

## Guava based intercropping for doubling farmers' income

The current study was started in July 2018 at village Suhana, Post Bhandahera, Block Sultanpur, District Kota, Rajasthan. The area comprising Kota, Baran, Bundi and Jhalawar Districts of Rajasthan is popularly known as *Haroti* region. This region comes under south-eastern part of the state. A farmer (Sh. Ghanshyam) was identified for different modules based on his existing production system, potential and interest. The major cropping system of the region were paddy-wheat, urd-wheat and soybean-wheat. The village is near to the Agriculture University, Kota and adopted by the university under *Mera Gaon Mera Gaurav* but the technology awareness and adoption was very low. Farmers are still cultivating old varieties and do not have access to quality seed. The soil texture is clayey. Being in peri-urban situation, there is an immense opportunity and potential to make agriculture a profitable enterprise.

**G**HANSHYAM, a farmer of village Suhana, Kota (Rajasthan) was growing soybean, wheat, etc. with traditional practices of agriculture. These traditional crops were mainstay of his livelihood. The idea of guava based intercropping helped to harness potential yield and attaining more profit as compared to individual crops of tomato, coriander, onion, garlic and potato. For sustainable crop production in Rajasthan conditions, by cultivating intercrop in fruit orchard, farmers can enhance the water-use efficiency, sustain soil fertility, reduce weed growth, minimize soil erosion, maximize utilization of interspaces left in orchard, which ultimately leads to sustainable production and enhanced farm income. Keeping these points in view, different combinations of vegetable crops, viz. guava +

onion, guava + tomato, guava + garlic were grown by Sh. Ghanshyam in guava orchard, spaced at  $5 \times 5$  m, which has attained the age of 3 years. He also adopted brinjal + pumpkin intercropping and garlic + bottle gourd relay cropping. According to Sh. Ghanshyam, the guava based intercropping with vegetables during both the seasons (*rabi* and *khariif*) is practically feasible and economically viable under *Haroti* region of Rajasthan. Among the sole crops of vegetables, guava and guava based intercropping, the net economic return ₹ 611,983/ha with the B:C ratio 4.13 was achieved in guava based intercropping. In order to obtain more sustainable returns, intercropping not only enhances the productivity and income but also utilizes the unutilized space left in orchards.



Garlic and bottle gourd intercropping



Kishan Divas at Sh. Ghanshyam's field



Scientific cultivation of potato as sole crop

### Objectives

- To introduce new cropping patterns as intercropping in the fruit orchard
- To encourage the farmers for crop diversification for doubling farmers income
- To enhance farm income by adopting horticulture based cropping system

### Generic problems in the area

- Scarcity of ground water and uneven distribution of monsoon
- Low market price of traditional crops and less farm income per unit area
- Limited awareness of farmers regarding good agriculture practices
- Less adoption of horticulture-based cropping system

### Reason for selection of this area

*Haroti* region of Rajasthan is known for cultivation of soybean, coriander, garlic, wheat and mustard. *Haroti* region comes under Humid South Eastern Plain agro-climatic zone of Rajasthan. Soil of this zone is heavy textured vertisols which is swelling and shrinking in nature. The farmers of this zone grow sole crops like soybean, wheat, mustard, garlic, coriander etc. Farmers face many problems viz. price issue at the time of selling because the above crops are in glut in the *Mandi* or in the market, therefore, farmers do not fetch good prices of their produce. Apart from that, heavy and erratic rainfall cause unbearable losses to the farmers, severe incidence of insect pests and diseases in the latter years, ultimately reduces the yield and quality of the produce.

### Impact of Agriculture University

Sh. Ghanshyam belonging to Village Suhana, Block



Pumpkin + brinjal intercropping



Muskmelon and marigold intercropping

Sultanpur, District Kota, Rajasthan came in contact with Agriculture University, Kota and deliberated his problems with university scientists. He faced many problems like scarcity of good quality irrigation water, low yield and poor quality of produce. He was looking for adoption of recent technologies developed by the agriculture scientists.

Scientists suggested to Sh. Ghanshyam for various trainings and he got training on propagation methods, irrigation water management, nursery management, drip irrigation, mulching, importance of guava based intercropping, etc. from various units of Agriculture University, Kota. After that, idea of guava based intercropping came to his mind and he discussed deeply so many times regarding this with scientists of the university who explained him that how guava based intercropping is better than sole crops. This type of cropping system utilise inter row space and nutrients judiciously until the main crop is affected by intercrop.

He was advised to take guava as main crop because it is well suited to this agro-climatic zone, this region also called *Haroti* region (comprises Kota, Baran, Bundi and Jhalawar districts of Rajasthan). Farmer agreed to take guava crop and established an orchard of 3 ha in the year 2018. He had insufficient ground water for the



Guava and garlic intercropping



Guava and chilli intercropping

**Table 1.** Net returns obtained in different cultivation practices

| Crop                                              | Area   | Gross return | Total cost | Net return | BC ratio |
|---------------------------------------------------|--------|--------------|------------|------------|----------|
| Sole crop (Vegetables)                            | 1.0 ha | 391,600      | 110,240    | 281,360    | 2.55     |
| Sole crop (Guava)                                 | 1.0 ha | 503,690      | 118,430    | 385,260    | 3.25     |
| Guava based intercropping<br>(Guava + Vegetables) | 1.0 ha | 760,053      | 148,070    | 611,983    | 4.13     |



Guava + onion intercropping



Harvesting, cutting and curing of onion bulbs

summer crops, so he was advised to create a farm pond to harvest the rain water. Later he had farm pond for fulfillment of irrigation water requirement and this pond was filled with rain water harvesting only. For irrigation, drip and check basin methods were adopted for guava and intercrops respectively. In between the rows of guava plants, farmer took onion, tomato, chilli, potato, cucurbits (initially), marigold, garlic, etc. as intercrop.

### Outcome

According to farmer, sole crop of onion, potato, garlic, tomato, etc. gave average net return of ₹ 281,360 per ha with B:C ratio of 2.55 . Whereas, in case of guava as sole crop, net return of ₹ 385,260 per ha and BC ratio of 3.25 was observed. New intervention of guava based intercropping with onion, potato, garlic, tomato and cucurbits gave net return of ₹ 611,983 with BC ratio of 4.13 (Table 1).



### SUMMARY

Sh. Ghanshyam regularly observe the prices online and accordingly sells his produce in cities like, Kota, Jaipur, own farm etc. and elsewhere from where he gets more return. He uses social media actively on regular basis for promotion of produce like, farm/orchard photographs, harvested produce, etc. He also adopted animal husbandry and properly utilises the by-products obtained from the crops. Sh. Ghanshyam is popular among the farmers community in his block for adopting new technologies and his success stories are published periodically in magazines and newspapers. Being inspired by Mr. Ghanshyam, nearby farmers of his village and other villages are adopting new technologies and knowledge provided by Agriculture University, Kota. He also inspires the farmers by providing training at his own farm for adopting new interventions. Scientists of Agriculture University, Kota also visit his field as and when he call them to solve his problems.

For further interaction, please write to:

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