SPRING 2008

THE NEWSBEET

MICHIGAN SUGAR COMPANY

Spring Forward to Technology

PIONEER • BIG CHIEF
MICHIGAN SUGAR

root of the BUSINESS

By Mark Flegenheimer, President and CEO

As our shareholders head into the fields this spring, they will bring with them a variety of new technologies to help plant, grow and ultimately harvest a bountiful crop of sugarbeets. These advances range from Roundup Ready® varieties to GPS-guided planters and sprayers. In this issue of the *Newsbeet*, we discuss and review a number of these new tools that are available to assist our growers. As costs continue to rise and pressure from competing crops mount, we must utilize these and other technologies to keep the sugar industry viable.

Seed varieties continue to make great strides in increasing yield, disease resistance and now weed control. Shareholders have seen dramatic increases in yield with the new nematode resistant varieties, helping them overcome severe yield loss from this pest. Fields where weeds were unmanageable can now be planted to Roundup Ready varieties to combat that problem. As we move our Co-op forward, we must continue to set high expectations for the seed companies' new varieties. With ever increasing freight and fuel costs, we need to look at sugar content and quality to help lower the cost of making a bag of sugar.

GPS assisted planters and sprayers, coupled with grid sampling and field mapping, will allow growers to apply the right amount of inputs without wasting product. We need to increase the number of acres being grid sampled and tested so our growers can maximize their returns. Matching the right varieties to your fields and maintaining them to produce the highest yield and quality will be the key to your success. I encourage our shareholders to utilize the Co-op's agronomy personnel in maintaining the crop this year. Another technology that is worth using is the BeetCast leafspot forecasting program. This program can save shareholders and their Co-op a great deal of money with timely treatment of this quality and yield sapping disease.

New this year is the use of tablet computers for contracting and field tracking. This new program will allow our shareholders the ability to track their sugarbeet crop, field by field. Over time, this program and database will allow us to give better advice on what seed varieties and growing practices are working best. To read more about the "ag tablets" see the story on Page 22.

I hope the 2008 crop of beets is one of the best ever and I hope our shareholders are able to utilize some of these exciting new technologies, which are helping the Co-op and industry move forward.

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Cover: New ventilation equipment at Caro.

2007 CROP UPDATE

By Paul Pfenninger,
Vice President of Agriculture

Harvest of the 2007 crop was a very successful event. Yield was much higher than originally expected, sugar and clear juice purity (CJP) were good and harvest conditions were favorable, for the most part.

The late summer drought in August and early September had most of us expecting a lower than average tonnage year. There was enough concern for yield that we actually delayed our scheduled startup for one full week. Fortunately, rains arrived in September and with record-breaking heat in early October, the crop responded in a very big way.

Our first day of harvest was a pleasant surprise. Delivery was steady and it lasted all day. We received a total of 141,082 net tons of beets at the 12 stations open that day. In total, 670,785 tons, or 18 percent of the crop, was delivered before we opened all stations for long-term storage on October 23. The warm weather influenced our early delivery schedule right up to the first day of open delivery. Once the weather turned cooler, the temperatures throughout the remainder of harvest were near perfect. There were a couple of days where nighttime lows dropped into the upper 20s and, on occasion, daytime highs approached the upper 50s. Generally speaking, beet temperatures during harvest were very, very good. These favorable conditions, along with your ability to harvest, allowed us to set 11 beet receiving records including the most impressive, which was 293,501 net tons of beets received on October 30.

2007 CROP RESULTS

Acres contracted	162,650
Acres planted	160,133
Acres harvested	158,354
Tons received	3,736,700
Tons per acre	23.6
% Sugar	18.12
Clear juice purity (CJP)	94.46
Recoverable white sugar per ton (RWST)	265 lbs.

Looking ahead to Crop Year 2008, we can finally say that we are in our first year of transition from conventional beets to biotech beets. For the first time, the Board has authorized up to 45,000 units of Roundup Ready® beets to be planted.

Not only is this technology exciting, the potential for improved yield and production efficiency is what we need for our crop at this time in history. With new varieties, recoverable white sugar per acre (RWSA) is expected to be 7 to 13 percent higher than our three-year average. This is due to the Roundup Ready varieties and the nematode resistant variety having inherently higher yield potential. If you do the math and factor in the genetic potential of the new varieties available in 2008, we can reasonably expect our average yield to approach 24 tons per acre. Looking even further ahead to the 2009 crop year, we would expect the same 24 tons per acre or more with a much improved RWSA.

It is truly an exciting time in the sugarbeet industry. Biotech varieties and Roundup Ready beets are no longer a dream, but a dream come true. It has been a long and exhausting trial period, but now we begin to reap the rewards of our efforts.

Crop years 2008 and 2009 will truly be "transition years." Varieties will change and their genetic potential will amaze all of us. This will help us stay competitive in the local and global markets. If we stay diversified and improve our bottom line only good things can happen.

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2007 FARM BILL HEADED TO CONFERENCE COMMITTEE

By Ray VanDriessche, Director of Community & Government Relations

Drafting a new farm bill is never a fast or easy process and the 2007 Farm Bill debate and legislative track seems to be going down the same bumpy road. After many months of discussion, debate and defeat of a number of amendments that would have negatively impacted most of agriculture, the House version of the farm bill was passed at the end of July, but not without controversy. Just prior to the vote, the method of funding a $4 billion increase to the food and nutrition program in the farm bill became a major hurdle. What one side of the aisle considered a method of closing a loophole as a funding source, the other side interpreted as a tax increase to foreign-owned manufacturers here in the U.S. Here are a few quick facts about the House bill.

- The budget baseline of the House bill is $60 billion less than the 2002 version
- About 76% of the farm bill Funding would go toward Food Stamps and related programs compared to 60% in the 2002 Farm Bill
- Only 15% of the 2007 Farm Bill budget will go to farmers or agri-business, compared to roughly 16% in the 2002 Farm Bill.

BELOW IS A SIMPLISTIC COMPARISON OF THE SUGAR PROVISIONS IN THE HOUSE AND SENATE BILLS.

1. LOAN RATE INCREASE SCHEDULE

Crop Year	House bill		Senate bill	
	cane	beet	cane	beet (implied at 128.5% of cane)
current law	18.0	22.9		
2008	18.5	23.5	18.00	23.13
2009	18.5	23.5	18.25	23.45
2010	18.5	23.5	18.50	23.77
2011	18.5	23.5	18.75	24.09
2012	18.5	23.5	19.00	24.42

2. FEEDSTOCK FLEXIBILITY PROGRAM FOR BIO-ENERGY PRODUCERS (SUCROSE-TO-ETHANOL): These provisions are in the House bill's Energy title, but they are in the Senate bill's Commodity title.

3. SUGAR STORAGE FACILITY LOANS: The Senate bill amends current law to preclude imposition of a loan prepayment penalty. The House bill contains no provision regarding the storage facility loan.

4. CCC STORAGE PAYMENTS: Currently, by FSA regulation, the payment rates to processors for storage of CCC inventory are 8 cents per hundredweight per month for raw cane sugar and 10 cents per hundredweight per month for refined sugar. The Senate bill increases those monthly payments to 10 cents per hundredweight for raw cane, and 15 cents per hundredweight for refined sugar. The House bill contains no provision regarding CCC storage payment rates.

5. TRQ SHIPPING PATTERNS: The House bill requires the Secretary of Agriculture to establish shipping patterns annually for TRQ imports from "Large" and "Very Large" exporters. The Senate bill contains no provision regarding shipping patterns.

6. NAFTA SUGAR COORDINATION: The Senate bill contains a "Sense of the Senate" resolution calling on the governments of the U.S. and Mexico to coordinate the operation of their respective sugar policies in order to avoid market disruptions and to maximize benefits of sugar policies to sugar growers, processors and consumers in the two countries. The House bill contains no provision regarding NAFTA policy coordination.

