

## PEPPER CULTIVATION IN KERALA

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### Abstract

*The largest producers of pepper in the world are Vietnam and Indonesia. India comes third. Pepper is mostly grown in Western Ghats in Kerala, Karnataka, and Tamil Nadu. Production and export of the pepper in the world was dominated by India but the status is losing and there has been stagnant in the production of pepper at around 50,000 tonnes in the last few years. The major portion of black pepper production in the country is accounted by Kerala and Karnataka. In the country, Kerala accounts for 75 percent of the total production, the production has recorded a slight increase in 2014-15 from 40.6 tonnes to 42.1 tonnes in 2015-16. The yield of pepper is highly affected by the frequent attack of diseases, lack of pest control measures, lack of fertilizer, water facilities, climatic conditions and nature of soil.*

**Keywords:** *Pepper, Yield, Theoretical Yield, Potential Yield, Water-Limited Yield, Productivity.*

### Introduction

Black Pepper is one of the most ancient and traditional spice crops of India which has been produced and traded worldwide. India reigned supreme till 1990s in the production and export of pepper, however, now it stands third in production and export. Black pepper is cultivated mostly by small and marginal holders and their livelihood has crucial bearing on this crop. Idukki and Wayanad are the two major pepper producer districts in Kerala. In 2008-09 Kerala became the largest pepper producer state with over 41,000 tonnes on 1.75 lakh hectares. The other states include Karnataka and Kanyakumari and Dindigul districts in Tamil Nadu. Pepper production in the State in present years has been affected mainly by low productivity and various diseases. In order to revive spices development in the state, the Department of Agriculture had initiated comprehensive pepper development programmes in all districts in 2014-15 (Economic Review 2016). From third year onwards black pepper starts yielding. In India 273kg/ha, is the average yield while it is 425kg/ha in Indonesia, 2,000kg/ha in Malaysia and 431kg/ha in Sri Lanka. The economic life of black pepper is 20 years and the yield of the vines start declining after about 20 years of regular bearing.

### Review of Literature

**Sanjana (2004)** low priced peppers are being imported in India and are re-exporting under Indian label is seriously affect the quality image of Indian pepper in the international

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market and also affect the demand in future. The problems such as diseases, lack of skilled labourers, financial instability, cost of manure and the quality of seedling decline the productivity. Nature of soil, water facilities, climatic conditions, lack of fertilizers attack of diseases and lack of pest control measures affect the yield of pepper. High production cost and low productivity make pepper costlier in the world market.

**Thomas (2009)** the share of Kerala's export of black pepper is gradually declining from the country. The study observed that the majority of spice traders and spice cultivators find black pepper cultivation in Kerala is not profitable. Import of pepper to Kerala falls the domestic price and the main reason for decaling profit. Paradises of spice growers Wayanad and Idukki districts present a grim picture today. Many pepper growers committed suicide in these districts due to pay off the agricultural debt. In India, Karnataka is the highest productivity state followed by Kerala and Tamilnadu. Fall in domestic price is the major concern, this is due to the import of pepper to Kerala from other pepper producing countries.

**Magesh (2012)** the performance of pepper in post globalised era noticed that there was instability in the production of pepper due to the instability in productivity than in area. The comparative study of pepper growing states in last two decades (1991-2010) had shown 0.04 percent per annum CAGR which was very low. There was a negative growth with stagnation in the production of pepper during the period in Kerala. The instability in the production was due to the fluctuation in pepper productivity. There was a positive growth rate trend in terms of production, area and productivity in Karnataka. This was due to the increase in area than in productivity. The growth rates in production were area led in Tamilnadu because the growth rates in productivity was negative. In other states also the growth in area, production and productivity were decelerating.

**Jeyarani (2006)** 2004 recorded a production of 3.08 lakh tons, the fluctuation in the global production of pepper between 3.5-4.0 lakh tons due to the result of the sudden increase in the Vietnam's production in the global production. 90 percent of India's pepper production was from Kerala and the other producers are Karnataka and Tamilnadu. United States was the main market for malabar black which traditionally imported 50 percent of Indian's export, followed by Canada, Netherland and Italy. Sultan Batery and Kochi are the major primary markets in Kerala. Recently Delhi, Indore and Nagpur developed as the major markets for pepper in India. Non-availability of hybrid varieties on time and lack of proper guidance from the government agencies on scientific farming were the reasons for low productivity of pepper.

