

Preharvest Forecasting of Groundnut Yield in Gujarat Utilizing Eye Estimate and Rainfall Variables

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A timely and reliable forecast of yield of crop needs little emphasis for monsoon dependent country like India and where the economy is mainly based on agricultural production. In view of the fluctuating prices of groundnut and the economic importance of this crop in Gujarat, the present study has been taken up to develop appropriate model for preharvest forecasting of groundnut yield in Gujarat.

The data on 29873 crop cutting experiments conducted in different districts of Gujarat State for the past 24 years from 1953-54 to 1977-78 and the daily rainfall data of 17 representative rain gauge stations for the corresponding 24 years have been used to combine two complementary approaches viz. (i) eye estimate and (ii) rainfall variables to provide an objective method of preharvest forecasting which has helped to arrive at the following results/findings.

The differences between the average field based on actual crop cutting (CCY) and the corresponding average yield based on eye estimate (EEY) indicated that the departure of KEY from CCY was of random nature. The correlation coefficient between CCY and EEY in different districts varied from 0.6433 to 0.9078. At State level, the correlation was even

higher to the extent 0.9199. The significant positive correlation of Eye estimate with the actual crop cutting yield, therefore, has been the basis for the inclusion of EEY as independent variable in the prediction equation.

The results of prediction equation for all the districts revealed that the major contribution is of eye estimate and the additional contribution of the rainfall variables included in the prediction equation is to the tune of 10 to 20 per cent. The overall picture of the significant regression coefficient of rainfall variables indicated that the rains during the vegetative development stage and full pegging to pod development in groundnut have positive effect on yield, while rains during presowing, germination and flowering to pegging periods have negative effect on yield. The R^2 values of the prediction equations for different districts were highly significant and ranged from 0.6594 to 0.9888.

Thus, a satisfactory prediction of groundnut yield in Gujarat is possible using eye estimate in combination with selected rainfall variables. The time at which the forecast is available varies from 2nd week of September to the end of October. However, it is possible to give the forecast earliest by the end of September for major groundnut growing area of Saurashtra which accounts for 83% of the total area under the crop in the State. This forecast will be one month earlier to the actual harvesting of the crop in the State and about four months earlier to the final forecast issued by the State Department of Agriculture.

It is presumed that the weather conditions and the damage caused by pests and diseases would be normal during the period after the forecast is made. In reality, this cannot be ruled out and to that extent it is a limitation.