



DISEASE OF FIELD AND HORTICULTURAL CROPS – I

SESSION 3 RICE DISEASES – 1

Important Diseases

❖ Major Diseases

1. Blast - *Pyricularia oryzae* (T - *Magnaporthe grisea*)
2. Brownspot - *Bipolaris oryzae* (T - *Cochliobolus miyabeanus*)
3. Sheath Blight - *Rhizoctonia solani* (T- *Thanetophorus sasaaki*)
4. False Smut - *Ustilaginoidea virens* (T – *Claviceps oryzae sativae*)
5. BLB - *Xanthomonas oryzae* pv *oryzae*
6. Tungro - RTSV (*Waikavirus*) + RTBV (*Tungrovirus*)
7. Khaira disease - Zn deficiency

❖ Minor Diseases

1. Stem Rot - *Sclerotium oryzae*
2. Sheath Rot - *Saracladium oryzae*
3. Udbatta disease - *Ephelis oryzae*
4. BLS - *X. oryzae* pv *oryzicola*
5. Grassy stunt - *Tenuivirus*

Rice Blast

❖ *Pyricularia oryzae* (*Magnaporthe grisea*)

❖ Discovery: China (1637); India – Tanjavur (1918)

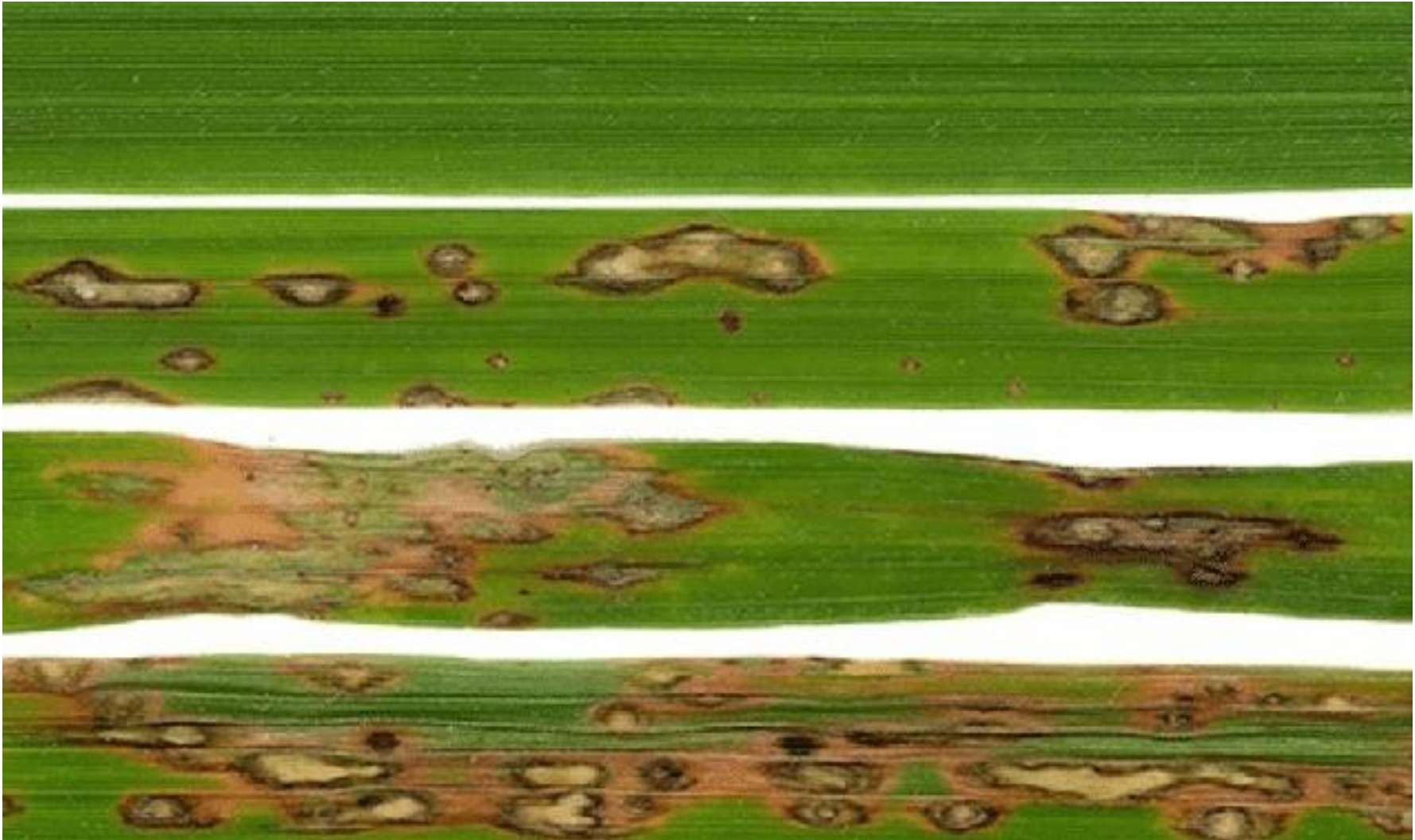
❖ Symptoms

1. Leaf blast – Spindle/ eye shaped spots with brown margin and whitish grey centre
2. Node blast – Blackening and Shrivelling
3. Neck blast – Panicle break at the neck

