AGRONOMY

IDENTIFYING THE ADVANTAGES OF THE CORN–SOYBEAN ROTATION IN MISSISSIPPI

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"JUST LIKE IN THE MIDWEST, BOTH CORN AND SOYBEAN BENEFIT FROM BEING IN ROTATION WITH EACH OTHER IN MISSISSIPPI."

John Orlowski

Until recently, cotton was the major row crop in the Mississippi Delta. However, as cotton acreage has contracted over the past 10 years, the acreage of corn in the Delta has increased dramatically. The increase in corn acreage, coupled with the already extensive soybean production has allowed for the establishment of corn-soybean rotations, similar to those practiced in the Midwest. Because the corn-soybean rotation is relatively new in Mississippi there is very little reliable data about the potential benefits of the rotation in this region of the country.

In order to determine the effects of a corn-soybean rotation in the Mid-South, a large multi-state rotational study was established three years ago in Mississippi,

Table 1. *Rotational treatments.*

Cont Corn - No Res Mgmt	Cont Soybean	Soy MG4/Corn 1:1 Res Mgmt	Soy MG4/Corn 2:1 No Res Mgmt	Soy MG4/Corn 1:2 Res Mgmt	Dryland Cont. Corn - No Res Mgmt	Dryland Cont. Soybean	Dryland Soy MG4/Sorg 1:1 Res Mgmt	Dryland Soy MG4/Corn 1:1 Res Mgmt	Dryland Cont. Sorghum	Corn/Wht MG4 Soy No Res Mgmt	Corn/Soy MG4/Wht Res Mgmt
					Alley						
Cont Corn Res Mgmt	Cont Soybean	Soy MG4/Corn 1:1 No Res Mgmt	Soy MG4/Corn 2:1 Res Mgmt	Soy MG4/Corn 1:2 No Res Mgmt	Dryland Cont. Corn - Res Mgmt	Dryland Cont. Soybean	Dryland Soy MG4/Corn 1:1 No Res Mgmt	Dryland Soy MG4/Sorg 1:1 Res Mgmt	Dryland Cont. Sorghum	Corn/Wht MG4 Soy Res Mgmt	Corn/Soy MG4/Wht No Res Mgmt

		Corn following Corn	Corn following Soybean	Difference
	Irrigated	150	160	+ 6.6%
	Dryland	141	148	+ 4.9%
Difference	+ 6.4%	+ 8.1%		
		Soybeans following Soybeans	Soybeans Following Corn	Difference
	Irrigated	49	52	+ 6.1%
	Dryland	33	41	+24.2%
Difference		+ 48.5%	+26.8%	

Table 2. *Yields of corn and soybeans rotations under irrigated and dryland management.*

Louisiana, Missouri, Arkansas, and Texas. Rotations investigated include continuous corn, continuous soybean, and multiple-corn soybean rotations under both irrigated and dryland conditions (Table 1). Also, since it is a common practice to burn corn residue in Mississippi, the rotations were split between treatments where corn residue was burned and treatments where the corn residue was conserved.

Soybeans Following Corn		
Burned	Not burned	Difference
51	55	+ 7.8%

Table 3. *Yield of soybeans following corn residue burning vs. corn residue not burning.*

In 2016, the various rotations finished their first rotational cycle allowing us to perform analysis for the first time. Results can be seen in Tables 2 and 3. When corn followed soybeans in the rotation, yields were increased by 10 bu/ac compared to corn following corn under irrigated conditions and seven bu/ac under dryland conditions. Similarly, when soybeans followed corn in the rotation, soybean yield was increased by three bu/ac under irrigated conditions and eight bushels per acreunder dryland conditions. From a residue management perspective, soybean following corn where the residue was not burned had a four bushels per acre yield increase compared to soybean that followed corn where the residue was burned.

Much like the Midwest, it appears that corn and soybeans both benefit from being rotated with each other in Mississippi and the Mid-South. This is only the first three year cycle of the study but the results have been very positive. The study will be carried out for multiple rotational cycles to investigate the effects of a corn soybean rotation over a long time period.