

A Cast Study :

Enhancing the sowing quality of seed by grading in onion (*Allium cepa* var. *aggregatum*)

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ABSTRACT

Size grading of seeds with BSS 12×12 was optimum for onion cv. COON5. Seed size had positive association with seedling quality characters. Upgrading of size graded seeds using specific gravity separator revealed that selection of heavy and medium seeds under the machine settings of vertical, horizontal slope of 1, 1 and air blow rate of 4 was optimum for onion cv. COON5. The germination improvement of graded seeds was found to be 12 per cent higher than the ungraded seeds. Seedling vigour was also higher in graded seeds.

Key words : Onion, Size grading, Density grading, Seed size, Vertical slope, Horizontal slope, Air blow rate.

In most of the vegetable crops due to longer period of flowering and ripening, earlier formed seeds differed from later formed ones in quality due to exposure to different environmental conditions like air, temperature and moisture stress and also differential supply of the essential nutrients (Ovcharov and Kisilova, 1966) and thus considerable variation in seed size occurred within the same plant (Whalley *et al.*, 1966) necessitating the grading of seeds for quality enhancement. Dharmalingam, (1982) also expressed that the method of grading and processing aims at removing presumably the non-viable seeds and ensure that those final produce were uniform in size and shape. Gregg *et al.* (1970) also opined that seed size is the commonest phenomenon considered for grading the seeds while Paul and Ramaswamy, (1979) and Srimathi *et al.* (2003) stressed that the optimization of sieve size based on the recovery of quality seed is warranted for better economic utility of the seed with good quality.

Size grading uses techniques of separation by width and thickness in which holes with a certain cross section are set in screens or cylinders (e.g. round holes for onion). Ferguson and Turner (1971) reported that grading by size alone was not adequate to remove inferior seeds from seed lot and an efficient method has been warranted based on the filling of seeds, while Tupper *et al.* (1971) opined that seed lot grading based on density was more effective than based on size. Hence, standardization of sieve size and upgrading by using density variations for recently released onion (COON5) becomes necessary since the seed size varies

significantly with genotypes.

MATERIALS AND METHODS

Size grading :

The pre-cleaned seeds were processed using BSS 10x10 and BSS 12x12 hand sieves. The seeds retained on each sieve and those passed through the BSS 12x12 sieves were weighed and the recovery percentage computed to the total seed weight. The graded seeds were tested for quality using the following parameters such as seed recovery, 100 seed weight, germination percentage, vigour index and field emergence per cent

Density grading :

Size graded seeds were subjected to specific gravity separator (WESTRUP LA-K No.89036) at 550 rpm. In order to identify the appropriate machine settings, the vertical height (0, 1, 2, and 3), horizontal height (0, 1, 2, and 3) and air blow rate (0, 2, and 4) adjustments were tried in all possible combinations. The experiment was formulated in completely randomized block design with four replications.

The oscillating movement of the table 'walks' the heavy seeds in contact with the deck uphill, while the air floats the light seeds downhill. The seeds traveling to the edge of the table ranged from light at the lower end to heavy at the upper end and discharged into 5 density fractions designated as A,B,C,D and E, where A was the heaviest seed and E was the lightest seed fraction. After grading, the seeds were evaluated for the following