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Correlation And Path Coefficient Analysis For Pod Yield And Its Components In Groundnut (*Arachis Hypogaea*l.) Under Organic Fertilizer Managements.

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ABSTRACT
The present study was undertaken at dry land farm, S.V. agricultural college, Tirupati, during Kharif, 2016. One hundred and sixty eight germplasm lines and five checks were evaluated in Augmented design II for assessment of correlation and path analysis. Analysis of correlation revealed that pod yield was significantly and positively associated with kernel yield per plant followed by number of mature pods per plant, total number of pods per plant, harvest index, 100 seed weight, days to maturity, number of pegs per plant, days to 50% flowering and shelling percentage.Path analysis revealed that kernel yield per plant recorded high positive direct effect on pod yield per plant signifying the importance of these traits in the improvement of pod yield.
***KEY WORDS**: Groundnut, Correlation, Path Analysis, Pod yield per plant.*

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INTRODUCTION

Groundnut (*Arachis hypogaea* L .) is an annual legume native in South America. Groundnut is an allotetraploid (2n=4x = 40) with a basic chromosome number of x=10. It is highly self-pollinated crop and has cleistogamous flowers. It is a cheap source of vegetable oil and protein. China and India are the leading groundnut producers followed by USA and Nigeria. Organic farming, in recent years, is gaining impetus due to realization of inherent advantages it confers in sustaining crop production. Groundnut being an important exportable commodity there may be some demand for organic groundnut in the international market. Apart from non availability of technology, there is practically no idea about what will be the differential economic advantage to the farmers if he produces organic groundnut and what will be the effect on groundnut quality. The main reason for focussing on organic farming is, we can also increase our economic yield. With this background it may be stated that basic research support for organically farmed groundnut and the integration of the known components of production technologies which can go into organic farming have to be taken up with some specific niches of groundnut farming.
Most of the characters of breeder's interest are complex and are the result of interaction of several components. Correlation analysis is a biometrical technique to find out the nature and degree of association between various physico-chemical traits indicating yield, while path analysis splits the correlation coefficient into direct and indirect effect so as to measure the relative contribution of each variable towards yield. Hence a study is made in the present investigation to explore correlation among yield and yield component traits and also to measure the extent of direct and indirect causes of association among traits through path coefficient analysis.

MATERIAL AND METHODS

The experimental material consisted of 173 groundnut genotypes, out of which five were standard checks. The experiment was laid out in Augumented design II, during *kharif*, 2016 at dryland farm of S.V. Agricultural college, Tirupathi.Each entry was accommodated in a single row of 2 m length with a spacing of 30 x 10 cm. To ensure optimum crop performance FYM @ of 5 t $ha^{-1}$was applied at the time of field preparation. Seed treatment was done with *bijamrutha* before one day of sowing. *Jeevamruth* was applied at fifteen days interval and *panchagavya*was applied on 25th and 35th day after sowing and also whenever pest incidence occurred.

The observations were recorded on five randomly selected plants in each germplasm line for fourteen traits viz., days to 50 % flowering, days to maturity, plant height (cm), number of primary branches per plant, number of pegs per plant, number of mature pods per plant, number of immature pods per plant, total number of pods per plant, 100 seed weight (g), shelling percentage (%), sound mature kernel percentage (%), harvest index (%), kernel yield per plant (g) and pod yield per plant (g). Simple correlation analysis (Panse and Sukhatme, 1985) was done to determine the magnitude and type of association between the characters concerned, while path coefficient analysis was calculated according to Dewey and Lu (1959) to partition the total correlation into direct and indirect effects.