The Senate took up the farm bill in mid-October and before the Thanksgiving recess, 304 amendments were filed to be attached to the farm bill legislation. With progress stalled over the number of amendments that each party could debate on the floor and time running out, a compromise by party leaders settled on 40 amendments to be offered for consideration. Debate then started immediately and the Senate version of the farm bill was passed on December 14 by a vote of 79-14.

The Administration continues to threaten a veto of the farm bill if the issue of a proper method of funding the bill is not resolved (there are problems with both the Senate and House version). A senior White House official indicated that the President would sign the farm bill once budget and funding issues have been corrected. As of the writing of this article (February 1) the farm bill process is still stalled and Chairman of the House Ag Committee, Colin Peterson, and Senate Ag Committee Chairman, Tom Harkin, have expressed that they would like to see a farm bill passed by Easter recess due to the fact that the short-term extension of the 2002 Farm Bill expires on March 15. A resolution to the funding issue is expected in time to meet the deadline.

In other Washington, D.C., news, former Governor of Nebraska, Ed Shafer, has been nominated by President Bush to be the new Secretary of Agriculture. His nomination appears to be non-controversial and quick approval by the Senate is expected.

Annual MEETING

By Julie Perry, Executive Assistant, Administration

On January 15, 2008, approximately 215 stockholders attended Michigan Sugar Company's Sixth Annual Shareholders Meeting held in Saginaw Valley State University's Curtiss Hall, along with other invited guests and employees.

Attendees were welcomed by Chairman Gene Meylan, who reviewed the successful campaign of 2006, ending in March of 2007, the farm bill lobbying efforts made in Washington, D.C., the importance of PAC contributions in keeping our industry strong, his pride in the Cooperative's employees and the growers' excellent crop. He also discussed the improvements made in communications, the importance of maintaining a solid acreage base to assure a future for sugarbeets here in the State of Michigan, and not letting "short-term gains create long-term pains." He thanked the members for the pleasure of allowing him to serve the industry.

Frank Bragg, Michigan Blueberry Growers, and Gene Meylan.

Chief Financial Officer, Brian Haraga, reviewed the past year's financials, which illustrated a continuing increase in the financial strength of the Co-op's balance sheet. Jerry Coleman, Vice President of Marketing & Sales, and Jim Eichenberger from Midwest Agri-Commodities presented marketing reports on our sugar and co-products.

President & Chief Executive Officer, Mark Flegenheimer, discussed the need to focus on influences within our control, such as fuel consumption, efficiency, research, agronomic practices, quality improvement, beet storage, value-added products, and maximizing returns.

Our keynote speaker, Frank Bragg, President of the Michigan Blueberry Growers, spoke about "The Evolving Cooperative Structure" and keeping an open mind to opportunities that may present themselves.

Annual Meeting photography by Matt Shaw.

The Cooperative's attorney, David VanderHaagen, presented a bylaws amendment recommended by the Board of Directors, which would allow an outside director to become a "voting" member of the Board. The bylaws amendment was voted on by the members, and accepted, and elections took place as a result of the nominations made at the district meetings held in December of 2007.

Exiting directors Gene Meylan, Wayne Hecht and Marty Lewis were presented with plaques by Charles Bauer recognizing and thanking them for their years of excellent representation of the Cooperative and the sugar industry. Chairman Meylan was given a commemorative gavel for his role as chairman for the past year.

After recess of the business portion of the meeting, and before lunch, non-member guests were excused and members were shown a special presentation by Brian Haraga with more depth on the Cooperative's financials and given the opportunity to ask questions about current issues in an open forum.

Cooperative members are encouraged to attend the annual meetings, the December district meetings, tool shed talks held in early spring and the summer "CEO Field Days" to stay informed about the Cooperative's issues. Borrowing from the annual meeting's theme of "maintaining focus," we must all focus on keeping the sugarbeet industry strong…working together toward that common goal.

The Co-op Board of Directors, at their reorganization meeting, named Richard Gerstenberger as Chairman, Charles Bauer as Vice Chairman, William Herford as Secretary, and Richard Sylvester as Treasurer. You can find current contact information for the Co-op Board of Directors, District Boards and committees in the Co-op Directory on the grower website (www.michigansugar.com/members), under "Secure Documents."


RESEARCH
REF

PORT

RESEARCH REVIEW 2007

By Jim Stewart, Director of Research, and Lee Hubbell, Research Agronomist

Michigan Sugar Company is continually researching ideas that can lead to growing a high yielding, quality product to be processed in the factories. Profitability of Michigan Sugar Company's shareholders is the first priority of the research program.

One of the important research topics is variety testing. The seed companies work hard to develop good varieties for planting, but how do growers know which variety is best for them? Seed company salespeople are a knowledgeable resource; however, they are focused promoting their company's varieties. Impartial evaluations of yield, quality, emergence, and resistance traits are all conducted by the Michigan Sugar Company research program. That information can help growers select the best variety for their field, considering soil conditions, diseases and pests.

The variety testing program separates the good varieties from all that have been submitted for testing. Improvements over the last few years have been significant (Figure 1). The increases in RWSA projected for 2008 and 2009 are based on an increase in tons per acre from many of the Roundup Ready varieties. The new Roundup Ready varieties do not yet have all the traits growers desire. Most are low on recoverable sugar per ton (RWST) or lacking tolerance to Cercospora leafspot. There may also be less tolerance to other diseases or pests. The low RWST is an important consideration when trying to maintain factory efficiency and maximizing grower payment with the new quality contract.

FIGURE 1

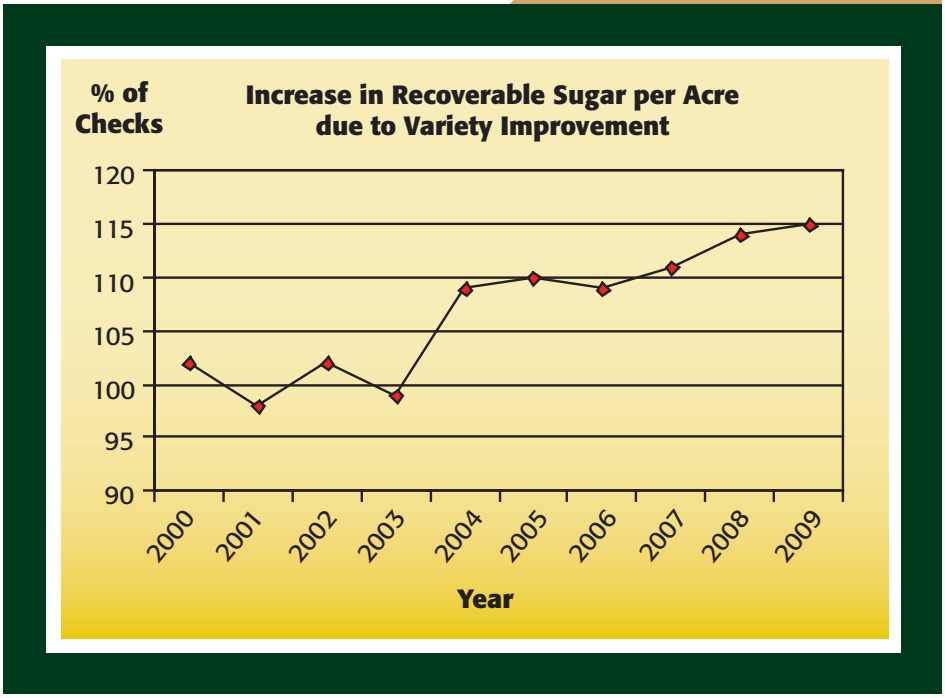


Figure 1. Upward trend of RWSA compared to check varieties.

Planting varieties with low leafspot tolerance can result in increased fungicide cost and extra trips across the field. If leafspot is not controlled, losses can occur in the field and in storage.

Pest management, through variety resistance, is important in the Michigan Sugar Company growing region. Each field can have different and multiple issues which can be managed using resistant varieties such as Rhizoctonia crown rot, Rhizomania, Aphanomyces, root aphid, and cyst nematodes. Which variety should a grower choose? Look at the nursery results

Picture 1. A variety with a high level of tolerance to Cercospora leafspot.

