Minireview Article

Scenario of black pepper production in North-East India

Abstract

India, the land of spices is one of the major exporters and consumers of black pepper. India lost its top position 20 years ago in pepper production despite the land of origin. Black pepper is cultivated commercially in southern states and on a small scale in north eastern India at present. The farmers started cultivation of black pepper in north eastern states 10 years back. Initially the production from North east India contributed only 1% of country's total production but currently it is one of the major pepper producers contributing 10% of total production. The North eastern region provides tremendous scope for the cultivation because of diverse agro-climate, well-distributed rainfall, and fertile virgin land. Even though north east India is bestowed with ample of natural resources, growers are still not able to harness them efficiently. This paper discusses the current scenario, constraints, and future thrust of pepper production in the north eastern region.

Keywords: Assam, Black pepper, Cropping scenario, North East India, Pepper, Resistant varieties

1.1 Introduction

Mankind is blessed with various herbs and spices, which add more taste and flavor to our food. Among them, black pepper, also known as the "king of spices" is the most important and traded spice in the world [1]. Black pepper (*Piper nigrum* L.) is a perennial flowering vine, cultivated for its berries which are dried and used as a spice. It is a crop in a tropical region, which requires a humid climate and good rainfall [2]. Various archaeological evidence suggests that black pepper is native to south India (Kerala) and was exported to other countries in huge quantities. Medicinal properties and uses of black pepper are well

documented in ancient Vedas and Sanskrit literature [3]. Apart from being used as a spice, black pepper is also used as a preservative, insecticidal & larval control agent, and drugs as Anti-apoptotic [4], Antibacterial [5], Anti-Colon toxin [6], Antidepressant [7], Antifungal [8], Antipyretic and Anti-inflammatory [9], Antispermatogenic [10], Antithyroid [11], Antitumor [12] and Ciprofloxacin potentiator [13]. The major bioactive component is 'piperine', which imparts medicinal properties to black pepper [14].

Black pepper is cultivated in more than 26 countries among which Indonesia, Vietnam, Brazil, Malaysia, and Sri Lanka are important producers [15]. In 2020 Vietnam was the highest exporting and producing country accounting for 59% of the world's pepper export share (285,292 tonnes) followed by Brazil (89,756 tonnes) and Indonesia (51,718 tonnes) (www.thehindubusinessline.com). In India, black pepper is commercially cultivated in Karnataka, Kerala, Tamil Nadu, and Andhra Pradesh. Karnataka is the leading state both area-wise (160774 ha) and production-wise, producing 36000 tons of black pepper. Kerala is the second leading state followed by Tamil Nadu producing 22000 tons and 1750 tons of black pepper every year, respectively (Directorate of Arecanut and Spices Development, 2020-21). Domestic consumption of pepper in India is around 45,000 tonnes per annum. India is one of the top five exporters exporting 16,714 metric tonnes of black pepper every year. Compound annual growth rate in production of pepper is 5.65 per cent. On average 85% of black pepper is exported to USA from India [2].

The cultivation of black pepper in the NE India started in 2011-12 and during that year total production accounted for just 1.16 per cent of country's total production (National Horticulture Board, 2012). At present NE India is contributing around 10 per cent of India's total pepper production. The reason for this uplifted pepper production within short duration lies within favourable abiotic factors. The soils of NE India are usually rich in organic matter and acidic, thus suitable for growing a wide range of spice crops. Most NE

states have virgin land, thus having tremendous potential to produce organic black pepper [16].

2. Cropping scenario in NE India

NE region of India is known for its wide diversity in flora and fauna. Although the NE region comes under the non-traditional area for pepper production but ideal factors like variation

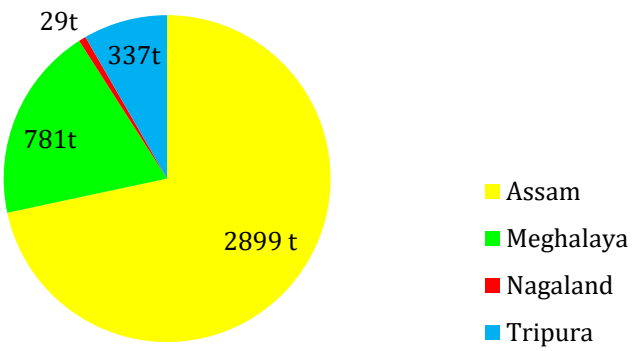

Fig 1: Major NE states producing pepper (tons)

(Data source: DASD, 2020)

Figure 2. Main districts (state-wise) engaged in pepper production

in climate (cold to warm-humid), organic matter-rich soil and good well-distributed annual rainfall provide immense scope for black pepper production [17]. NE includes Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura which total account for 262,180 sq. km geographical area [17]. NE can harbour more than 1 million pepper vines in tea estates. It is estimated that the country can easily fulfil the requirement of the international market if at least 30-50 shade trees/ha in tea estates is planted with peppercorns [18].

