

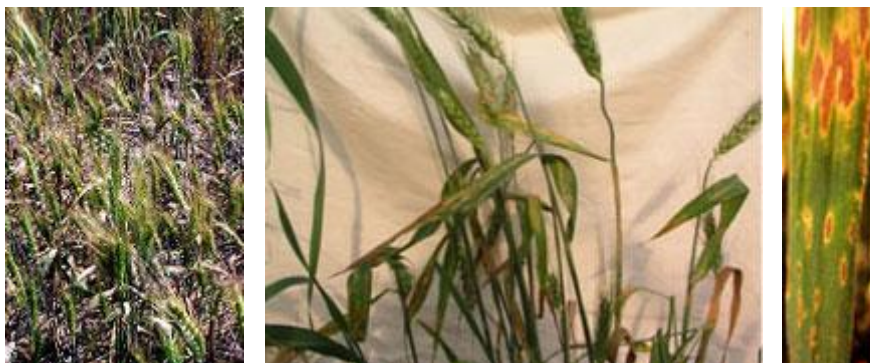
# Integrated management of leaf blight complex in wheat with special emphasis on host resistance

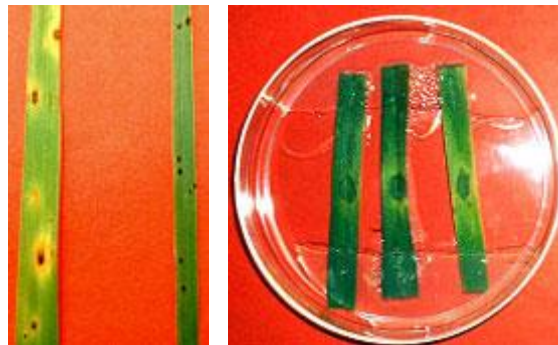
## Introduction

Intensified wheat cultivation in non traditional areas, changes in cultural practices, tillage, crop rotation and higher emphasis on rust and growing of susceptible wheat varieties to leaf blight has resulted development of leaf blight in epidemic proportions in India and many countries of South Asia and world. One time popular cultivars like, HD 2329, Sonalika, UP 262 etc. suffered a lot due to high incidence of leaf blight and farmers were forced to replace these with tolerant varieties in spite of good grain quality. The disease is still causing losses worth millions of rupees in India as well as deteriorates the seed quality. The recent assessment of losses done under AICWBIP indicated up to 50% losses in yield in susceptible varieties in different agroclimatic zones of India. Leaf blight is a complex disease and caused by three pathogenic fungi, *Bipolaris sorokiniana*, *Alternaria triticina* and *Pyrenophora tritici repentis* occurs through out India on three cultivated species of wheat (*Triticum aestivum*, *T. durum* and *T. dicoccum*) and Triticale. It can cause symptoms on different plant parts as well as root rot.

## Objectives

- Generating information on pathogenic variability, supply of pathogenic variability to different cooperating centres, maintenance, role of abiotic factors in disease development, host resistance, use of toxins in screening of breeding lines as well as possible induction of systemic resistance in host using PGPR.
- Identification of durable resistant genotypes and varieties against leaf blight complex.
- Generate technology for an effective management of quantitative and qualitative losses caused by disease in wheat thus leading to increased productivity of crop in country.





### Activities

- Support to breeding projects in creation of disease epiphytotics in parental and segregating material.
- Analysis of blighted samples and detection of pathogenic variability.
- Epidemiological studies under polyhouse to know the effect of weather on disease.
- Use of toxin in evaluating host resistance.
- Testing of promising PGPR against leaf blight pathogens in field.
- Seedling Resistance Test (SRT and validation of results of SRT in field.
- Microscopic studies on host resistance at cellular level.
- Effect of tillage practices of leaf blight incidence.

### Achievements

- One spot blotch (*B. sorokiniana*) resistant genotype “Harit 1” (INGR 04023) has

been registered.

- One bioagent *Trichoderma harzianum* isolate DWRLB1 has been isolated from wheat leaves and found quite effective against leaf blight.
- The leaf extract of Bel (*Aegle marmelos*) were found quite effective against leaf blight.
- The results of seedling resistant test were found to correlate with adult plant reaction up to 85% cases in resistant and up to 95% cases in susceptible genotypes.
- The toxin “Helminthosporol” of *B. sorokiniana* was found selective during early phase (up to 48 h of application) and may be used for rapid screening of wheat genotypes against spot blotch *in situ*.
- The frequency of occurrence of leaf blight pathogens varied in different zones. At national level, *B. sorokiniana* was dominant and its incidence increased at adult stage. *Pyrenophora tritici repentis* the cause of tan spot showed increasing trends in northern India and was major pathogen in NHZ.
- Spot blotch was found to be the major cause of poor seed viability and germination in warmer and humid weather. Seed treatment with Vitavax power (carboxin+thiram) @ 0.3% was quite effective against seedborne infection.
- A total of 13 distinct isolates were identified in *B. sorokiniana*. Two each of *A. triticina* and *P. tritici repentis* were also identified.
- The protocol for extraction of DNA and its RAPD in case of *B. sorokiniana* was standardized.

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