Picture 2. A variety with a low level of tolerance to Cercospora leafspot.

that rate variety resistance. Nurseries are conducted for Cercospora leafspot and Rhizoctonia crown rot here in Michigan. The research team is also learning how to conduct a root aphid nursery. Disease nursery results are critical for determining which varieties will respond the best to challenging growing conditions.

The first Rhizoctonia crown rot nursery was conducted in Michigan in 2006. Dave Wishowski, Research Technician, has learned the process of producing Rhizoctonia solani inoculum. Rhizoctonia solani is grown in controlled conditions and is mixed with sterilized barley for application to sugarbeets in the field. There were two Rhizoctonia crown rot nursery locations planted in 2007. At one location, the disease developed to a level that provided very good separation between the different tolerance levels in the varieties. To evaluate a Rhizoctonia crown rot study, beets are defoliated and lifted at the end of the growing season. All roots are then placed on tables and teams of two people rate every root on a one to seven scale. The results are then summarized and published.

Pest management through variety resistance is important in the Michigan Sugar Company growing region. Each field can have different and multiple issues which can be managed using resistant varieties.

Michigan Sugar Company has also been conducting Cercospora leafspot nurseries for over 25 years. This nursery is inoculated using diseased leaves kept from previous years and every third row is a susceptible variety used to spread the disease evenly. There is a large variation in the amount of tolerance in the varieties tested.

Picture 1 is a variety with a high level of tolerance. Picture 2 (taken at the same time) is a variety without much tolerance, similar to the nematode tolerant variety and some Roundup Ready® varieties that do not have the level of Cercospora tolerance we need.

In 2007, we conducted multiple locations of a trial comparing Quadris applications based on soil temperature and plant size. All treatments, except the 59˚F

RESEARCH REVIEW 2007 (CONT'D.)

application, were significantly better than the untreated check. The main thing to learn from this trial is that an early application of Quadris, to eight-leaf beets, is effective in reducing Rhizoctonia crown rot.

Some researchers have promoted the strobilurin class of fungicides, specifically Headline, as a growth stimulant. The increase in yield would be in addition to improving yield from managing disease. Michigan Sugar Company conducted a strobilurin yield enhancement trial in 2007. The results of the trial did not show any yield improvement by applying Amistar, Eminent, Gem or Headline to sugarbeets when Cercospora leafspot was controlled. Additional research will be conducted to determine if yield enhancement will occur in the Michigan Sugar Company growing region by applying strobilurin fungicides.

Three Roundup Ready small plot replicated weed control trials were conducted in 2007. One trial examined applying Roundup OriginalMax at 22 fl oz per acre in combination with traditional herbicides such as Nortron, Outlook, Stinger and Select. All of the applications included spray grade ammonium sulfate (AMS) at 17 lbs per 100 gallons of water. Tank mixing Nortron, Stinger and Outlook provided excellent control of common lambsquarters and redroot pigweed. The standard treatment, Progress, applied as a micro-rate, was significantly less effective in controlling weeds than the Roundup OriginalMax treat-

ments. Roundup OriginalMax alone did not cause crop injury in the trial. Applying Outlook with Roundup OriginalMax to two-leaf stage sugarbeets did cause noticeable injury as did the preemerge application of Nortron. Minor crop injury was noted when Stinger and Nortron were applied postemergence with Roundup OriginalMax. When Outlook was applied with Roundup OriginalMax at the six-leaf stage, injury did not occur. Injury symptoms were not observed from any of the herbicide treatments by mid-season. All of the treatments with Roundup OriginalMax resulted in greater yield than the untreated check. Roundup OriginalMax combined with Outlook was the lowest yielding of the treatments containing Roundup OriginalMax. All of the Roundup OriginalMax treatments also resulted in greater yield than the Progress micro-rate treatment.

A second Roundup Ready trial evaluated Roundup OriginalMax tank mixed with Gem SC, Headline, Eminent and Super Tin at a Cercospora leafspot application timing. None of these treatments caused any crop injury or reduced weed control. Quadris was also tank mixed with Roundup OriginalMax at typical timings for managing Rhizoctonia crown rot. Minor sugarbeet injury was noted when Quadris and Roundup OriginalMax were applied together to two-leaf stage sugarbeets. When Roundup OriginalMax and Quadris were applied together to six-leaf stage sugarbeets, no injury occurred. Weed control was not reduced from tank mixing Quadris and Roundup OriginalMax.

Rating sugarbeets for Rhizoctonia crown rot.

One trial compared the efficacy of the registered fungicides for controlling Cercospora leafspot in sugarbeets. In this trial Gem SC, Headline, Eminent and Enable + Dithane all provided very good leafspot control.

A third Roundup Ready trial was conducted to evaluate the timing of the Roundup OriginalMax application. Greatest weed control was obtained by applying Roundup OriginalMax three times to two-leaf, six-leaf and ten-leaf stage, sugarbeets. Two well-timed applications to two- and ten-leaf sugarbeets also resulted in good weed control. Roundup OriginalMax applied at the four- and ten-leaf stage, with Dual Magnum or Outlook included in the four-leaf stage application, also provided good weed control, but minor sugarbeet injury occurred. A single Roundup OriginalMax application at the four-leaf stage did not provide adequate weed control since new weeds grew after the herbicide application. A single Roundup OriginalMax application at the ten-leaf stage was somewhat more effective than at the four-leaf stage timing, but still did not provide effective weed control (Table 1).

Several small plot replicated trials focused on managing Cercospora leafspot were conducted in 2007. One trial compared the efficacy of the registered fungicides for controlling Cercospora leafspot in sugarbeets. In this trial, Gem SC, Headline, Eminent and Enable + Dithane all provided very good leafspot control. Gem SC provided significantly better control than Gem DF. Super Tin and

RESEARCH REVIEW 2007 (CONT'D.)

TABLE 1

Roundup Ready Research – Timings, Rates and Tank Mixes
Blumfield, MI – 2007

Trial Validity: Good

Treatment[1]	Rate Per Acre	Leaf Stage[2]	Tons/ Acre	% Phyto[3] Early	% Phyto[3] Late	% Weed Control Lambq[4]	% Weed Control R Pigw[5]
Roundup OrigMax	22 fl oz/A	2, 6, 10	23.7	0.0	0	99.4	98.6
AMS	17 lb/100 gal	2, 6, 10					
Roundup OrigMax	22 fl oz/A	2, 10	23.5	0.0	0	97.6	99.4
AMS	17 lb/100 gal	2, 10					
Roundup OrigMax	11 fl oz/A	2, 6, 10	22.8	0.0	0	98.8	98.8
AMS	17 lb/100 gal	2, 6, 10					
Roundup OrigMax	22 fl oz/A	4, 10	22.6	4.2	0	99.4	98.3
AMS	17 lb/100 gal	4, 10					
Outlook	1 pt/A	4					
Roundup OrigMax	22 fl oz/A	4, 10	21.9	3.3	0	98.4	98.3
AMS	17 lb/100 gal	4, 10					
Dual Magnum		4					
Roundup OrigMax	22 fl oz/A	4	21.7	0.0	0	87.1	87.1
AMS	17 lb/100 gal	4					
Roundup OrigMax	22 fl oz/A	10	21.2	0.0	0	91.8	92.8
AMS	17 lb/100 gal	10					
Betamix 1.3 EC	8 / 12 fl oz/A	Cot, 2 / 4, 6	20.9	5.8	0	89.8	91.3
UpBeet	0.125 oz/A	Cot, 2, 4, 6					
Stinger	1 fl oz/A	Cot, 2, 4, 6					
MSO	1.5 % v/v	Cot, 2, 4, 6					
Dual Magnum	1.33 pt/A	4					
Untreated Check			12.5	0.0	0	0.0	0.0
LSD 5%			2.1	2.9	0.0	4.4	3.9
CV %			8.4	166.0	0.0	4.5	4.0
Mean			21.2	1.5	0.0	84.6	85.0

[1] Spray Grade Ammonium Sulfate added to each Roundup OriginalMax Application (17 lbs/100 gal)
[2] Applic. Timings: (Cotyl: Jun 5), (2 lf: Jun 11), (4 lf: Jun 17) (6 lf: Jun 22), (8-10 lf: Jun 29)
[3] Phyto: Visual Injury Symptoms. Early and late ratings.
[4] % Common lambsquarters Control: Visual Weed Control Rating. Average of early and late ratings.
[5] % Pigweed species Control: Visual Weed Control Rating. Average of early and late ratings.

