Accelerated ageing tests - useful measures of soybean seed planting quality

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Germination tests conducted by seed laboratories using the methods prescribed by the International Rules for Seed Testing (International Seed resting Association 1976) have not proven to be overly useful guides to the field planting value of soybean seed. Many instances in which seed which germinated satisfactorily under the artificial and favourable conditions of the laboratory, but which failed to produce adequate field stands have been reported in this State, and in Kentucky TeKrony and Egli (1977) reported that the predictive value of the routine tests was merely 8.3%.

A series of experiments which were conducted in the 1978/79 season compared a modified accelerated ageing (a.a.) test (Delouche and Baskin 1973) with the routine laboratory testing procedure for their ability to predict field performance at 7 sites across northern N.S.W.

Establishment (of normal seedlings one month after planting), varied widely between sites (figure 1) with a 77-80% success rate at the 2 Grafton and 1 of the Tamworth sites. At other locations the rate of success fell to as low as 40%. ("Success" is indicated by a 50% or greater establishment rate).

Fig. 1. Correlation coefficients for regression of 2 laboratory tests on field establishment, and proportion of the 30 seedlines which produced 50% field establishment.

The two tests were approximately equivalent in their ability to predict field establishment at the 2 Grafton sites, but as the establishment rate declined, so too did the predictive value of the routine laboratory test as indicated by the reduction r values from 0.74 at Grafton 1 and 2, to 0.55 at Wee Waa. Conversely, the correlation coefficients describing the relationship between the 7 day accelerated ageing tests and field performance increased as establishment declines. At all sites, except Grafton where it was mot different to the routine test, the a.a. test proved to be a more accurate guide to field results, especially in predicting the responses to unsuitable planting conditions.

International Seed Testing Association (1976) Seed Sci. and Technol. 4, 51

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