Cotton based multi tier intercropping system

K. Sankaranarayanan, CICR, Coimbatore

Cotton system is ideally suitable for intercropping because of the relatively longer duration and its slow growth in the initial stages. The objective of intercropping is to obtain a maximum yield of cotton crop along with additional returns from intercrops. The common practice of cotton cultivation is inter or mixed cropping with pulses. However, the monetary advantage of pulses intercropping is meager. In addition to that existing low price situation for cotton produce is discouraging cotton cultivation. To overcome the above situation, intercropping of high value vegetable crops is one of the viable options. While considering the inconsistency in performance and price fluctuation of vegetable crops, intercropping of multi vegetables with different growth habits are aimed

The intercropping system experiment was conducted with objective to find out the suitable cotton based multitier vegetable intercropping system for higher production and economic return. The results revealed that the highest seed cotton yield (24.8q/ha) was harvested with the intercropping of radish + beetroot + coriander between the cotton rows. Periodical harvest of intercrops coriander 30 Days After Sowing (DAS), radish (45 DAS), and beetroot (75 DAS),leads to less competition within the component crops which ultimately resulted in higher seed cotton yield with Cotton+radish + beetroot + coriander system. The numerically least seed cotton yield (20.8q/ha) was harvested with control plot. The highest gross return of Rs. 167614/ha, net return of Rs. 118217/ha and benefit cost ratio 3.4 were calculated with cotton intercropped with radish + cluster bean + beetroot system and the system produced seed cotton yield of 21.8 q/ha and vegetable yield of 4.2 tons of radish, 6.7 tons of cluster bean and 4.8 tons of beet rootrespectively. This was followed by cotton + coriander + vegetable cow pea+ cluster bean (GR- Rs. 143036/ha, NR- Rs. 91430/ha and B.C ratio 2.8) Cotton + radish + cluster bean + beetroot system recorded the seed cotton equivalent yield of 79.8q/ha, which is equivalent of producing 4 times of seed cotton yield of sole cotton system. The highest percentage of weed smothering efficiency (64.5%) leaf area index (7.2 times as compared to sole cotton) and percentage of light interception (86.4%) (Sole cotton intercepted 31.6% of the sun light) was observed with cotton + cluster bean+ vegetable cowpea + dolichos system.

Cotton+radish+clusterbean+beetroot

Field view of multi-tier cropping system

Cotton quality parameter viz., ginning percentage lint index seed index, 2.5% span length, maturity ratio, uniformity ratio, micronaire, strength (g/tex), and fibre elongation percentage were not significantly altered in cotton intercropped with different vegetable crops.

Sucking pest population (no. of Jassid and no. of whitefly) and beneficial insect population (lady bird beetle and spider population) had not significantly varied among the different multitier intercropping systems.

Income flow of different intervals of cropping period was calculated for different multitier cropping system. The total income was realized at the end of the cropping season in sole cotton system. However, in multitier cropping system, income from intercrop is realized in different interval of throughout the cropping periods. The multitier systems that include coriander and radish as components crops effected the perfect flow of income.

The highest land equivalent ratio (3.56) diversity index (3.83) and per day return (Rs. 788/day) were calculated with intercrops viz., radish, cluster bean, and beet root between the cotton rows. The produce harvested from cotton + radish + cluster bean + beet root system in an one hectare land is equivalent to producing of yield from 3.83 ha land of sole cotton system. Diversity index measures the multiplicity of crops. Among the different multitier system tested cotton intercropped with radish, cluster bean and beetroot is found to be more diversified and sustainable one.