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Impact of bacterial blight disease (B.B.D.) on pomegranate orchards in Maharashtra

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Abstract
The pomegranate is mainly cultivated in Nashik district and about 15 different districts of Maharashtra. The Solapur District was identified as other pockets of pomegranate cultivation in the state. However epidemic spread of Bacterial blight disease occurred in every pomegranate district of Maharashtra. To collect primary data the field survey method, the interviews and discussions with pomegranate growers were liberally used. Random sampling method was used to interview the growers. The respondents to the extent of about 27.50% were affected this disease. The agronomic practices adopted by growers is interesting to find out the possibility to cultivate pomegranates in the study area and consequently the problems faced by growers.

Keywords: pomegranate, bacterial blight disease, Maharashtra

Introduction
Day by day developing of pomegranate is hard for farmers. The trouble of wilt disorder changed into a big issue, then growers were attempting a whole lot to remedy the killer trouble of bacterial disorder (hereafter known as as B. B. D.) on pomegranate. However manipulate measures but no longer observed to eliminate this ailment absolutely. The bacterial blight disorder is principal obstacle in further development of pomegranate cultivation. Jadhav and sharma (2009) [2] reports of bacterial blight prevalence in India are widely emphasised. Yet these days it turned into maximum studied pomegranate ailment in India. To perceive the character of bacterial blight disorder trouble, its reasons and results on pomegranate farming in addition to offer first-class viable tips for grower to adopt suitable treatments. In Bijapur and Bellary districts of northern Karnatakaa disease of much less financial importance posed its outbreak severity inside the year 2001-02. Then after the disorder spread of B. B. D. Additionally extended in neighbor districts solapur and sangali as well as in other pomegranate regions of Maharashtra (Yenjarappa and *et al*. 2006) [3]. It have become a negative component of pomegranate orchards. The boon materialistic fruit crop became as massive destruction after the intense attacks of this ailment to the affected growers inside the have a look at region.
Study area: The pomegranate is cultivated as a cash crop in extra than 17 districts of Maharashtra. But, its location, manufacturing and productiveness differ widely. Initial evaluation of secondary records for place below pomegranate cultivation became conducted by means of the use of technique of place quotient given by using Bhatia (1965) [1, 8] to choose the look at place. Based totally at the results of crop concentration indices, Solapur and Nashik district were diagnosed as most important pockets of pomegranate cultivation in the kingdom. However epidemic spread of bacterial blight ailment came about in each pomegranate district of Maharashtra. Consequently complete state became taken into consideration for look at. It's far well worth mentioning that the qualitative and quantitative evaluation made within the gift research work is more often than not primarily based on primary information collected from explorative interviews of growers through great area survey work.

1. Primary records: the technique of the examine become geographical in nature so procurement of primary facts for the observe place was crucial venture. It became executed via the sphere survey technique, the interviews and discussions with pomegranate growers have been liberally used to accumulate primary statistics. Random sampling method changed into used to interview the growers. The questionnaire together with 3 sections regarding declaration of B. B. D. Hassle viz. i) reasons ii) consequences, iii) treatments followed became designed in line with the goals of gift study.
2. Secondary information: except, the secondary statistics have been additionally received from authorities places of work, reviewing books, studies journals and reviews, published magazines, newspapers.

Methodology
Choice of pattern growers: the primary unit of the sampling became the pomegranate growers. Village sales information are used to make a list of pomegranate growers for every sample village. It is worth bringing up that the qualitative and quantitative evaluation made in the present studies work is typically based totally on primary statistics gathered from explorative interviews of growers via widespread discipline survey paintings.
Out of the overall growers in that respective sample village, 5% growers on the premise of 'pomegranate maintaining' were decided on for the reason of the interview. These are divided into three businesses according to length of keeping for inter farm contrast; as under.

