Effect of integrated nutrient management on growth parameters of taro (Colocasia esculenta var. antiquorum)

Meena Mandavi, Mo. Navaz, Dr. Neeraj Shukla, Dr. Jitendra Singh and Dr. Sunil Kumar

Abstract
A field experiment was conducted at the horticultural cum research farm, under AICRP on Tuber Crops, Department of Horticulture, IGKVV, Raipur (C.G.) during kharif season of 2007. The whole experiment comprised of 9 treatments of Colocasia received nutrient combinations along with control. The Cormels (plating material) of Colocasia were planted in randomized block design with three replications. The data revealed that the highest average plant height (72.60 cm) was recorded in T3: FYM (10 t/ha) + Neem cake (10q/ha). As respect to number of tillers per plant showed that the maximum no. of tillers (6.0) was recorded in T5: Vermi compost (200kg/ha) + 75% of recommended dose of NPK.

Keywords: colocasia, tuber, cormels, nutrient management, growth parameters

Introduction
Taro (Colocasia esculenta var. antiquorum) is one of the important tuber vegetable of the world and known as "Great leaved Caladium" or "Elephant ear" in English, "Dasheen" in USA, "Cocoyam" in West Africa. In Chhattisgarh it is locally known as "kochai" and popularly cultivated tuber crops in the whole state. Plants are perennial but cultivated as annnals, lactiferous and very variable herb with 30-150 cm in height. Leaves are large or rather large, obliquely erect petiole long petioled, with varing colour and size. Petiole is sheathering at the base, uniformly light or dark green, green with dark streaks or violet, 40-150 cm long. It consists mainly of the leaves with long petiole which arises in a whorl from the apex of the underground corm. Corms are cylindrical with short internoders and few side tubers. In India, taro is chiefly grown for human consumption and is food after peeled, sliced, cooked and taken with condiments and adjuncts. Taro is mainly cultivated for the edible tubers but the leaves and its young stacks (petiols) are also cookee for the edible tubers but lhle leaves and its young stacks (petiols) are also cooked, used for making pakoras. Taro is mainly used as food, in some countries it is used for making fermented products. The pressure cooked taro corms after being passed through strainer are allowed to ferment giving an acidic product called "poi". Taro flour is used as baby food and also used for making chips. In global scenario, Africa ranks first in area and production of Colocasia followed by Asia and Oceania. In Chhattisgarh, Colocasia is mainly grown in tribal areas like Bastar, Kanker, Dantewada, Kawardha, Surguja and Raigarh districts as major tuber crop. In Chhattisgarh state total area under Colocasia is 4133 ha with production of 48687 metric tonnes.

Material and Methods
Investigation was carried out during kharif season of 2007, at horticultural cum research farm, Department of Horticulture, IGKVV, Raipur (C.G.) under AICRP on Tuber Crops, Department of Horticulture, IGKVV, Raipur (C.G.). Raipur is located in Central Eastern part of Chhattisgarh and lies between 21° 16’ North latitude and 8° 36’ East longitudes with an altitude of 289.56 meters above the mean sea level. The soil of experimental field was sandy loam in texture, medium in P and high in K. The whole experiment comprised of 9 treatments of colocasia received nutrient combinations along with control. The cormels (plating material) of colocasia were planted in randomized block design with three replications.
The planting of experimental material was done on 27th July, 2007. All the recommended practices were adopted to raise a good crop. Five random competitive plants were tagged from each plot to take observations. The average values of each observation were calculated on the basis of five random tagged plants. Treatments include, T1: Vermi compost (200 kg/ha) + 25% of recommended dose of NPK, T2: Vermi compost (200 kg/ha) + 50% of recommended dose of NPK, T3: Vermi compost (200 kg/ha) + 75% of recommended dose of NPK, T4: FYM (10 t/ha) + Neem cake (10 q/ha), T5: FYM (10 t/ha) + Mustard cake (10 q/ha), T6: Recommended dose of NPK @ 80:50:100 kg/ha, T7: PSB (5 kg/ha) + Azospirillum (5 kg/ha), T8: VAM (5 kg/ha) + Azospirillum (5 kg/ha), T9: Control.

