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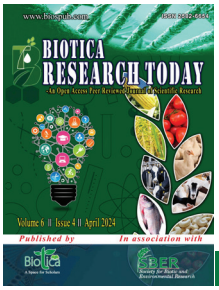

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**Article ID: RT1647** **Success Story**

# Organic Production of Tomato through Biopesticides, Biofertilizers and Macrobials of TRA, NBRRDC, Nagrakata, CAU-CPGSAS Meghalaya and NBAIR Bangalore, Respectively - A Success Story

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## Abstract

Under the DBT funded project in the identified village of West Sikkim a team of scientist of CAU-CPGSAS, TRA-NBRRDC and ICAR-NBAIR in collaboration with KVK-West Sikkim identified Mrs. Manika Rai for promotion of proven technologies of organic input for organic cultivation vegetables. Mrs. Rai before our intervention she practiced the cultivation of vegetables without any practices. Under DBT funded project, Mrs. Rai was trained at village level and at KVK level on different aspects of organic practices, seed selection, line sowing, seed treatment, use of organic inputs like enriched compost, sticky traps, use on parasitoid and predators, timely agronomic practices *etc*. After two years of continuous support and practice Mrs. Rai could able to produce healthy crop with 80-85% reduction of pest and diseases. She could able to get a profit of 40-44% with CBR of 1:5 with positive soil biological index. Seeing the success of Mrs. Rai many fellow farmer started practicing the scientific organic practices.

**Keywords:** Farm income, Organic cultivation, Organic inputs, Predators

**Farmer's Name:** Mrs. Manika Rai
**Address:** Village- Mabong, Tehsil- Soreng, District- West Sikkim, Sikkim

## Introduction

Manika Rai (45 years) is a progressive women farmer from the village Upper Mabong, West Sikkim, Sikkim (Figure 1). She is also one of the project beneficiaries of DBT funded project who served as Farmer Fellow in the project. She was imparted training, demonstration and awareness programs conducted at Village Mabong, West Sikkimon organic cultivation practices of tomato, potato, maize, turmeric and mass production technologies of microbials. She also assisted in conducting training program and distributing inputs among the fellow farmers in Upper and Lower Mabong. She is one of the most potential farmers of Mabong where she grown tomato adopting organic practices recommended by TRA-NBRRDC, Nagrakata, West Bengal, CAU-CPGSAS, Umiam, Meghalaya and ICAR-NBAIR, Bangalore. She also cultivates citrus, cabbage, cauliflower, potato, turmeric, maize, pulses and several cut flowers. She sells the farm produce like tomato, potato and flowers in

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local market of Jorethang, West Sikkim. However, the major problems, which limit tomato yield production is wilt and blight diseases, red ant, sucking pests and caterpillars and lack of quality seeds and organic inputs like biopesticides, biofertilizers, compost and lack proper knowledge on organic cultivation practices.

## Training

Since the inception of the DBT funded project, *i.e.*, 2022, she was imparted several trainings, method demonstration, skill development programme on organic integrated pest management, mass production of biopesticides and macrobials and use of biopesticides such as seed treatment and soil application for organic cultivation. She also took part in distribution of organic inputs and imparting training to the fellow farmers (Figure 6). She grows all her crops including tomato using organic methods only as per suggestion provided by TRA-NBRRDC, Nagrakata, West Bengal, CAU-CPGSAS, CAU (Imphal), Umiam, Meghalaya and ICAR-NBAIR, Bengalore which brought potential results both in terms of increased yield and disease and pest reduction. Through the training, she benefited with increase income by utilizing the knowledge and skills acquired. She is an example of a successful women farmer who has shown that agriculture can be converted with the right investments after adoption correct agronomic measures.

## Achievement

Before organic practices/ bio-inputs provided by CAU-CPGSAS, CAU (Imphal), Umiam, Meghalaya; TRA-NBRRDC, Nagrakata and ICAR-NBAIR, Bangalore, her tomato field was significantly hampered by pests and diseases and got low yield. However, by adoption of organic approaches like use of disease free planting materials, proper nursery bed and land preparation, seed treatment with biopesticides and biofertilier @ 10 ml litre$^{-1}$, nursery bed treatment with *Trichoderma* enriched compost @ 3 kg m$^{-2}$, use of 100 kg enriched compost acre$^{-1}$, installation sticky trap @ 4 acre$^{-1}$ two foliar spray with Um-Bir @ 10 ml litre$^{-1}$, 2 release of macrobials led to the increase plant stand, reduced the incidence of wilt, early blight and late blight diseases, caterpillar and sucking pest's, whitefly infestation and significant increase in yield by 30.52% (Figure 2-5). There was also improvement in seed germination up to 20% than normal practice adopted by her. From these practices she obtained an increased in 30.52% of her produce, as yield of tomato after adoption of organic practices was increased from 2195.6 kg ha$^{-1}$ to 3160.4 kg ha$^{-1}$. Besides, the total microbial population of beneficial microbes were also significantly increased which was proved through laboratory test. Through the adoption of organic practices, not only she secured her food security, but also increased her income by selling tomato, with net earnings Rs. 1.20 lakh annum$^{-1}$ (approx.).

## Importance for Farmers

Mrs. Manika Rai inspired other women farmers of the upper Mabong also to start organic cultivation in their fields. She became the source of inspiration for other women farmers involved in farming. She always helps other farmers about organic practices and aware them to do in their field by her innovative ideas gained in training program.

## Economic Analysis

Table 1: Comparative analysis between before and after adoption of organic practices

| Component | Before adoption of Organic practice | After adoption of Organic practice |
|---|---|---|
| No. of Sprays | two rounds of spray week$^{-1}$ | • Seed treatment followed by two rounds of spray of Trichoderma (TRPATH01) biocides at 15 days intervals.<br>• Yellow/ blue sticky traps @ 4-5 traps acre$^{-1}$.<br>• Pheromone traps @ 1 trap acre$^{-1}$.<br>• Installation of tricho-cards and field release of lacewing. |
| Farmer's profit margins | Less | High |
| Production level | Average | Increased |
| Average net return | 2195.6 kg ha$^{-1}$ | 3160.4 kg ha$^{-1}$ |
| Pest damage level | Wilt, blight and white fly | Nil |
| Cost Benefit Ratio | 1:2 | 1:5.65 |

Figure 1: Mrs. Manika Rai with harvested healthy organic tomato from her field

Figure 2: Organic composts enriched with *Trichoderma* prepared by Manica Rai, ready for application in field


Figure 3: Manika Rai putting Tricho-card in her tomato field

Figure 4: Project staff collecting soil samples from Manika Rai tomato field for microbial analysis

Figure 5: An image of trich-card installed in tomato field of Manika Rai provided by ICAR-NBAIR, Bangalore

Figure 6: Mrs. Manika Rai receiving traps and bio-inputs in a field demonstration program at Mabong, West Sikkim

Figure 7: Tomato field of Manika Rai with traps and trichocards

## Conclusion

The success of Mrs Manika Rai showed that organic practices with proven biopesticides and biofertlizers and other critical input may lead to the successful cultivation of tomato. The organic practices may be recommended for the other fellow framer for higher plant growth and yield attributing parameter with significant reduction pf pests and disease infestation.

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