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Success Story

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Drumstick Cultivation - A Success Story

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Abstract

Cotton is the major crop in Nagarkurnool district accounting for 62% of total cropped area. Cotton is a highly input and labour intensive crop, but, fetch low net profit ranging from Rs. 25,000-50,000 ha⁻¹. The KVK, Palem has introduced the drumstick crop and popularized the PKM-1 variety during 2018 to 2020 through front line demonstrations (FLDs). Drumstick (*Moringa oleifera* Lam.), family Moringaceae, is a softwood tree, popular for its tender pods, leaves and flowers. The pod is used as a vegetable in Indian cuisine for its flavor and nutritional value. The commercial cultivation of drumstick has been increased and became profitable after the availability of annual variety PKM-1. The drumstick farm is easy to maintain and effective due to less operational maintenance and expenses as compared to that of cotton crop. As a result, it's cultivation had increased to 20 ha under PKM-1 variety in the district. A success story has been presented here which inspired fellow farmers in the district.

1. Introduction

The Drumstick (*Moringa*) was cultivated mainly for tender fruits which is a popular vegetable in South Indian cuisine and is valued for its distinctly inviting flavor. It is commonly known as Saijan (Hindi), Shevaga (Maratha), Murungai (Tamil), Muringa (Malayalam) and Munagakaya (Telugu) in different Indian languages. *Moringa* is rich in nutrition owing to the presence of a variety of essential phytochemicals present in its leaves, pods and seeds. *Moringa* is said to provide seven to ten times more vitamin C than oranges, ten times more vitamin A than carrots, 17 times more calcium than milk, 9 times more protein than yoghurt, 15 times more potassium than bananas and 25 times more iron than spinach (Rockwood et al., 2013). *Moringa* is rich in phytosterols like stigmasterol, sitosterol and kampesterol which are precursors for hormones. These compounds increase estrogen production, which in turn stimulates the proliferation of the mammary gland ducts to produce milk. It is used to treat malnutrition in children younger than three years (Mutiaru and Estiasih, 2013). About six spoonfuls of leaf powder can meet a woman's daily iron and calcium requirements,

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during pregnancy (Gopalakrishnan et al., 2016). Though perennial types have been known for a very long time, its cultivation is beset with many production constraints, such as a relatively long pre fruit bearing period, non-availability of planting materials, requirement of a greater number of rainy days in regions where water is scarce and vulnerability to pests and diseases. After the development of the annual type cultivar, PKM-1 has replaced the perennial moringa in South India, spreading fast due to their adaptability to varied soil and climatic conditions. It can also be grown in marginal land with high temperatures and low water availability, where it is hard to cultivate other crops (Nouman et al., 2014). It can tolerate a wide range of annual rainfall (250 mm-3000 mm) and pH (5.0-9.0) (Palada and Changl, 2003). Drumstick was cultivated in the southern states of Tamil Nadu, Karnataka, Kerala and Andhra Pradesh in about 14,683 ha area (Anonymous, 2018). Based on wider adaptability, nutritional aspects and market demand, the KVK, Palem has conducted front line demonstrations (30 Nos.) to popularize Drumstick crop in the district.

2. Project Impact

Sri Vundyala Krishna Reddy (60 years), a resident of Parvatayapalli (V), Nagarkurnool district having 2.4 ha of irrigated and 2.8 ha of rainfed red sandy loamy soil. He usually cultivates regular field crops like cotton, paddy and redgram during rainy season and groundnut during *rabi* season for the past two decades. He was facing irrigation water shortage, labour scarcity and low net returns from field crops, thus, unhappy with farming. He had decided to raise any new crop, which has great market demand, perennial with less cost of cultivation. He has visited Krish Vigyan Kendra, Palem and discussed with Horticulturist to find a solution for his problem. Then KVK, Palem team created awareness and motivated to cultivate Drumstick crop in 0.4 ha area initially and provided 0.25 kg PKM-1 variety seed. The PKM-1 variety was propagated by seeds, it comes to harvest 7-8 months after planting, fruits are 75 cm long, fleshy and taste, individual fruit weight is 150 g, average yield 200-250 fruits tree⁻¹. It gives total yield about 53 t ha⁻¹ and suitable for 3-4 ratoons.

