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RESEARCH PAPER

Status of post harvest diseases of mango in Nothern Karnataka

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Abstract : Mango fruit suffers from many post harvest diseases among them anthracnose [*Colletotrichum gloeosporioides* (Penz) Penz and Sacc.] In stem end rot [*Botryodiplodia theobromae* (Pat.) Griffon and Maubl.], Alternaria rot (*Alternaria alternata* Keissal) and black mould (*Aspergillus niger* V. Tieghem) are the important diseases which contribute to the post harvest losses of mango. The market survey conducted during 2015 in Dharwad, Gadag and Uttara Kannada districts revealed that, among the post harvest diseases of mango anthracnose showed maximum PDI (14.25) followed by stem end rot (8.85) and Alternaria rot showed least PDI (5.10). Among the districts surveyed maximum PDI (10.98) was recorded in Dharwad followed by Hubballi (9.01) and least PDI (6.53) was recorded in Ankola. Among varieties, Alphanso showed maximum PDI (10.66) followed by Pairi (7.83) and least PDI was observed in Ishadi (6.40) and Neelam (6.22). The PDI ranged from 6.22 to 10.66.

Key Words : Post harvest diseases, Mango, Market survey

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INTRODUCTION

Mango (*Mangifera indica* L.) is one of the most important fruit crop of India and it is grown throughout the tropics and subtropics, belongs to family Anacardiaceae and having chromosome number 2n = 40. Indo-Burma region is considered as origin for mango. It is one of the oldest tropical fruits and has been cultivated by man for over 4000 years and has been the favourite of the commoners because of its nutritive value, taste, attractive fragrance and health promoting qualities and now it is recognised as one of the best fruits in the world market (Hulme, 1971). It is considered as a "King of fruits" as its captivating flavour, excellent taste, attractive fragrance, irrespective sweetness and beautiful shades of colour both inside and outside the fruit. It is a national fruit of India, Pakistan and Philippines. It is grown in more than 110 countries of the world. India, being the largest and oldest cultivator and producer of mango in the world gives a prime and royal state to this fruit which is very much associated with the history of Indian agriculture and civilization. India is a major mango growing country contributing nearly 46.74 per cent of

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world's area and 40.48 per cent of world's production. In India mango is grown in area of 2.02 million hectare with a production of 15.02 million tonne and productivity of 6.2 tonne/hectare. Major mango producing states in India are Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal. In Karnataka mango is grown in area of 0.18 million hectare with a production of 0.17 million tonne and productivity of 9.48 tonne/hectare (Anonymous, 2015). Fruits generally have a very short shelf life. Since fruits contain high amount of moisture and nutrients, they are highly amenable for various decay due to physiological and microbial causes (Vyas, 1984). Mango fruits suffer from many diseases among them, anthracnose (*Colletotrichum gloeosporiodes* (Penz) Penz and Sacc.) is a major pre and post harvest disease, followed by stem end rot, Alternaria rot (black rot) and Rhizopus rot caused by *Botryodiplodia theobromae* (Pat.) Griffon and Maubl., *Alternaria alternata* Keissal and *Rhizopus stolonifer* (Ehrenberg) Vuillemin, respectively and cause drastic reduction in the yield as well as ultimate marketability by way of severe spotting of the produce. Arauz (1994) reported in CENAD wholesale market reported 64.6 per cent anthracnose disease incidence on mango fruits during 1990 season. An increase in the post harvest disease incidence in Karnool and Manvi mango market was reported by Prasannakumar *et al.* (2002). The mean per cent disease incidence was maximum (31.83) in cultivar Neelam and least (26.00) incidence was noticed in Alampur and Beneshan. Sangeetha (2003) conducted the survey on mango anthracnose using 0-5 scale in some of the regions of South India during 2001-2002 and recorded maximum (54.50) per cent disease index in Devanahalli region of Karnataka and lowest (27.71 PDI) in Tiruvur of Andhra Pradesh.

MATERIAL AND METHODS

The intensive survey was conducted during 2015 in the markets of Dharwad, Hubblli, Gadag and Ankola districts of Karnataka to assess the severity of post harvest diseases of mango. Samples were randomly selected from different venders in the market. To assess the disease severity, observations was taken on area of fruit surface showing symptoms in 0-5 scale (Prasannakumar *et al.,* 2002).

