

Continued Rainfall Halts Harvest

Friday, October 19, 2018

By Mary Jane Buerkle

You most likely never will see a grower wish a rainfall away, but it's safe to say that although growers across the Texas High Plains are grateful for the precipitation, they would rather see the sun peeking through the clouds right now as they wait for a break in the cool, rainy weather that has blanketed the region for the past couple of weeks and brought harvest activity to a standstill in most of the area.

A few growers were able to get back in the fields this week, but for the most part, it's still too wet to run harvest equipment. Late Sunday night into early Monday morning, temperatures dipped below freezing from about Lubbock north through the Panhandle. However, clouds, wind and soil moisture may have helped keep temperatures near the plant just above freezing, causing injury but not sustaining a complete killing freeze in most areas.

Although forecasts include slight chances of rain over the next week, temperatures should warm into the mid-60s and even 70 by Thursday. Barring any additional significant rainfall, some growers may be able to resume – or begin – harvest by the middle to the end of this next week.

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“Ag in the Bag” Program Teaches Elementary Students About Agriculture

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By Mary Jane Buerkle

More than 1,400 fourth-grade students, teachers, parents and volunteers from Lubbock and the surrounding areas watched a dairy cow being milked, saw how their jeans were made, and learned how agriculture impacts their daily lives at the annual “Ag in the Bag” program, held October 16-18 at the Texas Tech Livestock Arena in Lubbock.

Topics included dairy, corn, cotton, sorghum, water, beef, sheep, meat science, food science, and various other agricultural concepts. A committee of volunteers plans the event, which is free to the schools because of financial support from sponsors. Students from Lubbock ISD and several area schools attended the program.

“It’s vital that we reach out to our kids to teach them where their food and fiber comes from,” spokesperson Ronda Alexander, Texas A&M AgriLife Extension-Lubbock County 4-H Agent said.

Program sponsors include FiberMax, the College of Agricultural Sciences and Natural Resources at Texas Tech, Texas A&M AgriLife Extension, South Plains Electric Cooperative, Lubbock Chamber of Commerce, PhytoGen, Plains Cotton Growers, AgTexas Farm Credit Services, Capital Farm Credit, City Bank, High Plains Water District, Hurst Farm Supply, Lubbock County Farm Bureau, Peoples Bank, ARMtech, Lubbock Electric, Lyntegar Electric Cooperative, Texas Corn Producers, Texas Department of Agriculture, Texas Peanut Producers Board, Wellington State Bank, Wylie Implement and

Spray Centers, Cornerstone Group Inc., United Sorghum Checkoff Program, Southwest Dairy Farmers, Gandy’s, Taylor Insurance, Farmers Cooperative Compress, and DairyMax.

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Protein Derived From Cottonseed for Human Nutrition One Step Closer to Reality

Tuesday, October 16, 2018 By Kay Ledbetter, AgriLife TODAY

Cottonseed ground into flour to deliver protein to millions of people, a project to which Dr. Keerti Rathore has devoted more than half his professional career, is one step closer to reality.

Rathore, a Texas A&M AgriLife Research plant biotechnologist in College Station, received word that Texas A&M's "Petition for Determination of Non-regulated Status for Ultra-Low Gossypol Cottonseed (ULGCS) TAM66274" has been approved by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, or APHIS.

Through a project funded by Cotton Incorporated, Rathore and the Texas A&M team have developed a transgenic cotton plant – TAM66274 – with ultra-low gossypol levels in the seed that maintains normal plant-protecting gossypol levels in the rest of the plant.

Dr. Kater Hake, vice president of agricultural and environmental research at Cotton Incorporated, said it has been a decades-long journey.

"Gossypol suppression in cottonseed has been part of our funded research portfolio for over 30 years," Hake said. "It took time to tap the innate protein potential in the seed; time for the right technologies to develop; and time for the right research team to come along."

Tom Wedegaertner, director of cottonseed research and marketing at Cotton Inc., underscores the potential of the breakthrough and the journey through the regulatory process.

"Gossypol in the leaves and stalks of the cotton plant serve as a pest deterrent, but its presence in the seed serves no purpose," Wedegaertner said. "The more widespread use of cottonseed as a livestock feed and even for human consumption has been stymied by the natural levels of gossypol in the seed. As we progress through the regulatory review, the ability to utilize the protein potential in the seed gets that much closer."

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The recent USDA action confirms that TAM66274 and any cotton lines derived from crosses between TAM66274 and conventional cotton or biotechnology-derived cotton granted non-

regulated status by APHIS are no longer considered federally regulated articles, he said.

Only six months after starting to work with Texas A&M in 1995, Rathore, who had never seen cotton growing in a field prior to coming to Texas, decided something needed to be done about the underutilized protein in cottonseed.

For the past 23 years, he has been determined to create cotton plants that produce seeds containing gossypol well below what the U.S. Food and Drug Administration considers safe levels while maintaining normal levels of gossypol and related chemicals in the foliage, floral parts, boll rind and roots.

