California Rice Diseases

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California Rice Diseases

- **Seed rot**
- **Seedling disease**
- **Bakanae**
- **Steam rot**
- **Aggregate sheath spot**
- **Leaf blast**
- **Panicle blast**
- **Kernel smut**
- **False smut**

![Diagram of rice plant growth stages]

<table>
<thead>
<tr>
<th>Phase</th>
<th>Days: early variety</th>
<th>Days: late variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preflood</td>
<td>25–30</td>
<td>25–30</td>
</tr>
<tr>
<td>Early tillering</td>
<td>55–60</td>
<td>65–75</td>
</tr>
<tr>
<td>Midtillering</td>
<td>85–90</td>
<td></td>
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<tr>
<td>Flowering</td>
<td></td>
<td>95–105</td>
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</tbody>
</table>
Seed Rot and Seedling Disease

- Caused by *Achlya klebsiana* and *Pythium* species
- Pathogens survive in the soil
- Symptoms appear shortly after seeding
- Unfavorable conditions for germination and seedling growth favor disease
- Seedlings outgrow disease under favorable plant growth conditions
Growth of fungal hyphae from rotten seed
Seed Rot and Seedling Disease Management

- Plant high quality seed
- Laser level and maintain 4 inch flood
- Plant when temperature is favorable for seed germination and growth
- Use higher seeding rate in fields with history of disease or in cool weather
**Bakanae Disease**

- First identified in CA in 1999
- Widespread and caused some significant yield losses in 2002
- Caused by *Gibberella fujikuroi*
- Produces growth hormones gibberellin and fusaric acid
- Symptoms may be quite variable
Thoughts on Seed Handling

• Use certified seed and obtain the cleanest seed possible
• Use an Ultra Clorox soak according to the label
  – 5% soak for 2hr or 2.5% soak for 24hr
• Do not sit around too long after draining seed
  – Anything over 24hr may lead to multiplication of the pathogen and result in higher disease incidence even in treated seed
Ultra Clorox Effects on % Bakanae in Naturally Infested M-205
Stem Rot

• Caused by *Magnaporthe salvinii (Sclerotium oryzae)*
• Pathogen survives as sclerotia associated with crop residue in the soil
• Sclerotia float to the surface of flooded fields and infect plants
• Incidence and severity is correlated with the density of sclerotia in top layer of soil
• Excessive nitrogen fertilization favors disease
Stem rot sclerotia
Stem Rot Management

• Dependent upon cultural methods
• Limit the amount of inoculum carry over
  – Burning
  – Swathing and removal
  – Fall incorporation with winter flood
• Avoid excessive nitrogen fertilization, thick stands
• Fungicides: Quadris
Aggregate Sheath Spot

• Caused by *Rhizoctonia oryzae-sativae*
• Pathogen survives as sclerotia associated with crop residue in the soil
• Sclerotia float to the surface of flooded fields and infect plants
• Excessive nitrogen fertilization does not increase the severity of disease, associated with potassium deficiency
Aggregate sheath spot sclerotia
Aggregate Sheath Spot Management

• Very similar to stem rot management
• Limit the amount of inoculum carry over
  – Burning
  – Swathing and removal
  – Fall incorporation with winter flood
• Fungicides: Quadris, Stratego
Rice Blast

• Caused by *Pyricularia grisea*
• First identified in CA in 1996
• Most important rice disease worldwide
• Fungal spores dispersed by air
• Multiple cycle disease
• Very dependent upon environmental conditions
  – Leaf wetness, high R.H., moderate temperatures
• May infect most aboveground plant parts
Rice Blast Management

• Plant resistant or tolerant cultivars (M-208, M-206)
• Avoid less tolerant varieties (M-205, M-104)
• **Water seed and maintain flood**
• Avoid excessive nitrogen fertilization
• Limit the amount of inoculum carry over
• Fungicides: Quadris, Stratego
  – Scouting is essential
Kernel Smut

• Fungal disease (*Tilletia barclayana*)
• Black mass of spores that replace kernels
• Easier to spot in the morning
• Smutted grains produce stained kernels
Kernel Smut

• Spores overwinter in soil, seeds
• At flowering, secondary spores infect kernels
• Favored by
  – Wetness (dew, rainfall)
  – High N rates
  – Long grain varieties
• Management
  – N rates
  – Fungicides: Quadris, Stratego
False smut

- First observed in CA in 2006
- Glenn and Colusa counties
What is the most important “input” you can put in your field to prevent disease problems?

A. Fungicides
B. Resistant varieties
C. Bleach
D. Water
E. Your shadow

A. B. C. D. E. 0% 0% 0% 0% 0%
Monitoring is essential to manage diseases in California rice!