On farm testing: An effective way of transfer of technology of yard long bean [$Vigna unguiculata$ ssp. $sesquipedalis$ (L.) Verde.] in Ernakulam district of Kerala, India

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ABSTRACT
On Farm Testing (OFT) of Yard long bean variety Arka Mangla and Lola were conducted at KVK Ernakulum during 2014-15 with five farmers in area of one ha. The OFT were conducted with active participation of farmer’s to disseminate improved technology of Yard long bean to achieve production potential. The improved technologies consisting the use of modern variety, seed treatment, balance fertilizer application and integrated pest management. On Farm Testing data were recorded with respect to green pods yield as compared to farmer’s local practice. The results of suggested that improved technology recorded higher green pods yield 50.7 q/ha, 45.6 q/ha and 40.7 q/ha, in Arka Magala and Lola and Local variety, respectively. In addition to high in yield of Arka Mangla, lower values of technology gap, extension gap and index existed. The improved technology gave higher gross return, net return with higher benefit cost ratio Yard long bean as compare to farmer’s practices.

Key words: On farm testing, Pods length, Yard long bean.

INTRODUCTION
Yard long bean ([$Vigna unguiculata$ ssp. $sesquipedalis$ [L.] Verde.]) is a distinct form of cowpea grown as a vegetable crop in southern Asia and in the Far East for its immature pods, which are used as a vegetable. It is one of the most popular and cosmopolitan vegetable crop grown in many parts of India. It is an important tropical Indian pulse and vegetable crop covering an area of about 7.7 m ha (Yadav et al., 2004). It is a rich and inexpensive source of vegetable protein. It enriches soil fertility by fixing atmospheric nitrogen. Because of its quick growth habit it has become an essential component of sustainable agriculture in marginal lands of the tropics. The Yard long bean is a nutritious vegetable, which supplies protein (3.5 g), calcium (72.0 mg), phosphorus (59 mg), iron (2.5 mg), carotene (564 mg), thiamine (0.07 mg), riboflavin (0.09 mg) and vitamin C (24 mg) per 100 g of edible pods. This crop meets greater demand of the vegetable especially in South India and some parts of north India (Yadav et al., 2004).

Lack of awareness about the multifarious uses of Yard long bean and availability of production technology viz suitable high yielding varities as well as poor knowledge about production practices are ascribed as main reason for low popularity and productivity of Yard long bean in Kerala. The productivity of Yard long bean per unit area could be increased by adopting recommended scientific and sustainable management production practices using suitable high yielding varieties through OFT. On Farm Testing is the new concept of field growing new variety developed by the Indian Council of Agriculture Research (ICAR) with main objective to demonstrate newly released crop production technologies and its management practices in the farmers field, under different agro-climatic region of the country in diverse farming situations. While demonstrating the technologies in the farmer’s field the scientist is required to study the factors contributing higher crop production. Field constraint of production and thereby generate production data and farmers feedback information. Taking into account the above considerations, OFT’s were carried out in a systematic manner on farmer field to show the worth of a new variety and convincing farmer to adopt improved production management practices for enhancing productivity of Yard long bean ($Vigna unguiculata$ ssp. $sesquipedalis$ [L.]).

MATERIALS AND METHODS
The study was carried out at Krishi Vigyan Kendra, Enakulam of ICAR- Central Marine Fisheries Research Institute, Narakkal, Kochi, Kerala. Five villages have been adopted purposively. Varieties “Arka Mangla and Lola” of Yard long been developed by IIHR were used in OFT programme during 2014-15. OFT were organized at 5 farmer’s field on 2000 m² area per farmer. Two varieties

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Arka Mangla and Lola were tested through OFT with seed treatment and recommended doses of fertilizers and interventions compared with Local variety grown with farmer’s practices. The materials and inputs required under the study with respect to OFT and farmers’ practice are given in Table 1.

Critical inputs namely quality seed, fertilizers, agrochemicals for plant protection measures were provided in OFT plots, and non-monetary inputs like timely sowing in lines and timely weeding and irrigation were also performed. The OFT farmers were facilitated by the KVK Scientists in performing field operations during the course of trainings and visits. Two Off-campus trainings have been organized for the group of beneficiaries Farmers. A harvest mela was organized at farmer’s field at Mooknoor and print and visual media were also used to disseminate the technology.

To study after on farm trial were out of 50 participating farmer, total of 10 farmer were selected as respondent through proportionate sampling. Production and economic data for OFT and Local practices were collected and analysed. The extension gap, technology gap and technology index were calculated using the formula as suggested by Kumar (2014 a).

**Extension gap (qha⁻¹) =**

Demonstration yield (qha⁻¹) – yield of local check (qha⁻¹)

**Technology gap (qha⁻¹) =**

Potential yield (qha⁻¹) - Demonstration yield (qha⁻¹)

**Technology index (%) =**

Potential yield (qha⁻¹)- Demonstration yield/ Potential yield x100

**RESULTS AND DISCUSSION**

**Constraints in Yard long bean production:** Farmer’s field Yard long bean cultivation problems were documented in this study. The ranking given by the different farmers are given in Table 2. Preferential ranking scientific techniques were utilized to identify the constraints faced by the respondent in Yard long bean production. A perusal of data in table-2 indicated that lack of suitable high yielding variety (HYV) was given the top most rank (90.00%) followed by low technical knowledge (70.00%). Other constraint such as low or erratic rainfall, high labour cost, marketing and post harvest management were found to reduce Yard long bean production. Other studies conducted by Hassn et al., 1998; Ouma et al., (2002); Dhaka et al., (2010); Ranawat et al., (2011); Dhruw et al., (2012) and Sreelakshmi et al., (2012) at different locations have also reported similar problem in different crops.