Leaf Blast



Leaf Blast



Node Blast



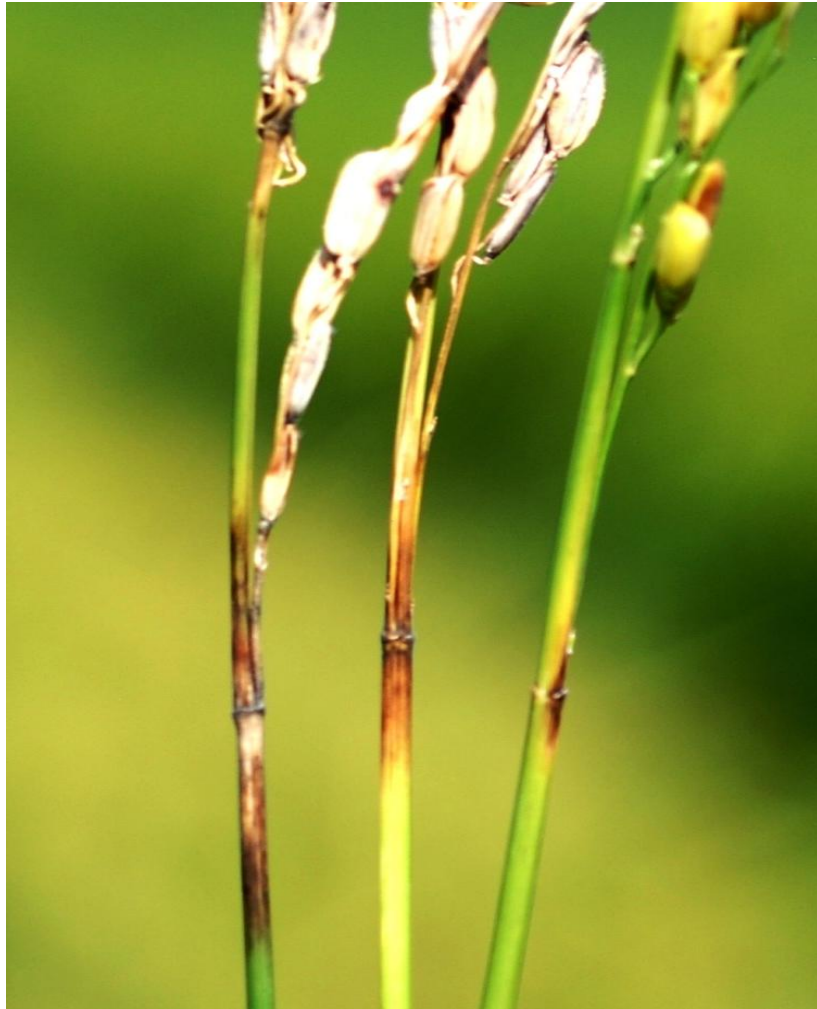
Healthy



Diseased

ARAVIND.T, ASST. PROFESSOR, MSSOA

Neck Blast



Neck Blast



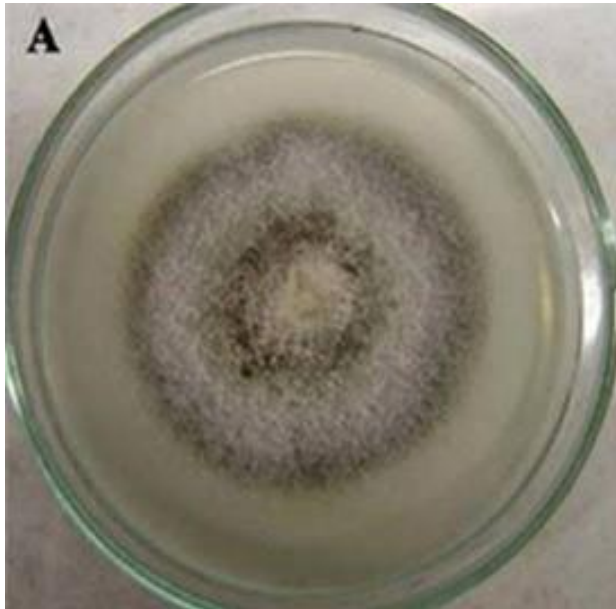
❖ Etiology

✓ *Pyricularia* (Anamorphic fungi)

- Conidia
