

Integrated management of Bacterial leaf blight of rice

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I. About the disease

Hindi Name: Jeevanu Angamari (जीवानु पत्ती झुलसा रोग or पत्ती झुलसा रोग)

Odia name: Patrapoda roga (ଜୀବାଣୁ ଜନିତ ପତ୍ରପୋଡ଼ା ରୋଗ) (Jibanu Janita Patrapoda roga); ପତ୍ରାଛାଦ ପୋଡ଼ାରୋଗ (*PatrachhadaPodaroga*)

Bacterial leaf blight (BLB) is a devastating and widespread disease of rice. The disease can cause huge loss under severe epidemic conditions. The disease can cause yield loss up to 70% based on varieties grown and climatic conditions. This bacterial blight disease causes reduction in photosynthetic area of the leaf, reduction in 1000 grain weight, empty/chaffy grains, and quality deterioration.

II. Disease Symptoms

1. Seedling wilt or kresek phase

- Observed 1-3 weeks after transplanting
- Green water-soaked layer along the cut portion or leaf tip of leaves as early symptom
- Leaves wilt and roll up and become grayish green to yellow
- stunted growth and bushy appearance of the plant
- Entire plants wilts completely and die in few days of infection.

2. Leaf blight phase

- Water-soaked to yellowish stripes on leaf blades or starting at leaf tips with a wavy margin and progress towards midrib
- Leaves with undulated yellowish white or golden yellow marginal necrosis, drying of leaves back from tip and curling, leaving mid rib intact are the major symptoms.
- Appearance of bacterial ooze that looks like a milky or opaque dewdrop on young lesions early in the morning
- Severely infected field looks like *burnt appearance*
- Severely infected leaves tend to dry quickly
- Loss in grain yield may be up to 60%.

3. Confirmation of bacterial leaf blight infection

- Squeeze the infected seedling and confirm that it will not come out easy. This is the distinguishing different between stem borer and kresek infection.

- Yellowish bacterial ooze come out of the cut end

4. Simple confirmation test for bacterial blight infection

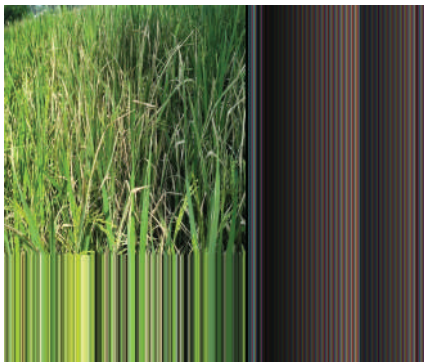
- Take clean water in a transparent glass.
- Immerse the cut end of the bacterial blight infected/suspected leaves in water and allow for few minutes.
- Observe for the milky ooze coming out from cut ends
- After few minutes entire water in the glass becomes turbid.



Initial symptoms of bacterial blight



Severely infected leaf



Bacterial exudate/ooze on leaf blade



Severely infected field

III. Pathogen

- *Xanthomonas oryzae* pv *oryzae*
- Gram negative, rod shaped bacteria having $1.2 \times 0.3-0.5 \mu\text{m}$.
- The colonies of the bacteria looks pale yellow, circular, and smooth margin with convex and viscid.

IV. Economic thresh hold level (ETL)

2-3 infected leaves/m² at early to late tillering stage

V. Critical Stages of Infection

- Seedling stage, post transplanting tillering stage and panicle emergence stage

VI. Favorable conditions

- Susceptible varieties continuously growing in same field
- Application of high dose of nitrogenous fertilizers
- Warm temperature(25-30° C), , high humidity, rain and deep water
- Cloudy and humid conditions for at least 5 days.
- Continuously flooded field
- The use of trimming tools for transplanting or mechanical cutting of tips and by handling during transplanting can also trigger new infection
- Severe winds makes mechanical damage and thus enhances disease severity
- Rice stubbles, ratoon plants near crop field.

VII. Integrated Disease Management

- Cultivate disease resistant/tolerant varieties
- Upland: Sadabahar
- Irrigated ecosystem: Chandrama, Ajay, Rajlaxmi, Satabdi, Tapaswini, Kshitish, Pallavi, Indira
- Shallow rainfed lowland ecosystem: Ketekijoha, Padmini, Dharitri, Savitri, Ramakrishna
- Medium deep water logged ecosystem: Durga, Gayatri
- Use disease free seeds:
- Seed treatment should be made with Streptocycline or Plantomycine 500 ppm/kg of seeds
- Biological seed treatment can be made using Bacillus or Pseudomonas talc based formulations at 8-10g/kg of seeds.
- Seedling root dip with above chemical/biocontrol agents for 30 minutes just before transplanting.
- Follow optimum spacing 20 X 15 cm
- Weed control and collection and destruction of infected debris of the previous crop.
- Avoid water logging continuously or follow alternate wet and dry situation.
- Proper nitrogen management and application of Potash minimizes the disease.

Biological Control: Spray with *Bacillus* or *Pseudomonas* talc based formulations at 8-10g/lit of water at early infection stage (2-3 sprays at an interval of 7 days)

Organic Control: Spraying fresh cowdung extract: 200-250g cowdung dissolved in 1 lit water, sieve it. 10 lit of such extract dissolved in 500 lit water is required for 1 ha.

Chemical control: Spray the crop at tillering to booting stage with 500ppm

streptomycin + 2.0 g copper oxychloride (COC) dissolved in 1 lit water.

Always remember to add adjuvant like soap water or sticker to spray solution to enhance the efficiency.

VIII. List of chemical chemicals approved for management of bacterial blight (As on 31.03.2025).

Fungicides/ antibiotic	Commercial formulations available in market	Dosage/ha			Waiting period from last application to harvest (Days)
		a.i (g)	Formulations (g/ml) %	Dilution in Water (L)	
Copper Hydroxide 53.8% DF	Kocide 2000 (Corteva),	525	1500	500	10
Copper Sulphate Pentahydrate 6% SC	Mastercop (Adama)	60g	1000	500	21
(Streptomycin Sulphate 90% + Tetracycline Hydrochloride 10%) SP	K-Mycine (Katyayani), Streptocycline (Hindustan Antibiotics Ltd)	NA	NA	NA	NA
Streptomycin Sulphate 9% + Tetracycline Hydrochloride 1%) SP					

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