RESEARCH ARTICLE

INVESTIGATION FOR FOREMOST DISEASES OF POTATO CROP IN SEEDS RECEIVED FROM DIVERSE SOURCES UNDER NORTH GUJARAT CONDITION

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Abstract: During a survey in Gujarat, three types of tuber rots were recorded on potato tubes. A total of 125 seed samples containing 400 tubers each, representing five different seed sources *viz*., seeds from Himachal Pradesh, Uttar Pradesh, Punjab, Gujarat (Potato seeds produced by seed plot technique at Potato Research Station, Deesa) and Market seeds were examined before planting in respective years. The results of survey revealed that the Market seed was heavily infected with all the tuber rot diseases in comparison to other sources of seed. Dry rot and soft rot were observed in all the sources of seed. Maximum incidence of charcoal rot was observed in Market seed (6.00 %) and negligible in Uttar Pradesh (0.37 %) and Punjab (0.25 %) seed whereas, Himachal Pradesh seed and Deesa seed were free from charcoal rot disease.

Keywords: Incidence, Dry rot, Charcoal rot, Soft rot

INTRODUCTION

Potato (*Solanum tuberosum* L.) is one of the most nutritious sources of food in the world. Besides cereals, the potato is one of the crops, which can supplement food needs of a country. Potato being a vegetative propagated crop and commercial potato propagation is through the 'seed' tubers, has the risk of carrying most of the pathogens. Potato is prone to attack by more than hundred of diseases caused by fungi, bacteria, viruses, phytoplasma (mycoplasma) like microorganisms and nematodes that deteriorate quality and reduce yield of tubers. Unfortunately, many of them are tuber born in nature. The rapid development of tuber and soil borne diseases in these areas, which have never been cropped with potatoes before, suggested that the diseases were being introduced on seed potatoes. Losses of potato in storage are a problem confronting all the potato producing countries. In majority of cases, the incipient infection/ infestation of tubers takes place in the field itself and it is the storage environment, which is mainly responsible for their further development resulting in losses due to decay, poor germination and deformation.

Heavy losses in potato at the post-harvest phase have been reported from many countries both temperate and tropical. The tubers injured at lifting, riddling or transport are usually more prone to such rottage during storage. Temperature and humidity are important factors responsible for disease development during storage. Many storage rots are incited by wound parasites. Therefore, avoidance of mechanical injuries at harvest and post-harvest stages, by improving the technology would go a long way in reducing tuber decay.

This lead to a closer examination of the incidence of diseases those were present on potato seed tubers imported into the state, hence it is felt necessary to carry out systemic investigation on sources of seed tubers in the Banaskantha district.

MATERIAL AND METHOD

In Banaskantha district, survey of major tuber rot diseases of potato was carried out in different sources of seed tuber used for planting. A total of 125 seed samples containing 400 tubers each, representing five different seed sources *viz*., seeds from Himachal Pradesh, Uttar Pradesh, Punjab, Gujarat (Potato seeds produced by seed plot technique at Potato Research Station, Deesa) and Market seeds were examined before the planting in the respective years. Seed samples were taken randomly from various seed supplying agencies.

Observations in respect of dry rot, charcoal rot and soft rot of potato were taken on per cent disease incidence.

RESULT AND DISCUSSION

In Gujarat, seed material of potato crop is brought from Himachal Pradesh, Uttar Pradesh and Punjab in Gujarat during the *Rabi* season. Many a times these seed materials has been found infected with tuber rot diseases like dry rot, charcoal rot and soft rot which are known to occur in seed producing areas. Seed tubers representing five different sources were examined. Average per cent incidence of diseases in tuber brought from different seed sources was recorded from 125 random seed samples each containing 400 tubers.

The results of survey presented in Table 1 positively revealed that the Market seed was heavily infected with all the tuber rot diseases in comparison to other sources of seed. Dry rot and soft rot were observed in all the sources of seed. Maximum incidence of charcoal rot was observed in Market seed (6.00 %)

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and negligible in Uttar Pradesh (0.37 %) and Punjab (0.25 %) seed whereas, Himachal Pradesh seed and Deesa seed were free from charcoal rot disease.

