Integrated nutrient management for *Piper longum*

Varsha Tapre, NK Patke, BM Muradi, AG Deshmukh, KM Deshmukh and AR Pawar

Abstract
The experiment was conducted at Nagarjun Medicinal Plant Garden Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (MS). The experiment was laid out in randomized block design with the three replication. Treatments consisted of nine organic and inorganic sources of nutrient. The data in respect of growth and yield contributing characters, and piperine content as influenced by application of FYM, Neem cake and chemical fertilizer. The data revealed that the addition of neem cake along with NPK might be effected into slow release of nitrogen and was available throughout the crop growth period, which out yielded the increased dry berries yield of *Piper longum*. The piperine content was found numerically highest with the use of 100:50:50NPK kg/ha + FYM10t/ha.

Keywords: highest with the use of 100:50:50NPK kg/ha + FYM10t/ha.

1. Introduction
*Piper longum* L., commercially called as long pepper and commonly known as pippali is an important spice cum medicinal plant belonging to the family Piperaceae. It is the third most important species of genus piper after black pepper and betel vine. It is a native of Indo-Malaya region and India. The main product of trade is the dry spikes of female types. The spikes contain alkaloids, tannins, flavonoids, and essential oil. It is known to act as an antimutagenic and antiproliferative agent. The methanolic extract of *P. longum* has been reported to have strong antioxidant and free radical scavenging properties. The aqueous extract of the plant has been shown to possess significant anti-inflammatory properties. The methanolic extract of the plant has been shown to possess significant anti-inflammatory properties.

Fruits are small and oval shaped berries, grown a

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it improves the appetite, abdominal pains, fever, leucoderma, urinary diseases etc. The present investigation was undertaken to evaluate the effect of intergrated nutrient management on the yield of *Piper longum*.

**Material and Method**

The experiment was conducted at Nagarjun Medicinal Plant Garden Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (MS). The experiment was laid out in randomized block design with the three replication. Treatments consisted of nine organics and inorganic sources of nutrient. The crop was subjected to recommended package of agronomic practices to obtain a healthy crop. The net plot is converted in to quintal per hectare by using hectare factor. The three years pooled data is discussed in the present paper.

**Treatment details**

It includes nine organic treatments viz. T1-Control, T2-100:50:50 Kg NPK/ha, T3-50:25:25 Kg NPK/ha, T4- FYM 10t/ha, T5- Neem cake 10q/ha,T6- 100:50:50NPK kg/ha + FYM 10t/ha, T7- 100:50:50NPK kg/ha + Neem cake 10q/ha, T8-NPK 50:25:25 kg/ha+ 10t FYM/ha, T9-NPK 50:25:25 Kg/ha + 10q Neem cake/ha. Yield recorded during the investigation and data analyzed statically.

**Table 1: Growth, yield and quality of *Piper longum* as influenced by different treatments**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Height (cm)</th>
<th>No. of berries/plant</th>
<th>No. of berries/plot</th>
<th>Dry wt. of berries g/ plant</th>
<th>Dry wt. of berries Kg/ ha</th>
<th>Piperine content %</th>
<th>Piperine kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1-Control</td>
<td>80.83</td>
<td>41.66</td>
<td>475</td>
<td>7.53</td>
<td>241.95</td>
<td>5.41</td>
<td>13.09</td>
</tr>
<tr>
<td>T2-100:50:50 Kg NPK/ha</td>
<td>106.4</td>
<td>45.27</td>
<td>670</td>
<td>15.97</td>
<td>341.15</td>
<td>5.67</td>
<td>19.34</td>
</tr>
<tr>
<td>T3-50:25:25 Kg NPK/ha</td>
<td>103.17</td>
<td>41.92</td>
<td>498</td>
<td>10.29</td>
<td>314.92</td>
<td>5.57</td>
<td>17.54</td>
</tr>
<tr>
<td>T4- FYM 10t/ha</td>
<td>85.033</td>
<td>43.60</td>
<td>494</td>
<td>9.86</td>
<td>261.16</td>
<td>5.66</td>
<td>14.78</td>
</tr>
<tr>
<td>T5-Neem cake 10q/ha</td>
<td>89.63</td>
<td>47.30</td>
<td>552</td>
<td>10.85</td>
<td>273.38</td>
<td>5.44</td>
<td>14.87</td>
</tr>
<tr>
<td>T6 100:50:50NPK Kg/ha + FYM 10t/ha</td>
<td>106.40</td>
<td>52.25</td>
<td>592</td>
<td>13.83</td>
<td>397.17</td>
<td>5.75</td>
<td>22.83</td>
</tr>
<tr>
<td>T7- 100:50:50NPK kg/ha + Neem cake 10q/ha</td>
<td>108.37</td>
<td>63.5</td>
<td>783</td>
<td>15.75</td>
<td>435.82</td>
<td>5.65</td>
<td>24.62</td>
</tr>
<tr>
<td>T8-NPK 50:25:25 kg/ha + FYM 10 t/ha</td>
<td>95.77</td>
<td>60.9</td>
<td>541</td>
<td>11.53</td>
<td>354.06</td>
<td>5.71</td>
<td>20.22</td>
</tr>
<tr>
<td>T9-NPK 50:25:25 Kg/ha + Neem cake 10q/ha</td>
<td>81.40</td>
<td>48.01</td>
<td>592</td>
<td>11.9</td>
<td>342.37</td>
<td>5.43</td>
<td>18.59</td>
</tr>
<tr>
<td>SE (m) +</td>
<td>8.61</td>
<td>1.78</td>
<td>36.5</td>
<td>.968</td>
<td>13.22</td>
<td>0.11</td>
<td>1.45</td>
</tr>
<tr>
<td>CD(P=0.05)</td>
<td>NS</td>
<td>5.21</td>
<td>109.64</td>
<td>1.368</td>
<td>39.63</td>
<td>NS</td>
<td>4.36</td>
</tr>
</tbody>
</table>

**Result and Discussion**

The data in respect of growth and yield contributing characters, and piperine content as influenced by application of FYM, Neem cake and chemical fertilizer are present in Table-1. The data revealed that the application of nutrients through FYM, neemcake and chemical fertilizers significantly influenced the growth as well as yield of *Piper longum*. However, height and piperine content was not significantly influenced by nutrient application treatments.

Number of berries was significantly highest with the application of 100:50:50 NPK kg/ha + Neem cake 10q/ ha (T7). Dry weight of berries was recorded significantly more in 100:50:50 NPK kg/ ha+ Neem cake 10q/ ha (T7) which was at par with and 100:50:50NPK kg/ ha + FYM10t/ ha (T6). The addition of neem cake along with NPK might be effected into slow release of nitrogen and was available throughout the crop growth period, which out yielded the increased dry berries yield of *Piper longum*.

The piperine content was found numerically highest in 100:50:50NPK kg/ha + FYM10t/ha (T6). However, total piperine yield was significantly superior with (T7) 100:50:50NPK kg/ha + Neemcake 10 q./ha which was at par with 100: 50:50 NPK kg/ha+ Fym10t/ha (T6).

**Conclusion**

Application of NPK 100:50:50 kg + Neemcake 10q per hectare recorded significantly more dry berries yield and piperine yield followed by application of NPK 100:50:50 kg + 10 t FYM/ ha.

**References**