

## PRE-SOWING RAINFALL AND THE GERMINATION OF THE WHEAT CROP

As is well known, an adequate supply of moisture in the soil is essential for the successful germination of crop plant. It was, therefore, considered worthwhile to examine the relationship between rainfall before the sowing time and the germination count of the wheat crop. For the purpose of this study the data collected under the All India "Co-ordinated Crop Weather Scheme" have been utilised. Under this scheme, systematic crop-weather observations are being recorded on a uniform basis, at a net-work of selected experimental farms in India. At each recording station 2 varieties of each of the crops are under observation. In the case of wheat, the variety N. P. 4 is common for all the stations so that the data relating to this particular variety are available from all selected crop-weather stations in different States.

The names of the stations and the number of years for which the data are available from each of the stations are shown below—

Station	Number of years for which the data are available
Dharwar	8
Parbhani	6
Niphad (near Nasik)	8
Jalgaon	8
Powerkheda (near Hoshangabad, M. P.)	7
Nagpur	5
Labhandi (near Raipur, M. P.)	4
Total	46

It was seen from the data examined that normally germination starts 2 or 3 days after the sowing in the case of the wheat crop and is completed within 8 or 10 days after the sowing. The number of seedlings appearing in the field day by day was recorded daily using the sampling technique described in Agri-Met. Technical Circular No. 50. The maximum number of seedlings recorded represented the maximum number of seeds germinated and this value was utilised for the calculation of the germination percentage. The number of seeds sown was calculated from the seed rate and the weight of 1000 grains which are routine items of observations under the crop-weather scheme. Thus, if  $N$  is the maximum number of seedlings per acre recorded and  $W_1$  is the weight of seeds sown per acre (seed rate) and  $W_2$  is the weight of 1000 grains, then germination percentage

$$= N \times \frac{W_2}{1000} \times \frac{1}{W_1} \times 100 \text{ or } \frac{NW_2}{10W_1}$$

For rainfall, the total rainfall recorded at meteorological observatory at the station

during the 4-week and 6-week period immediately preceding the sowing week was taken. Under the Crop Weather Scheme meteorological data are tabulated according to the standard weeks of the Growers' year (*vide* Agri. Met. Technical Circular No. 50). The figures used for this study refer, therefore, to the standard weeks. For example, if the crop was sown on 18 October in any year, the standard week for the sowing was Standard Week No. 42 and the total rainfall during standard weeks Nos. 38 to 41 (4 weeks) and 36 to 41 (6 weeks) have been correlated with the germination percentage in the field.

The data of all the stations have been pooled together as if these were for one station for 46 seasons, *i.e.*, a replication in space has been accepted as a replication in time. By adopting this procedure, a set of 46 pairs becomes available for study. The correlation co-efficients  $r$  between germination percentage and total rainfall during the period (i) 4 weeks before sowing and (ii) 6 weeks before sowing were worked out using the usual method. The values of these are given below:

Correlation co-efficient between germination percentage and rainfall :

- (1) during 4 weeks immediately preceding the week of sowing  $r_4 = +.54$
- (2) during 6 weeks immediately preceding the week of sowing  $r_6 = +.58$

Considering the degrees of freedom for the data as 44, to be significant at 1 per cent level, the correlation co-efficient  $r$  has to be  $>.372$  (Snedecor 1946). Hence the correlation co-efficients are highly significant.

Therefore, for wheat variety N. P. 4, the higher the total amount of rainfall during the 4 or 6 weeks before sowing, the higher will be the germination percentage up to the point when too much rain causes water logging of the soil.

It is also seen that the correlation co-efficient is higher though ever so slightly, in the case of rainfall for 6 weeks.

## LETTERS TO

The results given above may prove to be of some use in attempts to forecast a suitable date for sowing the N. P. 4 wheat in the different parts of India.

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### REFERENCE

- Snedecor, G. W.      1946      *Statistical Methods,*  
p. 149, Table 7·3.
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