first followed by SS 30 X FD 1694 among the hybrids.

CO 27 recorded the least percentage of crude fibre content followed by SS 33.

The pollen parents *S.halepense* had high crude fibre values than the ovule parents. All the hybrids involving CO 27 and SS 33 registered low crude fibre. High crude fibre content reduces the digestibility of the fodder. Regarding the HCN content, SS 30, FD 1691 and FD 1694 recorded the least amount of HCN among the parents. Hydrocyanic acid content has been found to be a hereditary character, influenced by environmental condition (Boyd *et al.*, 1938). All the parents and hybrids had HCN content below 200 ppm. The toxic level of hydrocyanic acid has been reported to be 200 ppm (Gillingham *et al.*, 1969 ; Parasad, 1987). All the parents and hybrids in the present study recorded HCN content below the toxic level and worthy of utilisation in the hybridisation programme.

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Madras Agric. J., 82(2): 75-77 February, 1995
https://doi.org/10.29321/MAJ.10.A01127

SEED PELLETING AND SOIL TYPES ON GERMINATION AND VIGOUR OF SEEDS IN ASH GOURD AND RIBBED GOURD

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ABSTRACT

A study on seed pelleting in ash gourd *(Benninhasa hispida* and ribbed gourd *Luffa acutangula* indicated that pelleting with *arappu* powder *(Albizia amara)* was found to be the best pre-sowing seed management practice, as it enhanced field emergence besides including early seedling vigour in sandly loam soil at 60 per cent water holding capacity.

KEY WORDS : Pelleting, Soil Types, Seed Vigour, Gourds

Ash gourd and ribbed gourd are the two important cucurbitaceous vegetables being extensively grown in the tropics. In general cucurbitaceous seeds are sensitive to soil moisture. Either a little, high or low moisture results in poor emergence.

According to Miller and Bensin (1974). pelleted seeds perform differently depending upon the hydrophilic or hydrophobic properties of the coating material on seed and soil water content. Hence, studies were undertaken in ash gourd and ribbed gourd to standardise the pelleting technique for improving germination and vigour of seeds as influenced by soil types at different water holding capacities

MATERIALS AND METHODS

Two month old seeds of ash gourd cv. COI and ribbed gourd v. CO 1 were pelleted with *arappu* powder @ 500g/kg of seed (T1), *arappu* powder + DAP @ 70g/kg. (T2), *arappu* powder + carbendazim @ 2g/kg (T3) and *arappu* powder +

Table 1. Effect of seed pelleting, soil type and water holding capacity on germination and vigour index in ash gourd.

Treatment	Germination (%)						Vigour index					
	W1	W2	W3	Mean	M1	M2	W1	W2	W3	Mean	M1	M2
T0	81.5 (64.55)	90.0 (71.62)	85.0 (67.22)	85.7 (67.80)	86.9 (68.83)	84.4 (66.77)	286	286	275	282	281	284
T1	86.0 (68.05)	92.2 (73.80)	87.4 (69.22)	88.7 (70.36)	90.4 (71.97)	86.8 (68.74)	311	346	307	321	315	327
T2	70.0 (56.83)	75.0 (60.00)	64.0 (53.12)	69.8 (56.65)	68.7 (55.99)	70.8 (57.31)	279	305	245	276	279	274
T3	79.1 (62.78)	86.0 (68.05)	75.6 (60.36)	80.4 (63.73)	82.2 (65.04)	78.6 (62.42)	319	245	275	270	270	270
T4	74.0 (59.34)	79.0 (63.41)	74.0 (59.33)	75.7 (60.47)	75.4 (60.26)	76.7 (61.13)	339	294	329	321	324	317
Mean	78.4 (62.31)	85.2 (67.38)	77.8 (61.85)		80.7 (64.82)	79.8 (63.27)	307	295	280		239.8	294.4
M1	76.3 (60.86)	86.0 (68.06)	79.9 (64.37)				310	290	282			
M2	80.5 (63.76)	84.3 (66.69)	74.0 (59.37)				303	300	279			
	T	W	M	TxM	TxW	MxW	TxMxW	T	W	M	TxW	TxM	MxW	TxMxW
CD P=0.05	1.45**	1.13**	0.92**	2.06**	2.52**	1.60**	3.56**	22.47**	17.40**	8.52**	38.91**	NS	NS	NS

carbendazim + DAP (T4) Unpelleted seeds formed the control. The seeds were sown in sandy loam (M1) and clay soils (M2) at three water holding capacities *viz*., 40 (W1), 60 (W2) and 80 per cent (W3). Pelleting materials were first sieved through 300 mesh sieve. Rice gruel was used as an adhesive while *arappu* powder was used as filler material. For preparing the medium at various

Table 2. Effect of seed pelleting, soil type and water holding capacity on germination and vigour index in ribbed gourd.

