



## **Economic Analysis of Small Scale Horticultural Nursery Enterprise in West Godavari District of Andhra Pradesh**

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### **ABSTRACT**

*Small scale horticultural nursery enterprise is a self-employment business that can contribute to income generation and socio-economic development of an individual. A study was conducted to study the economic analysis of horticultural nursery enterprise at our krishi vigyan Kendra, Dr. Y.S.R. Horticultural University, West Godavari district, Andhra Pradesh, India during 2017-18. Nursery is a place where quality planting material production will take place. As per the farmer's requirement, we under taken vegetable seedlings nursery and cashew grafts nursery and also worked out economics of those two nurseries. With respect to cashew nursery, for every 35,000 grafts, the success rate was recorded as 50 per cent and production cost, net profit and benefit cost ratio were recorded as Rs. 2, 96,260, Rs. 2, 28,740 and 1.8:1 respectively. With this activity nearly 300 ha area under cashew plantation was increased in the coastal area of Andhra Pradesh. In case of growing of raising seedlings under protray which is gaining importance for the production of pest free healthy seedlings, Krishi Vigyan Kendra, Venkataramannagudem has initiated the production of hybrid vegetable seedlings during 2017-18 where seedlings were raised under fifty per cent shade net. Nearly 2 lakhs of vegetable seedlings were supplied to the farmers. For every, 100 protrays, the production cost, net profit and benefit cost ratios were noticed as Rs. 2130, 4926 and 3.31:1 respectively.*

**Key Words:** Cashew nursery, Horticultural nursery, Hybrid vegetable seedlings

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### **INTRODUCTION**

Nursery mainly grouped into private and public nurseries depending on the mode of ownership (Adebanjo *et al.* 1996). One of the major different between the private and the public nursery is that the priority on profit maximization (Mailumo *et al.* 2006). The motive and goal of any private business enterprise is to make as much profit as possible while the public enterprise has the ultimate motive of catering for the welfare of the public (Sargent 1993)

Cashew (*Anacardium occidentale*), one of the important plantation crop in West Godavari district of Coastal Andhra Pradesh, is widely grown in many states of India. It is found mostly in India in the West Coast, East Coast and in some plain areas of Karnataka, Maharashtra etc. These are the traditional areas for cashew cultivation. During 2006-07, west Godavari district had an area of 40,625 hectare under cashew nut with a production of 24,375 metric tonnes but at present had an area of 23,379 ha with a production of 11,689.5 metric tonnes. These comparison in both the years pointed out that, there is drastic reduction (more than 50%) in area as well as production of cashew nut. It may be due to many reasons like, non availability of quality planting material, selection of low yielding varieties, poor cashew orchard management practices, uneven rains or lack of irrigation facilities during critical periods of crop growth, poor nutrient management, in addition to neglected pest and disease management practices, To achieve this, use of high quality planting material having potential for higher yield as well as adopting scientific management practices in all future plantation programmes is a paramount importance factor (Hegde, 1997). Production of quality planting material can be achieved through a regulated network of nurseries set up for production of certified planting material.

In vegetable nursery, the protray or plug type nursery is an upcoming technique for quality vegetable seedlings production, where vegetable seedlings are produced under 50 per cent shade net and such seedlings have better germination, appears healthy and are protected from pest and diseases and build up well developed root system within 25-35 days depending upon a variety or crop. The main benefits of protray nursery includes, optimum use of high value seed, reduced seed wastage, quality seedlings, improved seed germination, better root development, minimized seedling mortality, provides uniform, healthy and sturdy seedlings, easy handling and cheaper transportation and good main field establishment.

Hence the cashew as well as hybrid vegetable nursery was planned for production of quality and high yielding varieties with disease and pest free planting materials. This economic study may be helpful for the establishment of Cashew and vegetable nurseries in our state as well as in India.

## **MATERIALS AND METHODS**

The study was conducted at Krishi vigyan Kendra nursery, Dr. Y. S. R. Horticultural university, Venkataramannagudem, West Godavari district (India) during summer, 2017-18. The nursery was raised under 50 per cent shade net.

### **Cashew nursery**

#### **Rooting media for cashew nursery**

The red soil, Vermicompost, SSP and *Trichoderma viridae* were used for preparation of rooting media. The rooting media contains red soil, Vermicompost in the ratio of 2:1 and 5 kg of *Trichoderma viridae* and 10 kg of SSP per every 1000kg of red soil. The prepared rooting media was filled in 6 × 9 inch poly bags and watered thoroughly. Each bag with rooting media may weigh around 1 to 1.2kg.

