Field studies of root growth dynamics and functional aspects, such as nodulation, are difficult, but this preliminary experiment suggests there are genetic differences in nodulation and root growth, which must receive increased attention for breeding plant types which perform well under conditions of limited soil moisture.

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Grain Quality/Biochemistry

Variability in the Seed Coat Content of Desi and Kabuli Chickpea Cultivars

In grain legumes the nature and amount of seed coat play important roles in terms of nutritive value and cooking and processing quality. Anti-nutritional factors such as polyphenols have been reported to be mostly located in the seed coat. The qualitative losses that occur during milling also depend, to some extent, on seed coat characteristics. In chickpea the seed coat accounts for about 80% of total seed crude fiber. Further, it has been reported that seed coat percentage and crude fiber are the constituents that distinguish desi and kabuli cultivars.

To assess the magnitude of variation in seed coat content in chickpea, 21 desi and 19 kabuli cultivars were studied. The cultivars were grown at ICRISAT Center (17°N) in single row (4 m), unreplicated plots. Seeds were dried at 70°C for 16 hr and weighed, after which the seed coats were removed. The seed coats were weighed and the thicknesses of the seed coats of 10 randomly selected seeds recorded. Seed coat percentage varied from 9.7 to 17.3 with a mean of 14.2 in desi and from 3.7 to 7.0 with a mean of 4.9 in kabuli cultivars. Similarly, the thickness of seed coat varied from 115 to 205 μ (mean 144 μ) for desi and from 37 to 106 μ (mean 58.5 μ) for kabuli cultivars. The weights of 100 seeds were 11.6 to 33.6 g with a mean of 16.4 g in desi and 11.3 to 43.9 g with a mean of 25.4 g for kabuli cultivars.

A positive and highly significant correlation ($r = 0.92$) between seed coat percentage and thickness was recorded. For kabuli types the correlation coefficient between seed coat percentage and thickness was 0.62 and for desi types, 0.59. A highly significant negative correlation between seed coat percentage and seed weight was recorded when desi and kabuli cultivars were considered together (-0.94). The reduced correlations (desi, -0.74; kabuli, -0.66) when the groups were considered separately were due to the large differences in seed coat content of the two groups.

Seed coat thickness was not significantly correlated with seed weight (-0.13, 0.16, and -0.19 for desi, kabuli, and overall, respectively). This observation requires further study but indicates that it may not be possible to reduce the thickness of seed coat by selecting for increased seed weight, although the proportion of seed coat is lower in large-seeded than in small-seeded types. However, selection for reduced seed coat thickness would improve grain quality. Knowledge of the effects of environment, seed position on the plant and other factors, on seed coat content will be necessary to develop effective selection procedures.

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Publications

We apologize that, due to reasons beyond our control, we have not yet been able to publish the Update of the Chickpea Bibliography by K.B. Singh and L.J.G. van der Maesen. However, we are making all efforts to have copies of this available by the time our next (June 1981) issue goes to press in May 1981.

We are composing a mailing list for the Update and wish to hear from all those who wish to be included. We will mail single copies to all on the mailing list and to libraries and our cooperators.