Gossypol, while toxic to humans and monogastric animals such as pigs, birds, fish and rodents, is useful to cotton plants for defense against insects and pathogens. Therefore, cottonseed containing gossypol is currently used mainly as ruminant animal feed, either as whole seed or cottonseed meal after oil extraction.

"Biotechnology tools that made the ULGCS technology successful had just become available when I started looking at the potential to make this new source of protein available to hundreds of millions of people," Rathore said.

"I also realized the value to cotton farmers everywhere of removing gossypol from the cottonseed because such a product is likely to improve their income without any extra effort on their part or additional input," he said. "Such a product can also be important from the standpoint of sustainability because farmers will produce fiber, feed and food from the same crop."

Cotton-producing countries with a limited supply of feed protein can realize great benefits by utilizing this seed-derived protein as a feed for poultry, swine or aquaculture species, Rathore said.

These animals are significantly more efficient in converting plant protein into high-quality meat protein, he said. Egg and broiler production could become the most efficient use of any available feed protein source, including the ULGCS.

Despite the obstacles, failures and lack of funding at times, Rathore said it was the dedication and loyalty of his team and supporters such as the late Dr. Norman Borlaug, who was known as the "father of the Green Revolution," that kept him going on this project.

"Dr. Borlaug was the biggest supporter of this project and during the lean times when I was struggling to get funding and after the failed attempts – there were many, it was his words of encouragement that provided the inspiration to continue," Rathore said.

While there were many team members over the years working on the project, he said key contributors to its advancement were Dr. Devendra Pandeya, LeAnne Campbell, Dr. Sreenath Palle and Dr. Sunilkumar Ganesan, all who worked in his laboratory at Texas A&M, as well as by Dr. Robert Stipanovic and associates with USDA-Agricultural Research Service who conducted biochemical analysis of gossypol levels in the ULGCS lines.

"It feels good to have come this far as Texas A&M AgriLife is only the fourth public institution to have accomplished such a feat as deregulation of an engineered crop."

Rathore's research has been reported on in numerous peer-reviewed science journals and he has been granted several U.S. patents. In 2006, he published in the Proceedings of the National

Academy of Sciences announcing the cotton plants had been successfully altered in the lab to "silence" gossypol in the seed. In 2009, field trials verified the lab and greenhouse studies indicating the crop could become a source of protein.

The cottonseed from these plants met World Health Organization and FDA standards for food consumption, he said, thus opening the potential to make the new source of high-protein food available to hundreds of millions of people a year.

Rathore said cottonseed, with about 23 percent protein content, can play an important role in human nutrition with the gossypol eliminated, especially in countries where cereal/tuber-based diets provide most of the calories but are low in protein content.

"Growing up in rural India as the son of a doctor, I had seen the effects of malnutrition firsthand in my father's patients," he said. "Many of their health issues were due to inadequate food and nutrition."

Rathore said for every pound of cotton fiber, the plant produces about 1.6 pounds of seed. The annual global cottonseed production equals about 48.5 million tons.

"The kernels from the safe seed could be ground into a flour-like powder after oil extraction and used as a protein additive in food preparations or perhaps roasted and seasoned as a nutritious snack," he said.

Rathore said cotton will continue to be grown as a source of natural fiber, but the adoption of the ultra-low gossypol varieties by farmers has the potential to make the seed just as valuable as the lint.

"Our approach, based on the removal of a naturally occurring, toxic compound from the cottonseed, not only improves its safety but also provides a novel means to meet the nutritional requirements of the burgeoning world population," he said.

Aside from the human aspect, Rathore said the potential of ultra-low gossypol cottonseed as a fish meal replacement in the diets of shrimp and southern flounder has been demonstrated. Additional aquaculture and poultry feeding studies are planned to fully evaluate the nutritional value of the unique cottonseed.

Even after this deregulation hurdle has been jumped, the team knows the work is not done.

"The next major effort will be aimed at activities to demonstrate the value-added potential of this technology," Wedegaertner said. "The first step will be to produce enough ULGCS seed for a commercial-scale production run at a cottonseed oil mill. This will take a couple of years."

Rathore said development of ULGCS involved several patented technologies, so additional steps must be taken to secure agreements with the patent holders, then to find a seed company willing to market the ULGCS trait and make it available to cotton farmers worldwide.

Rathore said as a scientist who has conceived and developed this technology, "My personal preference as we move forward would be to follow the 'Golden Rice' example in terms of its use for humanitarian purposes."

Editor's Note:

"Cotton News", a weekly service of Plains Cotton Growers to the cotton industry and news media in the 41-county High Plains area, is mailed from Lubbock each Friday. Its contents are confined to news items and comments pertaining to the High Plains cotton industry which is so vital to U.S. all. Anyone interested in making comments about the contents of this column can call 806-792-4904 or Email PCG at: editor@plainscotton.org