Topsin plus Super Tin provided intermediate leafspot control.

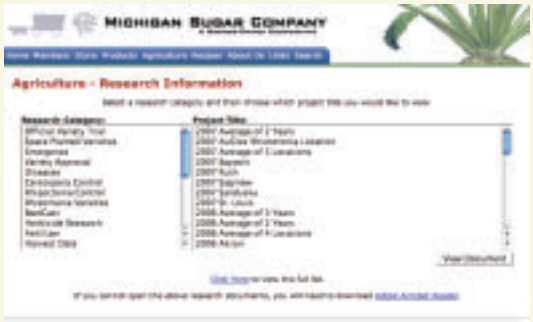
Another trial examined the effect of gallons per acre (GPA), spray pressure (psi) and a non-ionic surfactant in controlling Cercospora leafspot. This has been a two-year study. The non-ionic surfactant did not have any effect on leafspot control.

Increasing spray pressure from 50 to 100 psi and increasing water volume from 10 to 25 GPA both had significant and positive effects on leafspot control. It appeared that increasing spray pressure had more impact than increasing water volume.

Other trials evaluated new triazole fungicides from Bayer CropSciences and Syngenta. These fungicides are in the same chemical class as Eminent. The Bayer CropSciences product, Proline, and the Syngenta product, Inspire, both have very good efficacy. Both products are expecting registration this spring. Proline is also reported to provide control of Rhizoctonia crown rot.

TRIALS CONDUCTED IN 2007:

Official Variety Trial, 8 locations
Plant to Stand Variety Trial, 5 locations
Cercospora Nursery, 4 locations
Rhizoctonia Nursery, 2 locations
Seed Treatment, 3 locations
Priming, 4 locations
Roundup Weed Trial for Monsanto
Roundup Systems
Strobi Yield Enhancement, 2 locations
Nitrogen/Potash Rates
Boron Rates
BeetCast, 7 locations
New Fungicide for Dow/DuPont
New Fungicide for Syngenta, 2 locations
New Fungicide for Bayer
Fungicide for Sipcam
Gallons/Acre & Pressures for Fungicides
Fungicide Efficacy for Cercospora
Rhizoctonia Control, 4 locations
Nematode Control with Temik
Replant/Population
Nitrogen Rates/Ron Gehl, MSU, 2 locations



RESULTS: Results for 2007 are available on the website as well as from past years.

Choose www.MichiganSugar.com
Select "Agriculture"
Select "Research Information"
Select a Research Category
Then a Project Title
Click on "View Document"

VENTILATION UPDATE

By Corey Guza, Ph.D., Agronomist

Growers who delivered beets to the Sebewaing, Caro, and Bay City locations noticed a little more equipment in the yard and some changes in traffic flow, and we appreciate your cooperation. Your patience will result in improvements in pile storage and economic returns to Michigan Sugar Company.

At Bay City, a total of 130,000 tons of ventilated sugarbeets will be available for processing; at Sebewaing, 120,000 tons; and at Caro, 20,000 tons of sugarbeets are piled over ventilation tubes.

The expanded ventilation project is showing early signs of success. Warm weather in mid-October resulted in warmer beets delivered to the piling yards. While the weather was not warm enough to shut down, it was still warmer than late October and early November when conditions were ideal for piling beets. Since the early beets were able to be cooled using ventilation, warmer beets from other piles could be processed early in the campaign without sugar loss from respiration, while the ventilated sugarbeets can be saved until the end of the campaign.

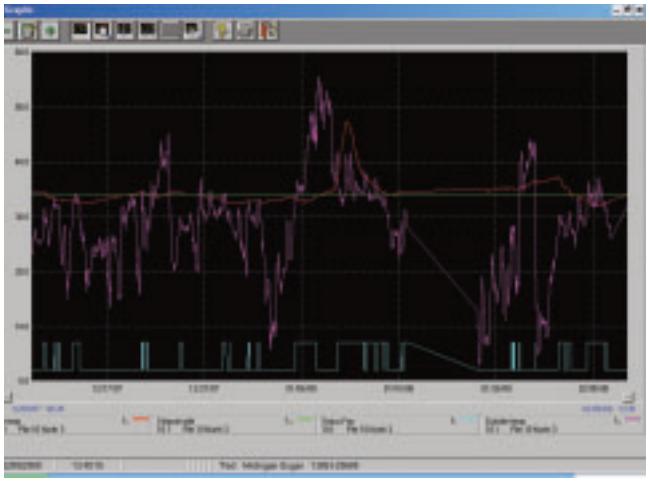


Figure 1. This is a screen shot of the computer software used to analyze temperature data for the air and beet pile interior. The jagged line shows how variable air temperature is. The smoother line shows how steady the computer control can maintain the pile interior temperature. The bottom line shows the time and duration of fan operation via the computer control.

One of the main reasons for implementing pile ventilation was the weather pattern of extreme warm temperatures in December and January. Extremely warm weather again occurred in January this year. Nearly 60˚F air temperatures with high winds caused pile temperatures to spike up to nearly 50˚F in some spots. As soon as the air temperatures cooled, the ventilation equipment cooled the beets back to 34˚F within a day or two (Figure 1). Due to ventilation cooling the beets in some piles, "hot spots" in non-ventilated piles could be processed quickly before beet quality could begin to rapidly decline.

The ventilated beets will be monitored closely for improvements in storage and processing quality. Pile ventilation can reduce the risk of storage loss. Reducing the risk of storage loss is especially critical when trying to maximize factory efficiency by increasing throughput and extending the campaign.

WEED CONTROL MADE "SWEETER" WITH ROUNDUP READY SUGARBEETS

By Christy L. Sprague, Associate Professor, Department of Crop and Soil Sciences, Michigan State University

After a long wait, Michigan sugarbeet growers will now, be able to grow Roundup Ready sugarbeets for the first time this year. Michigan growers have used the Roundup Ready® (glyphosate-resistant) technology in other crops, including soybeans and corn, for over ten years, but when the decision was made to stall the commercialization of Roundup Ready sugarbeets in the late-90s, sugarbeet growers adopted new strategies of controlling weeds with current herbicide technologies. One of these strategies was to use micro-rate herbicide applications. While micro-rate strategies worked well for a number of years, crop injury and, more recently, less consistent weed control have been major concerns; therefore, the excitement level for the commercialization of Roundup Ready sugarbeets is extremely high.

Figure 1. Weed control with four micro-rate herbicide applications compared with three applications of glyphosate in Roundup Ready sugarbeets.

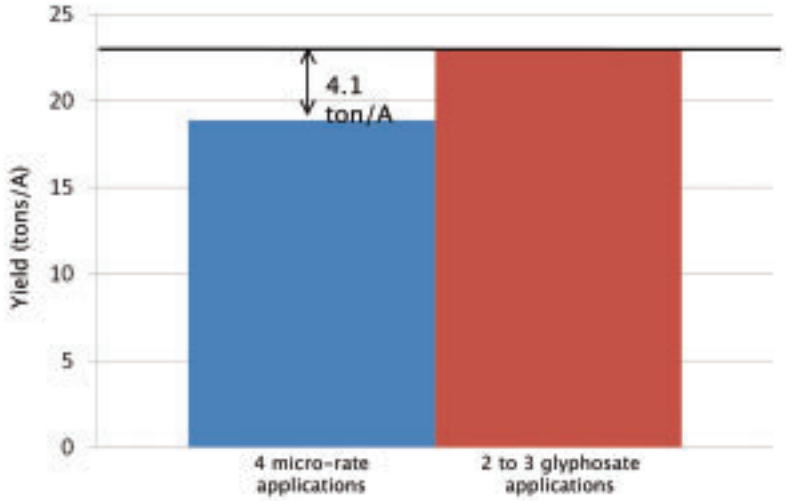


Figure 2. Differences in sugarbeet yield between micro-rate herbicide programs and two to three applications of glyphosate in Roundup Ready sugarbeets, averaged over four locations.

