

Project No. A-1

Weather based forewarning of sorghum shoot fly

Weather-pest relations studies were conducted on agrometeorological observatory based weather data and field experiment based dead-heart data collections due to shootfly in a multi-date trial on sorghum crop conducted during 1990-92 at the Regional Research Station, Bijapur. The analysis comprised correlations between the deadhearts caused by shootfly and the prevailing weekly meteorological parameters during one, two, three and four weeks prior to the date of observation of shootfly (Lead time) under early (September) and late (October) sown conditions. The analysis was performed individually as well as in combination for the various periods of lead time. Results indicated that rainfall received at one week after emergence (four weeks lead time) and higher day temperature at two weeks after emergence (three weeks lead time) reduced shootfly infestation, whereas lower afternoon relative humidity at four weeks after emergence (one week lead time) increased the same. All the significant associations are true only for the late sown conditions. No significance is found for the early sown crop. On the other hand, the crop sown during the 39th standard week (last week of September) was least affected by shootfly, and the same is identified as the most opportune time for sowing in order to avoid the shootfly menace. Basing on the above inferences, regression models were developed for forewarning of the pest impact. The same are given below.

$Y = 240.9 - 6.1 \text{ MaxT}(3)$	$R^2 = 0.70$
$Y = 111.1 - 1.01 \text{ RH2}(1)$	$R^2 = 0.69$
$Y = 221.1 - 4.24 \text{ MaxT}(3) - 0.65 \text{ RH2}(1)$	$R^2 = 0.89$

Where, Y= Dead heart percent caused by shootfly

MaxT= Maximum temperature in °C; RH2 = Afternoon relative humidity in %

Numbers in the parentheses indicate lead time in weeks

The first mentioned model can forewarn the shootfly deadhearts three weeks ahead with 70% accuracy, and therefore is useful for early preparation for control measures, if any. By incorporation of the afternoon relative humidity two weeks later, the forewarning can be updated with improved accuracy of 89%.