



Rice Disease Resistance

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Resistance vs. Tolerance

(host vs. pathogen)

- Definitions
 - **Resistance** is the ability of an organism to exclude or overcome, completely or in some degree, the effect of a pathogen or other damaging factor.
 - **Tolerance** is the ability of a plant to sustain the effects of a disease without dying or “suffering” serious injury or crop loss.

Agrios, G. N. 2005. Plant Pathology.

Fungicide Resistance

- A case of the active ingredient becoming less effective or ineffective.
- “Generally, resistance is more likely to develop to narrow spectrum pesticides than to broad spectrum pesticides.”

Fry, W.E. 1982. Principles of Plant Disease Management.

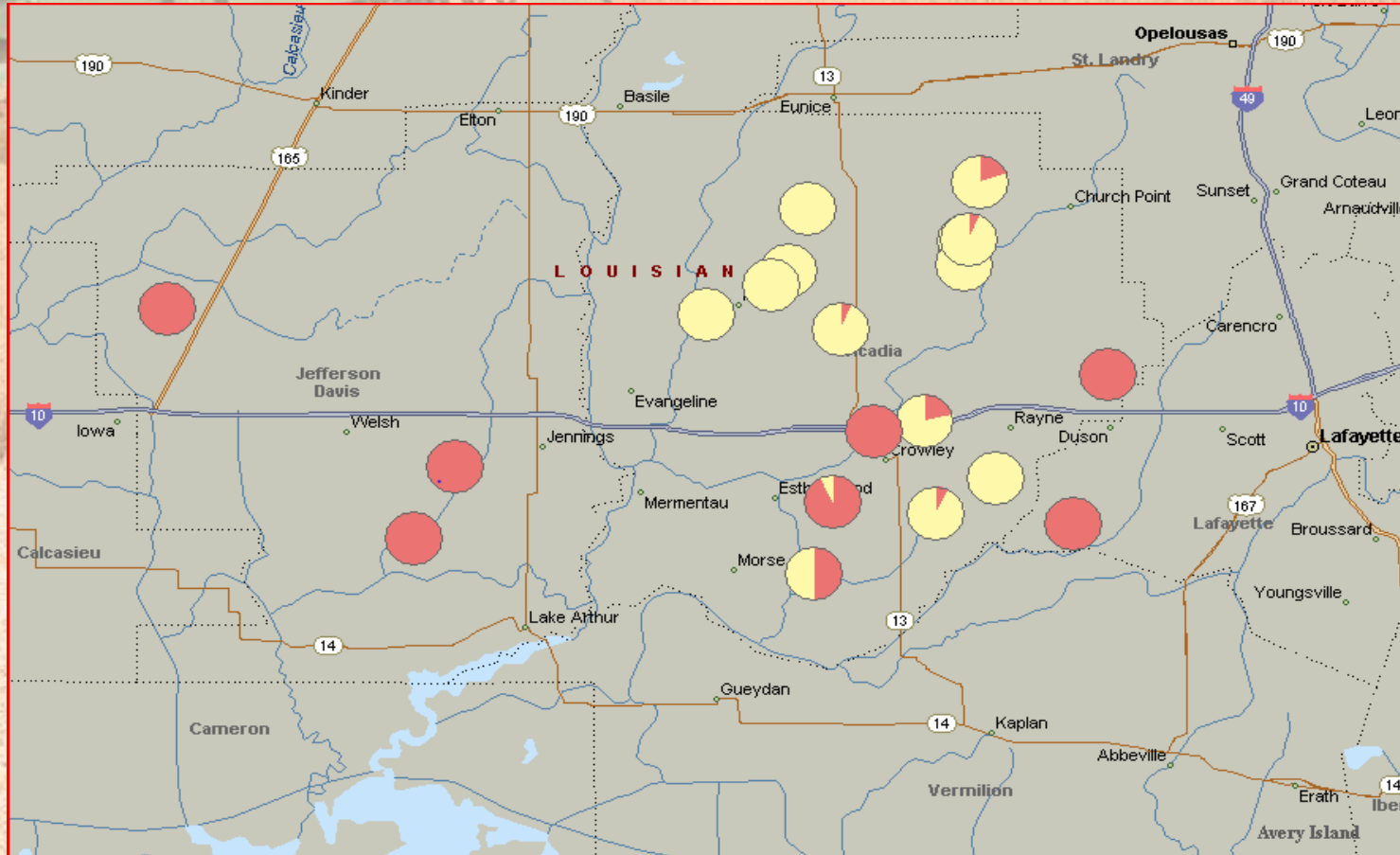
Determining Strobilurin Resistance in *R. solani* in Louisiana Rice and Soybean