**Krishnan (2012)** during the post reform there was an inflow of pepper into the country. The Sanitary and phytosanitary (SPS) compliance is the major barrier for export of spice products. Strict labelling and strict packing requirement are other non-technical barriers which affected trade adversely. Frequent changes in labelling requirement causes for additional cost to the exporters limiting the profitability. Loss of trade opportunities, in almost all the market due to the variation in stringency level across the market on account of one reason or other.

**Thampi (1999)** the rise in world production of pepper is deterrent to Indian pepper exports. The yield gaps are very wide between progressive farmers and research stations and between national average and elite farmers. To get gain of cost minimization, competence

price and exportable surplus the yield gap should be bridged. Frequent modification of quality standards and continued efforts at the pepper export calls front to keep up with requirement. The quality concern of the pepper are salmmella, moisture levels, mould, pesticide residues, extraneous matters etc.

### **Objectives**

- To assess the extent of growth in pepper production in Kerala.
- To estimate the yield of pepper cultivation in Kerala.

### **Methodology**

The paper is based on the secondary data and the information is retrieved from various publications, official reports, research papers/articles, Ph.D. theses etc. The data sources mainly include reports of Spice Board of India, RBI Hand book on Indian Economy, International Pepper Community, internet and other national and International journals.

### **Production Practices**

Production practices of pepper follow like varieties of pepper cultivated, climate, soil conditions, nursery management, pest management, disease management, field preparation, irrigation facilities available, production of pepper in Kerala and India.

### **Pepper Production System in India**

In India Western Ghats is a native of the Pepper, and is being produced:

- as a garden crop in every admixture
- as a combined or intercrop follow on different trees (including arecanut and coconut) in the garden and farmsteads
- as a pure crop on hill and in valleys of low hills
- as a mixed crop on shade trees in cardamom, tea and coffee plantations

“Extensive homestead cultivation” is the common system of cultivation in Kerala where pepper cultivation is absorbed as a secondary crop, scatter with various other crops.

### **Varieties**

Majority of the cultivated types of pepper are monoecious. More than 75 cultivars of pepper are cultivating in India. In Kerala, among the growers the best of all the traditional cultivars of pepper is karimunda. The other important cultivars are Kottanadan, Narayakkodi, Aimpiriyan, Neelamundi, Kuthiravally, Balancotta, Kalluvally, Malligesara and Uddagare.

(Source: Karshaka Information Systems Services and Networking (KISSAN), Department of Agriculture, Govt. of Kerala.)

### **Production**

The process of crop growing to cultivation product which is pepper in land from sapling trees to till getting yield for one year.

### **Propagation**

Black pepper vines produce three types of shoot, namely:

- Long internodes primary climbing shoot which attach to the support/standards having casual roots at nodes;

- Runner shoots having long internodes which emerge from the base of the vine and creep on the soil, which strike roots at each node and
- Fruit bearing lateral shoots.

Runner shoots mainly raised cuttings; however terminal shoots can also be practiced. A bushy habit develops with lateral branches cutting. Rooted lateral branches are applying for promote bush pepper. Though seeds (barriers) are absolutely usable, they are not commonly used for increasing plantations as seedling will not be genetically stable.

#### Area Utilized and Production of Pepper in Kerala State 2015-16

Table 1

S. No.	District	Area (Ha)	Production (Tonnes)
1	Thiruvananthapuram	2293	972
2	Kollam	3330	1093
3	Pathanamthitta	1707	599
4	Alappuzha	616	134
5	Kottayam	3215	1150
6	Idukki	42694	25495
7	Ernakulam	1867	527
8	Thrissur	1790	479
9	Palakkad	2510	954
10	Malappuram	2938	460
11	Kozhikode	3474	934
12	Wayanad	12498	6593
13	Kannur	4269	1553
14	Kasaragode	2747	1189
<b>State Total</b>		<b>85948</b>	<b>42132</b>

Source: Senthilkumar .T .S & Uma Swarupa .P, "A Quantitative Description of Pepper Cultivation in Kerala" February 2018, International Journal of Emerging Research in Management & Technology, vol.7, No.2, pp.1-6

Table 1 shows that, in terms of area (42694 Ha) and production (25495tonnes) Idukki district stands first followed by Wayanad district with area (12498Ha) and production 6593tonnes). Alappuzha district is the least pepper producing district in terms of area and production n Kerala.