- Pyriform/ Pear Shaped
- 2 septate; Hilum at base
- Melanized appressoria
- Incubation period – 4 days

✓ *Magnaporthe grisea* - Perithecia

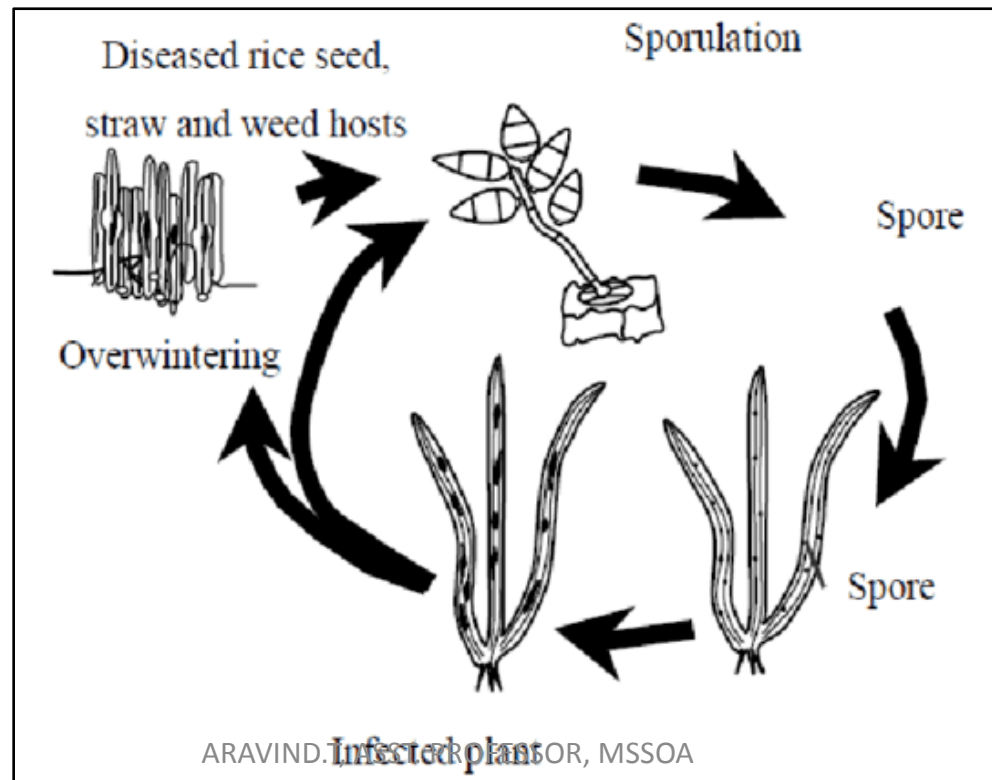
(*Ascomycota* > *Sordariomycetes* > *Magnaporthales* > *Magnaporthaceae*)



