Louisiana Cotton Bulletin

June 12, 2007

Volume 4
Issue 3

ARTICLES THIS WEEK

Suspected Glyphosate Resistance in Louisiana

Dr. Sandy Stewart and Dr. Donnie Miller.

The development of glyphosate resistance has been an important issue in row crop agriculture over the past few years. In the last two years, significant populations of a pigweed species, Palmer amaranth, have been found to be resistant to high rates of glyphosate in Georgia and North Carolina and is suspected in Tennessee and Arkansas. Over the last month, we have been working with a pigweed population with suspected resistance in southern Catahoula Parish, Louisiana. No confirmation can be made at this time, but several things indicate that this pigweed in question is exhibiting at least increased tolerance and possibly resistance to glyphosate. The following details some of what we know and do not know right now.

The pigweed, located in a cotton field, initially survived a 25 oz application of Touchdown, leading the farmer and the consultant to suspect a serious control problem. The population was difficult to control in 2006 and some survived through harvest. After being called to the field, we applied between 22 and 88 oz/A of Roundup Weathermax to two severely infested areas with pigweed that ranged in size from 1 to 12 inches tall. At least 75% of the plants were controlled and all were affected to various degrees. A slight rate response has been noted, however even the 4X rate did not provide satisfactory control. The survivors remain and they appear to be regrowing; some have flowered since the application and many are still green.


Figures 1 and 2. *Field shot following 25 oz/A Touchdown (left), plus 88 oz Roundup Weathermax 10 days after application (right). Catahoula Parish, LA.*

The exact pigweed species has not yet been determined. Pigweeds hybridize readily and positive identification is almost impossible without flowers and/or seedheads. Preliminary indications are that Palmer amaranth is not the species in question. Plants have been collected from the field for identification and research in controlled conditions.

Does this constitute resistance? From a scientific standpoint, seed must be collected from a surviving population, reared in controlled conditions, and these offspring must survive a normal or higher rate of glyphosate to confirm resistance. From a practical standpoint, we feel confident that this population will survive at least a normal use rate of glyphosate and probably higher, leading to serious control problems in the field.

Several things are unknown at this point. First, the species has not yet been positively identified. Second, it is not known what size may or may not be controlled; it is possible that smaller pigweed could be controlled by normal rates, but nothing can be confirmed without further testing. If this is truly a resistant population, we do not yet know the degree of resistance. Resistant Palmer amaranth has been shown to range from 4X to 10X levels in other states.

This situation is currently confined to a small area in southern Catahoula parish as far as we know. A few other situations in other areas are currently being watched closely. However, this finding has major implications for Louisiana producers. Glyphosate resistance has not previously been a problem in Louisiana. Pigweed seed can be carried at least short distances in the air, but travel over long distances is not thought to be possible. Therefore, this is almost certainly a "homegrown" problem. This should not be a surprise as other cases of glyphosate resistance in pigweed appear to have occurred independent of each other. However, it does show that we can

definitely develop resistance in our own backyard. Moreover, pigweed is generally not the major weed present in Louisiana cotton fields, and Palmer amaranth is not particularly widespread. However, this will not insulate Louisiana from potentially developing glyphosate resistance. This troublesome population is not thought to be Palmer, indicating that we can develop glyphosate resistance in other pigweed species as well.

Figure 3. *Partial control and surviving pigweed from 25 oz/A Touchdown followed by 88 oz/A Roundup Weathermax 10 days after application. Catahoula Parish, LA.*

Over the last two years, the LSU AgCenter and others have stressed the importance of herbicide resistance management. This situation should underscore the importance of implementing weed control programs that do not rely exclusively, or as heavily, on glyphosate. The use of multiple modes of action, especially residual herbicides with pigweed activity, is the best method of preventing resistance from occurring. As layby approaches, remember the value of using other modes of action besides glyphosate. For further information and recommendations, please see a glyphosate resistance fact sheet on the LSU AgCenter web site at http://www.lsuagcenter.com/en/crops_livestock/crops/Cotton/Weed+Control/Herbicide+Resistance+Management+in+Roundup+Ready+Cotton.htm.

It is an understatement to say that dealing with glyphosate resistance will change the approach to cotton production. This particular field will likely require a much different, more costly, and time-consuming herbicide program if cotton is to be grown in 2008. Rotating to corn may be a preferable option, but experience in other states suggests that even then populations will require aggressive control following corn harvest. In other words, there is no easy answer to managing a glyphosate resistance problem with pigweed or any other weed.

We would like to thank Roger Carter and Larry Sayes for recognizing the problem and alerting us to the situation quickly. It is important to identify a potential problem quickly. Resistant areas can develop from just a few plants going to seed. Even removing lone survivors in a field by hand can be an important resistance management practice. The knowledge gained from evaluating this weed population will hopefully aid in preventing other occurrences and developing management strategies in the future. It should be noted as well that Monsanto and Syngenta have been extremely helpful and are studying the problem in full cooperation with everyone.