#### **Preparation of cashew nuts for sowing**

The selected cashew nuts were soaked in water for one day. The floated nuts were discarded as those are unfit for sowing. The remaining nuts were sown in the poly bags at appropriate depth. The sown bags were covered with paddy straw for good germination. The seedling was grafted (soft wood grafting) with BPP-8 scion stick 45 days after sowing.

#### **Pre curing of scion**

Non flowered, 2-3 month old lateral shoots of current season growth was selected as scion material for grafting. The selected shoots were 15 cm long straight; uniformly round with pencil thickness, brown coloured having dormant plumpy terminal buds. The selected scion shoots were pre cured before 10-15 days of grafting by clipping of leaf blades, leaving the petiole. Soon after separation from the mother plant, scion sticks were dipped in water and placed in a gunny bag and brought to the nursery shed for grafting. The grafting work was carried out during September month. The successful cashew grafts were sold 4 months after grafting. As per university sanction, the price of each graft was Rs.30

#### **Vegetable nursery (hybrid tomato seedlings)**

Well decomposed cocopeat and Vermicompost in 1:1 ratio and 1kg *Trichoderma viridae* per 100kg rooting media was used as a rooting media, which prevented damping off disease in the nursery and also possessed high water holding capacity and good texture, improved air circulation, encouraged seed germination and root growth.

Protrays were filled with rooting mixture @ 1.2 kg per tray. Small depressions were made in the centre of each cell in the protray and one seed per cell was sown and covered with same media. Ten trays one over the other was kept and covered with a plastic sheet and left for about 3- 5 days. This helped in increasing temperature of media, maintained the humidity level and also enhanced the seed germination. Raised beds were prepared having 100 cm width, 15 cm height and convenient length with slope on both the side. In between beds 2 ft space was left for watering. The trays were arranged 5 days after sowing in double row over beds and watered once in a day. The seedling growth was encouraged by foliar application of water soluble fertilizers 19:19:19 @ 3 g/ lt on 12 and 21 days after sowing. Watering was stopped 2 days prior to sale, which helped in hardening the seedlings. The tomato seedlings were ready for sale in 25 days. And were sold at Rs.0.80 per seedling and in case of cashew, it was Rs. 30 per graft. The observations were also recorded on germination percentage, seedling height and number of seedlings germinated per tray.

## **RESULTS AND DISCUSSION**

In case of cashew the average germination percentage was recorded as 87.5% and days taken for germination of cashew nuts was 15-20days. For every 40,000 cashew nut sown in poly bags, the germinated seedlings were noticed as 35,000 and the grafting work carried out on the same number of seedlings during September month of 2017. The final success rate approximately noticed as 50%. This may be attributed to moderately high temperature coupled with high humidity, less fluctuation in

maximum and minimum temperatures, adequate supply of healthy and matured scion sticks because the mother trees resume the active growth phase after the onset of monsoon with adequate supply of moisture and nutrients, fast cambial activity and high accumulation of carbohydrates in scion shoots. Similar observations were reported by Syed and Rao (1989), Singh *et al.*, (1989) and Sawke (1992). With respect to economics of the cashew nursery, the cashew nursery production cost, gross income and net income were Rs. 2, 96,260, Rs. 5,25,000 and Rs. 2,28,740 respectively (Table 3) and the benefit cost ratio was 1.8:1.

With respect to vegetable seedling nursery (hybrid tomato), the maximum germination percentage was noticed as 90.8% at 10 days after sowing under west Godavari district conditions (Table 1). The excellent germination percentage (90.8%) was observed at our nursery over private nursery (78.5%) which was located nearby our nursery. They were used only cocopeat as potting media. It could be due to the fact that vermicompost rich in organic matter with high water and nutrient holding capacity of the media for supply to the seedling. Vermicompost is reported to have bioactive principles considered to be beneficial for germination, root initiation, root growth, and growth of the seedling, as also having a balanced composition of nutrients. The synergistic combination of Vermicompost, mixed with cocopeat and *Trichoderma viridae*, affects physical, chemical and biological properties of the rooting media. Vermicompost provides adequate nutrients and enhances both physical properties and waterholding capacity. This result is in line with the findings of Campos Mota *et al* (2009), Bachman and Metzger, (2008), Zaller., (2007), Karama and Manwan, (1990), Sahni *et al*, (2008). Abirami *et al* (2010) suggested that since cocopeat was low in nutrients when mixed with vermicompost it provides a better growth medium for seedling establishment.

