

B.Sc. Third Year, Semester - V
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Plant Pathology Unit-2

2) Pulses

b) Yellow mosaic of legumes (beans)



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b) Yellow mosaic of legumes (beans)

Causal Organism: Yellow Mosaic Virus (YMV)

Host: Legume crop

Distribution

This viral disease is the most destructive disease of kharip legumes of India. It was first reported from Delhi in 1960 but is known to occur in other parts of country also. The loss in yield depends upon the stage at which the crop is infected. If the infection is early in the season there may be total loss of yield. Mung bean shows heavier loss than other legumes.

Symptoms:

The diseased plants start appearing in the field when the crop is about a month old. Infected plants show mottling, yellowing and malformation of leaves and pods. Infected plants may be stunted and bunchy, seeds may abort, smaller or malformed and yields may be reduced. The most common symptoms are the development of a pattern of light and dark green area, giving a mosaic appearance on systemically infected leaves. There is clearing or yellowing of the veins. The areas making up the mosaic are generally irregular in outline. There may be two shades of colour involved: dark green and pale or yellow green. In infected leaves the borders between darker and lighter areas may be sharp.



Yellow mosaic of legumes (beans)

Causal organism and disease cycle:

The disease is caused by yellow mosaic virus (Gemini group virus). In India it has a large host range which includes other legumes. The paired particles of the geminate virus measure 30 × 18 nm. Isolate studied in Thailand has thermal inactivation point of 40° to 50° C, dilution end point of 1:100 to 1:1000 and *invitro* longevity of one to two days at 20° C.

The viruses are transmitted through several aphids. YMV is transmitted through the seeds infrequently (3% - 6%). YMV overseasons in one of its many cultivated and wild hosts, from which the aphids transmit it to the crop.

Bean plants are involved in the natural virus spread in three ways: for breeding the vectors, for providing virus-infected materials, and as recipients of virus from infective vectors. YMV survive from season to season in infected seeds which are primary source of inoculums. In tropical and subtropical areas, agricultural practices allow the viruses to survive throughout the year in successive crops of the same bean species grown at the same locality.

Control measures:

Following measures do not ensure complete protection but can check the spread and reduce losses.

- 1. Local varieties are highly susceptible. These should replace with improved varieties. Urd bean varieties T9, UPU1, Pant 19, Pant 26, Pant 30 and Pant 35 are fairly resistant. In mung bean Pant 1, 2, 3, T1 and T44 are resistant.**
- 2. Control of disease through prevention of population of the vector has been recommended. Spraying of Metasystox (0.1%) at 10-15 days interval, starting when the crop is about a month old or as soon as a single diseased plant is detected in the field. Application of Aldicarb alone or with Endosulfan and Captan reduces white fly population. Diseased plants as well as host also are eradicated after each spraying.**

3. Common insecticides do not cause instant death of vectors. For this oil sprays have been found more effective since they can immobilize the white fly within 15 minutes. Systemic granular insecticides for soil application as recommended for yellow vein seem to be the best chemical method for reducing vector population and delaying the appearance of the disease.

4. The management of crop in respect of space and time helps in disease control. For ex. Cultivation should be started at that time when vector population is poor.

5. Healthy, virus free seeds should be selected, as these are the primary source of inoculums. Seeds to be used must be tested by appropriate methods for the presence of virus inoculums.

Thank you