#### Variation in Area Utilized and Production of Pepper in Kerala

Table 2: Variation in Area and Production of Pepper between 2001-02 and 2015-16

Crop	Area (Ha)			Production (Tonnes)		
	2001 - 02	2015 - 16	Variation %	2001 - 02	2015 - 16	Variation %
Pepper	203956	85948	-58	58240	42132	-28

Source: Senthilkumar .T .S & Uma Swarupa .P, "A Quantitative Description of Pepper Cultivation in Kerala" February 2018, International Journal of Emerging Research in Management & Technology, vol.7, No.2, pp.1-6

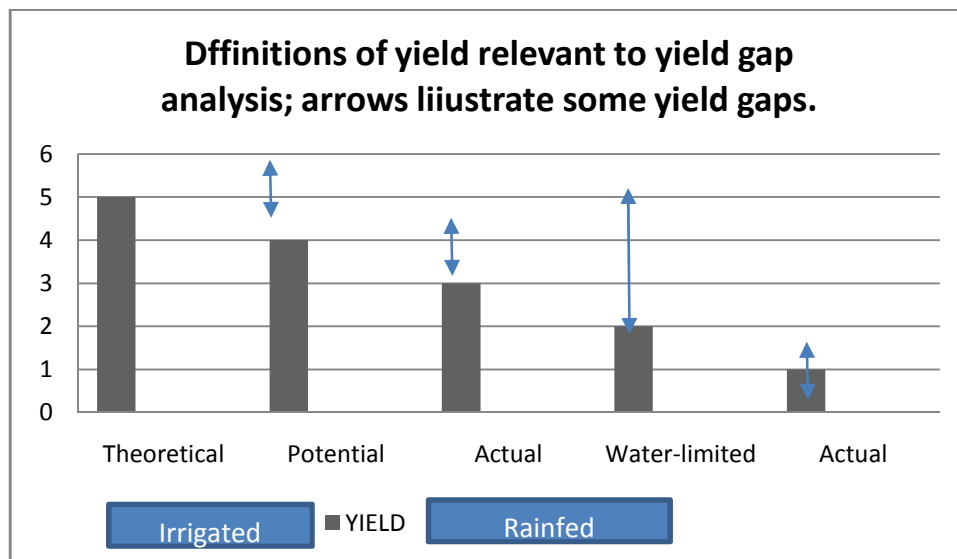
Table 2 shows between the period 2001-02 and 2015-16 the variation was -58 in utilizing the area and in production of pepper also the negative value -28 in the period 2001-02 and 2015-16.

#### Yield

Crop yield is a measurement of the amount of agricultural production harvested per unit of land area. Yielding in black pepper starts from third year onwards.273kg/ha is the

average yield of pepper in India. (Black Pepper Cultivation in India, indianestates.co.in, 2016) Economic life of a black pepper is 20 years and after normal bearing for around 20 years, the yield of the vines start declining.

Black pepper starts yielding from third year onwards. Average pepper yield in India is 273kg/ha. Black pepper has an economic life of 20 years and after regular bearing for about 20 years, the vines start declining in yield.



Source: Multiple sources (Bingham 1967; van Ittersum & Rabbinge 1997; Evans and Fischer 1999; Lobell et al. 2009; Connor et al. 2011).

Yield gap is the difference between two levels of yield. Yield potential is defined as the yield of a crop cultivar when grown in environments to which it is adapted, with nutrients and water non-limiting, and pests and diseases effectively controlled (Evans, 1993). (*Yield gap analysis of field crops Methods and case studies, Food and Agriculture Organization of the United Nations, Rome, 2015*)

Crop yield encompasses two factors: the amount of a particular crop that a piece of land can grow and the monetary value of those crops.

- Dependent variable – Yield
- Independent variable – human labour, fertilizer, cattle manure, pesticide, irrigation
- Parameters – small cultivators, large cultivators and overall categories of cultivators
- Yield gap – difference between experiment station yield and actual farm yield.
- Yield constraints – the factor that prevents planters from achieving the potential yield under plantation conditions.

