



New Biotech Crop Traits Offer Huge Opportunity for Minnesota Agriculture

Biotechnology has emerged as a key tool that allows growers and processors to provide more food, feed, fuel and fiber to the world using fewer resources. In recent weeks, several biotech crops that will be uniquely suited for Minnesota have been fully or partially deregulated by USDA, following a lengthy science-based review process. The crops include **Syngenta's Enogen™** corn amylase trait for the ethanol industry, Roundup® Ready alfalfa and Roundup Ready® sugar beets (partial deregulation). While all of these crops were given the green light for planting this spring, new motions filed in early March by the Center for Food Safety seek to stop planting of Roundup Ready sugar beets. The Center for Food Safety has also threatened new litigation for Roundup Ready alfalfa and Enogen corn.

As a major producer of ethanol, sugar beets and alfalfa, Minnesota has a major stake in all three biotech traits:

- One-third of Minnesota's corn crop is used to produce about 1 billion gallons of ethanol in the state.
- With a strong dairy industry, alfalfa and forage is the state's third most valuable field crop.
- Minnesota is the largest producer of sugar beets in the U.S.

The following article summarizes each technology, its legal status, as well as potential impacts for Minnesota.

Enogen™ Corn: First Corn Output Trait for Ethanol Industry Approved



WHAT:

The Enogen™ corn amylase trait is the first genetically modified output trait in corn for the ethanol industry. Enogen enables the expression of an optimized alpha-amylase enzyme directly in corn, which improves dry grind ethanol production. Adding 10-20% Enogen corn to its feedstock mix, an ethanol plant

eliminates the need for liquid alpha-amylase. Enogen technology can reduce energy and water use in ethanol plants and increase ethanol output, while reducing a plant's carbon footprint approximately 10 percent.

LEGAL STATUS:

FDA completed its review of Enogen corn in 2007 and deemed it as safe as conventional corn for human and animal consumption. On Feb. 11, 2011 USDA granted full deregulation for Syngenta's corn amylase trait. It is approved for cultivation in Canada and the U.S. It is also approved for import into Australia, Canada, Japan, Mexico, New Zealand, Philippines, Russia and Taiwan. These approvals ensure the dried distillers grains (DDGs) derived from grain containing the Enogen trait is available for export from the U.S.

VOLUNTARY RISK MITIGATION:

Production of Enogen corn will be managed by Syngenta using a contracted closed production system to avoid the potential for misdirection

of grain that could negatively impact some industrial and food starch processes. An advisory council of stakeholders in the value chain will also be established.

AVAILABILITY:

Very limited acres will be planted in 2011 in one area of western Kansas. This production will primarily be used for testing in ethanol plants. Syngenta plans to strictly manage sales of Enogen corn and not immediately offer the trait for licensing. A 50 million-gallon ethanol plant would typically contract with 35 to 40 growers and offer a value-added premium.

Even though Minnesota has 21 ethanol plants and 1.1 billion gallons of capacity, it will probably be a few years before Minnesota grows much Enogen corn. That's because each ethanol plant needs to first test the Enogen technology and then contract with growers to produce the corn the next year. With deregulation of Enogen corn coming relatively close to planting season the opportunity to increase acreage even for testing was very limited, as most farmers had already committed corn acreage through forward pricing contracts.

BENEFITS:

According to **Jack Bernens**, who serves on the **Agri-Growth** Board and is head of technology acceptance at Syngenta Seeds, Enogen corn technology increases ethanol throughput by about 8 percent and reduces energy use by about the same amount. "Having the enzyme expressed directly in the grain makes starch conversion much more efficient," he says. "Enogen provides a value of 8 to 10 cents per gallon. A 100-million-gallon ethanol facility could expect savings of approximately \$8 million to \$10 million with the technology."

Environmental benefits are significant. In a 100-million gallon plant, efficiency improvements enabled by Enogen corn can save: 450,000 gallons of water, 1.3 million KWH of electricity, 244 billion BTUs of natural gas and reduce carbon dioxide emissions by 106 million pounds.



