
2.	K. Annamalai	Singampettai, Bhavani
3.	P. Kaliyana gounder	Ponnachi, Bhavani
4.	K. Subramaniam	Singampettai, Bhavani
5.	S. Sengodan	Ananthampalayam, Bhavani
6.	K. Mathappan	Boothapadi, Bhavani
7.	N. Nallagounder	Kadappanalle, Bhavani
8.	M. Eswaran	Singampettai, Bhavani
9.	T. Thangavelu	Kannamoochi, Bhavani
10.	K. Sengoda gounder	Singampettai, Bhavani
11.	M. Ponnusamy	Singampettai, Bhavani
12.	K. Velu	Poosarithottam, Bhavani

Table 2. Assessment of quality parameters of different lots of farmers produced blackgram seed

Source of sample	Seed quality parameters								
	Moisture content (%)	100 seed weight (g)	Germination (%)	Root length (cm)	Shoot length (cm)	DMP (g 10 seed lings ⁻¹)	Vigour index	EC (dSm ⁻¹)	Mechanical damage (cm)
Komarasamy	8.95	4.15	60	12.5	20.3	0.151	1968	1.1	15.0
Annamalai	9.37	4.04	64	11.1	18.4	0.224	1888	1.0	15.0
Kaliyana gounder	8.96	4.21	76	13.1	21.5	0.220	1869	0.4	8.0
Subramaniam	8.60	4.07	80	13.5	21.0	0.235	1960	0.3	5.0
Sengodan	8.95	4.02	64	11.3	20.8	0.217	2054	0.9	12.0
Mathappan	8.84	4.03	70	12.0	23.0	0.211	2450	0.5	10.0
Nallagounder	9.26	4.12	60	11.2	19.2	0.181	1824	1.0	15.0
Eswaran	9.50	4.01	60	11.0	18.3	0.201	1758	1.0	15.0
Thangavelu	9.12	4.21	64	11.8	19.0	0.192	1971	0.9	12.0
Sengoda gounder	9.10	4.11	68	11.2	17.3	0.188	1938	0.8	12.0
Ponnusamy	8.80	4.02	60	10.8	20.1	0.199	1854	1.1	15.0
Velu	9.20	4.04	68	12.1	19.2	0.204	2128	0.9	13.0

germination and other seed quality parameters correlation analysis was worked out (Rangaswamy, 1995).

Results and Discussion

Blackgram

The seed sample collected from K. Subramaniam recorded higher germination (80 per cent), root length (13.5 cm), drymatter production (0.235) and low electrical conductivity (0.3 Sm⁻¹) and mechanical damage (5.0 per cent). The sample collected from P. Kaliyana

gounder and K. Subramaniam recorded germination above the minimum seed certification standard prescribed for germination. The remaining samples recorded below the minimum seed certification standard. The possible reason may be due to harvesting of pods when 60% of the pods turn black in colour and after harvest the farmers heap the material for sometime before threshing. During heaping due to presence of more amount of foliage heat may be generated and this condition favour the microorganism attack and spoilage of seed germination. Also due to mechanical

Table 3. Assessment of quality parameters of different lots of farmers produced greengram seed

Source of sample	Seed quality parameters								
	Moisture content (%)	100 seed weight (g)	Germination (%)	Root length (cm)	Shoot length (cm)	DMP (g 10 seed lings ⁻¹)	Vigour index	EC (dSm ⁻¹)	Mechanical damage (cm)
K. Komarasamy	8.79	3.45	84	15.0	24.0	0.199	3276	0.5	5.0
K. Annamalai	8.81	3.44	82	14.6	22.1	0.202	3009	0.3	4.0
P. Kaliyana gounder	9.41	3.29	80	13.8	21.0	0.205	1976	0.4	5.0
K. Subramaniam	9.12	3.38	80	14.0	27.5	0.209	3320	0.6	6.0
S. Sengodan	8.83	3.32	74	12.8	22.6	0.206	2619	0.6	6.0
K. Mathappan	9.16	3.33	76	13.7	21.3	0.206	2660	0.7	6.0
N. Nallagounder	8.80	3.21	84	13.3	22.8	0.200	3032	0.3	4.0
M. Eswaran	9.10	3.28	80	14.1	21.2	0.198	2824	0.3	4.0
T. Thangavelu	8.90	3.46	88	15.5	24.1	0.212	3484	0.3	4.0
K. Sengoda gounder	9.40	3.30	80	13.2	20.8	0.208	2720	0.4	5.0
M. Poninusamy	9.20	3.24	76	13.0	21.2	0.198	2599	0.5	6.0
K. Velu	8.90	3.11	80	14.1	22.2	0.211	2904	0.3	4.0

