Research Paper *The Asian Journal of Horticulture,* (December, 2009 to May, 2010) Vol. 4 No. 2 : 464-466

Synergistic cropping system of *Lakha bari* for sustainable development of horticulture in Uttar Pradesh

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Accepted : *October, 2009*

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ABSTRACT

An innovative farmers participatory adaptive trial was carried out during winter (*Rabi*) season of 2002 and 2003 on farmers fields, located on riverine soils in the catchments area of Kali river, it is a tributary of river Gangetic, near Bhogaon at Mainpuri district of U.P. The site typically represents soils, climate and socio-economic condition of semi-arid zone. The main objective of this study was to improve the socio-economic status of farmers under change in climate. The three synergistic cropping systems *i.e.* tree melon + garlic + pumpkin, tree melon + garlic + bottle gourd and tree melon + garlic + sponge gourd were framed and executed on ten farmers fields. The filler crop of garlic yielded bulbs as 87.50 q/ha, 88.10 q/ha and 87.60 q/ha from tree melon + garlic + pumpkin, tree melon + garlic + bottle gourd and tree melon + garlic + sponge gourd cropping systems, respectively. The pumpkin, bottle gourd and sponge gourd yielded marketable size fresh fruits as 120 q/ha, 128 q/ha and 115 q/ha, respectively, rose under synergistic cropping system. The fruits of tree melon plucked of 960 q/ha from tree melon + garlic + sponge gourd, 880 q/ha from tree melon + garlic + bottle gourd and 800 q/ha from tree melon + garlic + pumpkin. Likewise, the companionship of tree melon + garlic + pumpkin, tree melon + garlic + bottle gourd and tree melon + garlic + sponge gourd gave net return of Rs. 265900/ha, Rs. 291885/ha and Rs. 330180/ha, respectively, to the farm families.

Key words : Innovative, Socio-economic, Tree melon, Riverine soils, Synergistic

A *Lakha bari* system under synergistic cropping system for modus vivendi in rural area has been developed by National Agricultural Research Project, Mainpuri. This system provides more than Rs. one lakh net profit to the farm families in a year from one hectare land.

Tree melon or papita widely grown all over India in commercial orchards as well as in Kitchen garden. It is an herbaceous, quick growing plant with usually unbranched stem and a crown of palmate lobed leaves with long, hollow petioles. Such plant behaviour of tree melon nurse to the filler crops of cucurbitaceous vegetables and bulb crops. Papaya enjoys sun, proper irrigation and frostless conditions. Well-drained and adequately manured light soils are considered best for the growth of tree melon. Riverine soils are well suited for its cultivation. Similarly, cucurbitaceous vegetables can also be grown in various soils, which are free from bad drainage, yet light loamy soils with good water holding capacity are preferred for their successful production. Abundant of sunshine produces high quality fruits. A constant and unchecked growth, especially during early growth period leads to large yields of high quality.

The bulb crop of garlic is an important condiment. It grows under a wide range of climatic conditions. However, it cannot stand in too hot or too cold weather. It prefers a moderate temperature in summer as well as in winter. Therefore, short days are very favourable for the formation of bulbs. The garlic requires well-drained loamy soil rich in humus with fairly good content of potash.

In alluvial belt of semi-arid climate farmers start plantation of tree melon from July and continue up to October. The wide gaps between rows of younger tree melon can easily be used for filler cropping up to seven to eight months. The condiment crop of garlic during winter season and cucurbitaceous vegetables in spring season may easily be grown in association of tree melons.

MATERIALS AND METHODS

The site of pilot villages is located in the catchments area of Kali river near Bhogaon at Mainpuri district of U.P. The site typically represents soils, climate and socio-economic condition of semi-arid climate. The length of growing period of operational area varies between 120-150 days. The soils developed over alluvium. The major soils belong to loamy sand, sandy loam and loam and are most suitable for cultivation of tree melon, cucurbitaceous vegetables and condiments crops. The three synergistic cropping systems *i.e.* tree melon + garlic + pumpkin, tree