Table A: Per cent index calculation

Grade	Description
0	No symptoms on fruit surface
1	0.1 – 5 per cent area covered by lesions
2	5.1 – 10 per cent area covered by lesions
3	10.1 – 25 per cent area covered by lesions
4	25.1 – 50 per cent area covered by lesions
5	>50 per cent of area covered by lesions

Further data were computed for per cent disease index (PDI) calculation (Wheeler, 1969)

$$PDI = \frac{\text{Sum of all individual ratings}}{\text{Total number of fruits observed x Maximum disease grade}} \times 100$$

RESULTS AND DISCUSSION

The present work was initiated with survey to know the severity and distribution of post harvest diseases of mango. Survey of mango markets of Dharwad, Hubballi, Gadag and Ankola revealed that disease severity varied from one market to another due to varied environmental conditions prevailing, storage condition and inoculum build up. The market survey was conducted on the disease severity to know the disease distribution and prevalence. The market survey conducted during 2015 revealed that (Table 1), among the post harvest diseases of mango anthracnose showed maximum PDI (14.25) followed by stem end rot (8.85) and alternaria rot showed least PDI (5.10). The above findings are in confirmation with Jagadishchandra *et al.* (1992) reported that the incidence of infection by *Colletotrichum gloeosporioides* was 0.5 to 2 per cent in Udaipur market during May-August. Maximum occurrence of anthracnose might be due to favourable environment and susceptible host. Among the districts surveyed maximum PDI (10.98) was recorded in Dharwad followed by Hubballi (9.01) and least PDI (6.53) was recorded in Ankola. Ekbote (1994) who reported maximum PDI (39.08 %) in Krishinagar of Dharwad district. The least PDI (33.94%) was observed in Navalur. More disease severity was observed in Dharwad market, might be due to environmental conditions like warm and humid condition and non-adoption of disease management practices by the farmers could be a another reason for higher incidence of disease in the Dharwad market. Among varieties, Alphanso showed maximum PDI (10.66) followed by Pairi (7.83) and least PDI was observed in Ishadi (6.40) and Neelam (6.22). The PDI ranged from 6.22 to 10.66. Madan and Subramanyam (1988) estimated a loss of 36.7 per cent

Table 1: Survey of post harvest diseases of mango during the year 2015

Market place	Source of produce	No. of location	Variety	Fruit spoilage due to severity of			Mean
				Anthracnose	Stem end rot	Alternaria rot	
				PDI			
	Dharwad	2	Alphanso	18.60	13.40	9.15	13.71
	Narendra	2	Alphanso	17.40	14.80	0	10.73
Dharwad	Chikkamalligawada	1	Pairi	16.90	0	8.64	8.51
	Mean			17.63	9.40	5.93	10.98
	Nuluvi	2	Alphanso	16.56	8.90	7.90	11.12
	Hubballi	2	Alphanso	14.60	7.70	6.36	9.55
Hubballi	Gabbur	1	Pairi	12.32	6.80	0	6.37
	Mean			14.49	7.80	4.75	9.01
	Gadag	1	Pairi	11.70	6.80	3.20	7.23
	Hosahalli	1	Pairi	10.87	9.33	0	6.73
Gadag	Hulakoti	2	Alphanso	15.62	11.68	0	9.10
	Mean			12.73	9.27	3.20	7.68
	Hebbala	2	Neelam	10.20	8.46	0	6.22
	Navagaddi	2	Ishadi	8.45	6.87	3.89	6.40
Ankola	Hebbala	2	Alphanso	17.78	11.56	0	9.78
	Mean			12.14	8.96	6.52	6.53
Total mean				14.25	8.85	5.10	9.40

Table 2: Mean per cent disease index of post harvest disease of mango in different cultivars

Cultivar	Per cent disease index (PDI)			Mean
	Anthracnose	Stem end rot	Alternaria rot	
Alphanso	16.76	11.34	3.90	10.66
Pairi	12.90	7.64	2.96	7.83
Neelam	10.20	8.46	0	6.22
Ishadi	8.45	6.87	3.89	6.40

0 - No disease

in Totapuri, 22 per cent in Neelam and 20 per cent in Banganapalli varieties of mango in the markets. The market survey conducted during 2015 revealed that, among the post harvest diseases of mango anthracnose showed maximum PDI (14.25) followed by stem end rot (8.85) and Alternaria rot showed least PDI (5.10). Among the districts surveyed maximum PDI (10.98) was recorded in Dharwad followed by Hubballi (9.01) and least PDI (6.53) was recorded in Ankola. Among varieties (Table 2), Alphanso showed maximum PDI (10.66) followed by Pairi (7.83) and least PDI was observed in Ishadi (6.40) and Neelam (6.22). The PDI ranged from 6.22 to 10.66. The presence of spots on the fruit reduced the market value and keeping quality will be reduced. Post harvest diseases in mango play major role in reducing the price and demand for the fruits, hence its necessary to take the management strategies since from the beginning.

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