Enogen grain has been tested extensively at Western Plains Energy, L.L.C. (WPE), a 48-million-gallon ethanol plant in Oakley, KS. Using Enogen corn, WPE attained an 8 percent increase in ethanol production combined with an 8 percent reduction in natural gas consumption. "What that means for us is more profits, with less expense," said general manager and CEO, **Steve McNinch**. **ARTICLE CONTINUED ON PAGE 3**

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Member In Focus

LarsonAllen[®] LLP

CPAs, Consultants & Advisors

Locations: Minneapolis, MN

More than 40 locations in 13 states

(Arizona, Florida, Idaho, Illinois, Massachusetts, Minnesota, Missouri, North Carolina, Pennsylvania, Texas, Washington, Washington DC, and Wisconsin)

LarsonAllen LLP (LarsonAllen) is a professional service firm that provides assurance, accounting, tax, consulting and advisory services to organizations and individuals managing business ventures and finance. The firm was founded in 1953, when young entrepreneurs Rholan Larson and John Allen started their own accounting firm. In 1957, Bob Weishair joined, forming Larson, Allen, Weishair & Co., LLP. In 1987, the headquarters and 165 employees moved to downtown Minneapolis. By 1990, the firm expanded to locations in St. Cloud, Brainerd and St. Paul, Minnesota and throughout the 1990s and 2000s, offices were established in numerous other locations throughout Minnesota and across the United States.

LarsonAllen has grown into a top 20, nationally recognized professional service provider with approximately 1,800 people and \$280 million in annual revenues. LarsonAllen is an independent member of Nexia International, a top 10 worldwide organization providing global connections. The firm has been named a great place to work nine times by local business journals and the top state accounting firm in Minnesota by Twin Cities Business.

Q & A with Steve Thorson, Agribusiness Principal-in-Charge: What is new with LarsonAllen?

In 2010, LarsonAllen added LeMaster Daniels, a CPA and consulting firm based in Spokane, Washington, which

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more than tripled the firm's agribusiness sector. We now have more than 55 professionals serving agribusinesses, mainly in the Midwest and Northwest regions. With this move, we've expanded to a new region, are serving new types of agribusiness clients and are offering a broader range of services.

As the needs of the clients change, LarsonAllen has grown to meet them. Beyond the traditional accounting firm services of audit and tax, LarsonAllen has consulting staff to provide outsourced controller and CFO services for the ag industry. We also have consultants trained in farm family dynamics to assist clients with farm transition and estate tax planning.

What are key trends affecting your industry?

There are two predominant trends in agribusiness today: increasing size of farming and production operations and the increasing average age of agricultural producers. To further complicate things for agribusiness producers, the business of agriculture is affected by world pressures. We're seeing increasing volatility in operating costs as well as prices obtained for products, and that causes a significantly greater need for capital to fund agribusiness operations and withstand the business cycles.

To help address this, we became the founding sponsor of the "New Tools for New Rules" agribusiness seminar presented at South Central College in North Mankato. The third annual, full-day seminar took place in early March and focused on the economic and managerial changes occurring in agribusiness. Jim Marzolf, LarsonAllen agribusiness consultant, gave a presentation to the agricultural producers to help them identify the chief financial officer level of responsibilities in their operations and determine who should be performing those tasks.

What are your legislative priorities?

I'm not sure we have legislative priorities, other than adapting to the passed and pending legislation and how it can affect our clients' businesses and financial well being. We strive to educate our clients on changes and help people take advantage of tax and business opportunities available to them. Within our ag practice and firm, our acclaimed national and international tax resources are often called on by the media as news sources and even offer tax training seminars to other CPAs. We endeavor to proactively plan for, clearly interpret, and strategically apply the laws for our businesses and individual clients.



(Left to right): Cheryl Meyer, Tax Principal; Joe Kluender, Engagement Specialist in Farm Transition Planning; Jim Marzolf, Manager, Agribusiness Consulting; and Steve Thorson, Agribusiness Principal-in-Charge.



The Minnesota Agri-Growth Council is an advocate for the state's food and agriculture industry. Founded in 1968, the Council is a nonprofit, nonpartisan organization that represents the shared interests of its 200-plus members, which include food and agriculture businesses, organizations and producers, as well as the service industries that support them.

MINNESOTA AGRI-GROWTH COUNCIL
408 St. Peter Street, Suite 20
St. Paul, MN 55102
p: 651.905.8900 • f: 651.905.8902
info@agrigrwth.org • www.agrigrwth.org

Staff

Daryn McBeth, president
Tony Mondry, program manager
Krystal Caron, communications director

Randy Doyal, CEO of **Al-Corn Clean Fuel** and Agri-Growth Board member says ethanol producers are always looking for ways to increase efficiency. He notes that his plant was one of the first plants to achieve zero liquid discharge and recycle all its water. Over the years, Al-Corn's ethanol yield from a bushel of corn has increased from 2.5 to 2.9 gallons with the adoption of new technologies. "It is exciting to see a corn output trait aimed at the ethanol industry," says Doyal.

