Growth and Yield of Groundnut Intercropped with Tamarindus Indica Under Different Levels of Fertility

G. Bheemaiah and M.V.R. Subrahmanyam

Department of Forestry, College of Agriculture, Rajendranagar

Arable farming dominated the Agriculture so far, with unstable and poor yields of crops. The crop management practices adopted are not in a position to sustain the soil health and productivity, near future. Groundnut, being king of oilseed crop specially under rainfed conditions is suffering from many production constrains. Situation of such mature demand alternate land use systems like agro forestry for sustainable returns. It was reported that integration of tamarind with arable crops enhanced the returns (Degar et al 1995). Therefore the present investigation was undertaken to assess the economics of groundnut intercropped with tamarind.

The field experiment was conducted at Student’s Farm, College of Agriculture, Rajendranagar during Kharif 2001. The site of the experiment was under 4 years old Tamarind Plantations (PKM – 1) spaced at 6 x 4 meters. The treatments consisted two cropping systems viz. Intercropping and sole cropping, as main plots, seven N & P combinations as sub plots and designated as N₀P₀, N₂ₐP₂₀, N₂ₐP₄₀, N₂ₐP₆₀, N₄₀P₂₀, N₄₀P₄₀, N₄₀P₆₀. All the treatments replicated thrice under split plot design. The soil was low in organic matter, available nitrogen and medium in available P & K. The Plot size was 6 x 4 and 4 x 4 m. in intercropping and sole cropping area respectively. The groundnut crop variety vemana (k-134) was sown on 7th July 2001 at 30 x 10 cm spacing both in tamarind and sole crop area earmarked for the purpose. The N & P were applied as per treatments. The crop is harvested on 20th October, since the tamarind did come to fruiting anticipated fruit yields and returns were taken into account for calculation of returns.

Results and Discussion

Growth and Yield

The perusal of data in table 1 showed that the significant difference were observed in Dry matter, and crop growth rate and pod yield of groundnut due to cropping systems and fertilizer doses. Higher dry matter of 4162 kg/ha and almost comparable crop growth rate of 1.30 g/m²/day was recorded under sole cropping as compared to intercropping with tamarind. Pod yields of 768 kg/ha was recorded under sole cropping which was significantly higher than the pod yields of 634 kg/ha recorded under intercropping. The low dry matter under intercropping might be due to competition from the tamarind for resources.

Significant differences in dry matter, crop growth rate was observed due to fertilizer doses. The values of dry matter and CGR were found low
Table 1. Dry matter, CGR and seed yield of groundnut as influenced by cropping systems and fertilizer levels.

<table>
<thead>
<tr>
<th>Treatments Fertilizer Levels</th>
<th>Dry matter (kg/ha)</th>
<th>Cropping systems</th>
<th>Seed yield (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>intercrop</td>
<td>Solecrop</td>
<td>Mean</td>
</tr>
<tr>
<td>N₀P₀</td>
<td>1621</td>
<td>3467</td>
<td>2544</td>
</tr>
<tr>
<td>N₂₀P₂₀</td>
<td>2533</td>
<td>3655</td>
<td>3094</td>
</tr>
<tr>
<td>N₂₀P₄₀</td>
<td>2566</td>
<td>3871</td>
<td>3218</td>
</tr>
<tr>
<td>N₂₀P₆₀</td>
<td>2864</td>
<td>4010</td>
<td>3437</td>
</tr>
<tr>
<td>N₄₀P₂₀</td>
<td>4366</td>
<td>4322</td>
<td>4349</td>
</tr>
<tr>
<td>N₄₀P₄₀</td>
<td>4044</td>
<td>4710</td>
<td>4377</td>
</tr>
<tr>
<td>N₄₀P₆₀</td>
<td>4222</td>
<td>5088</td>
<td>4655</td>
</tr>
<tr>
<td>Mean</td>
<td>3174</td>
<td>4162</td>
<td>1.33</td>
</tr>
</tbody>
</table>

C.D (P = 0.05)
- Main 745 0.27 123
- Sub 534 0.22 90
- Main x sub 755 0.31 127

(2544 kg/ha and 0.81/m²/day) in control while drymatter and CGR were found higher at N₄₀P₂₀ (4655 kg ha⁻¹) and N₄₀P₄₀ indicating P dose can be reduced at higher dose of N due to synergic effects of both the nutrients. Application N & P fertilizers resulted in significantly higher Pod yield of groundnut with values of 829 kg/ha at N₄₀P₆₀, comparable with N₂₀P₆₀ (764 kg/ha) indicating advantage of application ‘P’ in reducing nitrogen dose.

Interaction effects were found significant with increased values of drymatter and CGR with increase in doses of fertilizers under both the cropping systems. The yields were found comparable with values of 718 kg/ha under intercropping at N₂₀P₆₀ with the values obtained at N₄₀P₄₀ under sole cropping.

Economics

Significant differences were observed in Gross, Net returns and Benefit Cost Ratio (BCR) due to cropping systems. (Table 2). Inter cropping with tamarind had resulted in higher gross returns of Rs. 8122/ha, net returns of Rs. 3855/ha and BCR of 0.85 over sole cropping of groundnut (Rs. 6143/ha, Rs. 2284/ha and 0.41). the reason being additional income from tamarind trees without much reduction in pod yields. Reddy and Sudha Das (1988) also reported similar findings from evaluation of Agri- Horti System.

Though Gross and net returns recorded were higher at N₄₀P₆₀ (Rs.8299/ha, Rs. 5132/ha) but found on par with the net returns obtained at N₂₀P₆₀ and other levels of P at same level of
N indicating advantage of nitrogen application. Similar trend was observed in BCR.

Both the Gross net returns and BCR were influenced by the interaction effects. Net returns produced were higher at N$_{40}$P$_{60}$ (Rs. 6185/ha) under sole cropping found on par with the net returns obtained at N$_{20}$P$_{60}$ (Rs.4249/ha) under intercropping indicating the advantage of intercropping with tamarind. Under both cropping system increase in doses of both the nutrients increased the Gross and net returns, except under intercropping at N$_{40}$. BCR also followed similar trend.

The results of present study indicated that intercropping of groundnut with tamarind proved more remunerative than sole cropping with N$_{20}$P$_{60}$ under rainfed situations.

### References

