

## EVALUATION OF SEED VIGOUR TESTS IN BAJRA

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Correlations were worked out to find out the inter-relationship among the vigour tests. The standard germination test was positively and significantly correlated with the vigour tests viz., field emergence, shoot-length, root-length, dry-matter production, vigour index, germination energy, brick-grit test and ammonium chloride soak test.

Seed quality is primarily determined by its purity, germination and vigour. Of these, germination and vigour decide its planting value. Methods are available to measure the purity and germination of seed lot and these two aspects are taken into consideration for seed certification purposes. So far, seed vigour has not been included as one of the components of seed testing, though its importance has been known to all associated with seed. This is mainly because the 'vigour' encompasses many aspects of the seed and no one has attempted to prescribe a 'test' or 'tests' which can measure it precisely. A number of tests is in vogue and is being followed for a single crop and this situation may continue for ever, if serious attempts are not made to define the term 'vigour' precisely and to prescribe tests by which the variation in vigour among the seed lots can be measured without ambiguity. Therefore, investigations were initiated to obtain information on the most suitable vigour test or tests that can be recommended for the seeds of bajra.

### MATERIALS AND METHODS

The bulk seed of bajra KM 2 hybrid was size-graded using 5/64 and 4/64<sup>11</sup> round-perforated metal sieves. The samples were drawn from the seeds retained on the two sieves and

passed through 4/64<sup>11</sup> sieve for conducting the following vigour tests viz., (i) Standard germination, (ii) field emergence, (iii) shoot length, (iv) root length, (v) dry matter production, (vi) vigour index, (vii) germination energy (viii) brick-grit test, (ix) ammonium chloride soak test, (x) electrical conductivity, (xi) leaching of sugars and (xii) leaching of free amino acids. Correlations were worked out between the percentage of germination obtained from (i) paper towel medium and (ii) field emergence on one hand and the data obtained from individual vigour tests on the other. Inter-correlations among the above mentioned parameters were also worked out.

### RESULTS AND DISCUSSION

A significant and positive correlation was obtained between standard germination and each of the following vigour tests viz., field emergence, shoot-length, root-length, dry-matter production, vigour index, germination energy, brick-grit test and ammonium chloride soak test. Grabe (1964) reported a close association between standard germination and field emergence in corn. In sorghum, Abdullahi and Vanderlip (1972) obtained a close correlation between standard

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germination and ammonium chloride soak test.

Field emergence positively and significantly correlated with all other vigour tests except electrical conductivity of seed leachate, leaching of sugars and free amino acids. Mackay (1970) reported that relative field emergence was closely correlated to laboratory germination.

In this investigation, positive and significant correlation was observed between shoot-length and each of other vigour tests except electrical conductivity of seed leachate and leaching of free amino acids and sugars. Woodstock and Feeley (1965) reported that the length of shoot during early stages of germination could be taken as an index of seed vigour.

A positive and significant correlation was observed between root-length and each of the other tests except electrical conductivity of seed leachate and leaching of free amino acids and sugars. Similar association was observed by Rajendran (1976) in black gram.

According to Evans and Bhatt (1977), dry weight of root and shoot is a measure of seedling vigour in wheat. In the present study also, positive and significant correlation was observed between dry matter production and each of other vigour tests except the leachate tests.

Abdul-Baki and Anderson (1973) recommended vigour index as a criterion

for the assessment of seed vigour in soyabean. Positive and significant correlations were observed between vigour index and each of other tests except the leachate tests. Rajendran (1976) also observed similar associations in blackgram.

Rate of germination was positively and significantly correlated with all other tests except the leachate tests. This is in agreement with the results reported by Rajendran (1976).

Schoorel (1956) reported that a sort of heavy top layer (with brick-grit) test was used to assess the seedling vigour. In the present study, positive and significant correlations were observed between brick-grit test and each of other tests except the leachate tests. Rajendran (1976) in black gram observed a positive correlation between brick-grit test and each of standard germination, field emergence, vigour index and rate of emergence.

Positive and significant correlations were observed between ammonium chloride soak test and all other tests except the leachate tests. Abdullah and Vanderlip (1972) observed a close relationship among ammoniumchloride soak test, standard germination and field emergence in sorghum.

Nagarajan (1975) in sorghum, observed an association of loss of vigour and viability with the leaching of sugars into the seed-steep water.

Ching and Schoolcraft (1968) employed latching of free amino acids for assessing the viability and vigour in clover seed. In the present study no such associations could be found.

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