5. TECHNOLOGY ASSESSED AND TRANSFERRED

Nagpur

Frontline Demonstrations (FLD)

Cotton based technologies of INM in cotton, cotton based inter cropping with soybean, opening of ridges and furrows for moisture conservation, foliar application of nitrogen along with Magnesium sulphate, Zinc sulphate and Borax and detopping for management of leaf reddening disorder in cotton, *G. arboreum* cultivar Turab, *G. hirsutum* cultivar NH 615 and IPM in conventional hybrid NHH 44 and Bt hybrid NCS 145 were demonstrated on farmers' fields. The improved technologies were demonstrated in fields of 145 adopted farmers of Atmuddi, Belgaon and Jalka villages of Warora taluka of Chandrapur District and Khairi, Kosara, Sukali and Takali villages of Yeotmal district. An average seed cotton yield of 1071 kg/ha was obtained with the various demonstrated technologies as against 937 kg/ha with the farmers practice. An increase in seed cotton yield ranged from 11.67 to 42.80 per cent with an average of 14.30 per cent. Spraying with power sprayer and battery operated sprayer was demonstrated. Battery operated sprayer showed better efficiency without spray drift and covered more surface area with fine spray. Cotton stalk slasher was demonstrated for improving the organic content in the soil.

Coimbatore

Demonstration of Multi-tier cropping system for enhanced profitability and sustainability in cotton

The newly developed cotton based multi-tier system (cotton+radish+beet root+coriander)was demonstrated in Field no 20 of main farm. Hybrid cotton is followed at 120 x 45 cm. Two ridges at 60 cm apart are formed making 120 cm. Cotton, radish, beet root and coriander are planted on 4 sides of the 2 ridges in sequence. Periodic harvest of intercrops (Coriander at 35 DAS, Radish at 45 DAS and Beet root at 75 DAS) resulted in less competition within the components of multi-tier crops leading to yield equal (21.5 q/ha) to sole cotton (22.1 q/ha). Per hectare gross return of Rs. 1,18,440 was realized from multi tier intercropping as compared to sole cotton raised plot of Rs 44,200/ha.

Low cost drip irrigation system in cotton use of micro tubes & poly-tubes

Even though drip is an acceptable technology, its adoption by Indian farmers, is very slow mainly due to high initial installation cost of the system especially for annual crops including cotton. Thus, developing low cost drip irrigation system by suitable means is of immense help for wider adoption of this technology. After three years of testing and subsequent modification, two low cost drip systems (micro tube and poly tube drip systems) were developed for cotton successfully at CICR, Coimbatore. In micro tube drip system, Cotton is planted in paired rows (60/120 cm) and single lateral (LLDPE) is placed in the middle of the two paired row (60/120-60/120). Micro-tubes are connected to the laterals to deliver water on either side of the pair to supply water for two plants**.** Polytube drip system, polytubes (150 gauge thickness) punctured at regular intervals (60 cm) on single side, tied by waste cloth to avoid jet action are placed in between the paired row/single row. Microtubes (Rs 32,000/ha) and poly tubes (Rs 17,000/ha) drip systems are 49 and 73 per cent cheaper respectively as compared to the existing drip system (Rs 62,750/ha). Water saving to the tune of 44 per cent is achieved following adoption of low cost drip system.

Sirsa

Demonstration of newly released *arboreum* hybrid CICR 2

Demonstration of *G. arboreum* hybrid CICR-2 was conducted at 24 farmers' fields. In the FLD plots as well as in the check plots, average of 5.3 sprays were resorted to. The hybrid CICR-2 out yielded the other cultivars grown by the farmers with 5.0 -29% yield increase.

Demonstration of newly released *G. arboreum* variety CISA 310

The newly released *desi* variety CISA 310 was demonstrated at four farmers' fields. In case of CISA-310 and local cultivars, similar number of sprays and other practices were followed. In the demonstration plot, CISA-310 recorded the average seed cotton yield of 11.25 q/acre as compared to 10.12 q/acre in the traditional varieties with an increase of 11%.

Demonstration of intra-*hirsutum* hybrid CSHH 198

The hybrid CSHH 198 was demonstrated at seven farmers' fields. In the FLD plots, 6.1 sprays were done, while in farmers practice 5.3 sprays were done. For yield comparison, the hybrid CSHH 198 out yielded the other cultivars grown by the farmers with an

increase of 12.27%.

Hybrid seed production of CICR 2 and CSHH 198 at Farmers' field: Front Line Demonstrations on hybrid seed production were conducted in the fields of Smt Manpreet Kaur, Smt Lalita Devi and Smt Kaushalaya Devi, wherein profit of Rs 88050, Rs 85600 and Rs 80625 per acre respectively were recorded.

Integrated Pest Management (IPM) Technology

The average population of sucking pests in IPM was comparatively less than non-IPM practices both in varieties and Bt cotton hybrids but the damage to the fruiting bodies like square and bolls is significantly more in non-IPM fields (3.46 & 3.49%), whereas the population of natural enemies like spider, *Chrysoperla* and Coccinellids remain the same. The maximum pheromone traps catch (50.64/traps) was found to be in *Spodoptera litura* followed by *Pectinophora gossypiella* (+18.39/traps), while it was found minimum in *Helicoverpa armigera* (0.07/traps) and the trap catch of *Earias* spp (+0.67/traps). The average yield obtained in IPM and non-IPM plots of Bt cotton hybrids was 28q and 25.5 q/ha as but it was 23 and 22 q/ha in IPM and non-IPM plots of varieties. The number of sprays applied both in IPM and non-IPM are 5 but in non-IPM plots the mixture of insecticides was used. The total reduction in cost in IPM plots of Bt cotton hybrid and varieties was Rs 2920. The net profit gained per hectare was Rs.55750 and Rs. 46767 in IPM and non-IPM plots of hybrids alongwith C:B ratio of 1:5.58 and 1:4.10. Simultaneously, in case of varieties, the net profit per hectare Rs. 45625 and 40280 in both IPM and non-IPM plots with a C:B ratio of 1:5.50 and 1:4.08, respectively.

FLD on Implement Demonstration

An increase of 5.88 % in seed cotton yield/ha was recorded while adopting the deep plough and Rotavator system of cultivation. This is due to slight improvement in soil health and exposure of hibernating larvae of insect pests. The use of rotavator was more beneficial in term of inter cultivation and removal of weeds between the rows as compared to the cultivator being used by the farmers. The farmer got 27.0 q/ha while using deep plough and Rotavator with farmers' practices yielding 25.5 q/ha with more number of sprays.