

The estimation of sorghum yield following grain losses due to midge damage

T. Dickson and J.C. Dwyer

Department of Primary Industries, Kingaroy, Old., 4610

Grain losses in sorghum from midge when uncontrolled can be heavy. During the summer of 1980-81, midge activity was very high in the South Burnett, resulting in considerable grain loss. In one of our nutrition experiments midge damage caused grain losses, which varied between plots. A method was used to estimate yield and is reported in this paper.

Methods

Ways of estimating grain sorghum yield following head damage were discussed by Vance (1), who found that in undamaged heads the weight of a standard length of peduncle (WSP) was closely related to grain weight and that a loss of grain did not affect the WSP. We sampled 10 or more undamaged heads from each of 32 plots and derived the regression equation for undamaged head grain weight on WSP for each plot. We cut 10 cm of peduncle from just below the lowest panicle node. Correlation coefficients for all regression equations were highly significant ($P < 0.01$) with a mean value of 0.90 and ranging from 0.76 ($n = 15$) to 0.97 ($n = 11$).

The experiment was harvested using a small autoheader and all panicles and peduncles from each plot were collected from the back of the header. Heads were counted, peduncles cut as above and weighed. The mean grain weight per head for each plot was then calculated using the mean WSP in the appropriate regression equation, and plot yield was then estimated.

Results and Discussion

Yields estimated by the method described were much higher than corresponding yields obtained by direct heading. The coefficient of variation from the analysis of variance was much lower in the estimated data (14%) than in the harvested data (31%). Grain losses associated with midge damage ranged from 50% to 70% (mean value 64%) corresponding to yield losses from 1857 to 928 kg ha and 1658 to 490 kg ha respectively. Estimated yields more closely followed those from a similar experiment conducted in the previous season.

Our technique could be improved by collecting all heads from each plot after cutting with the header cutter bar before they passed through the header. This would allow easier identification and counting of heads, and peduncles would not be subjected to damage during the threshing operation.

1. Vance, P.N. 1976. *Aust. J. Exp. Agric. Anim. Husb.* 16: 129-134.