The hybrid tomato seedlings production cost, gross income and net income were in Rs. 2130, Rs. 7056 and Rs. 4926 respectively (Table 4). The benefit cost ratio was 3.31:1. The production cost and returns may vary from crop to crop and time to time due to variations in seed material cost as well input costs. Month wise the annual weather data of west Godavari district was also mentioned (Table 2).

The farmers have realized the benefit of raising of vegetable seedlings in protrays rather than on nursery bed. Because of better establishment of portray seedlings, gap filling was minimum as compared to nursery bed seedlings and also gave quality and early yields. Small scale horticultural nursery enterprise is a viable venture that one can engage in as a form of self employment. Apart from income generation, it is another means of conservation of plant species and it has a great role in the control of environmental problem like climate change. It creates employment opportunities to unemployment youth and improves livelihood of many individuals in rural areas.

**Table 1:** Germination percentage of hybrid tomato Arka samrat

S. No	Date	No. of seedlings germinated per pro tray	Germination percentage (%)
1.	7 DAS	74	75.53
2.	8 DAS	82	83.67
3.	9 DAS	86	87.75
4.	10 DAS	89	90.8

**Table 2:** Month wise annual weather of West Godavari district during 2017-18

Month	Rainfall (mm)	Temperature °C		Relative Humidity (%)
		Maximum	Minimum	
June, 2017	174.7	37.7	30.2	83.7
July, 2018	232.2	36.0	28.0	79.8
August, 2017	207.3	35.4	27.6	76.6
September, 2017	108.3	40.5	27.4	75.5
October, 2017	109.5	32.5	26.3	94.8
November, 2017	10.0	33.7	22.6	88.7
December, 2017	-	41.9	21.1	69.8
January, 2018	0.0	29.7	20.0	69.6
February, 2018	0.0	31.6	20.3	74.7
March, 2018	2.3	35.1	21.4	93.7

**Table 3:** Economic analysis of cashew nursery at KVK, Venkataramannagudem

Expenditure details for production of 17,500 grafts			
S.No.	Item/work	Quantity	Amount (Rs.)
1.	Cashew nuts for raising seedlings	400kg nuts @ Rs.140/- per kg	56,000
2.	Polythene bags (size:6 inches x 9 inches)	300 kg @ Rs.135/- per kg	40,500
3.	Potting media (red soil, vermicompost, SSP and DAP)		10,760
4.	Bag filling with potting mixture @ Rs. 0.50/- each (40,000x0.50)		20,000
5.	Grafting charges@ Rs.3/- each graft (35,000x3/-)	35,000	1,05,000
6.	Labour charges during grafting and watering and caring charges	150 labour days @ Rs. 200/- per person per day (150 x 200)	30,000
7.	Plant protection chemical		14,000
8.	Polythene strips and Polythene caps		5,000
9.	Miscellaneous		15,000
		<b>Total (Rs.)</b>	<b>2,96,260</b>
Income details			
1.	No. of bags filled and nuts sown	40,000	
2.	No. of grafted seedlings	35,000	
3.	No of Cashew grafts (50% survivability)	17,500 @ Rs. 30/- each graft	5,25,000/-
4.	Net profit (Rs.)	5,25,000-2,96,260 =	<b>2,28,740</b>
5.	Benefit cost ratio		<b>1.8:1</b>

**Table 4:** Economic analysis of hybrid vegetable (Tomato) nursery at KVK, Venkataramannagudem.

Expenditure details (for 100 pro trays)			
S.No.	Item/work	Quantity	Amount (Rs.)
1.	Potting media (cocopeat and Vermicompost at 1:1 ratio)	120kg @ each tray 1.2 kg potting media	780
2.	Seed cost (Tomata var. Arka samrat)	3.2 pocket@ 1 pocket @ Rs. 300	960
3.	Labour cost for media preparation and sowing		130
4.	Watering and caring (daily 15min)		120
5.	Plant protection chemicals		100
6.	Miscellaneous		100
7.	Total cost of raising nursery	Total (Rs.)	<b>2130</b>
Income details			
1.	No of seedlings ready for sale @ 90% germination.	8820	
2.	Income (Rs.) @ .80 per seedling	<b>7056</b>	
3.	Net profit	7056-2130 =	<b>4926</b>
4.	Benefit cost ratio		<b>3.31:1</b>



Soaking of cashew nuts for 24 hrs



Dipping of nuts in Copper oxy chloride solution



Plate 1: Figure showing different operations involved in cashew grafts production

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