Roundup® Ready Alfalfa: Deregulation Follows First Biotech Crop Environmental Impact Statement



WHAT: Roundup Ready® alfalfa (RRA), developed by **Monsanto** and Forage Genetics International, is genetically modified to be resistant to

Roundup herbicides. Roundup controls perennial weeds and can improve forage quality and yield. RRA requires less use of crop protection products, providing both financial, crop safety and environmental benefits. At least 23 seed companies are marketing Genuity® Roundup Ready alfalfa varieties. More than 40 varieties are being offered. Monsanto's technology fee in Minnesota is \$125 per bag.

LEGAL STATUS:

RRA was approved for sale and commercialized in 2005. More than 5,000 farmers had planted RRA on more than 250,000 acres before a court ruling halted further sales and planting. In May 2007, a district court banned the sales of RRA pending the completion of an Environmental Impact Statement (EIS). On June 21, 2010, the U.S. Supreme Court lifted the nationwide ban and ordered Roundup Ready alfalfa be returned to the USDA for appropriate regulatory actions. On Jan. 27, 2011, USDA deregulated RRA without conditions. This was the final step in an extensive environmental review process undertaken by the USDA that took 46 months to complete. The EIS, the first for a biotech crop, was published on Dec. 16, 2010. The Center for

Food Safety has threatened another lawsuit, but had not done so at press time.

IMPORTANCE TO MINNESOTA:

Alfalfa is the fourth-largest U.S. field crop grown, worth roughly \$8 billion to \$10 billion and grown on about 20 million acres as food for dairy cattle and other livestock. Minnesota ranks fifth among states in alfalfa production and 6th in dairy production.

"It's great to have this step up in technology available to alfalfa growers who have problem weeds," says dairyman and Agri-Growth Board member **Pat Lunemann** of **Twin Eagle Dairy**. "We have 470,000 dairy cows in this state and it takes a lot of acres to feed these cows. This technology can increase tonnage, freeing up acres for something else."

Dairyman **Bruce Stone** of Henning, Minnesota seeded 52 acres of RRA in 2005 and plans to plant 100 acres of it this year. "It did a great job of controlling white clover and grasses. Usually we're lucky to get three years out of an alfalfa stand, but with Roundup Ready alfalfa I can extend stand life another two years," he says.

Mark McCaslin, president of Forage Genetics International expects demand to be strong. "Growers who planted the alfalfa before the ban in 2007, self-reported an average advantage of \$100 per acre per year due to Roundup weed control. Based on this, we expect a high adoption rate among existing users and strong interest by new customers."

CONCERNS ADDRESSED:

Opponents voiced concerns that without any restrictions the biotech alfalfa will contaminate organic and conventional alfalfa seed production. According to McCaslin this is highly unlikely in the case of organic production. "As a forage crop, alfalfa is harvested well before the ripe seed stage, making gene flow from one alfalfa field to another highly remote. The EIS determined little risk of contamination of organic alfalfa fields by RRA," he says. In addition the Stewardship Program for RRA obligates growers to cut the alfalfa before 10 percent bloom when in proximity to certain fields. It also requires growers to be licensed and provide GPS coordinates for their RRA fields.

Gene flow is a concern in seed production fields however and that's why the National Alfalfa Forage Alliance (NAFA) created best management practices for RRA seed production as part of a co-existence workshop in 2007. Isolation distances are mandated for RRA seed production as is third party review and sampling through the Association of Official Seed Certifying Agencies (AOSCA).

“The activists have not been successful challenging biotech crop approvals based on safety or environmental concerns so they have had to resort to challenging USDA with procedural technicalities via our legal system to throw a monkey wrench into biotech approvals.

- JACK BERNENS, SYNGENTA SEEDS

"Co-existence of organic and biotech varieties has been managed for many years with other crops. We believe that through best management practices both organic and biotech crops can flourish," says **Steve Welker**, Monsanto alfalfa and sugar beet lead. He notes that growers are required to sign the Monsanto Technology Stewardship Agreement and follow the Technology Use Guide.

Another concern has been the potential for increased occurrence of glyphosate-resistant weeds. Resistance is a concern for any herbicide, but McCaslin says Roundup use in alfalfa is an unlikely source of new weed resistance because frequent cutting of alfalfa makes it unfriendly for weeds to produce seeds, thus alfalfa fields aren't likely to be sprayed frequently with Roundup. A University of Wisconsin study in 2000 showed that a RRA stand only needed to be sprayed twice during the stand's life for good weed control — once at seeding and once in the fall of the third year of the stand.

"Roundup Ready alfalfa has gone through a very lengthy review process and it's been found to be a safe technology that gives dairy producers another option for their alfalfa acreage," says **Bob Lefebvre**, **Minnesota Milk Producers**.

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CALENDAR OF EVENTS

April – 6: Policy Luncheon

May – 4: Policy Luncheon

June – 8: Legislative Wrap Up
13: Annual Golf Tournament

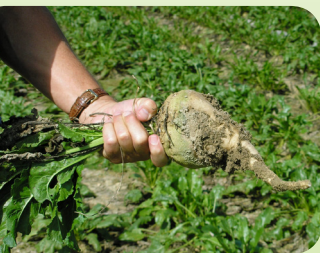
November – 16: Annual Meeting

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NEW BIOTECH CROP TRAITS OFFER HUGE OPPORTUNITY FOR MINNESOTA AGRICULTURE, CONTINUED FROM PAGE 3:

Roundup® Ready Sugar Beets: Planting Uncertainty Created by Further Legal Challenges



WHAT:

Genuity® Roundup Ready (RR) sugar beets are genetically modified to have in-plant tolerance to Monsanto's Roundup

brand herbicides. RR sugar beets received regulatory approval in March 2005 and quickly attained the fastest adoption of any biotech crop. By 2010, approximately 95 percent of the sugar beets grown in North America were Roundup Ready varieties and accounted for nearly half of the U.S. sugar supply. The Roundup Ready technology was widely adopted because it provided excellent weed control, crop safety and significant benefits to growers.

REGULATORY STATUS:

Three years after deregulation (January 2008), the Center for Food Safety filed a lawsuit challenging USDA's Animal Plant Health Inspection Service's (APHIS) decision to deregulate RR sugar beets. The U.S. District Court for the Northern District of California found that APHIS should have prepared an environmental impact statement (EIS) prior to full deregulation. In September 2009 the court ruled that an EIS must

be conducted. On Aug. 13, 2010, the court vacated APHIS' decision to fully deregulate RR sugar beets and remanded the matter to USDA.

On Feb. 4, 2011, USDA partially deregulated RR sugar beets and authorized the 2011 spring planting of RR sugar beets under compliance conditions. The interim measures will be in effect until APHIS completes its EIS (expected by the end of May 2012).

On Feb. 7, 2011, beet sugar industry plaintiffs filed a lawsuit in Washington D.C. that challenged some of the compliance conditions imposed on RR sugar beet root and seed crop production activities. They also asked for a declaratory judgment that APHIS' action fulfills the requirements of federal law and complies with the National Environmental Protection Act and the Plant Protection Act.

Even though USDA authorized 2011 spring planting of RR sugar beets on Feb. 4, new motions filed by the Center for Food Safety seek a restraining order and preliminary injunction to stop the plantings. Its most recent filing was on March 2 in the Northern District of California Court after it had failed to amend an existing case before the court and failed to convince the court that existing cases and the new case were related. USDA has filed a motion to dismiss the filing or transfer the matter to the Washington D.C. court. Final briefs were due

March 11. The sugar beet industry hopes the court will decide by the end of March.

UPSHOT:

As of mid-March, growers still faced uncertainty about whether they can plant Roundup Ready sugar beets. As they make planting decisions, growers need to talk to their cooperatives to have the latest and best information available.

AVAILABILITY:

It is not clear whether there will be adequate supplies of conventional sugar beet seedstock if an injunction is issued against planting of RR sugar beets. Undoubtedly, conventional seed would be from older genetics and could hinder performance. Availability of other sugar beet herbicide options is also of concern. Ironically, the challenges to Roundup technology by environmentalists would force the industry to use less environmentally friendly herbicides, increase trips over fields and use more fuel.

IMPACT ON MINNESOTA:

Sugar beets are planted on 1.2 million acres in the U.S. annually and supply half of the nation's sugar. Minnesota and North Dakota grow 57 percent of the total beet acreage in the U.S. and have seven grower-owned sugar beet factories. The outcomes of these court cases are important to the area's economy and will impact a key market for Minnesota growers.