Incidence of dry rot and soft rot increased year to year in Himachal Pradesh, Uttar Pradesh Punjab and Market seeds as evident from survey results of 2000 and 2001. Average incidence of dry rot (*Fusarium* sp.) ranged from 0.62 to 6.25 per cent, maximum being in Market seed (6.25%) followed by seeds of Himachal Pradesh (1.87 %), Uttar Pradesh (1.62 %), Punjab (1.12 %) and Deesa seed (0.62 %). Average incidence of soft rot (*Erwinia carotovora* subsp. *carotovora*) ranged from 0.87 to 5.5 per cent, maximum being recorded in Market seed (5.5 %) followed by Uttar Pradesh (2.12 %), Punjab (1.5 %), Himachal Pradesh (1.37 %) and Deesa seed (0.87 %). Survey of potato tuber diseases in seeds received from different sources clearly indicated that the Market seed was heavily infected with all the tuber rot diseases in comparison to Himachal Pradesh, Uttar Pradesh, Punjab and Deesa seed. Market seed was unspecified for variety and source and were locally available as table potato. Majority of small cultivators and kitchen gardeners purchase unidentified Market seeds from private agencies which ultimately results in heavy infection of diseases because minimum seed health standards are not maintained in Market seed. Minimum incidence of tuber rot diseases was observed in Deesa seed. This might be due to strictly following the principles of "Seed Plot Technique" at Potato Research Station, Deesa. The survey results indicate that the infection of potato tuber rot diseases in different seed sources was alarming and the incidence was more or less similar as it has been reported by Thirumalachar (1952), Thirumalachar and Pushkarnath (1953), Ebbels (1983), Wang *et al.* (1985), Shekhawat *et al.* (1992) and Singh and Shekhawat (1994). In the present study, our results are in confirmity with those obtained by above research workers.

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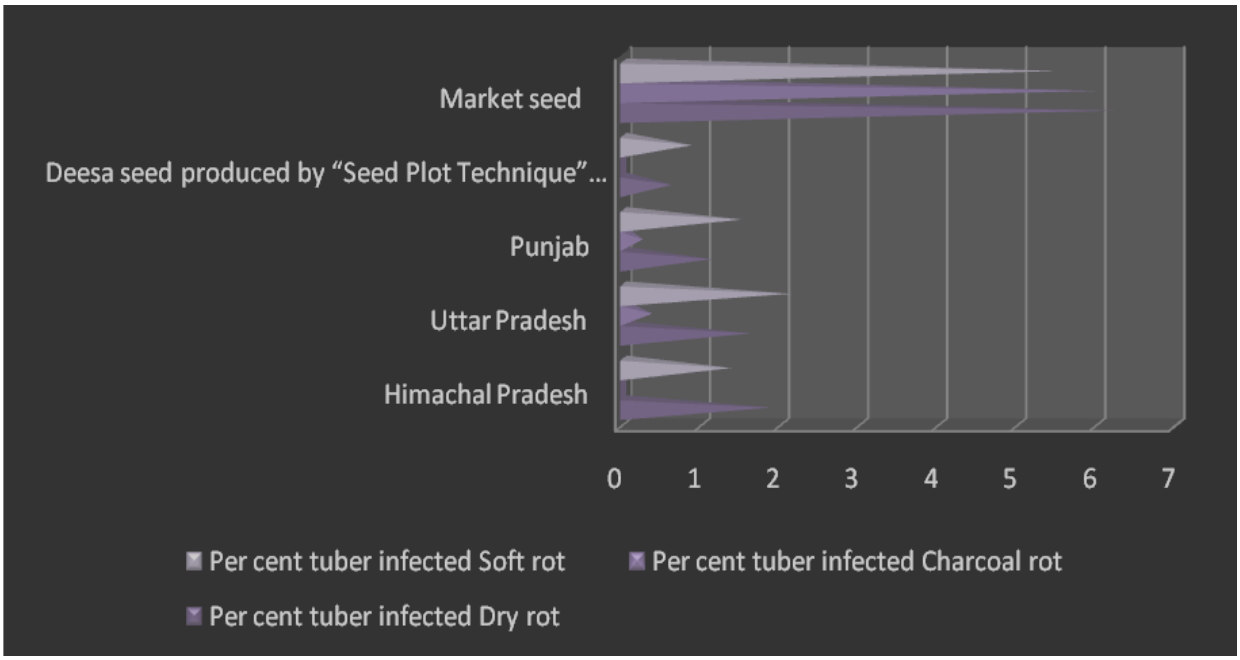
Table 1. Incidence of tuber rot diseases in seeds received from different sources

SR. NO.	SEED SOURCE	DISEASE	PER CENT TUBER INFECTED		
			2000	2001	AVERAGE
1	Himachal Pradesh	Dry rot	1.75	2.00	1.87
		Charcoal rot	0.00	0.00	0.00
		Soft rot	1.25	1.50	1.37
2	Uttar Pradesh	Dry rot	1.50	1.75	1.62
		Charcoal rot	0.36	0.38	0.37
		Soft rot	2.00	2.25	2.12
3	Punjab	Dry rot	1.00	1.25	1.12
		Charcoal rot	0.25	0.26	0.25
		Soft rot	1.00	1.25	1.50
4	Deesa seed produced by "Seed Plot Technique" Gujarat	Dry rot	0.75	0.50	0.62
		Charcoal rot	0.00	0.00	0.00

		Soft rot	1.00	0.75	0.87
5	Market seed	Dry rot	5.75	6.75	6.25
		Charcoal rot	6.25	5.75	6.00
		Soft rot	5.25	5.75	5.50

Fig. 1. Figure showing per cent tuber infected due to different diseases.



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