

BABB, THOMAS A.¹, GERALD KLEY¹ and JAMES S. GERIK², ¹Spreckels Sugar Company, 40600 County Road 18C, Woodland CA 95776 and ²Plant Pathology, Holly Sugar Corporation, P.O. Box 60, Tracy, CA 95378. Plant to stand in California: can laboratory tests predict field emergence?

Planting to stand in California is attempted by fewer than 10% of growers. A laboratory test that predicts field emergence would remove some of the uncertainty of planting to stand. The objective of this study was to document emergence rates for fall, spring and summer plantings and find any relationship to laboratory tests, particularly vigor (stress) tests. Treatments were eight seed lots selected according to laboratory germination and vigor tests. Laboratory tests rated seed lots for blotter germination, 2 and 3 day warm germination and 14 day cold germination. Plots were 40 feet in length on 30 inch beds arranged in a latin square design. Four trials were planted in the fall, three in spring (February-April) and five in summer (May and June). In fall planted trials (September and October), field emergence correlated well with a 2 day warm ($r^2=0.88$), 3 day warm ($r^2=0.81$) and 14 day cold germination ($r^2=0.85$). No significant relationship was shown for blotter germination. Field emergence averaged 86.6% in these trials. In contrast, spring and summer plantings averaged 50.3% emergence and correlated best with blotter germination ($r^2=0.69$, $p<0.01$). Field emergence was erratic in spring and summer, with trial means ranging from a low of 24.8% to a high of 77.3%. The results suggest that under ideal emergence conditions for fall planting, vigor tests should be used to rate seed lot quality. Emergence results in the spring and summer are confused by seedbed conditions, seedling disease and other factors unrelated to seed quality. Therefore, in these trials blotter germination was the best predictor of field performance; a 1% increase in blotter germination resulted in a 2% increase in field emergence.