3. Details of the Project Impact

The farmer was motivated to cultivate Drumstick crop in 0.4 ha area as a part of crop diversification in his field during 2018-19 to 2020-21 with PKM-1 cultivar. He

has installed a drip irrigation system to save water on the advise of the scientists. The plants were planted at 3×2 m² spacing and drip irrigation system with 16 mm size online drip lateral with dripper having 4 litres hour⁻¹ discharge capacity and two drippers per plant. Irrigation water given @ 4 litres tree⁻¹ day⁻¹ at flowering and fruiting stage during summer and non rainy days.

3.1. Methodology

Sri Vundyala Krishna Reddy has followed pruning, ratooning, integrated nutrient management and integrated pest management practices as suggested by KVK, Palem. Ratooning practice was done by cutting all branches on main stem leaving 1 m height from ground level after completion of harvesting during July month every year.

3.2. Cost economics

The comparison of Drumstick and field crop cost economics were recorded during demonstration and given below in table 1.

The net returns to the farmer by the cultivation of

Table 1: Cost of technological intervention (ha) and economic benefit (2020-21) over three years

Sl. No.	Operation	Drumstick	Cotton
1.	Land preparation	8,000	24,000
2.	Seed cost	3,750	6,800
3.	Nursery raising	10,000	-
4.	Farm yard manure	35,452	24,000
5.	Transplanting/sowing	7,500	14,200
6.	Herbicide application	3,000	7,200
7.	Inter cultivation	8,000	18,600
8.	Pest and disease management	24,000	66,000
9.	Fertilizers	34,725	54,000
10.	Drip irrigation system	27,500	-
11.	Harvesting	27,000	60,000
12.	Packing and transport	12,500	12,000
13.	Total expenditure	2,01,427	2,86,800
14.	Yield (q ha ⁻¹ in three years)	612.5	60
15.	Gross income @ Rs. 800 q ⁻¹	4,90,000	3,60,000
16.	Net income (Rs. ha ⁻¹)	2,88,573	73,200
17.	Water saving by drip irrigation (%)	45	-
18.	Benefit:cost ratio	2.43:1	1.26:1

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drumstick crop for an economic life of three years was to the extent of Rs. 2,88,573 ha⁻¹, while in case of cotton crop it is Rs. 73,200 ha⁻¹. The additional net returns per hectare with drumstick crop over cotton during three years is to the extent of Rs. 2,15,373. The higher benefit cost ratio (2.43:1) was obtained with drumstick cultivation over cotton crop (1.26:1).

3.3. Impact on livelihoods/socio economic conditions of the farmer

The farmer has harvested drumstick fruits up to three years by practicing ratooning and also saved 45% of irrigation water with drip system. He could reap 612.5 q ha⁻¹ pods and accrued the net returns of Rs. 2,88,573 ha⁻¹ with a B:C ratio of 2.43:1.

3.4. Feedback of the farmer

He strongly opined that PKM-1 variety has good size pod (75-90 cm), better yield (150-200 fruits tree⁻¹) and bearing within the six months, which has given maximum yield and net profit. He also reiterated that Drumstick cultivation was profitable than field crops in the district.

4. Sustainability

After successful economic returns, he has extended drumstick crop up to 1.0 ha in the subsequent year. He had shared PKM-1 seeds with nearby village farmers free of cost. About 25 farmers have adopted it totalling 20 ha in Kollapur, Nagarkurnool, Jadcharla, and Kalwakurthy mandals of the Nagarkurnool district.

5. Lessons Learnt

- Commercial cultivation of drumstick by adopting PKM-1 variety is profitable
- Pruning, application of foliar micro nutrients, integrated pest manage and ratooning will maximize drumstick yields
- Efficient use of water by using drip irrigation system
- Drumstick cultivation has been given better net returns than field crops

6. Conclusion and Future Perspectives

This demonstration proved that the drumstick cultivation was profitable which had given the maximum net return of Rs. 2,88,573 ha⁻¹ with a B:C ratio of 2.43: 1 than traditional field crop like cotton (Rs. 73,000; 1.26:1), respectively. Replacement of input and labour intensive cotton crop with drumstick crop is most essential to sustain the yield and economics. Due to the

nutritive, medicinal values of drumstick tree, there is a need for expansion of drumstick cultivation in a larger area and it will benefit both farmers and consumers.



Figure 1: Field visit by Dr. T. Prabhakar Reddy and Dr. A. Shankar, SMS (Horticulture), KVK, Palem to the FLD on Drumstick Variety PKM-1 at V. Krishna Reddy, Parvatayapalle, Nagarkurnool district, Telangana state



Figure 2: Drumstick variety PKM-1 on bearing stage at the field of V. Krishna reddy, Parvatayapalle, Nagarkurnool district, Telangana state

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