Treatment	Germination (%)						Vigour index					
	W1	W2	W3	Mean	M1	M2	W1	W2	W3	Mean	M1	M2
T0	89.0 (70.63)	95.0 (77.08)	84.0 (66.42)	89.3 (70.25)	90.67 (72.24)	88.0 (69.73)	3182	3744	2702	3209	3393	3025
T1	93.0 (77.66)	97.0 (80.03)	88.0 (69.73)	92.7 (74.33)	94.0 (75.82)	91.3 (72.85)	3700	4211	3125	3679	3868	3489
T2	84.0 (66.42)	90.0 (71.57)	82.0 (64.90)	85.3 (67.58)	88.0 (69.73)	82.7 (65.42)	2971	3504	2620	3032	3271	2792
T3	83.0 (65.65)	92.0 (73.57)	76.0 (60.67)	83.7 (66.44)	88.7 (70.36)	78.7 (62.51)	2703	3151	2237	2697	2993	2401
T4	82.0 (64.90)	78.0 (62.03)	71.0 (57.42)	77 (61.14)	79.3 (62.49)	74.7 (59.80)	2516	2635	2036	2396	2626	2166
Mean	86.2 (68.45)	90.4 (72.86)	80.2 (63.83)		88.1 (70.13)	83.1 (60.06)	3014	3449	2544		3230	2775
M1	90.8 (72.34)	92.0 (73.57)	81.6 (64.60)				3308	3680	2701			
M2	81.6 (64.60)	88.8 (70.45)	78.8 (62.58)				2719	3217	2386			
	T	W	M	TxM	TxW	MxW	TxMxW	T	W	M	TxW	TxM	MxW	TxMxW
CD P=0.05	6.19**	3.92**	4.80**	NS	NS	NS	NS	152.42**	118.06**	96.40**	NS	NS	NS	NS

water holding capacities, the amount of water added to a known quantity of the medium to reach saturation was first determined and that was taken as 100 per cent water holding capacity. (Balaji 1990). From this, the amount of water needed to create 80, 60 and 40 per cent water holding capacities were arrived at. plastic containers with the medium were kept in germination room maintained at $20 \pm \frac{1}{2} 1^0$ C temperature and 95 ± 5 per cent RH. Germination percentage through standard germination test (Anon., 1985) and vigour index (Abdul Baki and Anderson, 1972) were recorded.

RESULTS AND DISCUSSION

The results have brought out significant increase in germination due to seed pelleting in both ash gourd and ribbed gourd. Pelleting with *arappu* powder @ 500g/kg recorded higher germination percentage compared with the rest of the pelleting materials in both gourds (Table1,2). It is plausible that the pelleted seeds might have facilitated uniform access and increased chance of survival due to early vigour compared to naked seeds (Takekawa and Moriwaki, 1982).

The germination percentage of pelleted seeds was more in sandy loam than clay soil, at 60 per cent water holding capacity. Substrate moisture has been indentified as an important requirement in germination of pelleted seeds (Gaspar, 1972). As per ISTA (1976), the water supply may vary depending upon the nature of pelleting materials and kind of seed so as to achieve optimum conditions for germinations.

In this study, the germination in gourds, in general, is greatly influenced by substrate moisture while the optimum moisture content was found to be 60 per cent . Seeds of corn, soyabean and water melon when planted in sand under varying moisture recorded slow germination at lowa and high moisture levels (Delouche, 1953), while musk melon seed germination was greatly influenced by high moisture in the soil (Heit, 1951).

Speed of germination was higher in unpelleted seeds in both soils at all the three water holding capacities. Leach *et al.* (1946) found out that the pelleted sugar beet under different soil moisture conditions and temperature gave a lower total emergence during longer emergence period than the unpelleted seeds. Seed vigour interms of vigour index was maximum in *arappu* pelleting as compared with unpelleted seeds and other pelleting materials. Compared to clay soil, the performance of pelleted seeds in terms of seedling growth was better in sandy loam soil where it recorded maximum vigour potentials. Thus, *arappu* powder acted as a wick, regulating and correcting the soil moisture availability and thus enhanced the seed soil relationship.

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