

Cotton Varieties

Breeders Look For Traits To Help Cotton Plants Withstand Environmental Challenges

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There's excitement at Monsanto over the newest Deltapine cotton seed, according to Dave Albers, Cotton germplasm manager of Monsanto located in St. Louis.

"We've seen great advancements in the class '09 and class '10 varieties, so for this area we're particularly excited about DP 0912 B2RF for the high end acre, where growers that irrigate can push yields higher," he said. "In addition, DP 0920 B2RF and DP 0924 B2RF are great varieties, with the best fit on mixed to tougher soils. We've seen very consistent performance in those varieties on those acres. For the Class of '10, DP1028 B2RF is really showing good consistent performance, it follows the pattern of DP 0912 B2RF with best fit with higher yield potential systems. The thing we really like about it is it brings the yield of DP 0912 with

"We have good Arizona germplasm backgrounds that have been selected there and those varieties have historically held up to heat very well," Albers said. "It goes back to the Deltapine 5415, and even older Arizona germplasm like Deltapine 77. Some of the newer types like DP164 B2RF also have had great heat tolerance; but in addition to that we've seen really great performance in germplasms from the other Monsanto breeding programs. That's because early in their life those varieties are tested in our Arizona locations to evaluate them for level of heat tolerance. When periods of heat occur in the Delta and other parts of the country, we know that new Deltapine varieties have been tested in those heat conditions and the performance under those conditions. This approach also serves us well since there is still a market in Arizona where we sell and grow seed, so we need top performing varieties that will handle



Photo by John LaRose

Lloyd May, Cotton Breeder in Tipton, Ga., for the lower southeast, left, and Dave Albers, Cotton Germplasm Manager of Monsanto located in St. Louis, examine a field of DP 0935 B2RF at the Union City Field day. "The fruiting pattern on the cotton here had high retention. Now we're right at about three nodes above white flower, so the crop is well into cut out and the nodes made, we just need to finish it," Albers said. The mid-maturity variety typically grown in West Texas is performing well in the heat in Tennessee, and Albers has high expectations for it this year.

another step up in quality; specifically a longer staple, and lower micronaire. The Class of '09 and '10 varieties contain the Genuity Bollgard II with Roundup Ready Flex traits, so they've got the full technology package from Monsanto."

Then, beyond the Class of '10 we are also testing the Class of '11 group and we're excited about those as well."

The Class of '11 is expected to provide another step up in yield. In the past two years, Deltapine has released 11 different varieties that have comprised the Class of '09 and Class of '10. The Class of '10 set was more targeted regionally, such as DP 1028 B2RF and DP 1034 B2RF for northern and mid-tier portions of the Midlands and Southeast. The Class of '10 also included a couple of mid- to full-season varieties: DP 1048 B2RF and DP 1050 B2RF, that were targeted as DP 555 BG/RR replacements for the lower Delta and lower Southeast, especially for Georgia. They've shown great performance in those areas and have the advantages of the newer traits in the Genuity Bollgard II Roundup Ready Flex package.

"The Class of '10 also included two varieties for Texas," Albers said. "We haven't put 11 varieties in any particular market but we've targeted varieties that fit particular environments with the Class of '09 and '10. There are real challenges when you try to find a broadly adapted one-size-fits-all variety. The last one that was widely adapted may go all the way back to Deltapine 50. Breeders are always looking for the variety that can handle conditions anywhere from Arizona to the east coast, but we recognize that we're probably going to find varieties that have certain areas of fit and have certain areas of top performance.

"Among the Class of '11 variety candidates, it looks like one has had good fit from South Texas through the South Delta; while other candidates have great vigor and can provide good early season starts in the mid-maturity range and for the Texas market. We also have several Class of '11 candidates that are going to provide a good disease package to stand up to bacterial blight, Verticillium wilt and give growers the tough storm-proof plant that they need for west Texas."

It's unlikely there will be that one-size-fits-all bag of seed that will perform from one end of the coast to the other, but we are always looking.

"That's the real strength of the Monsanto breeding program," he added. "We've got breeding programs in Texas, in the Delta, in the Southeast and around the world to help us bring germplasm around to test and find those types that can handle different conditions in different parts of the world."

The heat of the south this past summer has been a challenge, however, one aspect of Deltapine's breeding and testing program that historically brings good heat tolerance is the company's strong presence in Arizona.

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Deltapine also has several things going on in drought resistance. Monsanto is looking for drought genes in corn, cotton and other crops.

"That's in the pipeline for Monsanto products, and Monsanto's biotech group is looking at new potential drought traits," he assured. "In addition to that, the breeding group is also looking at different germplasms; seeing what's there as far as their ability to handle drought and then using the molecular marker approach to identify where those traits are so we can breed those into new varieties.

"In our germplasm pipeline we are working in west Texas where it is consistently dry, doing some very detailed irrigation studies on new varieties, class of '09 class of '10, class of '11," he said. "The data can transfer across the country to find varieties that fit different water availabilities. Certainly, we know that water is a limited resource, the irrigation pumping costs can be a limiting input and expensive input for growers, especially in west Texas where they're paying as much as \$10, \$11, \$12 an acre inch just for their pumping costs. So we're helping growers identify the varieties if they only have limited amount of water, or varieties that fit if they have more water, and finally the varieties that fit the high end across that whole range of water availability. Of course, the perfect variety in a perfect world would be one that could handle the tough conditions, but if it does rain and conditions turn better, it responds, so we're looking for those types as well as the ones that fit within certain ranges of availability."

Irrigation is very important in cotton production. Typically, the Delta farmers are not spending as much as west Texas farmers on irrigation, but they need varieties that can handle the tough situation like this year, as well as respond when the conditions turn better. So that's what Deltapine is looking for across the whole spectrum of conditions to make sure that those varieties can be identified and characterized.

The future looks bright for the farmer in Albers' eyes as far as having better seed, better choices, or more choices in the future.

"Absolutely, in the coming seasons there will be a combination of new technologies to help handle some of these difficult to control weeds; and better germplasms that keep driving that yield curve even higher," he said. "I think, in general, what growers need to survive are the highest yielding varieties, with good quality that they can grow for the least cost. The U.S. grower really has become the low cost cotton provider to the world markets, so if the yield steps that we've seen in class of '09, class of '10 continue in the class of 11, that's going to help growers take their cost, divide it across more pounds of cotton so that they can stay competitive in the world market." Δ

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