#### Constraint Types

- Agro-biological - Diseases, rain, pest, soil
- Economic and Institution - Labour, fertilizer, pesticides, credit, marketing

**Table 3: Area, Production and Yield of Pepper in India**

Year	Area ('000 Ha)	Production ('000 Tonnes)	Yield (Kg/Ha)
1997-98	181.50	57.30	316
1998-99	239.80	75.70	316
1999-00	195.60	59.00	302
2000-01	213.90	63.70	298
2001-02	219.38	62.44	285
2002-03	224.40	71.70	320
2003-04	233.40	73.20	314
2004-05	228.30	73.02	320
2005-06	260.23	92.90	357
2006-07	245.96	69.01	281
2007-08	197.00	47.06	239
2008-09	238.71	47.40	199
2009-10	195.92	51.02	260
2010-11	184.00	52.00	183
2011-12	200.30	40.60	203
2012-13	124.60	52.60	422
2013-14	123.81	50.87	411
2014-15	123.62	54.59	442

Source: Senthilkumar .T .S & Uma Swarupa .P, " A Quantitative Description of Pepper Cultivation in Kerala" February 2018, International Journal of Emerging Research in Management &Technology, vol.7, No.2, pp.1-6

Table 3 shows that during the period 1997-98, 57.30 thousand tonnes was produced in the area of 181.50 thousand hectares and the yield was 316 kg per hectare. The area utilized had been increasing since 2000-01. But in the year 2014-15, production was 54.59 thousand tonnes and the area under production was 123.62 thousand hectares and the yield increased to 442 kg per hectare.

#### Variation in Production and Yield of Pepper in Kerala

**Table 4: Variation in Production and Yield between 2014-15 and 2015-16**

Year	Production (Tonnes)	Yield Rate (Kg/Ha)
2014 - 15	40690	476
2015 - 16	42132	490
Variation	3.54%	2.94%

Source: Senthilkumar .T .S & Uma Swarupa .P, " A Quantitative Description of Pepper Cultivation in Kerala" February 2018, International Journal of Emerging Research in Management &Technology, vol.7, No.2, pp.1-6

Table 4 shows that the positive variation in production and yield of pepper between 2014-15 and 2015-16. Production is 3.54% and Yield is 2.94% respectively.

#### Cost of Cultivation of Pepper in Kerala

**Table 5: Cost of Cultivation per Hectare of Pepper during the Year 2014-15**

S. No.	Component	Cost per Ha (Rs.)
1	Hired Human Labour	39107
2	Machine Labour	232
3	Seed/Seedlings	429
4	Farmyard Manure and Chemical Fertilizers	6646
5	Plant Protection	255
6	Land Tax and Irrigation Cess	144
7	Repair & Maintenance charges of implements, machinery and buildings	1011

8	Interest on working capital	5104
9	Other Expenses	4372
10	Total Cost 'A' (1-9)	57300
11	Interest on Fixed Capital	2133
12	Cost B1 (10+11)	59433
13	Interest on Land value	469893
14	Cost 'B' (12+13)	529326
15	Imputed value of Household Labour	14284
16	Cost 'C' (14+15)	543610
17	Value of Output received (Rs./Ha)	187414

Source: Senthilkumar .T .S & Uma Swarupa .P, "A Quantitative Description of Pepper Cultivation in Kerala" February 2018, International Journal of Emerging Research in Management & Technology, vol.7, No.2, pp.1-6

Table 5 shows that the cost of hired human labour (Rs. 39107/ha) stands first in the different components. The second is followed by manure and fertilizer (Rs.6646) and interest on working capital (Rs.5104). Cost on land and irrigation cess (Rs.144 /ha) is the minimum cost as compared to other components in the cultivation of pepper in Kerala.

### Conclusion

In the southern states of India the production of the pepper is predominantly concentrated. The larger producer of the pepper in India is Kerala but its output has been firmly worsening during the late 2000s. Pepper needs ample care particularly when it is immature and pepper is a weak plant. It requires rain, scattered and at definite spell and sun and warmth, in about equal measure. In 2011-12 the production of pepper in Kerala was declined to about 16 thousand tonnes from about 45 thousand tonnes in mid 2000s. However the production from Karnataka and Tamil Nadu has been increasing steadily. Though, the comprehensive production in the country has fallen accordingly. All over Kerala, production has fallen because of dangerous infestations in maturing pepper garden, unfavourable market conditions, variation in weather patterns and agitated shift in the more lucrative crops by the producers. Low productivity along with various diseases affected the pepper production in the state recently. Increasing yield or productivity is critical to economic growth. Cultivator needs to be trained on scientific crop management practices to provide improved productivity.