Table 1

Sr. No.	Category of Farmer	Plot Size	No. of farmers interviewed	Sampling (%)
1.	Small farmers	(less than 1 Ha)	45	(50%)
2.	Medium farmers	(1.1 to 2 Ha)	27	(30%)
3.	Large farmers	(more than 2 Ha)	18	(20%)

Data analysis

The obtained area survey statistics representing to the 12 months 2019-20 have been sorted in step with length of pomegranate growing of the farmers. Then for economic analysis, the sampled orchards had been in addition micro grouped consistent with small, medium and huge farmers. Statistical strategies used for evaluation are as mathematics average, percent, correlation co-green, straight line regression equations, quantity of exchange, location quotient and price advantage analysis helped to pick out sure relationship among environmental factors and pomegranate crop.

Discussion

The informal organism responsible for this sickness infection is bacterial pathogen '*xanthamonas axanopodis* pv. Punicae'. First of all brown to black spots with an oily appearance seems on leaves and fruit, therefore, it's also called 'oily spot sickness' (Patil A. V., Karale A. R., and Bose. K. 2002) [7]. This sickness remains widespread in mild to slight shape throughout yr at nine° to 43° c temp. And also at decrease humidity but emerge as greater severe beneath humid situations (> eighty %) and slight temperature (25° to 35°c) throughout the wet season (Jadhav and Sharma 2009) [2]. It other phrases, above pathogen is understood to continue to exist at the inflamed plant in resident section during the year till environmental conditions grow to be congenial for its re-prevalence. As soon as the sphere is inflamed, then it's miles difficult to control the ailment absolutely therefore causes epidemic in the pomegranate growing place. The growers were also inadequate to state the foundation cause of contamination of the disease to their orchard. The bacterial pathogen grows in inflamed plant debris e. G. Fallen leaves and fruits at some point of low season and spreads via planting fabric. Ailment discovered everywhere within the have a look at place.

As some distance as observe place is involved, the B. B. D turned into first of all observed in 2006 at few orchards in the villages of Deola tehsil. Despite the fact that ruby pomegranate variety isn't always encouraged in agro-climatic conditions of Maharashtra however in search of something new, few growers added uncertified plants of this variety from Karnataka inside the 12 months 2005. The ones plant life were B. B. D. Infected. Soon after planting, the disorder started to build up underneath favourable environmental conditions. It became discovered the basic supply or root purpose of B. B. D. Infection inside the have a look at area. Later it spread in fundamental pomegranate growing Deola, Satana and Malegaon tehsils. Now B. B. D. Is not unusual and ordinary sickness determined anywhere inside the look at location. Results:

affected sample growers defined that the preliminary contamination started first of all on leaves with the oily appearance of minute, abnormal spots with few timber later it turned to darkish brown or black spots (Shaikh M. K.. 2006). Then leaves became brown to black and dropped off. Secondly the fruit infection become the maximum unfavorable stage of b. B. D. Usually it assaults in the early fruiting level or whilst fruits are half grown. Appearance of oily spots on pores and skin of fruits is the predominant symptom. Affected fruit pores and skin became difficult that looses the pliability or softness that causes 'l' or 'y' fashioned cracks in fruits. Subsequently, the bacterial pathogen additionally enters inside through cracks main to rotting of the entire fruit. The rotted fruits flip black to brown in colour. Therefore they have become unfit for intake and advertising.

B. B. D is capable to damage whole orchard within 15 - 30 days. At some stage in the sphere survey, the culmination had been often visible within the shape of dark brown to black fruit mummies scattered at the ground of significantly affected orchards and a few of them putting over the trees. In this case, timber seemed susceptible that could be leading on the manner of demise in a few days. The respondents to the extent of 27. 75% had been affected this disorder. And the damages extensively various from one orchard to any other relying on severity of infection as attempted in the desk no. 7.8.

