

STUDIES ON SEED FORTIFICATION AND PELLETING IN BLACKGRAM

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ABSTRACT

Studies on seed fortification and pelleting on crop growth and yield in black gram was carried out at the Department of Seed Science Technology, Tamil Nadu Agricultural University, Coimbatore during 1995. The nutrients $ZnSO_4$, $MnSO_4$, Na_2MO_4 and DAP were used for fortification and pelleting. The blackgram seeds fortified with $ZnSO_4$ + $MnSO_4$ + Na_2MO_4 and the pelleted with DAP registered higher yield of 1.37 kg plot⁻¹ having the size of 2.25 m x 3 m.

KEY WORDS : Seed pelleting, Seed fortification, Micro and macro nutrients.

Pre-treatment of seeds with nutrient chemicals produce physiological effects on seed, increasing the yield. Seed fortification is nothing but a seed enrichment with nutrient solutions. Pelleting is the process of enclosing a seed in a small quantity of inert material to enlarge size of seed to facilitate precision planting. Seed coating has been reported to increase the yield of pulses particularly black

gram and greengram (Kuppuswamy *et al.*, 1985). This paper reports the response of blackgram to seed fortification and pelleting on crop growth parameters and yield attributes.

MATERIALS AND METHODS

Investigations were carried out during 1995 to evaluate the effect of seed fortification and

Table 1. Effect of fortification and pelleting treatments on crop growth characters in blackgram cv. CO B 282/1

Treatment	Field emergence (%)	Dry matter production (mg)			Plant height on 60 DAS (cm)	Number of pods plant ⁻¹	Pod length (cm)
		20 DAS	40 DAS	60 DAS			
To Control	91 (72.54)	0.12	0.86	6.86	20.2	23.6	4.1
T1 Fortified with micronutrient ($ZnSO_4$ 0.2% + $MnSO_4$ 0.2% + Na_2MO_4 0.1%)	92 (73.57)	0.13	0.92	7.10	20.8	24.4	4.3
T2 Pelleted with micronutrient	92 (73.57)	0.11	0.92	7.16	20.6	24.3	4.4
T3 Pelleted with macronutrient (120 g DAP/kg of seed)	93 (74.66)	0.11	0.92	7.20	20.8	24.8	4.5
T4 Fortified with micronutrients + pelleted with macronutrient	92 (74.66)	0.10	0.93	7.25	21.0	25.5	4.5
SEd	0.001	0.01	0.16	-	-	0.27	0.09
CD (P = 0.05)	NS	0.002	0.02	0.34	NS	0.58	0.19

(Figures in parantheses are transformed values)

pelleting on crop growth and yield in blackgram. The following treatments were given.

- T₀ Control
 T₁ Fortified with micronutrient
 (ZnSO₄ 0.2%, MnSO₄ 0.2%, Na₂MO₄ 0.1%)
 T₂ Pelleted with micronutrients
 (ZnSO₄ 0.2%, MnSO₄ 0.2%, Na₂MO₄ 0.1%)
 T₃ Pelleted with macronutrient
 (120 g DAP kg⁻¹) of seed)
 T₄ Fortified with micronutrient + pelleted with
 macronutrient
 (ZnSO₄ 2%, MnSO₄ 2%, Na₂MO₄ 0.2% +
 120 g DAP kg⁻¹ of seed)

Method of seed fortification

To the known volume of seeds one third volume of the nutrient solution was added and allowed to imbibe for five hours. The imbibed seeds were dried under shade for three days to bring back to the original weight.

Sequence of pelleting

Seed + fungicide + coating material + nutrient mixture

The biometric observations were made on 10 randomly selected plants and the data were analysed statistically.

RESULTS AND DISCUSSION

Effect of fortification and pelleting and field emergence and crop growth

The field emergence percentage and plant height were not significantly influenced by the treatments. The dry matter production of the seedlings collected at 20th, 40th and 60th DAS differed significantly due to the treatments. Fortieth and 60th DAS showed high DMP in the seeds fortified with micronutrients and pelleted with macronutrient. The same has been reported for neem (Ponnuswamy, 1993).