- Over 400 samples from 35 fields of rice and soybean were collected from Acadia parish with a few samples from Jefferson Davis, Vermillion, Madison, and Richland
- Typically 20 samples were collected in each field but not all resulted in viable isolates due to the quality of the sample

Determining Strobilurin Resistance in *R. solani* in Louisiana Rice and Soybean

- In fields where azoxystrobin resistant isolates were identified the percentage of resistant isolates varied from very low to 100%.
- Samples from the problem fields were also tested for propiconazole resistance – all isolates were sensitive to propiconazole.

Frequency of Azoxystrobin **Sensitive** and **Resistant** Isolates



NOTE: of the 35 farms, 2 are in N LA which are not shown, several locations were close so circles overlaid, and samples from several farms were not viable and are not shown on the map.

Disclaimer: The map indicates solely where viable samples were isolated and tested. The grower should be aware of previous fungicides performance and scout fields early in 2012 for possible disease breakthroughs after application due to resistance.

BMP Suggestions

None of these will eliminate the pathogen!

- **2012 Pre-Planting**

- Understand the pathogen. This disease is spread primarily through debris in the soil – not wind movement.
- Where possible, rotate to a crop that is not as affected by *R. solani* (e.g. crawfish, pasture)
- If planting rice or soybeans, variety selection is important. Try to plant tolerant or the least-susceptible varieties to *R. solani*.
- If available, use a seed treatment that provides *R. solani* control. This will help reduce the inoculum load and delay disease development.

BMP Suggestions

None of these will eliminate the pathogen!

- Do not over- or under fertilize. Use the rate recommended for the variety grown.
- Plant the recommended seeding-rate.
- With a pressure washer, clean soil and debris from land-leveling equipment or other field equipment *before* entering or when leaving a farm.

BMP Suggestions

None of these will eliminate the pathogen!

- **2012 Growing Season**

- Apply a non-strobilurin (Group 11) fungicide for control of *R. solani*.
- A strobilurin fungicide may be needed for control of other diseases.
- Scout early! Do not wait until disease is moving up the plant.
- Apply a **full** rate of the fungicide.
- If conditions are conducive for disease development, a second application of a non-strobilurin (Group 11) fungicide may be needed.
- Clean equipment with a pressure washer after every tillage operation and/or moving from field to another. Equipment will spread inoculum from field to field.
- Clean out combine after each suspect field is harvested.

BMP Suggestions

None of these will eliminate the pathogen!

- After harvest
- Burn fields.
- Disking. Make multiple passes across the same field with the objective to destroy as much crop stubble as possible.
- Do not ratoon /second crop.
- After disking, pull levees and hold water over the fall and winter.
- Fallow. Leave questionable fields out of production the following year.

BMP Suggestions

None of these will eliminate the pathogen!

- After Harvest
- If land can be rotated, rotate to cattle or crawfish.
- Clean equipment with a pressure washer after every tillage operation and/or moving from field to another. Equipment will spread inoculum from field to field.
- Clean out combines after each suspect field is harvested.
- Clean any land-leveling equipment or other equipment that moves soil in suspect fields before entering or leaving a farm.

Strobilurin Resistance

- Section 18 for Sercadis (fluxapyroxad)
- This is an issue for all of us!
- Help to prevent spread!
- If you suspect resistance, get in touch with the Extension Agent **and** Dr. Groth **and/or** me.

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I appreciate your attention! Are there questions?

Je vous remercie de votre attention! Y a-t-il des questions?