

Influence of weather parameters on success of sprouting and survival of softwood grafts of nutmeg (*Myristica fragrans* Houtt.)

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ABSTRACT

The analysis of simple linear correlation between various weather parameters and percent sprouting and survival of softwoods grafts of nutmeg revealed a significant positive correlation with minimum temperature, relative humidity, rainfall and a negative correlation with maximum temperature. Multiple linear regression analysis showed that among the various weather parameters, which could influence sprouting of grafts, maximum temperature, relative humidity - I and II had very high influence. Similarly maximum temperature, relative humidity - II and rainfall had very high influence on survival of soft wood nutmeg grafts, whereas contribution of other weather parameters were not significant.

Key words: *Myristica fragrans* Houtt. soft wood grafting, weather, regression.

Nutmeg (*Myristica fragrans* Houtt.) is an important tree spice; mainly propagated by different vegetative methods viz. epicotyl and softwood grafting. Softwood grafting in nutmeg can be followed throughout the year if medium matured to matured scion sticks are available in grafting period (Haldankar *et al.* 1997). They further reported that May was best month for softwood grafting (80% success) followed by June (54%) and July (50%). Hartman and Kester (1976) reported the influence of climatic factors on success in grafting. In another study, in India February, March and November were identified as the best months for softwood grafting in nutmeg (Anonymous 2003).

Similar results were also reported by different workers indicating best periods for softwood grafting in cashewnut, kokum and tamarind, etc. (Sarda *et al.* (1991); Swamy *et al.* (1990); Haldankar *et al.* (1993). As there is meager information on the role of weather parameters on the sprouting and survival of softwood grafts of nutmeg, present studies were undertaken at Dapoli.

MATERIAL AND METHODS

Sixty softwood grafts of nutmeg were prepared at the Horticultural farm, College of Agriculture, Dapoli (17° 45' north latitude, 73° 12' east longitude and 280 m amsl) on 15th of each month starting from 15 July 2002 to June 2004 for two

Table 1: Correlation matrix of sprouting and survival of nutmeg softwood grafts with weather parameters (n=12).

| Variables | Max Temp. (°C) | Min Temp. (°C) | Mean Temp. (°C) | RH- I (%) | RH- II (%) | Mean-RH (%) | Rainfall (mm) |
|-------------------|----------------|----------------|-----------------|-----------|------------|-------------|---------------|
| Sprouting Percent | -0.43 | 0.81** | 0.54 | 0.42 | 0.91** | 0.89** | 0.74** |
| Survival Percent | -0.59 | 0.66 | 0.33 | 0.64* | 0.89** | 0.91** | -0.52 |

* Significant at P = 0.05, ** Significant at P= 0. 1

successive years. The data on sprouting and survival of softwood grafts of nutmeg were collected one month and three months after grafting respectively. Observations on air temperature – maximum (X_1), minimum (X_2), mean (X_3), relative humidity – in the morning (X_4), in the after noon (X_5), mean relative humidity (X_6) and rainfall (X_7) percent sprouting (Y_1) and percent survival (Y_2) were recorded. The data collected were statistically analyzed for simple linear correlation, multiple regression and step down regression analyses.

RESULTS AND DISCUSSION

Sprouting percentage

The results of simple linear correlation analysis (Table 1) revealed a positive and significant correlation between minimum temperature, relative humidity-II, mean relative humidity, rainfall and percent sprouting. It was negative and non-significant relation with maximum temperature, whereas it has positive and

non-significant with mean temperature and relative humidity- I.

Partial regression coefficient of relative humidity-II was significant, whereas that of maximum temperature and relative humidity-I were nonsignificant. The multiple regression equation fitted with weather parameters to predict sprouting of soft wood grafts of nutmeg (Y_1) was –

$$Y_1 = -3.78526 + 0.649352 X_1 + 0.132225 X_4 + 0.653780 X_5,$$

with R^2 value 0.84. The relative contribution of each weather parameter (x) to the sprouting (Y_1) of softwood grafts of nutmeg could be understood from above equation. The relative contribution of other weather parameters towards the sprouting of grafts was not significant.

Survival percentage

There was a significant and positive correlation between minimum temperature, relative humidity – I and II and mean relative humidity whereas, it was

significant and negative with maximum temperature. Similar results were also reported for softwood grafting in kokum (Swamy *et al.*, 1990).

The results of present study revealed that partial regression coefficient of relative humidity-II was positive and significant, whereas that of maximum temperature and rainfall were negative and non significant. The multiple regression equation fitted with weather parameters to understand survival of softwood grafts of nutmeg (Y_2) was-

$$Y_2 = 48.83988 - 0.70382 X_1 + 0.628505 X_5 - 0.00165 X_7$$

with R^2 value of 0.81. The relative contribution of each weather parameter (X) to the survival (Y_2) of softwood grafts of nutmeg could be predicted from above equation.

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