irrigation every 10 days; however, for the 2 in. / 10 d irrigation level, progressively greater water use was observed with tillage practices that increased residue retention. The tillage effects were only significant later in the season.

In conclusion, residue retaining tillage practices, like no-till, increased crop water use through increased fallow season soil water storage and, possibly, through reduced evaporative losses of irrigation water.

Productivity And Net Returns From Best Management Practices (BMP) Cropping Systems

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Year-round systems with summer crops of cotton, corn, soybeans or grain sorghum and winter crops of wheat, rye or vetch are considered best management practices (BMPs) to protect surface water quality because they reduce soil and nutrient losses into water bodies. Winter crops stabilize the soil and eventually increase soil productivity by increasing organic matter and biological activity. Using no-till tillage systems is one of the most efficient ways to build organic matter in southern soils and, combined with residue from winter crops, provide unparalleled benefits for soil and water quality. In attempting to achieve the positive effects of conservation practices on water quality, economics has been a major concern of farmers because these practices may increase production costs, reduce productivity and may not provide short-term returns to justify increased expenses.

The LSU AgCenter has conducted research for many years on BMP cropping systems to evaluate the yield and economic benefits of these entire-year diverse crop sequences. These studies have evaluated systems that maintain ground cover through the use of crop residues, cover crops and no-till practices. The systems include winter cover crop/cotton, doublecrop wheat/cotton, wheat/soybeans, wheat/grain sorghum and doublecrop wheat/cotton rotated with corn, soybean or grain sorghum. Continuous monocropping/winter fallow of each of the summer crops was included for comparison purposes, though these are not considered BMPs.

Total commodity yield of the doublecrop systems was higher than any of the summer monocrop systems because of the winter wheat yield that averaged 65 bushels per acre. Summercrop yields usually, but not always, sustained yield losses in doublecrop systems. For example, doublecrop cotton yield varied from a 3 percent increase to a 21 percent reduction, and doublecrop soybean varied from a 12 percent increase to a 30 percent reduction. Sorghum produced the same whether planted as a monocrop or doublecrop. Yields of soybean and corn were 10 percent to 16 percent higher in doublecrop rotation systems than in doublecrop systems without rotations, but cotton yields were the same with or without crop rotations. Compared with monocropping, doublecrop cotton yields were reduced an average 67 pounds of lint per acre each year, and doublecrop soybean yields dropped an average of 5 bushels per acre each year. Any yield reduction of the summer crop is a significant economic penalty because it represents direct loss from potential net returns.

The economics of each system relied greatly on the commodity prices received in a given year but enterprise budgets showed some of the most-profitable systems included BMPs. Doublecrop cotton/wheat produced annual net returns that ranged from $164 to $340 per acre from average yields of 65 bushels of wheat per acre and 1,043 pounds of cotton lint per acre. The system of producing three crops of corn-wheat-cotton in two years averaged annual net returns that ranged from $86 to $221 per acre. In comparison, monocrop cotton net returns ranged from $112 to $167 per acre with average yields of 1,110 pounds of per acre. The BMP systems of doublecrop cotton rotated with corn or grain sorghum produced annual net returns that ranged from $101 to $181 per acre -- approaching that of monocrop cotton but less than continuous doublecrop wheat/cotton. Continuous monocrop soybeans, corn or sorghum produced highly variable net returns that ranged from -$40 to $148 per acre and were usually lower than monocrop cotton or BMP systems. Negative returns occurred in some years, usually with monocrop systems and seldom with multicrop systems.

The BMP systems evaluated in LSU AgCenter research programs are highly productive and have potential to improve soil and water quality. Despite their value for environmental protection, farmers face limitations in fully implementing these systems because, with current inputs and variable commodity prices, not all systems will be economically competitive with monocrop cotton every year. Government conservation programs that subsidize effective BMPs with public funding are needed for practices such as winter cover crops to promote implementation and attain their valuable environmental benefits, especially in combination with no till. These studies were conducted with no till, a viable economic practice because of the associated savings in fuel, equipment and labor costs.

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Research Results For Yield And Whole Farm Net Return With Spindle Picker Harvester Cotton In 15-Inch Row Patterns In Mississippi

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The recent introduction of the John Deere PRO 12 VRS 15-inch row spindle picker has allowed growers to grow 15-inch cotton without receiving a lint discount price of 3 to 5 cents that occurred with conventional stripper cotton. Due to limited available information on 15-inch row cotton, studies were conducted to evaluate whole farm cotton net revenue based on gin turnout, lint yield, fiber quality and input cost for 15-inch, 30 and 38-inch row patterns.

A study was conducted in 2003–2005 on a Marietta silt loam soil at Verona, MS; a Falaya silt loam soil at Falkner, MS; and in 2004 and 2005 on a Dubbs very fine sandy loam soil at Clarksdale, MS. The row patterns used in the study were 15, 30, and 38-inch row solid cotton, 15-inch rows with a 2 x 1 skip-row (2 rows of cotton with a 30-inch skip), 15-inch row 2 x 2 skip-row (2 rows with a 45-inch skip), 30-inch rows with a 1 x 1 skip-row (cotton in 60-inch rows), 30-inch rows with a 2 x 1 skip-row (2 rows with a 60-inch skip), and 38-inch rows with a 2 x 1 skip-row (2 rows with a 76-inch skip). Seeding rates were 4 seed/ft of row for all 38-inch rows and 3 seed/ft of row for all 30 and 15-inch row patterns.

Cotton was planted in a conventional reduced tillage seedbed at all locations in late April or early May in 2004 and 2005; and late May in 2003. All plots were harvested with a John Deere 9960 harvester equipped with two John Deere PRO 12 VRS units. The seed cotton from all plots was ginned with a mini gin (small gin equivalent to a commercial gin).

In the hypothetical whole farm revenue analysis, two 4-row harvesters and four tractors were used for the hill farms (Verona and Falkner); and three 6-row unit harvesters and six tractors were used for the delta location (Clarksdale). A John Deere model 9996 cotton picker was assumed to be configured to accommodate each row pattern. The 15-inch skip row patterns required some modifications because the marketed picker is not designed to accommodate skipped rows. Therefore, it was assumed that the picker could be converted to accommodate skip rows at an extra cost. Each picker was assumed to travel at 3.6 mph, have a field efficiency of 70% and to operate for 200 hours during the harvest season. Thus the amount of land per picker was adjusted to maintain the efficiency of the picker for each row pattern treatment. As the effective swath of a picker increased to accommodate the row width and/or skipped row patterns, its harvest capacity (acres/hr) increases, allowing it to cover more acres in the same amount of time. Acreage per harvester for 15-inch row solid cotton was 611 acres for the 4-row harvester and 916 acres for the 6-row harvester.

The estimated machinery cost was 90% of the MSRP. Ownership cost for the machinery items that were assumed to be required for each farm's row pattern was estimated on an annual basis using the capital recovery method at an interest rate of 5%. A land rent charge of $40/acre was assigned to the Hill farms and $80/acre was used for the Delta farm.

Input cost for each treatment and location were recorded and used in estimating operation