RESULTS AND DISCUSSION

The results of the Correlation Coefficient among the traits studied are shown in Table 1. The results of correlation analysis showed, pod yield per plant had highly significant and positive correlation with kernel yield per plant ($r = 0.963^{**}$) followed by number of mature pods per plant ($r = 0.832^{**}$), total number of pods per plant ($r = 0.828^{**}$), harvest index ($r = 0.604^{**}$), 100 seed weight ($r = 0.485^{**}$), days to maturity ($r = 0.447^{**}$), number of pegs per plant ($r = 0.464^{**}$), days to 50% flowering ($r = 0.276^{**}$) and shelling percentage ($r = 0.340^{**}$). These results indicate that increase in these traits leads to increase in pod yield.Significant and positive association of pod yield per plant with harvest index, number of pods per plant and 100 kernel weight was reported by Maunde *et al.* (2015). Significant and positive correlation of pod yield per plant with kernel yield per plant and number of mature pods per plant was registered by Kumar *et al.* (2012) and Jain *et al.* (2016). Significant and positive association for number of pegs per plant, days to 50% flowering and shelling percentage were in accordance with the reports of Mahalakshmi *et al.* (2005), Satish (2014) and Shukla and Rai (2014) respectively.

Pod yield per plant exhibited non-significant positive correlation with number of immature pods per plant ($r = 0.071$), sound mature kernel percentage ($r = 0.108$) and number of primary branches per plant ($r = 0.140$).Non-significant positive correlation of pod yield per plant with number of immature pods per plant and sound mature kernel percentage was in accordance with the reports of Vasanthi *et al.* (2015) and Patil *et al.* (2006), respectively. Pod yield per plant showed non-significant negative correlation with plant height ($r = -0.003$). Similar results of pod yield per plant with plant height were reported by Satish (2014).Negatively significant association of plant height was observed with harvest index and 100- kernel weight. Similar to the present findings significant and negative correlation of plant height with harvest index and 100 kernel weight was reported by Vasanthi et al. (2015) which suggested that selecting taller plants might adversely affect these traits. Plant height also showed significant negative relation with number of primary branches per plant.Similar results were observed by Parameshwarappa et al. (2005), which indicates that increase in plant height would increase in distance between the branches there by decreasing the number of primary branches per plant.

The result of path analysis (Table 2.)revealed that the trait kernel yield per plant (1.09086) exhibited very high positive direct effect and shelling percentage recorded high negative direct effect (-0.29621) on pod yield per plant. On the other hand 100 seed weight (0.02057), number of pegs per plant (0.00426), number of mature pods per plant (0.09194) exhibited negligible positive direct effects on pod yield per plant. Days to 50% flowering (-0.00112), days to maturity (-0.02554), total number of pods per plant (-0.03970), harvest index (-0.00817) showed negligible negative direct effects on pod yield per plant.

Negligible negative direct effect of days to 50% flowering on pod yield per plant was observed by Korat *et al.* (2010).Negligible and negative direct effect of days to maturity on pod yield per plant was reported by Pavankumar *et al*. (2014).On contrary to the present findings negligible negative direct effect of number of pegs per plant on pod yield per plant was reported by Francies and Ramalingam (1997).On contrary to the present findings negligible negative direct effect of number of mature pods per plant on pod yield per plant was registered by Pavankumar *et al.* (2014).On contrary to the present findings negligible negative direct effect of number of pods per plant on pod yield per plant was reported by Rao *et al.* (2014).Negligible positive direct effect recorded for 100 kernel weight on pod yield per plant was in conformity with the results of Pavankumar *et al.* (2014) and Rao *et al.* (2014).The results of high negative direct effect of shelling percentage with pod yield per plant were registered by Kumar *et al.* (2012) and Rao *et al.* (2014).The present results where harvest index recorded negligible negative direct effect with

pod yield per plant were in accordance with the reports of Venkateswarlu *et al*. (2007). High positive direct effect of kernel yield per plant on pod yield per plant was reported by Jain *et al.* (2016) and Kumar *et al.* (2012).

CONCLUSION

From the upshot of correlation and path coefficient analysis, it may be concluded that for improving the pod yield in groundnut, selection has to be exercised on kernel yield per plant. As kernel yield per plant exhibited positive direct effect with pod yield per plant and significant positive association with pod yield per plant indicated its importance in determining this complex trait.

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