

BROWN ROT OF POTATO IN THE PUNJAB

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Incidence of brown rot of potato in Sialkot, Faisalabad, Jhang and Lahore varied between 3.6 to 6.0 percent whereas losses caused by this disease ranged from 4.3 to 5.7 percent. As the sources of seed for the spring potato crop in the plains lie in the hills, it is proposed to concentrate efforts to produce seed free from brown rot in the hilly areas. Since brown rot does not affect winter crop, it is suggested that the possibility of using the produce of this crop as seed on regular basis should also be encouraged.

INTRODUCTION

Brown rot caused by *Pseudomonas solanacearum* (E.F. Sm.) Dowson has been reported from Pakistan since long ago but the extent of losses caused to potato crop by this disease are still unknown [1,2]. Nath *et al.* (Cit. Ranga-swami) [3] has reported 20-25 percent losses of potato crops in India due to this disease. In this country as no information is available on the effects of this disease a study was undertaken to find the incidence and losses caused by it to potato crop in different areas of the Punjab, so as to work out suitable control measures.

MATERIALS AND METHODS

As the disease appears in the spring crop, survey of the disease was carried out in the month of April in the districts of Sialkot, Faisalabad, Jhang and Lahore. In each district 10 plots, each about 0.442 hectare (one acre) were selected at random and each field was divided into three sub-plots. One hundred plants in each sub-plot were further selected at random and the incidence of disease was recorded. The yield of each diseased and an adjacent healthy plant was also recorded simultaneously. The losses caused by the disease in individual plants were calculated by the following formula:

$$100 - \frac{\text{Weight of tubers of diseased plant} \times 100}{\text{Weight of tubers of healthy plant}}$$

The data is presented on the basis of the average of disease incidence or loss in each district.

RESULTS AND DISCUSSION

In the field, general symptoms of this disease are slight flagging to wilting of infected plants. The leaflets may show bronze discoloration. The stem and the tubers of diseased plant show vascular browning. On pressing the diseased stem or the tuber between the fingers, whitish bacterial ooze could easily be seen [3,4]. On the basis of these symptoms the incidence of disease was recorded.

As shown Fig. 1 the incidence of brown rot was recorded as 6.0, 4.1, 4.0 and 3.6 percent in the districts of Sialkot, Faisalabad, Jhang and Lahore respectively. This clearly indicated that the disease occurred in all the areas surveyed in the Punjab. The reduction in the yield due to this disease in the four districts was 5.7, 5.5, 5.5 and 4.3 percent respectively resulting in a considerable loss to the crop.

In the Punjab, three crops of potato are grown during

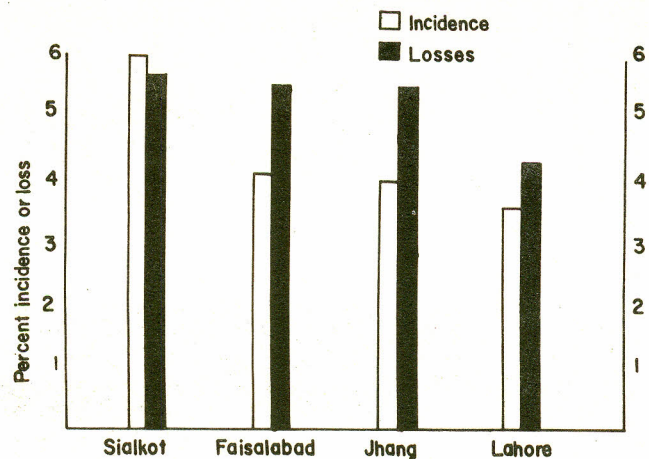


Fig. 1. Incidence and losses caused by brown rot of potato in four districts of the Punjab.

the year. One in the hilly areas as summer crop (April to October) and two in the plains; one as winter (October to January) and the other as spring crop (January to May). The produce of summer crop is used as seed for the spring crop whose produce in turn is used as seed for the winter crop. Umar, Bhatti and Khan[5] reported the presence of heavy brown rot infection in the summer crop grown in Murree Hills, thus the seed from this crop carries the pathogen to cause primary infection in the spring crop, which in turn transmits the disease to winter crop because the produce of spring crop is used as seed for the following winter crop. Thus the infection of brown rot is passed from summer to spring and then to winter crop. As the main source of seed for both potato crops of the plains lies in the hills, it is proposed that the efforts should be made to produce disease free seed in the hilly areas so as to produce brown rot free seed for the spring crop ultimately providing healthy seed for the winter crop.

Pseudomonas solanacearum is favoured by relatively high temperatures i.e. between 21°C to 38°C [3]. However, the soil temperature in the plains does not exceed 20°C for most part of the growing period of the winter crop, so there are less chances of this disease to develop in this crop. At low winter temperatures, the activity of *Myzus persicae*

Sulz. an aphid responsible for the transmission of virus diseases is also restricted[6] which limits the spread of virus diseases responsible for the quick degeneration of potato crop. Keeping the above factors in view it is proposed that instead of using spring crop, the produce of only winter crop should be used as seed for the following winter crop.

REFERENCES

1. M.A. Ginai, *A Treatise on Vegetable Culture*. (Deptt. Agri., Govt. of the Punjab, Lahore, Pakistan, 1970).
2. M. Kamal, and S.M. Moghal, *Studies on Plant Diseases of South West Pakistan*. (Agri. Res. Inst., Tandojam, Pakistan, 1968).
3. G. Rangaswami, *Bacterial Diseases of Plants in India*, (Asia Publication House, Bombay, 1962), p.163.
4. W. Ahmad, Some Studies on Brown Rot of Potato. M.Sc. thesis, University of Agri., Faisalabad, 1976.
5. S.M. Umar, M.A.F. Bhatti and M.I. Khan, Diseases of Potato in Murree and Hazara Hills: *Ziaraat Nama* No.11 (1962).
6. M.S. Mirza, *Annual Report for the Year 1980-81*. Plant Virology Section (Ayub Agri. Res. Inst., Faisalabad, 1981).