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DOWNY MILDEW OF ISABGOL AND OPIUM POPPY: A THREAT TO PRODUCTION

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Downy mildew is a serious disease which caused by the members of kingdom Straminopila. The pathogen of the disease produces downy or cottony growth under the surface of the leaves and causing oily spots and yellowing on upper surface. The disease mainly comes in initial stage of the crop growth and in severe conditions plant die before attaining the mature stage thus, production is threatened. The downy mildew pathogens are obligate parasites and can't be cultured on auxenic media. The pathogen is favoured by cool conditions and availability of moisture because it produces zoospore as asexual spore (except *Perenospora* and *Pseudoperenospora*). It colonises in plant systemically and draws the nutrition by haustoria. Pathogen produces oospore as a sexual spore *viz.* resting spore for survival in absence of the host. Downy mildew disease is most common in various crops like Bajra, Grape, Maize and many more. Here we especially mentioned about medicinal crops like Isabgol and Opium which increase its hectares in India and downy mildew is most common wherever it grow.

Isabgol (*Plantagoovata*) is a Rabi season medicinal crop which is grown for its seeds and seed husks. India produces highest seeds and husk in the world. In India it is grown mainly in Rajasthan, Gujarat and Madhya Pradesh. It has fabulous medicinal values like: relieve constipation, diarrhoea, indigestion, high weight, high BP and cholesterol.

Downey mildew is very serious and endemic diseases under Rajasthan conditions which caused by *Pseudoperonosporaplantaginis*in southernRajasthan and *Peronosporaalta*in western Rajasthan. The severity of disease in Rajasthan varies 70-75 % and it can cause yield losses up to 32 %. Moist weather conditions and high nitrogen dosage increase the disease whereas phosphorus brings resistance in plants. Disease starts appearing during December month and becomes severe but early and late sowing may escape the disease.

It causes severe systemic infection in plants which showed as yellowing and stunting of plants. Chlorotic streak along with mid ribs and downy growth of pathogen on leaf surface can be seen by naked eyes. Disease can be managed effectively by 2 foliar application and seed treatment with Metalaxyl*viz.* Ridomil MZ (0.2%) and Apron SD (5g/kg seed) respectively. Foliar spray should be repeated at 15 days interval and stopped before 45 days of harvesting to protect the seeds from residue problem.

Opium poppy (*Papaver somniferum)*have immense value as a pharmaceutical drug and grown by the permission of government. It contains alkaloid drugs like morphine, codeine, thebaine and papaverine. It is grown mainly in Rajasthan, Madhya Pradesh and Gujarat. Downy mildew caused by *Peronospora arborescens* disease is most commonly faced by the growers. Its symptoms started appearing as small chlorotic leaf lesion which leads to necrosis in severe infection. White cottony growth of the pathogen can be seen under humid conditions with naked eyes or by the help of simple hand lens.

For management of the disease crop rotation, deep ploughing, burning of stubbles and removal of volunteer can be followed. Protective fungicides like mancozeb are applied in moderate attack while in severe attack metalaxyl (0.2%) foliar spray can be adopted. Systemic fungicide has residual problems so reliance on them is harmful. In other hand case of phytotoxicity and reduced germination is also reported from seed treatment with metalaxyl under Rajasthan conditions.

Fig. Downy mildew of Opium poppy

Fig- Isabgol

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Pacckage of practices for isabgol cultivation by NRCMAP (ICAR)