ROUNDUP READY VS. MICRO-RATE WEED CONTROL PROGRAMS

Researchers at MSU started working with Roundup Ready sugarbeets over ten years ago. But when the decision was made not to move forward with the commercialization of this technology, research activities were switched to improving current weed management strategies. Research activities in Roundup Ready sugarbeets were ramped up again in 2004 when there was talk that Roundup Ready sugarbeets may become a reality. Over the last four years, seven different trials were conducted that compared weed control with two to three applications of glyphosate to micro-rate herbicide programs [4 applications of Betamix (8 oz) + UpBeet (0.125 oz) + Stinger (1 oz) + MSO (1.5% v/v)] in Roundup Ready sugarbeets. In all seven trials, common lambsquarters control with two to

WEED CONTROL MADE "SWEETER" WITH ROUNDUP READY SUGARBEETS (CONT'D.)

three applications of glyphosate was ten percent or more greater than the micro-rate herbicide program in mid-July (Figure 1). Root yields in these trials ranged from 0.3 to 5.6 tons per acre higher when glyphosate was used for weed control, compared with the micro-rate herbicide program. In four of seven of these trials, significant yield increases ranged from 2.2 to 5.6 tons per acre for beets treated with glyphosate versus the micro-rate herbicide program (Figure 2).

WHEN SHOULD THE FIRST GLYPHOSATE APPLICATION BE MADE?

Some of the earlier research at MSU in 1998 and 1999 with Roundup Ready sugarbeets focused on defining when the first glyphosate application should be made to avoid crop yield loss and to determine if preemergence herbicides were beneficial in a Roundup Ready sugarbeet system. To avoid sugarbeet yield loss, it was determined that glyphosate should be applied before weeds exceeded four inches in height and applications should be repeated through nine weeks after planting to avoid yield loss (Kemp and Renner). They also found that using preemergence herbicides improved common lambsquarters control at some locations, but there was no benefit in yield.

POTENTIAL FOR THE DEVELOPMENT OF GLYPHOSATE-RESISTANT WEEDS

Over 40 percent of corn and 85 percent of soybean acres in Michigan are now planted to Roundup Ready or other glyphosate-resistant crop hybrids/varieties. The widespread adoption of glyphosate-resistant crops has led to the potential for exclusive use of glyphosate for weed control in a grower's crop rotation and the development of glyphosate-resistant weeds.

Roundup Ready sugarbeets will be an excellent weed control asset to Michigan sugarbeet growers. It will be important for growers to be good stewards of this technology, so its benefits will be sustainable in the future.

In Michigan's primary sugarbeet growing areas, over 45 percent of growers surveyed in 2007 indicated that they were growing both Roundup Ready corn and soybeans. The addition of Roundup Ready sugarbeets into the rotation will likely lead these growers to use glyphosate for weed control in a major portion of their crop rotation. Currently, eight weed species have developed resistance to glyphosate in the United States. In order to delay the development of glyphosate-resistant weeds in Michigan, growers should consider using herbicides with different modes of action in part of their rotation. If glyphosate-resistant weeds start to appear in Roundup Ready sugarbeets, growers will also need to have alternative weed control strategies in place.

It will be important to include herbicides with different modes of action in the crop rotation. Because of the expected widespread adoption of Roundup Ready sugarbeets, many of the current herbicides exclusively used in sugarbeets will probably be no longer manufactured and marketed. With this in mind, in 2007, we examined the use of residual herbicides that can be used in other crops in Roundup Ready sugarbeets. In this trial, the initial glyphosate applications were made when weeds were two inches tall and the second applications of glyphosate were applied when newly emerged weeds were four inches tall. In the second application, glyphosate was applied alone, with Dual Magnum, with Outlook, and with KIH-485 (potential new herbicide in corn and soybeans). These herbicides added another mode of action in the program. Low rainfall later in the season limited new weed emergence and all

of the programs provided excellent weed control; however, in years where weeds continue to emerge later in the season, the use of residual herbicides will help with control of late-emerging grasses and pigweeds and may reduce the need for an additional glyphosate application. The use of residuals tank-mixed with the second glyphosate applications were the highest yielding treatments and were similar to two applications of glyphosate.

TANK-MIXTURES WITH FUNGICIDES

One of the questions I am often asked is, "Can I tank-mix fungicides for Rhizoctonia crown rot or Cercospora leafspot control with glyphosate?" Last year we conducted a study where we wanted to determine if there would be any injury or sugarbeet yield loss from tank-mixtures of glyphosate (Roundup OriginalMax) with different fungicides. We applied glyphosate alone and tank-mixed with Quadris, Gem, and Headline when sugarbeets were at the two and six leaf stages. Very little injury was observed from these mixtures; however, if we added Dual Magnum or Outlook to the glyphosate plus Quadris tank-mixture, injury was 31 and 13 percent, respectively, seven days after application. The injury was mostly leaf necrosis (burning) and the beets quickly recovered. At the time of a typical fungicide application for Cercospora leafspot (55 DSVs) we applied glyphosate with Copper Sulfate (Champ II), Penncozeb, Eminent, Gem, Headline, Super Tin, and Topsin M plus Penncozeb. We did not observe any sugarbeet injury from these treatments. Yield was not reduced in any of the treatments as compared with the glyphosate alone treatment. So the answer is yes, glyphosate can be tank-mixed with fungicides; however, some precautions need to be taken with tank-mixtures with other herbicides (i.e., Dual Magnum or Outlook). Even though glyphosate can be tank-mixed with a fungicide without causing sugarbeet injury, differences in nozzle types and application timings may affect both disease and weed control. Caution should be taken in matching up the correct application methods and timings.

CURRENT RECOMMENDATIONS IN ROUNDUP READY SUGARBEETS

- Plant Roundup Ready sugarbeets in a weed-free seedbed.
- The first glyphosate application should be made when weeds are two-inches tall, subsequent applications should be made before additional weed flushes exceed four-inches tall. Two to four applications will be needed for season-long weed control.
- Glyphosate should be applied at a minimum rate of 0.75 lb ae per acre (i.e., 22 fl oz/A Roundup WeatherMax or Roundup PowerMax). Higher rates up to 1.1 lb ae per acre (32 fl oz/A Roundup WeatherMax or PowerMax) can be applied to harder-to-control weeds prior to eight-leaf sugarbeet.
- Ammonium sulfate (AMS) at 17 lb per 100 gal should always be added to maximize glyphosate performance.
- Maximum in crop glyphosate application rates include two applications prior to eight-leaf sugarbeets totaling 1.9 lb ae per acre and two applications after the eight-leaf stage until 30 days prior to harvest totaling 1.5 lb ae per acre.
- Dual Magnum or Outlook can be tank-mixed with later glyphosate applications to provide residual control of late-emerging grasses and pigweed. Sugarbeets should have at least four true leaves.

Roundup Ready sugarbeets will be an excellent weed control asset to Michigan sugarbeet growers. It will be important for growers to be good stewards of this technology, so its benefits will be sustainable in the future.

ON-FARM PILING STUDIES

By John Zandstra, College Professor, Ridgetown Campus, University of Guelph

Beet growers in Lambton County (Ontario) store their crop in piles or "clamps" in the field after harvest and ship directly to the Croswell processing plant. Ideally, early harvested beets remain in the field for only three or four days, because of the warmer conditions, while late harvested beets can remain in clamps for up to three weeks.

