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CROP RESIDUE MANAGEMENT FACT SHEET

This is one in a series of fact sheets from the Mississippi Soybean Promotion Board and the soybean checkoff. Each sheet presents a brief overview of a topic important to Mississippi soybean production. More information on each topic can be accessed through the link at the bottom of the sheet. To see other fact sheets, click here.

Returning crop residues to the soil environment is an agronomically sound practice. The positive effects include: 1) providing ground cover to absorb the impact of raindrops, thus reducing soil particle detachment which in turn decreases erosion potential; 2) recycling nutrients removed by a growing crop; 3) reducing runoff of water following rainfall events; and 4) maintaining or increasing soil organic carbon (SOC) to provide a substrate for soil microorganisms and increase the organic component of soil.

The long-term sustainability of any agronomic system is closely linked to maintaining adequate SOC, and the maintenance of SOC is linked to tillage system and residue destruction. Therefore, it is critical that agricultural practices that contribute to destruction of plant residues or their removal be carefully evaluated before they are arbitrarily adopted in Midsouth crop production systems.

Management of residue from all crops is invariably linked to the amount and type of tillage that is performed following harvest of the grain portion of crops. So the choice of a clean tillage system (leaves essentially no crop residue on soil surface), a reduced tillage system (leaves 15-30% of soil covered with residue), or a conservation tillage system (mulch-till, strip-till, ridge-till, no-till–leaves more than 30% of soil covered with residue) is important in terms of residue management since residue cover resulting from degree of tillage is closely tied to the amount of soil loss.

General principles to guide residue management decisions follow.

- Follow a crop rotation sequence that includes high-residue-producing crops such as corn and grain sorghum with low-residue-producing crops such as soybeans. Plant the high-residue crop first in the sequence.
- Wait until spring to perform tillage operations deemed necessary, especially following soybeans.
- Plant a high-residue cover crop such as cereal rye or wheat following a soybean crop.
- If tillage is required, use operations that bury residue shallow vs. deep.
- Strive for even distribution of residue from a combine during harvest.
- Recognize that fragile residue from a soybean crop (high nitrogen content) decomposes quicker than non-fragile residue from a grain crop.
- Recognize that high grain yields result in more residue.
- Recognize that soybean produces only about 33% of the residue that is produced by corn.
- In rotation systems involving soybeans, use no-till following harvest of the soybean crop through planting of a following crop to preserve fragile soybean residue.
- An advantage of a soybean-corn rotation is the avoidance of the “yield drag” associated with continuous corn that results in large part because of accumulated corn residue, which is slow to decompose and thus exerts a negative effect on nutrient recycling and speed of N mineralization.
- In a continuous corn system, especially one that is irrigated, the yield-reducing effects of corn stover accumulation can be offset by removal (baling) of a portion of the corn stover. This fits well with a no-till continuous corn system.
- In a soybean-wheat doublecrop system, burning wheat residue (or wheat straw removal in general) prior to soybean planting will result in a significant reduction in potential SOC that is available for recycling to the soil, and lost value of nutrients in the wheat straw.
- Only an irrigated (vs. nonirrigated) soybean crop in Mississippi is likely to provide sufficient residue following harvest (and in the absence of tillage) to provide complete ground cover in the off-season.

Click here and here for a detailed discussion of this topic.

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