Result and Discussion

1. Plant height: The data revealed that the highest average plant height (72.60 cm) was recorded in T3: FYM (10 t/ha) + Neem cake (10 q/ha) and at par with T5: Vermi compost (200 kg/ha) + 75% of recommended dose of NPK. The minimum plant height (61.37 cm) was observed in T7: PSB (5 kg/ha) + Azospirillum (5 kg/ha). Similarly Rajes Kumar and Vijoy Kumar (2005) reported that the highest plant height was (70.40 cm) recorded with 120 kg N/ha. In Colocasia, the plant height was significantly higher under FYM @ 10 t/ha + neem cake @ 10 q/ha and under vermi compost @ 200 kg/ha + 75% RD of NPK and it may be due to sufficient nutrient, availability for obtaining good plant height.

2. Number of tillers per plant: The data observed on number of tillers per plant showed that the maximum no. of tillers (6.0) was recorded in T3: Vermi compost (200 kg/ha) + 75% of recommended dose of NPK, which was at par with T2: Vermi compost (200 kg/ha) + 50% of recommended dose of NPK, T5: FYM (10 t/ha) + Neem cake (10 q/ha) and T9: FYM (10 t/ha) + Mustard cake (10 q/ha). The number of tillers were recorded in above four treatments probably due to the presence of good provided nutrients and better fertility through combinations of applied manures and fertilizers. The minimum number of tillers (3.53) was recorded in T9: Recommended dose of NPK @ 80:50:100 kg/ha and at par with T9 (Control). Verma et al. (1996) also reported that increasing level of nitrogen had positive effect on number of tillers.

<table>
<thead>
<tr>
<th>Treatment No.</th>
<th>Treatments</th>
<th>Plant height (cm)</th>
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</thead>
<tbody>
<tr>
<td>T1</td>
<td>Vermi compost (200 kg/ha)+25% of recommended dose of NPK.</td>
<td>66.43</td>
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<tr>
<td>T2</td>
<td>Vermi compost (200 kg/ha)+50% of recommended dose of NPK.</td>
<td>66.60</td>
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<tr>
<td>T3</td>
<td>Vermi compost (200 kg/ha)+75% of recommended dose of NPK.</td>
<td>67.40</td>
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<td>T4</td>
<td>FYM (10 t/ha)+Neem cake (10 q/ha)</td>
<td>72.60</td>
</tr>
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<td>T5</td>
<td>FYM (10 t/ha)+Mustard cake (10 q/ha)</td>
<td>66.88</td>
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<td>T6</td>
<td>Recommended dose of NPK @ 80:50:100 kg/ha.</td>
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<tr>
<td>T7</td>
<td>PSB (5 kg/ha)+Azospirillum (5 kg/ha)</td>
<td>61.37</td>
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<tr>
<td>T8</td>
<td>VAM (5 kg/ha)+Azospirillum (5 kg/ha)</td>
<td>62.84</td>
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<td>T9</td>
<td>Control</td>
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<td></td>
<td>SEm±</td>
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<td></td>
<td>CD (5%)</td>
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<td>T2</td>
<td>Vermi compost (200 kg/ha)+50% of recommended dose of NPK.</td>
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<tr>
<td>T3</td>
<td>Vermi compost (200 kg/ha)+75% of recommended dose of NPK.</td>
<td>6.00</td>
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<td>T4</td>
<td>FYM (10 t/ha)+Neem cake (10 q/ha)</td>
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<td>T5</td>
<td>FYM (10 t/ha)+Mustard cake (10 q/ha)</td>
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<td>T6</td>
<td>Recommended dose of NPK @ 80:50:100 kg/ha.</td>
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<td>T7</td>
<td>PSB (5 kg/ha)+Azospirillum (5 kg/ha)</td>
<td>3.93</td>
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<td>T8</td>
<td>VAM (5 kg/ha)+Azospirillum (5 kg/ha)</td>
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<td>T9</td>
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References