For growers who deliver to a piling station during the main harvest period, tonnage and sucrose content is determined when the beets are delivered. Beets piled in clamps present a different scenario, because the weight and sucrose content of the crop is not taken until the beets are shipped, which may be up to three weeks after harvest. Since the value of the beets are adjusted based on their sucrose content, we needed to know how beet weight and sucrose content changes over time in clamps.

Previous studies indicate that for the first four to five days after harvest, sugarbeets respire (consume sugar) very rapidly, after which respiration drops to a steady level, which is largely dependent on the temperature of the beet. Other factors which affect storage losses of sugar include, the amount of physical damage occurring during harvest, storage rots, fertility and moisture conditions during growth in the field, and the degree of dehydration while in storage. Storage losses of sugar are reported to be in the range of 250 to 500 grams per ton per day (which is equivalent to 0.55 to 1.1 lbs per ton per day, or 0.02 percent sucrose per day); however, this data is quite old (studies were conducted 30 plus years ago), do not involve small on-farm clamps, include longer storage times (45 to 120 days), and were not conducted under environmental conditions in this region.

Piling studies were completed during the 2003 to 2005 harvest season in order to evaluate the weight loss and change in sugar quality and quantity of sugarbeets stored in clamps. Two types of trials were established; early harvested beets were stored for a maximum of nine days and beets harvested during the main season were stored for up to three weeks. Sugarbeet samples, each consisting of approximately 25 lbs of freshly harvested sugarbeets, were weighed and placed in mesh onion bags. Ropes were attached to the samples in order to aid in their retrieval. As the clamps were built, samples were placed at seven different locations across

"Clamps" or in field piles

the clamps, as depicted in Figure 1. The outer pair of samples were placed on the surface of the pile; the second pair of samples were approximately one to two feet below the surface; the third pair of samples were approximately five feet below the surface of the pile; and a single sample was placed in the center of the pile, one foot above the ground. This arrangement allowed us to account for changes in weight and sugar throughout a pile, especially rim-loss, which usually occurs in the outer two feet of a pile. Three sets of seven samples were dug out of the clamps at each removal time, reweighed and processed

Figure 1.

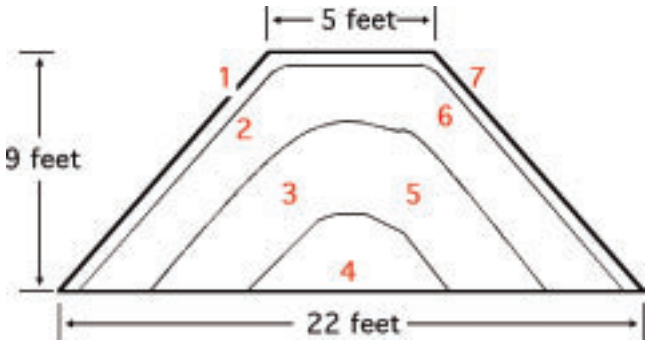
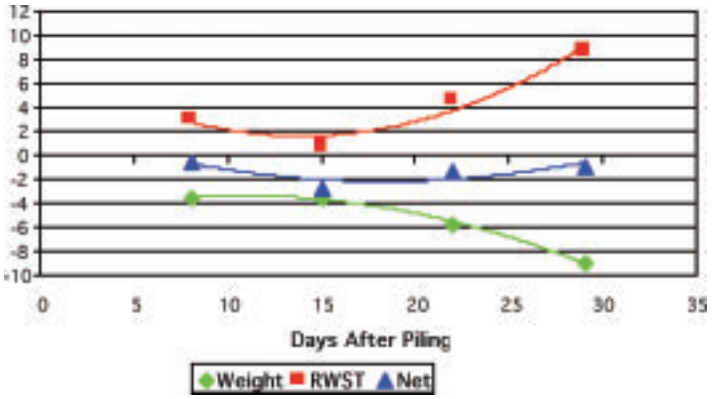


Diagram of research samples in the pile.

Figure 2.



Typical weight, RWST and net sugar changes of beets stored in "clamps".

for sugar analysis. All trials were conducted on cooperators' farms.

Temperature probes indicated that small on-farm clamps are well ventilated and heating was not found in any piles. Small beets were found to lose weight faster than large beets. Beet weight loss, in response to their position in the pile, over time differed greatly; beets on the pile surface lost the most weight (up to 25 percent over a 29-day storage period), while beets in the center of the pile lost less than 2.5 percent of their weight. Rim loss accounts for most of the loss in weight, since beets stored one foot below the surface of the pile lost between 5 to 12 percent of their weight over 29 days. The west side of the pile also lost more weight compared to the east side, presumably due to sunlight exposure and prevailing winds. Changes in recoverable white sugar per ton (RWST) followed the same general pattern. The method of top removal (flailing the leaves off to the crown of the beet, versus removal of the entire crown) had little effect on weight loss and sugar quality of beets when stored in on-farm clamps.

The 2003 and 2004 storage results were encouraging. When averaged over three trials, beet weights dropped by six percent after nine days of storage, while impurities remained stable and sucrose levels increased. As a result, RWST increased by six percent over the same time period, resulting in essentially no net sugar gain or loss (net sugar = tons x RWST). In the main season piles, the sugarbeets lost 5.1 percent of their weight, on average, and RWST increased 3.5 percent, on average, for a net sugar loss of only 1.7 percent. When the savings incurred by shipping fewer tons is considered, grower losses are minimal. In general, it appeared that any respirational sugar loss by the sugarbeet is small, and is masked by a concentrating effect caused by moisture loss. Typical weight losses, RWST increases and net sugar changes from one trial are shown in Figure 2.

Results from the 2005 season were different than the previous two years, while weight losses for early piled and main season beets were similar to what was seen in 2003 and 2004; RWST did not increase to the same degree as previous years, and even decreased by 3.2 percent in the main season trials. Part of this was due to a larger than usual decrease in clear juice purity; the result was a net sugar loss to the producer, which approached ten percent after 21 days of storage. Why these differences occurred is unknown; similar questions arise when large pile storage is poor in a given year.

AG TECH INITIATIVE UPDATE

By Christine Dunham, Director, Information Systems

It was less than one year ago that our Board of Directors and top management staff asked that we place strong focus on providing important information to our agriculturalists and shareholders anywhere, including in the field. The main objective was to provide valuable information for improving crop quality, and as a result the Ag Tech initiative began.

It was January of 2007, and contracting was just around the corner, so we immediately formed an Ag Tech task force and began discussions on short-term and long-term goals and objectives. One of our fundamental tasks was to evaluate various technological devices for providing mobile, real time access to information by our field staff for shareholders. After analyzing the hardware options, we agreed on a tablet PC, which seemed the best fit for several reasons. Tablet PCs are smaller than laptops, yet have a full-sized screen. We evaluated handheld PCs; while compact, they were too small to display a screen of information. Tablet PCs come equipped with touch screens, which are helpful in collecting signatures, and are blue-tooth enabled, which allows connection to keyboards, printers and etc., without the use of cumbersome cables. Therefore, tablets seemed the best option for us.

After establishing the type of computers to be used, it was agreed we should pilot this project with a smaller group of agriculturalists for 2007. We only had a couple of weeks before contracting would begin, and wanted to test the tablets for durability, reliability

and performance, before purchasing them for the entire ag staff. Our next focus was to provide a software application for contracting on the tablets for the pilot group. We developed a quick, easy method for generating the contracting documents on the tablet PCs, however, there wasn't enough time for us to develop a robust, permanent solution. Our 2007 application created the documents as intended, but all of the data collected on the tablets still required the office personnel to manually enter the data into our internal systems at Michigan Sugar. We knew there was still a lot of development to do on the software application before 2008 contracting began.

