nodes. The yield performance and crop value of DP 0935 B2RF has shown to be higher than ST 4554 B2RF in a Beltwide comparison, greater than DP 555 BG/RR in the S. Southeast region, and greater than FM 9180 B2RF in W. Texas region.

DP 0949 B2RF is a mid-full maturity variety with high fiber quality that was released for commercial sales in the 2009 growing season. The variety has light hairy leaf pubescence, medium to tall plant height. The average fiber properties of DP 0949 B2RF are 35.5 to 36 staple, 4.55 micronaire, and 28.9 g/tex fiber strength. The node of the first fruiting branch averages 6.7 nodes. The yield performance of DP 0949 B2RF has shown to be greater than ST 4554 B2RF and PHY 485 WRF in the southern Cotton Belt. The staple length of DP 0949 B2RF was longer and the lint yield was higher in all three comparison varieties: DP 555 BG/RF, PHY 485 WRF, and ST 4554 B2RF. The crop value of DP 0949 B2RF is greater than ST 4554 B2RF in several regions. The regional performance of DP 0949 B2RF showed the best performance in the S. Southeast, along with strong performance in W. Texas.

Trait	DP 0912 B2RF	DP 0920 B2RF	DP 0924 B2RF	DP 0935 B2RF	DP 0949 B2RF
Maturity	Early	Early-Mid	Early-Mid	Mid	Mid – Full
Leaf Pubescence	Semi-Smooth	Semi-Smooth	Semi-Smooth	Smooth	Lt. Hairy
Plant Height	Medium	Medium	Medium	Med	Med – Tall
Seed Size (seed / lb)	4400 - 4800	4800 - 5200	4400 - 4800	4800 – 5200	4800-5200
Verticillium Tolerance	Good	Good	Good	Good	Good
Micronaire	4.81	4.56	4.61	4.45	4.55
Staple	~35	35.5	~35	~ 35	35.5 to 36
Strength	28.3 g/tex	27.5 g/tex	28.4 g/tex	28.1 g/tex	28.9 g/tex
Node of First Fruiting Branch	6.1	6.4	6.2	6.3	6.7

*Class of '09 variety traits, fiber properties and plant map data based on 2008 Monsanto FACT plots.

<u>Class of '10</u>

The Class of '10 candidate lines were tested in 2009 in over 140 on-farm module-sized trials (NPE), over 200 on-farm strip trials (FACT), and almost 100 university variety trials (OVT's). Even though the harvest has been delayed due to fall rains in the Midsouth; the southeast U.S. and West Texas are producing normal yields from the tests that will advance the Class of '10. In addition to the standard variety tests outlined above, best management practice (BMP) trials of the Class of '10 candidates were conducted for irrigation, plant growth regulators, planting date (SE region), foliar fungicide, and harvest aid timing. Information from the BMP trials will supplement the standard variety tests and provide growers and consultants direction on managing the new Class of '10.

Burndown Programs In Reduced Tillage Cotton

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Most cotton in the midsouthern United States is grown using some form of reduced tillage; however, true no-till production is uncommon in the Mississippi River Delta region. The most common reduced tillage cotton systems in the Delta are variations of the stale seedbed system. In a stale seedbed system, previous crop residue is destroyed by tillage and raised beds are prepared in the fall and remain fallow through the winter. In the spring, beds may be "rehipped" to facilitate planting. Preplant weed management can be problematic in a stale seedbed system, especially in the presence of glyphosate-resistant (GR) horseweed.

Glyphosate resistance in horseweed was first documented in Mississippi in 2003. Since that time, the weed has become a tremendous problem in Mississippi row crop systems, including cotton, soybean, corn, and rice. Glyphosate-resistant horseweed has rapidly developed into one of the most troublesome weeds in midsouthern USA agriculture and is listed in the top 10 as one of the world's most important herbicide-resistant species. Horseweed prefers undisturbed areas such as pastures, fallow, and no-till production areas. Horseweed is spread via small, wind-disseminated seeds capable of traveling great distances. This ease of transfer allows horseweed to rapidly spread to areas not previously infested by this weed. Horseweed is generally considered a winter annual which primarily emerges in the fall. However, research has shown that horseweed can emerge throughout the winter and as late as May. The wide window for emergence coupled with the ability of the seed to move into previously uninfested areas has created a serious concern for producers attempting to manage this weed.

Burndown herbicide programs for Mississippi Delta cotton production usually consist of glyphosate plus 2,4-D or dicamba. Glyphosate plus 2,4-D or dicamba plus Valor (flumioxazin) is also commonly used in the region. The burndown herbicide application is made 2 to 6 weeks before planting, with specific application timings varying with herbicide and tillage system. In fields infested with GR horseweed, 2,4-D or dicamba are utilized for postemergence control and Valor is added for residual control of GR horseweed or other weeds that may emerge between burndown herbicide application and planting.

Kixor is a new brand of protoporphyrinogen oxidase (PPOase) inhibiting herbicides manufactured by BASF that received federal registration in late 2009. Sharpen (saflufenacil) is one of the Kixor brand herbicides and will be labeled for fallow, preplant, and preemergence application in a variety of small grain crops. Sharpen will also be labeled for preplant application in cotton at a rate of 1 oz/A. A minimum of 42 days plus 1 inch of rainfall or irrigation is required between application and cotton planting. Sharpen provides postemergence control of GR horseweed. Residual control of GR horseweed is also possible with Sharpen, but the level of residual control is dependent on the Sharpen application rate.