**Yield attributes:** The difference in green pod length (Table-3) of two hybrids Arka Mangla, Lola and Local variety was observed and maximum length was recorded in Arka Mangla (80 cm) followed by Lola variety (60-70 cm) and Local (40-60 cm). The average pod weight was also recorded highest in Arka Mangla (25-30 pod gave 1 kg weight) followed by Lola variety (40-50 pod gave 1 kg weight) and Local (70-80 pod gave 1 kg weight). The color of the two hybrids was red while local were white.

**Green pod yields:** A comparison of productivity levels between OFT varieties and Local vegetable crop variety has shown in Table 4. During the period of study, it was observed that yield of Yard long bean variety Arka Mangla, Lola and Local seed in Ernakulam district under improved production technologies ranged 50.7 to 45.6 q/ ha⁻¹. Yield of the On Farm trial and potential yield of the different varieties of crop were compared to estimate the yield gaps which were further categorized into technology index. The technology gap show that, 29.55 q ha⁻¹ and 29.66 q ha⁻¹ lower yields were observed than potential yield of 70 and 65q/ ha⁻¹ in Arka Mangla and Lola it indicates that technology has to be popularized in the area. Lower Technology index show the feasibility of the new varieties at the farmers field, as lower the value of technology index more is the feasibility.

**Table 1:** Technological intervention under OFT and farmers practices.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Improved technologies</th>
<th>Farmer practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety</td>
<td>Arka Mangla and Lola</td>
<td>Local seed</td>
</tr>
<tr>
<td>FYM</td>
<td>20 ton/ha</td>
<td>10-12 ton/ha</td>
</tr>
<tr>
<td>Seed rate</td>
<td>4-5 kg/ha</td>
<td>20-25 kg/ha</td>
</tr>
<tr>
<td>Spacing</td>
<td>2.0 m x 2.0 m</td>
<td>30 cm x 15 cm</td>
</tr>
<tr>
<td>Fertilizer dose</td>
<td>25:75:60 kg NPK/ha</td>
<td>20:30:10 kg NPK/ha</td>
</tr>
</tbody>
</table>

**Table 2:** Ranks given by farmers for different constraints (n=50).

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Percentage</th>
<th>ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of suitable HYV</td>
<td>90.00</td>
<td>I</td>
</tr>
<tr>
<td>Labour problem</td>
<td>85.00</td>
<td>II</td>
</tr>
<tr>
<td>Low soil fertility</td>
<td>40.00</td>
<td>VI</td>
</tr>
<tr>
<td>Marketing</td>
<td>50.00</td>
<td>IV</td>
</tr>
<tr>
<td>Low technical knowledge</td>
<td>70.00</td>
<td>III</td>
</tr>
<tr>
<td>Wild animals</td>
<td>45.10</td>
<td>V</td>
</tr>
</tbody>
</table>

**Table 3:** Average pod length, pods weight, and color of seeds used.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Average pod length size</th>
<th>Average pod per kg of weight</th>
<th>color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arka Mangla</td>
<td>80-90 cm</td>
<td>25-30</td>
<td>Red</td>
</tr>
<tr>
<td>Lola variety</td>
<td>60-70 cm</td>
<td>40-50</td>
<td>black seeds</td>
</tr>
<tr>
<td>Local variety</td>
<td>30-35 cm</td>
<td>70-80</td>
<td>White</td>
</tr>
</tbody>
</table>
The extension gap showed in decreasing trend. It was found that cost of production of cowpea under improved technology varied from Rs. 45500 ha \(^{-1}\) to Rs. 35000 ha \(^{-1}\). It was also found that depending on identification and use of farming situation, specific intervention may have more beneficial impact on demonstrating effect of technology. The trend of technology gap reflects the farmers cooperation in carry out such demonstration with encouraging results.

The technology index showed the feasibility of the evolved technology at the farmer field. The economic feasibility of improved technology over traditional farmers practices was calculated depending on the prevailing prices of inputs and output cost (Table 5).

The additional cost incurred in the improved technology was mainly due to higher cost involved in the cost of improved seed only. On Farm Testing records higher mean gross returns Rs. 42535 ha \(^{-1}\) and mean net return Rs. 22535 ha \(^{-1}\) with higher benefit ratio 2.125 under improved technology of different variety. A similar finding was also recording by Meena et al. (2015a). Meena et al. (2015b) and kumar et al. (2014) have also opined that depending on identification and use of suitable HYV seed as major constraint by the farmers through various mean for adoption of improved agricultural production technologies. The trend of technology gap reflects the farmer cooperation in carry out such demonstration with encouraging results. The technology gap observed might be attributing to the dissimilarity in soil fertility status and weather condition. Mukharjee (2003) have also opined that depending on identification and use of specific intervention may have more beneficial impact on demonstrating effect of technology. The trend of technology gap reflects the farmers cooperation in carry out such demonstration with encouraging results.
REFERENCES