❖ Disease Cycle

Primary inoculum - **Several grasses**
(*Leersia hexandra*, *Digitaria sanguinalis*)
- **Rarely seed borne**

Secondary inoculum - **Air borne conidia**



❖ Favourable Conditions

- ✓ **Susceptible stages** - Seedlings, Rapid tillering, Ear emergence
- ✓ **Weather**
 - Night Temperature $< 20\text{ }^{\circ}\text{C}$
 - RH $> 90\%$
- ✓ **Soil**
 - High Nitrogen content



❖ Management

1. Resistant varieties – **Jaya, IR-8, Naveen, Ajay, Phalguni**
2. Disease free seeds
3. Crop rotation
4. Field sanitation – Remove weeds, Crop residues
5. Split application of nitrogen fertilizer
6. Fungicides - Tricyclazole 75% WP – 0.8g/ L
 - Picoxystrobin 22.5% SC – 1g/L
 - Ediphenphos 50% EC – 0.8g/L
 - Azoxystrobin 18.2% + Difenconazole 11.4% SC
7. Antibiotic - Kasugamycin 3% SL - 1ml/L

Brown Spot

❖ *Bipolaris oryzae* (T - *Cochliobolus miyabeanus*)

❖ ~ Sesamum Leaf Spot

❖ Symptoms

1. Leaves and Leaf sheath

Brown, round to oval spots, scattered spots

Grey center with brown margin

Yellow halo (sometimes)

