

## Metahelix gets GEAC nod for cry1C gene, 2 Bt cotton hybrids

08 July 2009 | News



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*One of India's promising bioagri startups, Metahelix Life Sciences has crossed a major entrepreneurial hurdle with the regulator approving its two Bt cotton hybrids with the novel cry1C gene, making it the first Indian private company to develop a commercial gene on its own. An exclusive report by BioSpectrum Editor, Narayanan Suresh.*

The Bt cotton farmers in the central and southern Indian states will be spoilt for choice soon. Two more Bt cotton hybrids, which has enhanced capabilities to fight two major pests, bollworm and lepidopteran insect pests, developed by Bangalore-based Metahelix Life Sciences, will be available in the marketplace.

The biotech regulator, the Genetic Engineering Approval Committee (GEAC) has approved the commercial cultivation of the Bt cotton hybrids MH 5125 Bt and MH 5174 Bt, on June 1, 2009. The decision to approve these two Bt cotton hybrids which incorporate a synthetic cry1C gene was taken at the May 13, 2009 meeting of GEAC.

In this novel method, the single gene, cry1C, will provide protection against two major pests (bollworm and spodoptera) which account for more than 60 percent of the pests that damage this crop.

"The GEAC approval is a major milestone for Metahelix which has become the first Indian private company to develop a commercial cry1C gene on its own," said a visibly excited KK Narayanan, co-founder and MD of Metahelix. The company was founded in July 2001 by a group of enthusiastic agricultural scientists, Narayanan and Gautham Nadig, with two other bioagri industry colleagues with the singular objective of developing an Indian Bt gene on its own.

"We had done extensive due diligence on the capabilities of this cry1C gene before we started on our entrepreneurial journey. Metahelix has been considered to be one of the most promising biotech seed company and Narayanan was chosen the 2nd BioSpectrum Entrepreneur of the Year Award for 2004, by the BioSpectrum Awards Jury due to the company unique business model which placed a premium on its ability to develop a pioneering product.

BioSpectrum had then described Metahelix as "India's Own Monsanto." This confidence in the company's capabilities has now been justified. Over 100 Bt cotton hybrids are now available in the Indian market place. The most dominant ones which

fighters the major cotton pest, bollworm using the cry1Ac gene (Bollgard-1) and Bollgard-2 which has the cry2Ac gene to fight bollworm and spodeptera, was developed by American seed giant, Monsanto. These two genes have been licensed by over a dozen Indian seed companies and incorporated into their cotton hybrids.

The second set of Bt cotton seeds are made available in the country by Nath Seeds using cry1Ac genes licensed from a Chinese seed company. The third set of Bt cotton hybrids are distributed by JK Agri Genetics using the cry1Ac genes developed by a team of scientists at the Indian Institute of Technology, Kharagpur, West Bengal, under a public-private partnership arrangement. Regulatory approval has been given to the two Bt cotton hybrids by Metahelix to be cultivated in the states of Gujarat, Madhya Pradesh, Maharashtra, Andhra Pradesh and Karnataka. The cry1C gene (called event 9124) of Metahelix has been approved and now could be used for experimental trials in other crops. Based on the performance of the new Bt cotton varieties, monitored for three years, Metahelix will be in a position to seek approval for commercial use with other crops like tomato, rice, etc.

Proud of their path breaking achievements, Narayanan and his Metahelix team are moving into the market cautiously. The cotton planting season starts in April every year and most of the plantings for the current season have already been done. So Metahelix is not in hurry to rush into the market. "We have started giving samples of the Bt hybrids to a large number of farmers now itself for demonstration purposes. Some sales will also happen. We want to create awareness among the farmers about our hybrids and also let the performance of these hybrids speak for itself," Narayanan said.

"The two transgenic cotton hybrids have been tested extensively in the last two years as part of the regulatory process. The transgenic cotton seeds were tested in various fields of the Indian Council of Agricultural Research (ICAR) and the data has been evaluated by the regulators. In addition, the seeds were tested in the experimental fields of six state agricultural universities (SAUs) in Karnataka, Tamil Nadu, Gujarat, Maharashtra and Andhra Pradesh. These were large scale trials in one acre or more and was done in nine locations," Narayanan said.

Almost all the transgenic hybrids of Metahelix gave excellent performance except for one set grown in an experimental farm in Karnataka, according to the data provided to the regulator. One of the test plots in Karnataka did not give good results compared to that in other areas, due to delayed sowing and an unrelated bug attack.

After bollworm which accounts for nearly 60 percent of a farmer's pesticide input costs, spodoptera species whose larvae eats the cotton plant's leaves extensively is the next major threat to the crop. For every acre, a farmer spends on an average of Rs 1,000 or more on pesticide sprays to keep the infestation under control. In addition, for every acre a farmer will spend another Rs 2,000 to keep the bollworms away. With the use of a hybrid which has the genetically modified traits to kill both these major pests, a farmer will save substantial amounts of the costs on pesticides.

"We were extremely confident about the success of the cry1C gene. We had identified the nucleotide sequence of the gene which was codon optimized for the best expression of the proteins against the spodoptera pest," explained Tomal Dattaroy, a senior scientist who led the development efforts at Metahelix.

Like the other transgenic cotton hybrids in the market, the two Bt cotton hybrids from Metahelix too will have to be planted with "refuge" lines of non-Bt cotton in 20 percent of the sown area in each plot, according to the GEAC directive. A farmer could also plant two to three rows of pigeon pea equivalent to 10 percent of the total sown area as an alternative, according to the GEAC approval order given to Metahelix.

"We have done extensive biosafety studies on the gene and the hybrids," asserted Narayanan. The entire set of biosafety data related to the cry1C and the two Bt cotton hybrids are available for public scrutiny at an exclusive website which is the resource bank for information related to all genetically-modified crops.

One more Indian bioagri company has demonstrated the capability to handle the complex development process related to genetically modified crops. Narayanan and his team efforts will also bring a smile to the angel investor, Nadathur Holdings, run by one of the co-founders of Infosys, NS Raghavan, who funded the start-up to the tune of Rs 6.5 crore. Kotak Mahindra Private Equity Fund chipped in with another Rs 5 crore. Recently Nadathur Holdings and Kotak Mahindra have jointly invested another tranche of Rs 16 crore in Metahelix.

Narayanan is a relieved man these days as his bet on cry1C gene has come off. The perseverance with which the team tackled the complex task without any outside support has been rewarded. Now the investors too could be sure about their exit route and Metahelix will be primed for a public offering in two-three years.

Dhaanya Seeds, a fully-owned subsidiary of Metahelix, has already set up an efficient marketing and distribution network for hybrid seeds. This network will come in handy when full-scale commercial offerings start in the 2010 cotton season.

Bangalore's growing biotech cluster will have one more show piece company in Metahelix in the coming months.

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