

GRAIN SORGHUM FIELD EMERGENCE AND SEED VIGOR TESTS

by

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ABSTRACT

Poor emergence of sorghum [*Sorghum bicolor* (L) Moench] affects the stand and potential yields. The major objective of this research was to find correlations among field emergence data and laboratory seed vigor tests. Thirty-two and 30 hybrids of sorghum were planted at three Virginia locations in 1995 and 1996, respectively. Field emergence was subsequently compared with results from laboratory tests that included: 1) standard germination; 2) osmotic-stress using polyethylene glycol 8000 (mw); 3) heat-shock using 2 hr at 50°C stress; 4) electrical conductivity of steep water of germinating seeds; and 5) seed mass. Field emergence of grain sorghum differed among hybrids, years and locations. Mean emergence across years and locations was 67.5%, whereas mean germination in the laboratory was 87.8%. There were interaction between hybrid and location and between hybrid and year. Germination under optimal conditions (standard germination test) and with osmotic or heat-shock stress differed among hybrids. Regression analyses showed a weak correlation between laboratory germination (with or without stress) and field emergence in both years. The fresh weight of seedlings whether from standard germination or stress tests also differed among hybrids in both years, and the associations with field emergence were weakly correlated in 1996. Hybrids showed significant differences in radicle length when grown under laboratory stress in both years following standard germination. There was a weak correlation with field emergence and radicle length following heat-shock treatment in 1996. The measurement of electrical conductivity in the seed steep water showed significant differences among hybrids. A weak correlation with field emergence was seen in 1996. Conductivity values per gram of seed and per cm² of seed area revealed differences among hybrids. The correlation of these parameters with field emergence was higher than conductivity per seed. Seed mass varied among hybrids in both years, but was no correlation between seed mass and emergence. Of the laboratory parameters examined, germination proved to be the most consistent predictor of variations in field emergence of sorghum hybrids.

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