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Permaculture – Food Garden to Maximize Multiple Vegetable Yield – A Farmer Success Story

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Abstract

Vegetable cultivation is considered to be a high returned agri-business. The present case was documented for a Permaculture technique adopted by a farmer under the technical guidance of KVK, Namakkal at Palapatti village of Namakkal District, Tamil Nadu, India. The observations revealed that sale of multi vegetables at a time and get a gross income of Rs. 1,500.00 per day than sole vegetable (Rs. 300.00 – 500.00). The permaculture farmer considers that there is a need to diversify the mono cropping to multiple cropping in a piece of land for secure and sustainable future.

Background Information

Shri K. K. Velusamy is doing agriculture since 2007 and practiced vegetable cultivation in conventional pattern. He cultivated each type of vegetable in a single field as a monoculture in an area of 50 cent to 1 acre. He observed that the plants of the similar species compete for the same nutrients and become an attractive habitat for pests of that plant and in turn poor yield and return. He also noticed soil nutrient depletion in that cultivation system. Apart from these, he faced poor returns due to market fluctuation and huge arrival of the same type of vegetable at that time (Rs. 10.00 /kg). Hence he switched over to permaculture a positive and remunerative cultivation system and providing good returns under the technical guidance of KVK, Namakkal.

Institutional Involvement/ Intervention

Permaculture, an innovative mixed or multiple vegetable cropping with a large number of different vegetables, grown together in the same place (Shyam Shresta, 2014). A well-chosen combination of different vegetable species leads less competition for nutrients and other beneficial relationships between the different plants results healthy plants. The farmer adopted Permaculture in an area of 25 cent since 2017 under the guidance of KVK, Namakkal. He formed 26 beds with each bed size of 4 feet breadth, 3 feet height and 70 feet length in 25 cent for cultivation of multi vegetables. Bed to bed spacing is 1 feet. Initially each bed is dug up to 2 feet & it is filled with dried farm residues like cucurbits leaves, vines, twigs and leaves of multigrain plants, chopped coconut fronds in a compact manner and then it is drenched with EM solution @ 500 ml per 10 litre of water/ bed. After that the bed is covered with top soil, vermicompost @ 10 kg and Neem cake @ 1 kg/bed. He cultivates year round different types of vegetables belonging to different family together in an organic way. He has selected the crops according

to season, canopy & meet several purposes. Both side edges of all the beds were planted with cuttings of *Alternanthera* greens as ground cover to prevent soil erosion. The vegetables cultivated in permaculture are listed in Table 1. Irrigation is done with inline drip @ 10 minutes/day. Top dressing is done with vermicompost @ 5 kg at 2 months interval/bed.

Table 1: Cultivation of Vegetables in different layers in Permaculture

| Layer | Crop Name with family |
|-----------------------------|--|
| Canopy | Fabaceae – Sesbania; Euphorbiaceae – Tapioca; Rutaceae - Curry leaf; Graminae - Maize |
| Shrubs | Solanaceae - Tomato, Chillies; Malvaceae - Bhendi, Mesta; Fabaceae - Bush type lab lab, Beans & Cluster bean |
| Greens | Amaranthaceae – Sirukeerai, Arakeerai, Thandukeerai & Palak; Malvaceae - Mesta |
| Under-storey/ Herbs | Fabaceae – Fenugreek; Umbelliferae – Coriander; Lamiaceae - Mint |
| Ground cover on the edge | Amaranthaceae - <i>Alternanthera</i> |
| Root vegetables | Umbelliferae – Carrot; Chenopodiaceae - Beet root; Brassicaceae - Radish & Knol Khol |

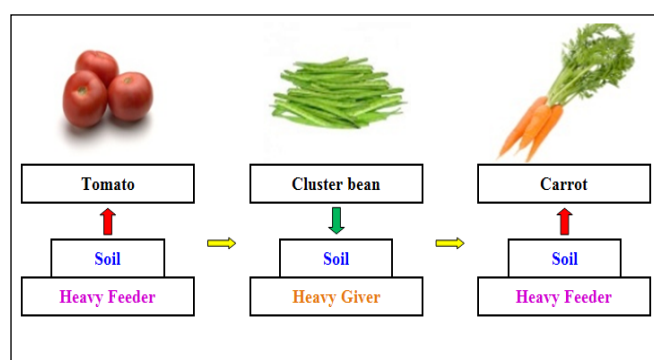


Figure 1: Multiple Vegetables Cultivation based on Plant Nutrients Demand in Permaculture

Special Innovations

Shri. Velusamy's innovative permaculture technique overcomes the pest & disease problems, nutrient management is achieved by cropping pattern and

continuous recycling of farm waste. One week after sowing, greens and herbs start to germinate. After 3 weeks all vegetables start germination. A dense cover spread over the ground and start harvesting of greens and herbs. Six weeks after sowing, production is increasing and there is no bare soil. Sustained harvest of vegetables (@ 30 – 35 kg/day) season after season.

Success Point/ Results

A vegetable permaculture technique provides better use of space, recycling & utilization of farm waste, and soil act as a shelter for beneficial microbes. In addition to that different layers above and below ground vegetable plants from different families prevents build-up of pests and nutrient depletion. The dense planting and the layer of mulch of vegetables help conserve moisture and keep down weeds, so the need for watering and weeding is minimized. This technique also facilitates market led production towards the sale of multi vegetables at a time and he gets a gross income of Rs. 1500.00 per day than sole vegetable (Rs. 300.00 -500.00). Obtained net income of Rs. 29,800.00 /month /25 cent and directly sell the vegetables at Farmers market and Organic vegetable retail shop at Mullai Nagar, Namakkal District, Tamil Nadu.



Figure 3: Bhendi, Chilli and Maize in Permaculture



Figure 4: *Alternanthera* as soil cover in Permaculture

Table 2: Economics – Conventional vs. Permaculture

| Economics – Area 25 cent or 0.1 ha | Conventional | Permaculture |
|------------------------------------|--------------|--------------|
| Expenditure (Rs.) | 21,500.00 | 15,100.00 |
| Gross income (Rs.) | 42,000.00 | 45,000.00 |
| Net income (Rs.) | 20,500.00 | 29,800.00 |
| B:C ratio | 2.0 | 3.0 |

Outcomes/ Extension Aspects

This technology is adopted by 61 fellow farmers in Namakkal District by seeing the success of permaculture. He acts as a resource person to various programmes and also propagated the technology to farmers, students & extension officials totalling 519. He got organic certification (1009 TNOCD) for his vegetables and started Namakkal Organic

Farmers Group in 2016. He received district level best farmer award during 2016. KVK also spread the technology through various extension activities to the farming community.

Conclusion

Multi vegetable garden under Permaculture techniques not only provides market led production of vegetables and but also favours biodiversity, and a range of plants mixed together, in the right combinations can support each other's growth and increase productivity of vegetables.

Reference

Shresta, S., 2014. Farmers Experience on Kitchen gardening. The Farmers' Handbook, "Near the House - Kitchen Garden, 13-19.