In the Fall of 2007, we were comfortable with the performance of the tablets, based on the pilot project, and ordered the tablets for the remaining agriculturists. After harvest, they were assigned tablets with a newly-developed seed and herbicide ordering system, to allow them time to become acclimated to their new tablets and the software, prior to contracting. Very recently, we formed a focus group of five individuals to develop the contracting application for the field staff. The group was challenged with an aggressive timeline and the team was made up of individuals from the Agriculture, Grower Accounting and Information Systems Departments. This dedicated group worked diligently for several weeks to ensure accurate information is gathered on the tablet PCs in the most efficient and appropriate manner for the field staff. The contracting information the field staff gathers in 2008 will be entered once during contracting, and then fed into Michigan Sugar Company's main database where it will be reviewed for accuracy by the office staff.

The tablets bring a vast and exciting opportunity in providing information to our shareholders. During contracting, we can define contracts on the field level, if desired. This allows us to provide our shareholders with delivery, yield and lab data at the field level, without dividing fields into separate contracts. If growers are interested in contracting in 2008 at the field level, please discuss this option with your agriculturalist at contracting time. In addition, the field staff has been provided Internet cards for accessing either internal systems at Michigan Sugar, or websites from anywhere there is cell phone service. If an Internet signal is available, we can email your contracting documents to you while at the contracting table. Later in 2008, copies of signed documents will be available as standard practice on our website.

Over the past few years, we have focused on improvements on the grower website with expanded reporting on items such as load reports and lab data. We have also enhanced the scale card system growers have used in delivering their sugarbeets. We are building on these foundations with the new applications we continue to develop. Over the next few months, we will continue to fine tune the contracting application, both for the tablets as well as for the office personnel. In addition, we have been working hard on a new external website, expected to go live sometime this spring. Our website will have a fresh look and feel with enhanced functionality. Future features will include an agricultural record-keeping system, field-level reporting, and the ability for members to access planting agreements and all other contracting documents online.

The ultimate vision for Ag Tech is to provide our shareholders with feedback and results that will help to improve their sugarbeet crop quality. We are blessed with a talented group of technical and functional team members who take pride in hard work and the challenges this project brings. We have a commitment to this initiative and will strive to achieve success, as this is a continuing work in progress.

CROP CANOPY SENSOR FOR SUGARBEET PRODUCTION AND NITROGEN MANAGEMENT

By Ron Gehl; Assistant Professor, Dept. of Soil Science, NC State University and Tim Boring; Research Assistant, Dept. of Crop and Soil Sciences, Michigan State University

FIGURE 1

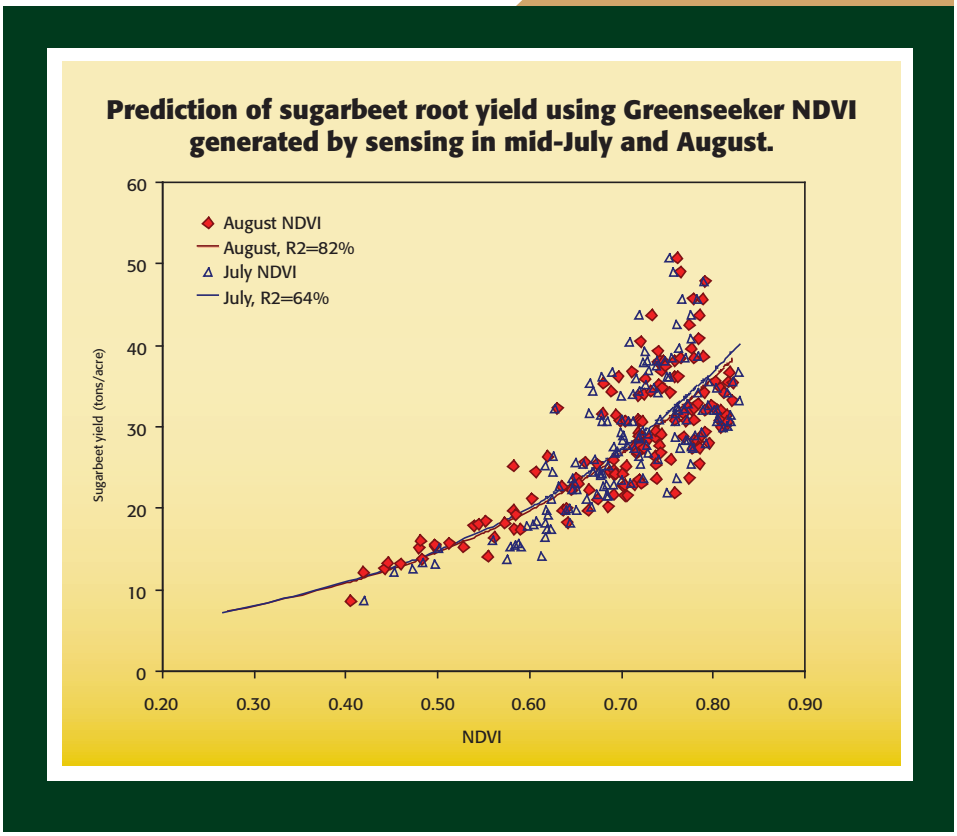


Figure 1. Prediction of sugarbeet root yield using Greenseeker NDVI ("greenness") generated by sensing in mid-July and August.

Sugarbeet production efficiency depends on both root quantity and sugar quality — factors that are largely influenced by nitrogen ("N") fertilization. Considerable efforts have been made to develop indicators of sugarbeet N need. Recently, measurement of the absorption/reflectance characteristics of foliage has been adopted for N status assessment in various crops. Optical sensing instrumentation can be used to calculate vegetative indices, which are indicators of a plant's photosynthetic potential and above ground, green biomass. Research efforts have focused on the use of active sensors as a tool to estimate N use efficiency, N requirement, and yield potential for crops including corn and wheat.

Yearly sugarbeet production is limited by suitable storage days and processing plant capacity. In this limited window, profitability is directly related to recoverable sucrose. Calibration of a vegetative index for prediction of sugarbeet yield and quality during the growing season would be a valuable tool to assist in harvest scheduling. Additionally, recent increases in N fertilizer costs have prompted renewed interest in system-wide N accountability. Fifty to sixty percent of total sugarbeet N is located in tops, and the organic N returned to the soil from tops can mineralize considerably the spring following harvest, becoming available to the subsequent crop. Results of previous studies indicate the use of active sensors during the sugarbeet growing season shows promise as a means to predict root yield and quality, and to improve rotational N management by providing an indication of N return to the cropping system.

With financial support provided by Michigan Sugar Company, a study was initiated in 2006 to evaluate the applicability of a Greenseeker (NTech Industries Inc., Ukiah, CA) optical sensor for estimating sugarbeet N requirement, root yield, root quality, and leaf residual N (top N)

Field experiments were established at three sites in 2006 and four sites in 2007. Treatments included six N rates ranging from 0 to 200 lbs N per acre in 40 lb N per acre increments. Nitrogen starter fertilizer was applied as urea in a 2x2 band at planting for all N rate treatments at a rate of 40 lbs N per acre except the 0 lbs N control. Sidedress N applied as 28% UAN, comprised the remainder of the N required for the treatments and was injected between rows in early June. One site in 2006 and 2 sites in 2007 did not receive starter fertilizer. At those sites, all N fertilizer was applied sidedress. Plots measured six rows wide by 40 feet long and each treatment was replicated three to four times. Plots were managed by cooperating producers as part of the entire field, with the exception of N application and harvest. One site each year was on the Saginaw Valley Bean and Beet Research Farm and was managed similarly to the other sites following general production practices of the region. Sugarbeet canopy