Research was conducted at an on-farm site near the Mississippi State University Delta Research and Extension Center in Stoneville in 2009 to evaluate burndown herbicide programs containing Sharpen. The objectives of this research were to (1) evaluate different rates of Sharpen applied at four application timings and (2) compare tank-mixtures of nonselective herbicides applied in combination with different application rates of Sharpen.

In the study to evaluate Sharpen application rates and timings, Sharpen was applied at 1 and 2 oz/A at 8, 22, 33, and 40 days prior to cotton planting (DPP). Roundup Weathermax (glyphosate; 22 oz/A) was included with all Sharpen applications. Roundup Weathermax (22 oz/A) and Clarity (dicamba; 8 oz/A) plus Roundup Weathermax (22 oz/A) applied 40 DPP were included as comparison treatments. Glyphosate-resistant horseweed averaged 9 inches at 40 DPP and 24 inches 8 DPP. Control of GR horseweed was visually estimated 7, 14, 28, and 42 days after each application (DAT). Phytogen 375 WRF cotton was planted May 30, 2009 and cotton seedling density was determined 2 weeks after emergence. Pooled across application timing, Sharpen at 2 oz/A controlled more GR horseweed than Sharpen at 1 oz/A at all four evaluation intervals. By 28 and 42 DAT, both rates of Sharpen applied 8 and 22 DPP provided greater control than when applications were made 33 or 40 DPP. Cotton seedling density was not impacted by application rates and timings of Sharpen.

A second study compared the efficacy of nonselective herbicides applied with different rates of Sharpen on GR horseweed. Roundup Weathermax (22 oz/A), Ignite (glufosinate; 22 oz/A), and Gramoxone Inteon (paraquat; 2.5 pt/A) were applied alone and in combination with Sharpen at 0.25, 0.5, 1, and 2 oz/A. Due to wet weather in Stoneville in April 2009, treatments could not be applied until GR horseweed reached 15 inches in height. Control of GR horseweed was visually estimated 7, 14, and 28 days after application. Regardless of tank-mix partner, GR horseweed control never exceeded 85% when Sharpen was applied at less than 1 oz/A. At 7 and 14 DAT, adding Sharpen to Ignite applications did not improve GR horseweed control compared with Ignite alone. At least 1 or 2 oz/A of Sharpen was required to increase control with Gramoxone Inteon plus Sharpen tank-mixtures compared with Gramoxone Inteon alone. However, only 0.5 oz/A was needed to improve control with Roundup Weathermax. By 28 DAT, at least 2 oz/A of Sharpen was required for 90% GR horseweed control regardless of tank-mix partner. Furthermore, pooled across Sharpen application rates, control with Ignite and Gramoxone Inteon was better than that with Roundup Weathermax.

Research in 2009 was difficult due to the prolonged period of wet weather in April and May at Stoneville. Some GR horseweed died due to the saturated soil conditions that persisted for several weeks at the research site. Furthermore, application timings were delayed until GR horseweed was larger than the size that should be targeted with burndown herbicide applications. The levels of control observed in 2009 may be different in years when less rainfall occurs during the spring. Also, cotton had to be replanted twice due to failed stands. Therefore, no negative impacts of the burndown herbicide applications on the developing crop were detected.

Sharpen holds excellent potential to supplement burndown herbicide options available for GR horseweed control. Other research indicates that Sharpen will adequately control GR horseweed when weed size does not exceed 6 inches.

Program 1C-2

▸ Optimizing Yields With Best Management Practices (BMPs)

Presented by Dr. Donald J. Boquet
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The LSU AgCenter has since the 1980s conducted cropping systems research to evaluate the yield and economic benefits of year-round diverse crop sequences that qualify as Best Management Practices (BMPs) for improving surface water quality. These studies have evaluated irrigated and dryland systems that maintain ground cover through the use of crop residues, cover crops and no-till practices. The systems include winter wheat cover crop/cotton, doublecrop wheat/cotton, wheat/soybean, 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 doublecrop systems was always higher than any of the monocrop systems because of the added yield of wheat grain that has averaged 66 bu/acre. Summer crop yields usually, but not always, sustained yield losses in double crop systems. For example, doublecrop cotton yield varied from a 3% yield increase to a 21% yield reduction and doublecrop soybean varied from a 12% increase to a 30% yield reduction. Sorghum yielded the same whether planted as a monocrop or doublecrop. Yields of soybean and corn were 10 to 16% higher in doublecrop rotational systems than in doublecrop systems without rotations, but cotton yields were the same with or without crop rotations. Compared with monocropping, doublecrop cotton yields lost an average 65 lb lint/ac each year and doublecrop soybean yields dropped an average of 5 bu/ac each year. Any yield reduction of the summer crop yields is a significant economic penalty because it represents a loss directly from the potential net returns.

Although BMP systems were proven in the AgCenter research to be productive, the economics of each system was reliant on the commodity prices received in a given year. In our studies, using enterprise budgets based on the yields and inputs for each system and annual prices, some of the most profitable systems were BMP systems. Across seven years, doublecrop cotton/wheat produced average annual net returns of $271.00 per acre from average yields of 65 bu wheat per acre and 1035 lb cotton lint per acre. The system of producing three crops in two years of corn-wheat-cotton averaged annual net returns of $284.00 per acre. In comparison, monocrop cotton averaged a net return of $124.00 per acre from average yields of 1108 lb lint per acre. The BMP systems of doublecrop cotton rotated with corn or grain