ferences as well; the twin row pattern enjoyed a mean of 81.2 kg ha-1, whereas the single row pattern had a mean of 73.6 kg ha-1. Higher NDVI values were collected from plants in the twin-row system and MG V variety. This MG and row pattern contribution to NDVI differences is due to the ability of the MG V variety to shade the row middles quicker and resulted in increased leaf area. These data will prove useful in providing lower Mississippi flood plain soybean producers assistance with agronomic decisions.

Program 4SB-2

Soybean Disease Management In Reduced-Tillage Systems

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An effective disease management strategy should consist of the following components: disease identification, cultural practices, genetic resistance, and fungicides. Proper disease identification is critical for effective management. This will determine the cultural practices implemented, the varieties selected, and the fungicides used.

DISEASE IDENTIFICATION AND DEVELOPMENT:

Cercospora Blight/Purple Seed Stain is the number one soybean disease in Louisiana. The disease is caused by the fungus Cercospora kikuchii. The foliar symptoms are usually not evident until soybean is in the mid to late reproductive stages of growth. Initial symptoms are small chocolate brown lesions on the petioles near the leaflet. As the disease progresses, foliar symptoms are expressed as a reddish brown to tan discoloration on the upper leaf surface in the upper canopy. Leaves have a leathery appearance. The fungus can sporulate in older lesions. The spore masses resemble ashes. Advanced stages of this disease result in premature defoliation, discolored pods, and reduced seed quality. The seed phase of this disease is evidenced by purple-stained seed at harvest.

This disease is favored by plant stress, temperatures between 70 to 80oF, and wet weather. The pathogen can be carried on seed and survives on plant debris in the soil. The fungus has also been isolated from some weeds. Risk to this disease is increased in reduced or no-till systems.

Aerial Blight can spread rapidly in soybean if not properly managed. This disease is caused by the fungus Rhizoctonia solani. This is the same fungus that incites sheath blight in rice. Initial symptoms appear as water-soaked greasy blotches on the leaves (usually in the lower to mid canopy). As the disease progresses, adjacent leaflets become stuck together by fungal mycelium (white cottony in color). If favorable conditions persist, the foliage becomes brown and pods will have reddish-brown lesions. Under high severity pods can abort from the plant. The disease is usually evident during and after the early reproductive stages of growth. The potential for risk is increased when soybean is rotated with rice.

Disease development is greatest during periods of warm temperatures combined with high relative humidity or free moisture. This disease can spread rapidly within the crop and should be managed immediately upon detection if the crop is in the late vegetative or reproductive growth stages. The fungus is soilborne and can survive on plant debris.

Soybean Rust is caused by the fungus Phakopsora pachyrhizi. Symptoms initiate in the lower canopy and begin as small brown to tan raised pustules (volcano-like) on the lower leaf surface. Spores produced in the pustules resemble sand and are tan in color when young. Older spores are darker in color. As the disease progresses, the pustules can coalesce and cause the leaflets to defoliate. Symptoms are usually evident when soybean is in the mid (R3) to late (R6) reproductive growth stages. Pustules can also be present on petioles and pods when disease is severe. Kudzu is another host for this fungus.

The disease develops best when temperatures are 59-77oF and when leaf wetness periods of 6 to 10 hours.

Pod and Stem Blight occurs most frequently on the stems and pods. The disease is caused by the fungus Diaporthe phaseolorum var. sojae Infection can occur early in the season; how-

ever, signs of the disease are not evident until late season (R7). Pycnidia (fruiting bodies / black specks) occur in linear rows on the stems and pods. If favorable conditions persist, seed quality will be compromised.

Disease develops best during warm, wet weather. The fungus overwinters in crop residue or infected seed.

Anthracnose is caused by the fungus Colletotrichum truncatum. Early infections by the fungus can result in pre- and postemergence damping-off. Foliar symptoms include petiole cankers, leaf rolling, necrosis of the laminar veins, and premature defoliation. The fungus can produce acervulli (fruiting bodies / black specks) on the stems and pods. If the disease continues to develop on the pods, seed quality will be compromised.

The disease is favored by periods of high relative humidity. Infection occurs throughout the growing season. The fungus overwinters in crop debris or infected seed.

CULTURAL PRACTICES, GENETIC RESISTANCE, AND FUNGICIDES

Cultural practices can be used to manage diseases. Tillage practices will impact the initial inoculum present at planting and during the growing season. Reduced tillage practices result in more plant debris in the field. This plant debris can harbor plant pathogens and increase the risk to Cercospora foliar blight, pod diseases, and aerial blight. Rotating out of these fields periodically to a non-host will reduce the initial inoculum. Plant when conditions favor rapid germination and seedling establishment. A healthy plant is the first step toward optimizing yields and preventing disease. Improve drainage within the field. This will help reduce the risk to soilborne disease such as Phytophthora rot and red crown rot. Practices that promote air movement within the canopy will reduce the leaf wetness period and lessen the risk to some foliar diseases.

When possible, genetic resistance should be the foundation of any disease management strategy. Always use high-yielding, disease-resistant varieties when available. The LSU AgCenter conducts variety evaluations on several research stations located throughout the state. Varieties are evaluated at some locations for disease reactions.

When genetic resistance is not available, fungicides can be utilized for managing diseases. The diseases present will dictate which fungicide class is needed. Three classes of chemistries are available to producers: strobilurins (Gem, Headline and Quadris), benzimidazoles (Topsin M or thiophanate methyl), and triazoles (soybean rust fungicides).

The strobilurins have broad spectrum activity. This class is effective against aerial blight and pod diseases, slightly effective against Cercospora blight, and suppressive against soybean rust. Topsin M is moderately effective against Cercospora blight and pod diseases, but not effective against soybean rust. Triazole fungicides are used for managing soybean rust.

Application timing and sprayer setup are other considerations. Applications should be made when soybean are between the R3 (pod initiation) and R5 (seed initiation) stages. Early applications (R3) usually provide better efficacy against Cercospora foliar blight and later applications (R5) will provide better efficacy against pod diseases. Ideally, sprays should be made in 15 gallons of solution per acre by ground and 5 gallons of solution per acre by air.

Notes: