

Non-GM Herbicide Tolerant Seed

Cibus uses "Gene Repair" technology for non-transgenic herbicide tolerant traits

by Lynn Grooms



In January, 2007, Cibus LLC and the National Grain Sorghum Producers Foundation (NGSPF), an affiliate of the National Sorghum Producers, announced a partnership with Valent U.S.A. Corporation to develop a non-transgenic herbicide tolerant grain sorghum.

This new trait will be developed using Cibus's proprietary gene conversion technology, the Rapid Trait Development System (RTDS™). It will provide tolerance to Valent's postemergence grass herbicide, Select Max® Herbicide with Inside Technology™.

Lower Cost Development

RTDS can be used to develop non-transgenic traits faster and at a lower cost than transgenic alternatives, which will help farmers save approximately \$25 million per crop nationwide, Cibus reports.

Traits developed via RTDS will generally require three to four years less R&D and regulatory approval time than traits developed through transgenic technology, says Cibus President Keith Walker.

This is because RTDS introduces traits through a natural process of gene repair within the same plant species. Transgenic technology inserts genetic material from one species into another which may take longer to sort out traits and ensure that they do not adversely affect other traits, says Walker.

Every time a cell copies DNA, it makes 'scrivener' errors or spelling mistakes. This is how natural variation occurs, reports Walker, adding that its technology "harnesses the cell's own natural DNA repair machinery to correct such spelling mistakes, thus directing DNA repair enzymes to correct and repair the targeted gene in a specific way to produce a desired trait."

"With the RTDS mutational technol-

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Cibus President Keith Walker (left), Peter Beetham and Christian Schöpke process an experimental line from RTDS to be collected and planted in research plots.

ogy, we don't have the same technical risk as with transgenics," says Walker, noting that the regulatory approval process for traits developed through RTDS is the same as for traits developed using conventional plant breeding techniques.

Because traits developed via RTDS do not have to undergo the additional regulatory constraints, they can reach the market faster, says Walker.

The privately-held Cibus was formed in 2001 based on the discovery of the RTDS technology. In addition to grain sorghum, the company's researchers are currently focused on rice, and spring and winter canola.

The company also sees future potential for the technology in wheat, potatoes, small grains, corn and soybeans, says Walker. Transgenic traits are well accepted in the corn and soybean markets, however, so Cibus is concentrating on smaller crop markets where farmers' needs for herbicide tolerance traits, for example, have been largely unmet.

Walker points out that RTDS also offers an option for markets that have restrictions on genetically modified traits. While the barriers to transgenic traits in some international markets are

softening, they will likely remain for the foreseeable future, says Walker.

Commercialization Timetable

The San Diego company's initial offerings will be in herbicide tolerance. The first herbicide tolerant grain sorghum may be commercialized in about four to five years.

Longer term, Cibus may use its technology to develop enhanced oil composition traits in crops, such as palm, coconut, corn and soybeans, says Walker. It may be possible to develop a program that defines specific oil composition, such as lower saturated fat.

Cibus expects to license its technology as well as possibly form some partnerships or joint ventures, says Walker. "We don't anticipate acquiring other companies. Today's technology delivery system is more than adequate."

He points to the alliance with NGSPP and Valent as an example. NGSPP will conduct the breeding work, seed companies will market the trait, and Valent will market the herbicide.

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