

Success Story under RKVY at Regional Horticultural Research and Training Station, Jachh, District Kangra, Himachal Pradesh

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REGIONAL HORTICULTURAL RESEARCH & TRAINING STATION

- 1. Title:** Eco-friendly production modules in Mango and citrus for sustainable fruit production in sub-tropical areas of HP
- 2. Category:** Horticulture, infrastructure, production and growth, Soil and water conservation, natural resource management
- 3. Challenge:** The contribution of sub tropical fruits in low hills and valley areas of Una, Hamirpur, Kangra, Bilaspur, Chamba, Solan, Sirmour and Mandi districts of Himachal Pradesh covering seven out of 12 districts in terms of area is 33.9% whereas in term of production it is 16.3%. In the state, mango is the leading commercial fruit crop in terms of area (41105 ha.) and production (47612MT).

Productivity of mango and citrus orchards in HP is quite low i.e., 4.5 and 1.29 tonnes/ha, respectively in comparison to other mango and citrus growing states/areas of India where higher productivity of 7.2 (mango) and 6.8 (Citrus) tonnes/ha has been achieved. The emerging global prospects for organic farm produce and the realisation of long lasting damages caused

to soils by chemical fertilizers and pesticides have propelled a shift to natural farming methods in developed and developing countries. World wide, about 130 countries produce certified organic products on a commercial scale. The global market for organic food is worth \$37 billion and is growing. Organic food is a premium commodity in the international market and it fetches 10 to 50 per cent higher price. Analysts consider that food sufficiency obtained by India is at the cost of our environment. In spite of the favourable factors like largest arable land in the world, and sunshine all through the year and being the second largest producer of fruits, we are still struggling to have worthy share in the agriculture business map of the world. India has to tread a new path to position itself in the global agri-trade and farming in harmony with the nature provides such an opportunity.

4. Initiatives:

4.1 Infrastructure initiatives: During the year 2016-17, installed various infrastructures like drip irrigation systems, conveyance irrigation system in mango and citrus orchards, farm development including fencing and farm paths and roads were made, Farm tools and implements for farm mechanization purchased, strengthening of training needs for farmers and farm hostel by spending Rs 43,50,500/-.

4.2 Research initiatives: Research initiatives started for the development of eco friendly modules for sustainable fruit production in mango and citrus by laying out different experiments as detailed below. Expenditure of Rs 56,92,500/- was also incurred on different recurring heads.

Treatments for organic production module for mango and citrus:

In first experiment different levels of FYM, vermicompost and bio fertilizers were combined to constitute a total of 17 treatments. The treatment combinations have been applied and the results are awaited.

Treatments for integrated production module for mango and citrus:

In this experiment different levels of NPK, FYM, and bio fertilizers were combined to constitute a total of 7 treatments.

Treatments for fertigation in mango and citrus:

Mango and citrus plants requires nutrition in the form of macro nutrients for quality fruit production and higher productivity of citrus orchards as these are heavy feeder of nutrients and require irrigations at critical stages of plant growth and fruit development. Besides, micro nutrient like zinc is also critical for fruit bud formation and development. Fertilizer application through drip system of irrigation which increases fertilizer and water use efficiency seems to be an alternative. In this experiment different levels of NPK with FYM were combined to constitute a total of 5 treatments. The results are awaited.

Development of weed management practices in mango and citrus:

Weed management practices by using different mulches like polythene mulches (black and white of 100 micron), paddy straw and saw dust each of 10 cm thick were used.

Development of strategies for management of different insect pest and diseases in mango and citrus using natural resources and bio pesticides and pheromone traps:

Development of eco-friendly technologies for management of key insect pests and diseases though the use of traps, intercrops, plant extracts, cow dung and urine in different combinations besides testing commercial formulations of bio pesticides.

5. Key results:

Under INM module, the maximum gross income (Rs. 1636.35), net income (Rs. 1186.78) and benefit cost ratio (2.64) was observed with the treatment of 75% NPK and FYM (75 kg) +Biofertilizers (Azotobacter , PSB and VAM @ 100g each/tree), which was followed by 50 % NPK and FYM (50 kg) +Biofertilizers (Azotobacter and PSB @ 100g each/tree having Rs. 1289.46, Rs. 862.87 and 2.02 gross, net income and benefit cost ratio, respectively. Overall the treatment 75% NPK) and FYM (75 kg) +Biofertilizers (Azotobacter , PSB and VAM @ 100g each/tree) was found to be the best for improving the tree growth, fruit yield and was also economical with more benefit cost ratio.

6. Impact:

Himachal Pradesh by default is organic in nature and development of management and production practices for organic produce will cut the cost of pesticides and inorganic fertilizers which otherwise are difficult to apply as 83 per cent of area under fruit cultivation is rainfed. Organic management

package of practices will ensure environment, soil and human health besides fetching premier price.

7. Lessons learned:

Integration of resources can answers almost all the problems in fruit production of mango and citrus.

8. Supporting Quotes and Images:

8.1 Supporting Quotes:

Development of infrastructure facilities for Research base is essential.

8.2 Images of success story:



Mango trees under organic production



Kinnow mandarin under organic treatments



Farm tools, equipments and machinery for farm mechanization



Fertigation through drip system



Production under drip management in mango



Production under drip irrigation system



Mulching for soil water conservation and weed management



Mulching with black polythene



Mulching with white polythene



Mulching with saw dust



Mulching with dried grass



Preparation of organic formulations for pest management

9. Additional Information:

Contact persons for this success story:

Name Position E- mail address.

| S. No. | Name | Position | Email address |
|---------------|---------------------------|--------------------------|-------------------------------|
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10. Checklist:

| S. No. | Question to consider | Yes | No |
|---------------|---|------------|-----------|
| 1. | Is the story interesting to the target audience of the project/activity report? | Yes | |
| 2. | Does the story explain what new insights the project brings? What is the main lesson learned from this story? Does the story describe a key insight on what work and what doesn't and something that future projects could build on | Yes | |
| 3. | Does the story describe the outcomes the project produced and the people who are benefitting? What changes-in skills knowledge, attitude, practice or policy- has the project brought about who is benefitting from these changes? | Yes | |
| 4. | Does the story make a compelling point that people will remember? Does the story show how the project makes a difference to improving livelihoods and lessening poverty? | Yes | |
| 5. | Does the story provide an interesting fact that people will remember? For example how yields increased how many hectares of land could become more productive from this innovation or technology? | Yes | |
| 6. | Does the story explain what kind of impact this innovation or technology could have if scaled up? | | No |
| 7. | Does the story show which partners contributed and how? | | No |
| 8. | Does the story include quotes from stakeholders or beneficiaries? | | No |
| 9. | Have I provided links to other media (journal articles, website news, newsletter, blogs and annual reports of other Programme/project) that also feature this story? | Yes | |
| 10. | Have I provided the contact details of people who can provide more information? | Yes | |