As more is known, we will keep you up to date. In the meantime, it is important to recognize that glyphosate resistance is a real issue in Louisiana and deserves your attention in developing weed control programs and planning layby programs.

DATES TO RMEMBER

June 13 – Northeast Research Station Field Day, St Joseph. Begins at 7:30 am with field tours and lunch to follow. Contact Dr. Donnie Miller at (318) 766-3769 or dmiller@agcenter.lsu.edu for more information.

August 23 – Dean Lee Research Station Field Day, Alexandria. Begins with registration at 3:30 with field tours and supper to follow. Contact Dr. John Barnett at (318) 427-4424 or jbarnett@agcenter.lsu.edu for more information.

Below is a list of contacts, both agents and specialists, in Louisiana cotton-producing parishes. They are ready and willing to assist you in any way they can.

COTTON COUNTY AGENTS			
PARISH	**AGENT**	**PHONE**	**EMAIL**
Avoyelles	Carlos A. Smith Jr	318-253-7526	CSmith@agcenter.lsu.edu
Bossier	Joe Barrett	318-965-2326	JBarrett@agcenter.lsu.edu
Caddo	John Levasseur	318-226-6805	JLevasseur@agcenter.lsu.edu
Caldwell	Jim McCann	318-649-2663	JMcCann@agcenter.lsu.edu
Catahoula	Vacant	318-744-5442	DNeal@agcenter.lsu.edu
Concordia	Glenn Daniels	318-336-5315	GDaniels@agcenter.lsu.edu
DeSoto	Hubert Wilkerson	318-932-4342 318-453-1615 (cell)	HWilkerson@agcenter.lsu.edu
East Carroll	Donna Lee	318-559-1459 318-282-1292 (cell)	drlee@agcenter.lsu.edu
Evangeline	Keith Fontenot	337-363-5646	KFontenot@agcenter.lsu.edu
Franklin	Carol Pinnell-Alison	318-435-7551 318-267-6713 (cell)	CPinnel-Alison@agcenter.lsu.edu
Grant	Matt Martin	318-627-3675	MMartin@agcenter.lsu.edu
Lasalle	Jim Summers	318-992-2205	JSummers@agcenter.lsu.edu
Madison	Mike Rome	318-574-2465 or 2483	MRome@agcenter.lsu.edu
Morehouse	Terry Erwin Richard Letlow	318-281-5742 or 5741 318-281-5742 or 5741	terwin@agcenter.lsu.edu rletlow@agcenter.lsu.edu
Natchitoches	Hubert Wilkerson	318-932-4342 318-453-1615 (cell)	hwilkerson@agcenter.lsu.edu
Ouachita	Richard Letlow	318-281-5742 or 5741	rletlow@agcenter.lsu.edu
Pointe Coupee	Miles Brashier	225-638-5533 225-281-9469 (cell)	MBrashier@agcenter.lsu.edu
Rapides	Matt Martin	318-473-6605	MMartin@agcenter.lsu.edu
Red River	Hubert Wilkerson	318-932-4342 318-453-1615 (cell)	hwilkerson@agcenter.lsu.edu
Richland	Keith Collins	318-728-3216 318-355-0703 (cell)	KCollins@agcenter.lsu.edu
St. Landry	Keith Normand	337-948-0561	KNormand@agcenter.lsu.edu
Tensas	Randy Smith	318-766-3320 318-267-6709 (cell)	RASmith@agcenter.lsu.edu
West Carroll	Myrl Sistrunk	318-428-3571 318-267-6712 (cell)	MSistrunk@agcenter.lsu.edu
SPECIALISTS			
Cotton Specialist	Sandy Stewart	318-473-6522 318-308-5625(cell)	sstewart@agcenter.lsu.edu
Weeds Specialist	Roy Vidrine	318-473-6525 318-308-7225(cell)	rvidrine@agcenter.lsu.edu
Entomology Specialist	Ralph Bagwell	318-435-2157 318-334-0393(cell)	Rbagwell@agcenter.lsu.edu
Nematodes Specialist	Charlie Overstreet	225-578-2186	Coverstreet@agcenter.lsu.edu
Pathology Specialist	Boyd Padgett	318-435-2157 318-308-9391(cell)	bpadgett@agcenter.lsu.edu
Economics Specialist	Gene Johnson	504-388-4081	GJohnson@agcenter.lsu.edu
Fertility Specialist	J. Stevens	318-427-4408 318-308-0754(cell)	JStevens@agcenter.lsu.edu
LOUISIANA COTTON BULLETIN			
Designer	Brandi C. W. Garber	318-290-0625(cell)	bgarber@agcenter.lsu.edu

Louisiana State University Center Agricultural Center, William B. Richardson, Chancellor
Louisiana Agricultural Experiment Station, David J. Boethel, Vice-Chancellor and Director
Louisiana Cooperative Extension Service, Paul D. Coreil, Vice Chancellor and Director
Issued in furtherance of the Cooperative Extension work, Acts of Congress of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. The Louisiana Cooperative Extension Service provides equal opportunities in programs and employment.