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EFFECT OF SEED HARDENING AND PELLETING ON SEED QUALITY IN RAGI

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ABSTRACT

Seeds of ragi hardened with chemicals like Kcl, $CaCl_2$ and aqueous leaf extracts like Prosopis and Pungam each at one per cent concentration as well as their combination followed by pelleting with pungam leaf powder showed that seeds hardened with Kcl (1%) followed by pelleting with pungam leaf powder (60 g kg^{-1}) recorded higher germination and seedling vigour characters over control.

KEY WORDS: Ragi, Seed hardening, Seed pelleting, Leaf powder, Germination, Vigour

Pre-sowing hardening or imbibition and drying of seed is one of the methods which result in modifying physiological and biochemical nature of seed so as to get the characters that are favourable for drought resistance (Henckel, 1964). Dawson (1965) obtained significant increase in plant height, tiller number, shoot weight and yield in ragi due to seed hardening with water. Krishnasastry *et al.* (1969) observed increased early germination, vigorous seedling production and yield due to pre-sowing seed hardening in ragi. Sorghum seeds hardened with aqueous solution of botanicals performed significantly better than control (Jagathambal, 1996). Seed pelleting offers scope for incorporating organic or chemical substances into the seed for improving germination, vigour and controlling the micro-environment in which the seed germinates (Scott, 1989). Since ragi is grown mostly as rainfed crop with low productivity seed hardening and pelleting before sowing will be useful in dryland cultivation.

MATERIALS AND METHODS

Genetically pure seeds of ragi Cv. Co 13 were precleaned and processed using BSS 12 sieve. The graded seeds after drying to 8-10 per cent moisture content soaked in the following chemicals and aqueous leaf extracts for 12 h adopting 1 : 0.7 seed to solution ratio. After soaking, the seeds were dried to original moisture content. For seed pelletings, 60 g. of pungam leaf powder and 50 ml of five per cent maida grual as adhesive were used for one kg of seeds.

Treatments -

T_1 - Control (dry seeds)

T_2 - Water

T_3 - Kcl (1%)

T_4 - $CaCl_2$ (1%)

T_5 - Kcl + $CaCl_2$ (0.5 % each)

T_6 - Prosopis leaf extract (1%)

T_7 - Pungam leaf extract (1%)

T_8 - Kcl (1%) + Pungam leaf powder pelleting

T_9 - $CaCl_2$ (1%) + Pungam leaf powder pelleting

T_{10} - Prosopis + Pungam leaf extract (0.5% each)

T_{11} - Pungam leaf powder pelleting

The pelleted seeds were air dried for 24 h and evaluated for germination potential and vigour using the following parameters under laboratory during 1996.

Germination test (ISTA, 1993)

Root length

Shoot length

Dry weight of seedling

Vigour index (Abdul-Baki and Anderson, 1973)

Speed of germination (Maguire, 1962)

Field emergence potential

The results are presented in table 1.

RESULTS AND DISCUSSION

The differences observed among the seed quality parameters were significant due to seed hardening and pelleting. The seeds given T_8 treatment recorded the highest germination per cent (93.0) when compared to the control (82.0). The remaining treatments were on par with each other. The root length of seedling recorded was maximum (9.5 cm) for T_8. The next best was T_9 (9.1 cm). The root length was minimum in T_2 (7.3 cm). The seeds given T_8 treatment produced longer shoot (8.3 cm) when compared to those from control seeds (5.6 cm). All other treatments were on par with each other. The dry matter production of seedling was more (4.3 mg) in T_8 when compared to control (2.3 mg). The computed vigour index values were higher in respect of T_8 (1664), T_9 (1521) and T_7 (1259). The values recorded in other treatments were on par. The field emergence was maximum (80.0%) in T_8 followed by T_9 (76.0%) and minimum in T_1 (62.0%). The maximum speed of germination (13.14) was recorded by the seeds received T_9 treatment followed by T_8 (10.54) as against control (7.58).