2. Glume – Black/dark brown spots

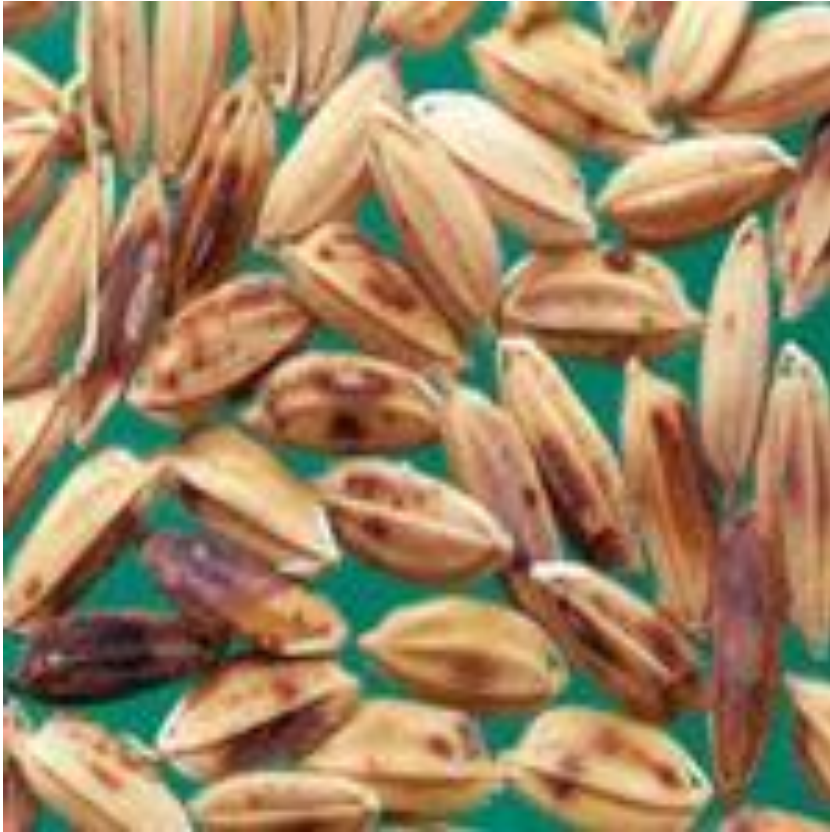
Leaf



Leaf



Grain

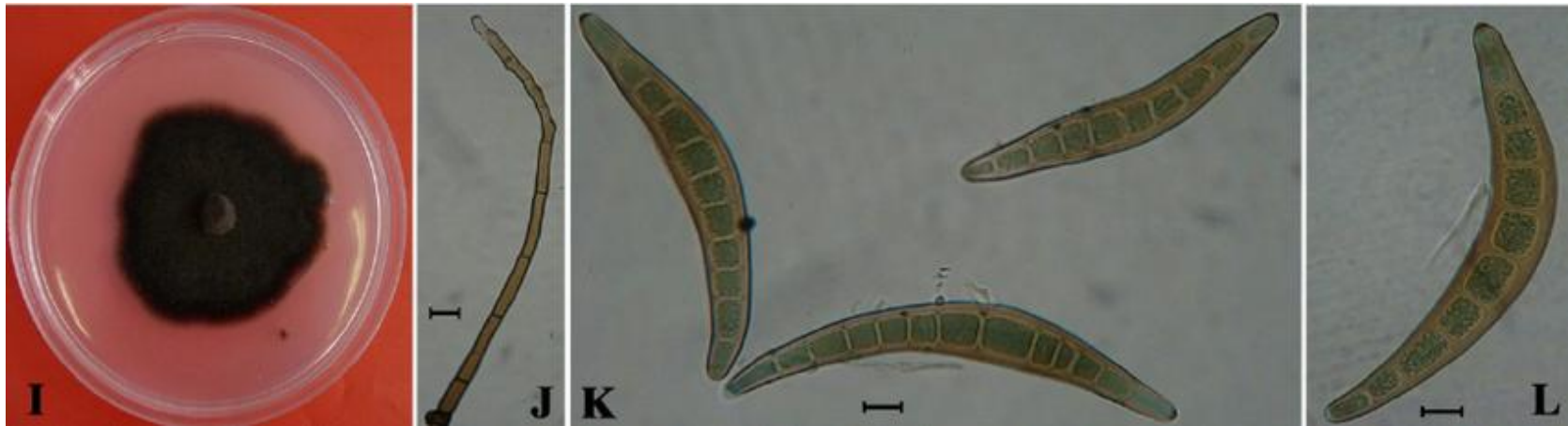


❖ Etiology

- Bipolaris*
- Conidia
 - Cylindrical, Multiseptate, Tapering
 - Brown coloured

Cochliobolus - Ascostroma

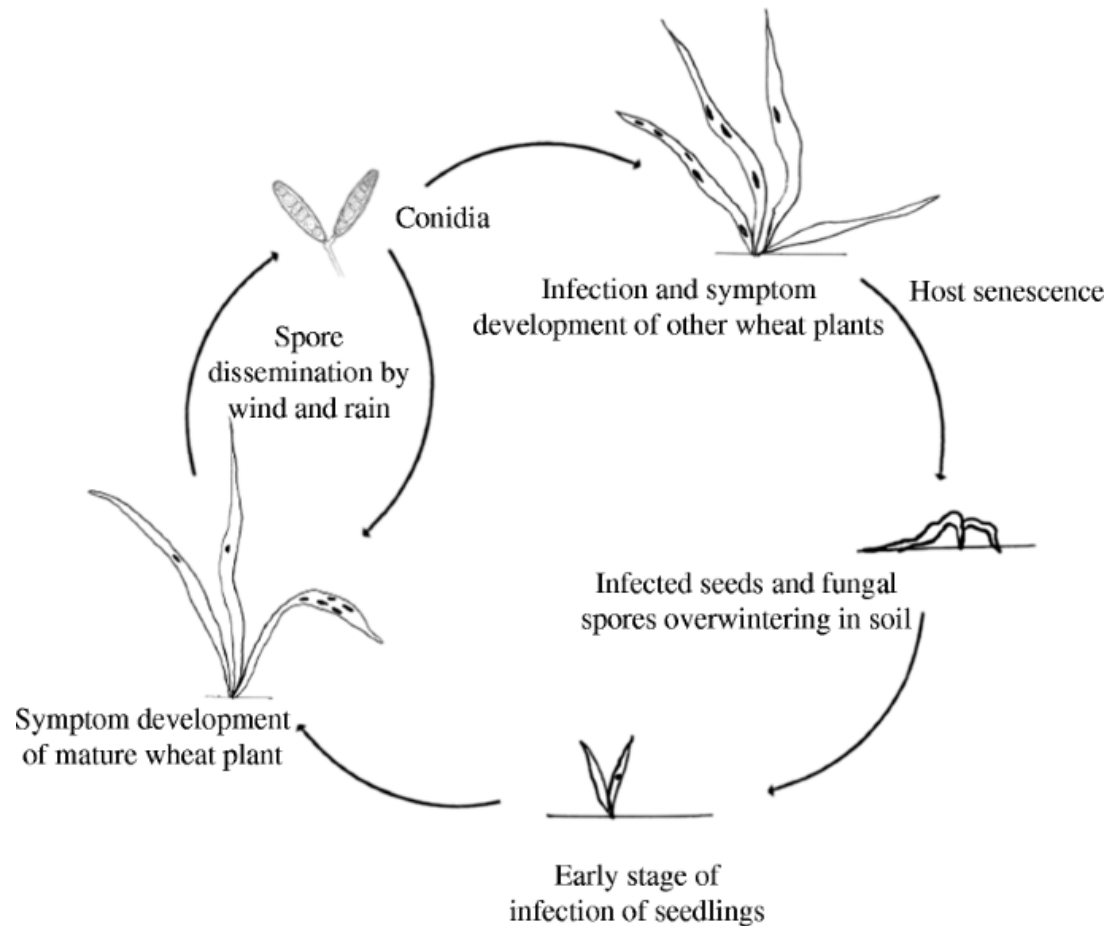
(*Ascomycota* > *Dothideomycetes* > *Pleosporales* > *Pleosporaceae*)



❖ Disease Cycle

Primary inoculum - Seeds, Collateral hosts, Crop debris

Secondary inoculum - Air borne conidia



❖ Favourable conditions

- ✓ Susceptible stages - Mature plants are more susceptible
- ✓ Weather - ~25 °C; RH > 90%; Cloudy weather
- ✓ Soil - Excessive nitrogen application

❖ Management

1. Resistant varieties – Padma, IR-24, **Naveen**
2. Disease free seeds
3. Crop rotation
4. Field sanitation – Remove weeds, Crop residues
5. Split application of nitrogen fertilizer
6. Seed Treatment – HWT- 55 °C for 10 min; Thiram – 3g/Kg
7. Fungicides - Tricyclazole 75% WP – 0.8g/ L
 - Picoxystrobin 22.5% SC – 1g/L
 - Ediphenphos 50% EC – 0.8g/L
 - Azoxystrobin 18.2% + Difenoconazole 11.4% SC
7. Antibiotic - Aureofungin 46% SP - 50 ppm

Blast vs Brown Spot



Sheath Blight

❖ *Rhizoctonia solani* (T- *Thanetophorus sasaaki*)

❖ ~ Banded Sclerotial Disease

❖ Symptoms

1. Leaf sheath- Elongated spots with greyish white center and brown margin; Extends to leaves
2. Sclerotia on affected tissue
3. Sheath rotting