2.1 Arunachal Pradesh

Arunachal Pradesh is less involved in pepper production, generally, Namsai district and areas bordering Assam are involved in production. The state is more engaged in the production of large cardamom [19]. The government is putting efforts towards encouraging cardamom growers to put a similar thrust on the production of black pepper by providing planting materials, fiscal incentives for inputs and training to local growers. The spice board of Arunachal Pradesh is putting efforts in Developing pepper gardens (www.newindianexpress.com).

2.2 Assam

Assam is the major black pepper-producing state in the NE region. Out of 33 districts 27 districts are involved in pepper production. Among which Lakhimpur district is the highest producer, producing 305.6 tons of pepper (Average of 2010-11 to 2015-16). The total area engaged under black pepper cultivation is 3428 ha [19]. In 2020, the state produced 2,899 tons of peppercorns (DASD, 2020). The productivity of black pepper in Assam is 535kg/ha which is the highest among all pepper-producing states in India [19].

2.3 Manipur

Black pepper production is not well commercialized in this state. Lack of market power and unorganized market make small holders to opt for inferior outcome that is certain in comparison to higher average return with greater risk. Cultivation of black pepper is practiced up to some extent in Juibam, Thanlon, and Morena areas which come under the Mild Tropical Hill Zone of NE [20].

2.4 Meghalaya

The total area under black pepper is 1000 ha, which produces 781 tons of pepper (DASD, 2020). Black pepper is grown in all districts among which West Garo Hill is leading in production (63 tons) as well as in the area [19].

2.5 Mizoram

In Mizoram only 72 ha of the area is involved in pepper cultivation, producing 10 tons of black pepper per year (Economic survey Mizoram, 2014-2015).

2.6 Nagaland

A total of seven districts are engaged in production accounting for 150 ha in area and producing 29 tons of pepper per year (DASD, 2020). Mokokchun and Dimapur are important districts in the state production-wise. According to Kandiannan *et al*. [19], Kohima is one of the most efficient districts in India for pepper production.

2.7 Sikkim

Pepper is grown at a very negligible scale. But in some areas especially lower tracts of Sikkim, farmers have started practicing organic cultivation of black pepper to uplift their living status. At present around 37 ha of area is under black pepper cultivation (www.thehindu.com).

2.8 Tripura

Every year Tripura produces around 337 tons of black pepper (DASD, 2020). As compared to other areas Dhalai and North Tripura are producing a good quantity of black pepper (www.eastmojo.com).

3. Varieties grown

The well-popularized varieties of black pepper in NE India are Panniyur -1 and Karimunda which provide good uniform yields. However other varieties which are well suited to the NE region by the black pepper research station, Panniyur, Kerala Agricultural University (KAU) are Panniyur-1, Panniyur-2, Panniyur-3, Panniyur-4, Panniyur-5,

Panniyur-6, Panniyur-7. Varieties released from IISR, Calicut are Panchami, Pournami, Sreekara, Subhakara, IISR Malabar Excel, IISR Shakthi, IISR Thevam, and IISR Girimunda. Among these, IISR Malabar Excel variety (13.5%) has the highest oleoresin content [20]. However, black pepper varieties suitable for high elevation areas need to be developed or identified and popularized for the NE region.

4. Constraints

Although the NE region has great potential for black pepper production various factors are causing lots of hindrances such as lack of disease-free & healthy planting material, pests & diseases like *Phytophthora* foot rot, anthracnose, basal wilt, and charcoal rot is prevalent, which causes direct loss. A high initial cost is required for orchard establishment which is generally difficult for marginal and small farmers. Lack of awareness and information among farmers about new technologies is another major constraint. NE region receives heavy rainfall, therefore, there is a high rate of soil erosion and nutrients leaching. No government arbitration in the spice market which in turn makes farmers sell the produce at very low prices to the nearest merchant, buyer, and shops. Absence of a good agro-based industry for spices value addition [16]. Other constraints include fragmented landholdings, limited water resources, low public and private investment, poor transport and communication facilities and poor infrastructure for farming which makes growers more dependent on weather, supply chain and marketing suitable for high value crops.

5. Future scope

Black pepper can be grown as monocrop or with arecanut and shade trees of tea garden as standard [19]. In the international market there is a huge demand for organic spices and to reap this benefit, the NE region can be exploited for organic black pepper cultivation since most of the NE states have virgin land and the use of chemical fertilizer and pesticides is far

below the country's average [16]. Another scope is for value-added products such as Dehydrated green pepper, Canned green pepper, Bottled green pepper, Dry packed green pepper, Freeze-dried pepper, White Pepper, Pepper Oil, Oleoresin, and Ground Pepper. Small-scale scale industries can be established which will help elevate the standard of living of farmers. It is predicted that future demand for black pepper will increase up to 1.28 lakh until the years 2026-2027 [18]. To obtain the benefit of the demand, non-traditional black pepper producing regions such as NE states can be exploited by using improved technologies, high yielding varieties which are well suited to high elevation areas, and improved tactics for pest and disease management [20].

6. Conclusion

NE India has tremendous potential to produce black pepper in appreciable quantity. To harness the potentiality of the region, making farmers aware of new technologies, influencing them to form organizations/co-operatives, improvement of market infrastructure and focused research is required. Apart from these, there is a high need of Government intervention in spice market in NE India.

7. References

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