The pod production was significantly altered by fortification and pelleting treatments. T₂ recorded the maximum number of 25.5 pods plant⁻¹ and the minimum number of 23.6 pods plant⁻¹ was recorded in T₀. The pod length was significantly influenced by all the treatments. T₄ and T₀ registered the maximum and minimum of 4.5 and 4.1 cm respectively.

Effect of fortification and pelleting on yield attributes

Number of seeds pod⁻¹ differed significantly due to treatments. The seed yield was significantly influenced by the fortification and pelleting

Table 2. Effect of fortification and pelleting treatments on yield attributes and resultant seed quality in black gram cv. CoBG 282/1.

Treatment	Treatment details	Number of seeds pod ⁻¹	Seed yield (g plant ⁻¹)	Seed yield (kg plot ⁻¹)	100 seed weight (g)	Seed recovery (%)	Germination (%)
T ₀	Control	5.7	4.8	1.09	3.60	90 (71.57)	94 (75.82)
T ₁	Fortified with micronutrient	6.0	5.3	1.19	3.62	92 (73.57)	95 (77.08)
T ₂	Pelleted with micronutrient	6.1	5.3	1.21	3.63	92 (73.57)	94 (75.82)
T ₃	Pelleted with macronutrients	6.2	5.5	1.29	3.72	93 (74.66)	95 (77.08)
T ₄	Fortified with micronutrients + pelleted with macronutrient	6.3	5.6	1.37	3.80	94 (77.08)	96 (78.46)
S.E.d		0.09	0.07	0.10	0.009	0.31	-
C.D (P=0.05)		0.20	0.15	0.23	0.02	0.68	NS

(Figures in parentheses are transformed values).

Table 3. Cost benefit ratio of seed fortification and pelleting in black gram.

Treat-ment	Treatment details	Cost of cultivation (Rs./ha)	Computed yield (kg/ha)	Total income (Rs.)	Increased yield over control (kg/ha)	% of increased yield over control	Increased income over control (Rs./ha)	% of increased income over control	Cost benefit ratio
T ₀	Control	6425	1372	24696					1:3.8
T ₁	Fortified with micronutrient	6476	1498	26964	126	9.18	2268	9.18	1:4.1
T ₂	Pelleted with micronutrients	6533	1523	27414	151	11.0	2718	11.0	1:4.2
T ₃	Pelleted with macronutrients	6534	1625	29250	253	18.0	4554	18.3	1:4.4
T ₄	Fortified with micronutrients + pelleted with macronutrient	6534	1725	31055	353	25.7	6359	25.6	1:4.7

treatments. T₄ and T₀ registered the maximum and minimum of 4.5 and 4.1 cm respectively.

Effect of fortification and pelleting on yield attributes

Number of seeds pod⁻¹ differed significantly due to treatments. The seed yield was significantly influenced by the fortification and pelleting treatments. T₄ and T₀ registered the maximum and minimum of 5.6 and 4.8 g of seeds plant⁻¹. Jeyabal *et al.* (1992) and Kuppusamy *et al.* (1992) have registered the increased yield due to pelleting of soybean and greengram respectively. The increased yield could be due to enhanced seed vigour resulting better seedling establishment and activation of metabolic activities of the seed on account of fortification and pelleting treatments.

Effect of fortification and pelleting on quality of resultant seed

100 seed weight was significantly influenced by the treatments. T₄ and T₀ registered the maximum and minimum of 3.80 and 3.60 g respectively. Similar findings were reported by Efimenko and Gnida (1975) in buckwheat. The maximum and minimum of 94 and 90 per cent of

seed recovery was registered in T₄ and T₀ respectively. The germination per cent of the resultant seeds obtained from different treatments were not significant.

The cost benefit ratio analysis also revealed that the T₄ treatment recorded the maximum (1:4.7) when compared with other treatments.

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