❖ Leaf Sheath



❖ Leaf



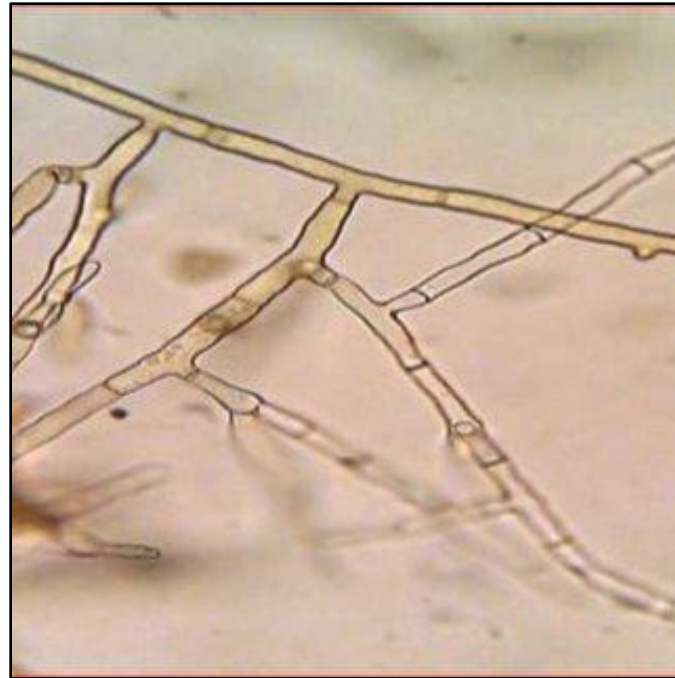
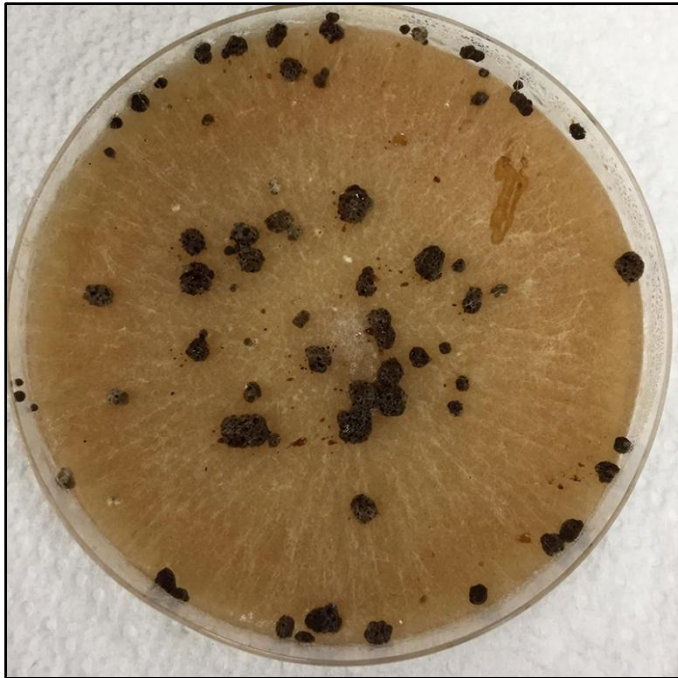
❖ Sign



❖ Etiology

❖ *Rhizoctonia*

- Sclerotia – Dark brown; Round
- Branching at right angle
- Constriction at the branching point



❖ Disease Cycle

- ✓ Primary inoculum - Soil borne sclerotia, Collateral host
- ✓ Secondary spread - Sclerotia and mycelia through irrigation water

❖ Favourable Condition

- ✓ Stage - Rapid tillering stage
- ✓ Weather - High temperature ($>30\text{ }^{\circ}\text{C}$), $\text{RH} > 90\%$)

❖ Management

1. Resistant varieties – **Satyakrishna, Phalguni**
2. Crop rotation
3. Field sanitation – Remove weeds, Crop residues
4. Split application of nitrogen fertilizer
5. Intermittant drainage
6. Soil amendment with organic manures – neemcake@ 5t/ha
7. Fungicides – Propiconazole 25%EC – 1ml/L
 - Tebuconazole 25% EC- 1ml/L
 - Flusilazole 40%EC – 0.8 ml/L
 - Azoxystrobin 18.2% + Difenconazole 11.4% SC
7. Antibiotic - Validamycin 3% L- 1 ml per L