### References

- ✿ A Sajitha, "National Research Programme on Plantation Development (NRPPD)", (Sponsored by Department of Commerce, Ministry of Commerce and Industry, Government of India, Discussion paper No. 33), Centre for Development Studies, Thiruvananthapuram Kerala, 2014
- ✿ C. Magesh, "A Indian Pepper Export : Performance in Post Globalised Era", Bharathiar University, September- 2012
- ✿ Dr. Roy Scaria, "Farm practices and pepper productivity in Idukki district: An empirical analysis", International Journal of Advanced Research and Development (Volume 2; Issue 5; September 2017; Page No. 440-444, ISSN: 2455-4030)
- ✿ P.S. Sreekantan Thampi, "Spices Marketing : Sales Promotion Strategies and the Pay offs -", Gandhigram Rural Institute, Tamil Nadu India, August 1999

- ✿ S. Jeni Sanjana “Production and Marketing of Pepper in Kanyakumari District”, Monomania Sundaranar University, December 2004
- ✿ S.Jeyarani “Economics of Pepper Plantations in Kerala State”, Madurai Kamaraj University, December 2006
- ✿ S. Krishnan, “Impact of WTO on Spices Sector in India – An Econometric Analysis”, Mahatma Gandhi University, Kottayam, 2012
- ✿ Thomas T.P. “Problems and Prospects of the Spices Trade in Kerala”, Mahatma Gandhi University Kottayam, June 2009
- ✿ Yield gap analysis of field crops- Methods and case studies, Food and Agriculture Organization of the United Nations, Rome, 2015
- ✿ Karnataka pips Kerala to become top pepper producer,V Sajeew Kumar Kochi | Updated on March 12, 2018 Published on December 29, 2015,<https://www.thehindubusinessline.com/economy/agri-business/karnataka-pips-kerala-to-become-top-pepper-producer/article21327474.ece1>
- ✿ Black Pepper Cultivation in India, February 22, 2016, <https://indianestates.co.in/blog/black-pepper-cultivation-in-india/>
- ✿ Economic Review 2016, State Planning Board, Government of Kerala ([http://spb.kerala.gov.in/Economic Review2016/web/chapter02\\_03.php](http://spb.kerala.gov.in/Economic%20Review2016/web/chapter02_03.php))
- ✿ “Sustainable Strategies of Small Scale Pepper Processing Industries – A Case Study in Wayanad, Kerala”, Vijay K Rajan & Dr. S. Ranjith Kumar, International Journal of Mechanical Engineering and Technology (IJMET) Volume 9, Issue 1, January 2018, pp. 348–355, ArticleID:IJMET\_09\_01\_037, <http://www.iaeme.com/IJMET/issues.asp?JType=IJMET&VType=9&IType=1>
- ✿ “A Quantitative Description of Pepper Cultivation in Kerala”, Senthilkumar .T .S & Uma Swarupa .P, International Journal of Emerging Research in Management &Technology ISSN: 2278-9359 (Volume-7, Issue-2), February 2018.
- ✿ “Economic Analysis of Black Pepper Cultivation in Kerala”, S Regeena, International Journal of Science and Research (IJSR)2013, [//www.ijsr.net/ archive/v5i2/NOV161057.pdf](http://www.ijsr.net/archive/v5i2/NOV161057.pdf)
- ✿ “A Quantitative Description of Pepper Cultivation in Kerala”, Senthilkumar .T .S & Uma Swarupa .P, International Journal of Emerging Research in Management &Technology ISSN: 2278-9359 (Volume-7, Issue-2), February 2018.
- ✿ [https://www.researchgate.net/publication/319622681\\_Production\\_Practices\\_and\\_Economic\\_Analysis\\_of\\_Cabbage\\_in\\_Traditional\\_and\\_Modern\\_Chain\\_Farmers\\_in\\_Cebu\\_Philippines](https://www.researchgate.net/publication/319622681_Production_Practices_and_Economic_Analysis_of_Cabbage_in_Traditional_and_Modern_Chain_Farmers_in_Cebu_Philippines)

