



## **Integrated Management of Yellow Mosaic Disease in Black Gram**

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### ***Introduction***

Black gram (*Vigna mungo* L.) is an important short duration pulse crop provides 24% protein, 60% carbohydrate, 1.3% fat, richest source of minerals, amino acids and vitamins. They play a vital role in improving the soil fertility by fixing atmospheric nitrogen. The main reason for low productivity is the susceptibility of crop to pests and diseases. A foliar disease known as yellow mosaic caused by the virus Mungbean Yellow Mosaic Virus (MYMV) is the most common, wide spread, destructive and economically important disease of black gram. They showed considerable yield loss ranging from 35 to 100 per cent.

### ***Symptoms***

Initially small yellow patches or spots appear on green lamina of young leaves. Soon it develops into a characteristics bright yellow mosaic or golden yellow mosaic symptom. Yellow discoloration slowly increases and leaves turn completely yellow. Infected plants mature later and bear few flowers and pods. The pods are also become yellow, small and distorted. Early infection causes death of the plant before seed set (Fig. 1 & 2).

### ***Transmission by Vectors***

Transmission is mainly by the tiny insect whitefly, *Bemisia tabaci* (Gennadius). Not transmitted through seed or sap or soil. Warm temperature, high humidity favours the whitefly population. A single viruliferous insect can transmit the virus but for 100 % transmission 10 viruliferous whiteflies per plant are required. They transmit the virus in a circulative persistent manner. Acquisition and inoculation by white flies can each be effected in a minimum time of 15 min. The latent period is less than four hours. They deliver the virus into the phloem cells of the plant. A viruliferous female and male adult in a population can retain infectivity for 10 days and 3 days respectively. Neither female whitefly nor male whitefly adults can retain infectivity throughout the life span. Female whitefly adults are over three times more efficient as vectors than male adults. The virus does not pass through eggs of whitefly. Nymphs of *Bemisia tabaci* can acquire the virus from diseased leaves. Pre-adult stages of whitefly could also acquire and transmit the virus into the plant cells.



**Fig. 1:** Yellow mosaic disease infected blackgram plants under field conditions  
Yellow plants are infected plants; Green plants are disease free plants



**Fig. 2:** Yellow pods in the yellow mosaic infected blackgram plant under field conditions



## Management

- Avoid sowing susceptible varieties during summer months instead cultivate the same crops during rabi season.
- Treat the susceptible seeds with imidacloprid 600FS @ 5 ml/kg of seeds.
- Selection of resistant varieties such as VBN 6, VBN 8, VBN 10, VBN 11 and moderately resistant varieties including VBN 9, MDU 1, CO 6 , ADT 6.
- Increase the seed rate (25 kg/ha) of susceptible varieties and rogue out the diseased plants up to 40 days after sowing. Finally optimum plant population with free of yellow mosaic disease can be maintained.
- Follow mixed cropping by growing two rows of maize (60 x 30 cm) or sorghum (45 x 15 cm) or cumbu (45 x 15 cm) as barrier crops for every 15 rows of susceptible black gram
- Maintain proper field sanitation by removing the weed hosts or alternate hosts periodically in the field.
- Removal and destruction of infected plant portions in early stage.
- Avoid heavy application of nitrogenous fertilizers during growth phase of susceptible varieties.
- Placing of yellow sticky traps at 5 per acre or light traps at one per acre to attract and kill the vector whiteflies.
- Spraying of 10% Nochi (*Vitex negundo*) Leaf Extract (or) 1% Tobacco Leaf Extract at 30 days after sowing.
- Spraying of 5% Neem Seed Kernel Extract (NSKE) or 3% Neem oil.
- Spray methyl demeton 25 EC 500 ml/ha or dimethoate 30 EC 500 ml/ha or thiamethoxam 75WG @ 100 g/ha or imidacloprid 17.8 SL @ 250 ml/ha or thiamethoxam 75 WS 1 g/3 lit and repeat after 15 days, if necessary.