Table 2: Distributions of B. B. D. Affected Respondents According to Yield Loss

Sr. No.	Nature of Yield Loss	Number of Respondents	% to Total Respondents
1.	Destruction of some infected fruits	11	2.42
2.	Half grown fruits were Plucked and sold out	08	1.76
3.	25 - 50 % of yield losses	19	4.18
4.	More than 50 % yield losses (fruits rotted)	13	2.86
5.	100 % yield losses	17	3.74
6.	Continuously last 2 Seasons infected or failed	06	1.32
7.	Affection in new plantation	04	0.08
8.	Threatened hence Bahar not practiced	14	3.08
9.	Thinking to cut off the orchards	13	2.86
10.	Uprooted half of the orchard	21	4.63
	Total affected respondents	126	27.75 %

The given statistics clear that the pomegranate cultivation became totally uneconomical because of B. B. D.

Treatments followed by using growers

1. To avoid further contamination plucked and burnt infected fruits after B. B. D. Were found on smaller share, 2. 42% respondents. Approximately 1.76% respondents harvested and offered 1/2 grown infected fruits at very low fees in nearby markets to compensate the manufacturing prices.
2. The massive hundreds of inflamed fruits have been thrown away or burnt at barren locations to avoid infection for the subsequent cropping season. The growers normally felt that the B. B. D. Spreads from the adjusting area.
3. Only a few growers modified the variety and area of orchards however new plantations were additionally now not unfastened from the disease.
4. Wet season (Mrig bahar) provides congenial climate situations recording maximum intensity. Therefore, 1. 32% growers shifted in the direction of hasta and aambe bahars of minimal intensity. But the ailment changed into prevailed inside the subject so about 3. 08% respondents were threatened and did now not practice any bahar.
5. Pomegranate growers lost their satisfactory fruit manufacturing. As an instance, as a result of the reality of insufferable financial losses 4. 63% respondents uprooted their 1/2 of the orchards lately. Even as 2. 86% respondents were not ready to any extra danger and firmly said to cut off the orchards.

The chemical sprays typically used among different management techniques to govern the sickness. The growers were located to depend totally on the agro-service centers for the treatment. Manifestly, it changed into skewed in the favour of their business. Even after making use of very powerful antibiotic, there had been no glad effects. Now, there may be growing recognition among growers that B.B. D can not be eliminated with the aid of the software of chemical compounds in fashion.

Conclusion

The revolutionary pomegranate growers recommend that the financial package for bacterial blight and wilt disease manipulate given by government is not anything however pouring of extra finances and amalgamation of present subsidy schemes. The scientists are of view that it is the need of the day to make an integrated approach related to every component of pomegranate price chain from plantation up to advertising (viz. Nursery holders, harvesting, growers, middleman, contractors, labours, transporters, agro-chemical corporations, government agri. Officers and pomegranate consultants) for decrease the hassle of wilt and blight sicknesses. It will without a doubt work to accumulate the self assurance among the growers to save the rural financial system based totally on pomegranate farming.

Due to the fact pomegranates yield losses because of diverse diseases stated in paper are typically better than subsidy quantities. No proper strategies have been given to remedy the trouble; certainly all present measures to govern the disease had been failed. Consequently, they cautioned that rather than giving monetary help to the growers, the funds must be diverted to analyze improvement on ‘bacterial blight sickness resistant variety’ and next extension activities like ‘pomegranate sickness diagnostic centre’ and installation of a climate station in pomegranate developing areas.

The budget will also be provided to pomegranate linked NGO’s, those posses nicely research infrastructure. In my view the combined fruit orchard; the ones are practiced in Iran, U. S. A. International locations may even help to manipulate the hassle of monoculture. The pomegranates can be planted with another hardy fruit plant life (appropriate in drought prone areas) like ber, aomla, custard apple, mango and many others. In alternate rows or among bushes (Roy P. K. 1999) [6]. It'll generate additional earnings to growers in addition to limit the chance of total monetary losses because of b. B. D. Attacks on pomegranate.

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