In the present investigation, the seeds hardened with Kcl (1%) followed by pelleting with Pungam leaf powder (T_8) gave higher germination and enhanced seedling growth than the control seeds. The improvement in seedling growth manifested was indeed great viz., 25 and 48 per cent in root and shoot length, 87 and 55 per cent in dry matter production and vigour index respectively. The improvement in germination could be ascribed to seed hardening as much as the early phase of germination was accomplished by process as described earlier (Henckel, 1964). The improvement in root and shoot length of seedling due to treatment might probably due to enhanced metabolic activity, earliness in germination and seedling growth (Kamalam and Nair, 1989). Similar beneficial effects on seedling growth was reported by Jagathambal (1996) in sorghum. The synergistic effect of leaf powder pelleting is due to presence of saponins, GA_3 in traces and micronutrients especially zinc. These biocontents might synergistically interact with amino acids especially tryptophan to form the indole acetic acid in the germinating seeds to bring about enhancement in seedling growth (Lu *et al.*,

Table.1 Effect of seed hardening and pelleting on seed quality in ragi Cv. Co.13.

Treatments	Germination (%)	Root length (cm)	Shoot length (cm)	Dry matter production (mg/seedlg)	Vigour Index	Field emergence (%)	Speed of germination
T_1 (Control)	82.0 (64.89)	7.4	5.6	2.3	1074	62.0 (52.32)	7.58
T_2 (Water)	87.0 (69.13)	7.3	5.8	2.0	1149	71.0 (57.82)	7.67
T_3 (Kcl %)	86.0 (68.03)	8.2	6.2	2.6	1240	71.0 (57.82)	8.46
T_4 ($CaCl_2$ 1%)	82.0 (64.89)	7.6	6.1	2.3	1125	71.0 (57.82)	8.00
T_5 (Kcl + $CaCl_2$ 0.5% each)	82.0 (64.89)	7.7	6.0	2.3	1137	72.5 (58.04)	8.50
T_6 (Prosopis leaf extract 1%)	82.0 (64.89)	8.1	5.9	3.0	1155	71.0 (57.82)	8.60
T_7 (Pungam leaf extract 1%)	86.0 (68.03)	8.4	6.1	3.0	1259	74.0 (59.77)	8.70
T_8 (Kcl + Pungam leaf powder pelleting)	93.0 (75.17)	9.5	8.3	4.3	1664	80.0 (63.42)	10.54
T_9 ($CaCl_2$ + Pungam leaf powder pelleting)	90.0 (71.59)	9.1	7.7	3.6	1521	76.0 (60.88)	13.14
T_{10} (Prosopis + Pungam leaf extract 0.5% each)	86.0 (68.03)	8.7	5.7	2.6	1246	71.0 (57.39)	9.25
T_{11} (Pungam leafpowder pelleting)	83.0 (65.91)	8.5	5.6	2.0	1174	72.0 (58.03)	8.73
CD (P=0.05)	3.07	0.28	0.21	1.25	53.8	2.21	0.03

(Figures in parenthesis indicate arc sine transformed values)

1983). Similar results were also reported by Jagathambal (1996) in sorghum.

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EXPENDITURE ON FOOD AND NON-FOOD ITEMS IN COIMBATORE AND PALAKKAD

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ABSTRACT

A study was conducted in Coimbatore and Palakkad with 200 sample households to analyse the expenditure pattern on food and non-food items. The results indicated that the average monthly expenditure on food items in Coimbatore was Rs. 3379.47 and in Palakkad it was Rs. 3668.49. Among the components, the major share was accounted by milk and milk products, followed by cereals, vegetables and non-vegetarian items. For non-food items, the average monthly expense was Rs. 11084.05 in Coimbatore and Rs. 10716.76 in Palakkad, the major components are education, clothing, housing and services.

KEY WORDS: Expenditure, Food, Non-food, Services.

As agricultural development takes place, it relaxes the constraints of availability of raw materials to related industries particularly agro-based industries. It also relaxes the demand constraints for processed products through increase in income above survival level of agriculturists and other low income population whose income elasticity of demand for these products is very high. Desai *et al.*, (1991) observed that with the development of agricultural sector and with the concomitant development of other sections, there occurs a systematic change in the demand structure especially when the growth in income above a certain minimum level is achieved.

Agro-processing industries have been appropriately accorded the due importance in the form of thrust industries. Government policy for agro-processing in general and food processing industries in particular has become much favourable in recent years. N.N.S. (1997) stated that the food processing business in India is currently undergoing rapid transformation into a hightech, high volume and export oriented industry. According to statistics provided by the Ministry of Food Processing Industries, from August 1991 to December 1996, 3885 Industrial Entrepreneur Memoranda (IEM) envisaging an investment of Rs. 45,752 crores have been received for various activities in the post harvest food