Table 4. Assessment of quality parameters of different lots of farmers produced redgram seed

Source of sample	Seed quality parameters								
	Moisture content (%)	100 seed weight (g)	Germination (%)	Root length (cm)	Shoot length (cm)	DMP (g 10 seed lings ⁻¹)	Vigour index	EC (dSm ⁻¹)	Mechanical damage (%)
K. Komarasamy	8.90	9.39	80	18.0	19.9	0.536	2952	0.4	5.0
K. Annamalai	9.18	9.30	74	15.2	18.2	0.529	2471	0.5	6.0
P. Kaliyana gounder	9.04	9.14	62	15.0	16.8	0.514	1971	0.7	8.0
K. Subramaniam	9.17	9.30	72	14.0	16.9	0.526	2224	0.6	6.0
S. Sengodan	8.88	9.34	64	14.0	16.9	0.511	1977	1.1	10.0
K. Mathappan	8.94	9.31	74	12.5	17.3	0.522	2205	0.6	6.0
N. Nallagounder	9.10	9.32	74	13.5	18.2	0.508	2345	0.7	6.0
M. Eswaran	8.80	9.21	80	17.8	20.1	0.504	3032	0.4	5.0
T. Thangavelu	9.21	9.30	78	16.5	16.9	0.511	2605	0.5	6.0
K. Sengoda gounder	9.11	9.22	74	15.8	17.1	0.509	2434	0.5	6.0
M. Ponnusamy	8.80	9.18	80	18.2	19.8	0.521	3040	0.3	4.0
K. Velu	9.21	9.20	72	15.0	18.1	0.518	2383	0.6	7.0

damage of seeds while threshing because of variation in manual force applied for threshing.

Germination was negatively correlated with moisture content (-0.546), electrical conductivity (-0.952) and mechanical damage (-0.954). While germination was positively correlated with 100

seed weight (0.187), root length (0.789), shoot length (0.440), drymatter production (0.645 and vigour index (0.295) (Table 5).

Greengram

Based on the observation, the seed sample collected from T.Thangavelu recorded high

Table 5. Relation between germination and other seed quality parameters

Parameters	'r' value		
	Blackgram	Greengram	Redgram
Moisture content	-0.546	-0.346	-0.319
100 seed weight	0.187	0.386	0.180
Root length	0.789	0.316	0.618
Shoot length	0.440	0.346	0.710
Drymatter production	0.649	0.121	0.183
Vigour index	0.295	0.629	0.908
EC	-0.952	-0.639	-0.828
Mechanical damage	-0.954	-0.527	-0.897

germination (88 per cent), drymatter production (0.212), vigour index (3484) and low electrical conductivity and mechanical damage when compared with other samples (Table 3).

More number of greengram seed sample posses germination higher than minimum germination standards prescribed for certification. This may be due to harvesting of seeds at correct stage of maturity i.e. the farmers follow pod picking method of harvest when the pod colour turns to black.

Germination was negatively correlated with moisture content (-0.346), electrical conductivity (-0.639), and mechanical damage (-0.527). However, germination was positively correlated with 100 seed weight (0.386), root length (0.316), shoot length (0.346), drymatter production (0.121) and vigour index (0.629) (Table 5).

Redgram

The seed sample collected from K.Komarasamy, M.Eswaran and M.Ponnusamy recorded higher germination (80 per cent) when compared to other samples. The sample collected from K.Komarasamy recorded higher shoot length (19.9 cm), drymatter production (0.536). Sample collected from M.Ponnusamy recorded lower electrical conductivity (0.3) and mechanical damage (4.0 per cent) (Table 4).

More number of redgram seed samples maintained germination higher than the prescribed minimum germination standard. This may be due to the fact the farmers keep the harvested planting material of redgram in erect position for drying after harvest and the redgram leaves

are small in size when compared to blackgram leaf, so redgram leaf quickly dried and not favour heat and microorganisms development.

Germination was negatively correlated with moisture content (-0.319), electrical conductivity (-0.828) and mechanical damage (-0.897). Germination was positively correlated with 100 seed weight (0.180), root (0.618), shoot length (0.710), drymatter production (0.183) and vigour index (0.908) (Table 5).

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