

OUTBREAK OF DOWNY MILDEW IN ONION: A NEW DISEASE RECORDED

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ABSTRACT

Among several diseases, Downy mildew caused by *Peronospora destructor* is a devastating one on onion crop. At the end of the year 1999, and in the beginning of 2000, this disease was appeared to be destructive in the farmers' field of different locations of Nepal in different varieties. Conducted survey and the information given by the farmers showed 5 percent to 90 percent disease severity in the field with 100 percent crop loss in some of the pockets. This is the first report of downy mildew occurrence in Nepal.

Keywords: *Peronospora destructor*, Severity, Sporangiphore

INTRODUCTION

Onion (*Allium cepa* L.) is one of the important vegetable crops of Nepal. It can be cultivated in terai to high hills where cold climate is prevailed with average temperature of 13^o -25^o C. A number of diseases such as Purple Blotch caused by *Alternaria porri* associated with *Stemphyllium sp.* and Smut caused by *Urocystis cepulae* (Shrestha, 1990) are reported to threat the cultivation of onion.

At the end of the year 1999, onion crop was found infected with a new disease in some of the farmers' field of Kathmandu valley. It was identified in the laboratory as Downy Mildew caused by *Peronospora destructor* (Berk.) Casp. The fungus was identified with typical sporangiophore typically branched in acute angle bearing pyriform thin walled numerous sporangia. It is attached to sporangiophore by its pointed end. This is the characteristic of the fungus, *P. destructor*.

MATERIALS AND METHODS

The disease sample was received for the first time in the first week of December 1999 from Shobhabhagbati area of Kathmandu. The onion variety was called as Madrasi from India. Identification of the fungus was done on the basis of symptomatology and microscopic examination. It was followed by the field visits in some pockets of onion and garlic cultivated areas to estimate the disease severity and the areas affected by the disease. During field visit, record of cultivated area, variety, source of plant-stand and disease severity were recorded. These information were also collected from the farmers who visited Plant Pathology Division in connection with the problem and management of the same disease.

RESULTS AND DISCUSSIONS

Disease symptom consisted of a grayish violet furry growth on the surface of leaves, which become pale green. In case of high severity, the bed looked gray instead of green. Affected leaves become pale green and late yellow. Diseased parts, such as leaf tips folded over and collapsed. This fungus is reported to have attacked floral parts also (Richardson, 1979).

The disease was first noted from Shobhabhagbati, Kathmandu. In one farmer's field, the disease affected the whole seedbed covered by one kilogram of seed. The visit of several farmers' field, showed the appearance of disease in December and continued its progression to February or to the third week of March. In one of the fields, the entire onion crop looked deteriorating leaving only the youngest leaf bud in the plant. It was observed that the disease severity was directly influenced by the planting time. Early planted crop was influenced more than late-planted crop. It was also found that severity was maximum in the plants grown for seed purpose, which was raised from planting the bulbs. Several farmers' field visits and information given by farmers showed different intensities of disease (Table 1). The sample received from Mahadevsthan, where onion and garlic are cultivated extensively in commercial scale as cash crop, was badly damaged with more than 90 percent disease severity with 100 percent crop loss.

Table 1: Downy Mildew disease intensities estimated and area affected in different farmer's fields

Location	Farmers field no.	Variety	Severity percent	Approx. area affected, sq.m.	Source of plant stand	Purpose of cultivation.
Shobhabhagbati, Kathmandu	1	Madrasasi	15	2500	Seedling	Vegetable
Banasthali, Kath.	2	Local	40	500	Seedling	Vegetable
Nayabazar, Kath.	3	Local	60	50	Bulb	Seed harvest
Pharping 6, Kath.	4	Local	60	250	Bulb	Vegetable
Tikathali 3, Lalitpur	5	Local	15	nt	Seedling	Vegetable
Tikathali 9, Lalitpur.	6	Kashmiri Red creole	5	800	Seedling	Vegetable /bulb harvest
Nala, 3, Kavrepalanchowk	7	Red creole	nt	nt	Seedling	Vegetable
Khopasi 3, Kavre.	8	Red creole	60	2000	Seedling	Vegetable/ Bulb
Panchkhal, Kavre	9	Red creole	50	250	Seedling	Vegetable
Mahadevsthan, Sindhupalchowk	10	nt	60	250	Seedling	Bulb
		nt	90	nt *	Seedling	Vegetable / Bulb
					it should be fun thin studied	

*nt = not determined

Literature revealed that the pathogen grows in the temperature less than 22° C with the presence of rain or dew on the leaf surface and the humidity exceeding 95 percent. The characteristics of this disease is that the fungal growth disappears in dry weather with relative humidity less than 80 percent and temperature more than 24° C, but it reappears causing new lesions when the weather turns wet and cool again (Anon, 1995). The bulbs infected with mycelium are considered to be the main source of primary infection (Richardson, 1979). Another fungus *Stemphyllium sp*, when establishes on the primary lesions masking the symptoms of downy mildew also causes severe losses in the crop.

CONCLUSION

It was observed that this disease could be most destructive for onion in the coming season years. The extent of loss was associated with the severity of disease. This is the first report of the occurrence of downy mildew in onion in Nepal. Hence, it should be further studied.

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