FIGURE 2

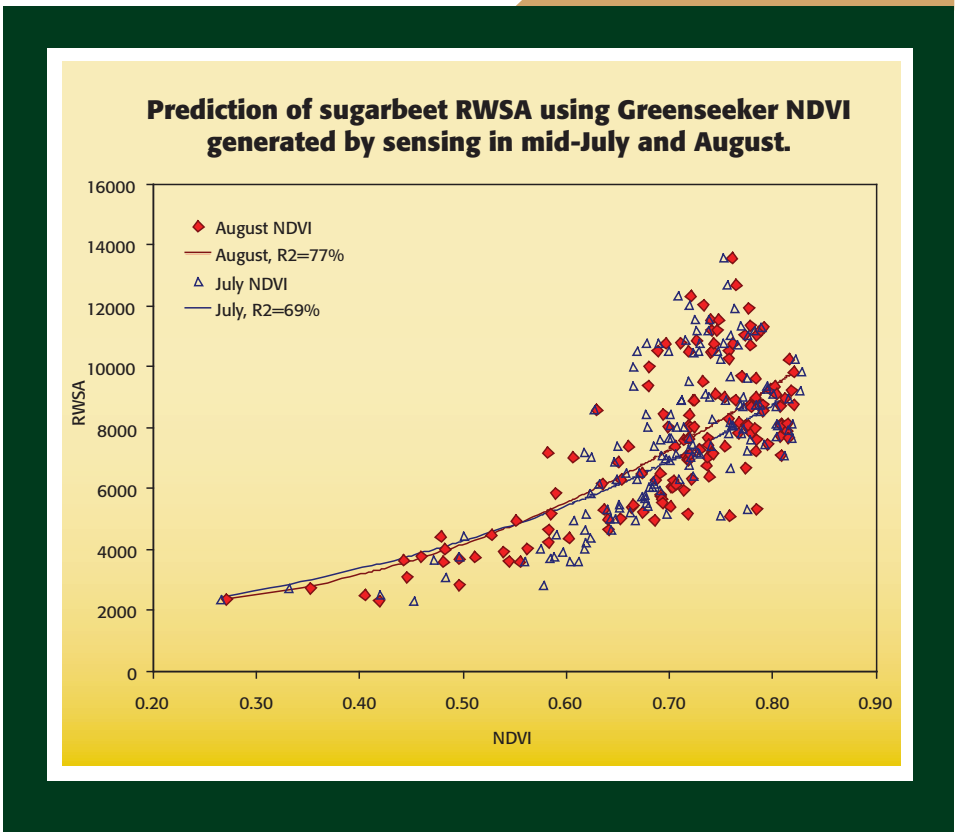


Figure 2. Prediction of sugarbeet RWSA using Greenseeker NDVI ("greenness") generated by sensing in mid-July and August.

NDVI, which is a measure of leaf ("greenness"), was measured in mid-June, mid-July, mid-August, and at harvest using a handheld Greenseeker optical sensor. The Greenseeker sensor calculates NDVI based on absorption/reflectance characteristics of plant tissue in the red and near-infrared bandwidths. Leaf tissue total biomass was determined immediately following Greenseeker scanning on the day of harvest, and subsamples were analyzed for total N. Root yield and quality were determined in each plot and were used to calculate RWST and RWSA.

Canopy NDVI was monitored throughout the season for assessment of crop N status. In 2006, NDVI measurements were similar for all N rates except the control in June, July and August. Mean NDVI values in September were

CROP CANOPY SENSOR FOR SUGARBEET PRODUCTION AND NITROGEN MANAGEMENT (CONT'D.)

greater for the 160 and 200 lb N per acre treatments compared with the 0 and 40 lb N per acre treatments. Similar trends were observed in 2007. As the season progressed, differences in relative greenness of the sugarbeet canopy among N rate treatments became more pronounced, as tops remained greener with increasing N rate. The differences in NDVI measured with the Greenseeker in the latter part of the growing season confirmed visual observations recorded at the field sites.

NDVI readings, regardless of N rate, tended to increase throughout the growing season as the sugarbeet canopy developed. The relatively low NDVI values and the lack of differentiation in NDVI among N treatments early in the season (June) is indicative that the use of active sensors for N management at that time may not be practical, particularly if small differences in canopy characteristics cannot be detected. Early season NDVI readings, in particular, are affected by soil background interference compared with later season readings, when the crop canopy begins to close and occupies a greater portion of the sensors field of vision. High soil background reflectance may be a significant challenge in sensing sugarbeet biomass at early growth stages and in appropriate time for corrective N management. Improved relationships observed between NDVI and leaf N from June to July in 2007 may be a result of increased canopy to soil ratios in the sensor field of vision.

FIGURE 3

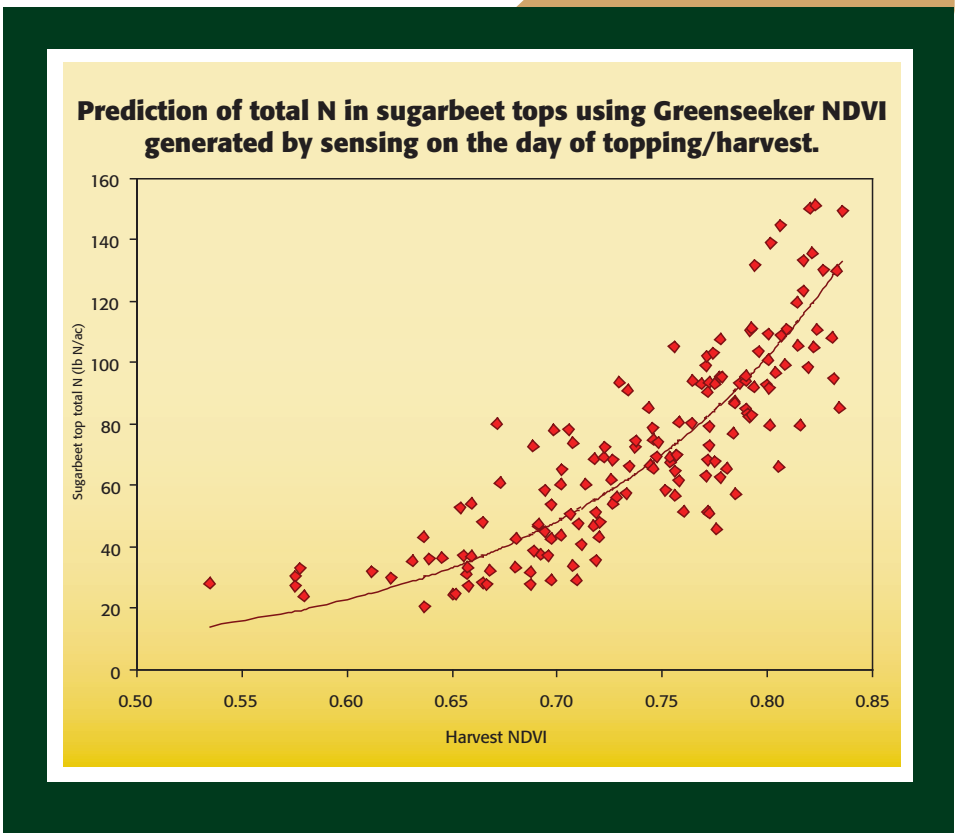


Figure 3. Prediction of total N in sugarbeet tops using Greenseeker NDVI ("greenness") generated by sensing on the day of topping/harvest.

Averaged across all sites and both years, sensor NDVI readings showed a strong relationship with root yield in July (R2=64%) and August (R2=82%) (Figure 1). Additionally, as early as mid-July, NDVI was strongly related to RWSA (R2=69%) and this relationship improved at August sensing (R2=77%) (Figure 2). Our results indicate that using a Greenseeker active sensor to generate NDVI measurements was useful for predicting root yield and recoverable sugar per acre with relatively good accuracy from mid-season through harvest. The difficulties correlating early season

(prior to July) NDVI measurements with yield may be due to final determination of yield and quality occurring only later in the growing season.

Harvest NDVI was strongly related to sugarbeet top total N across all sites and N rates in 2006 and 2007 (R2=0.85, Figure 3). The ability to accurately predict total N in tops improves late in the season near harvest, particularly on the day of topping/harvest. Results indicate that NDVI measurements may be useful for determination of a N credit or delineation of N zones for improving N management of the subsequent crops in the rotation. Using sensors for this purpose could have a significant impact on producers' input costs and reduce concerns regarding over-application of N fertilizers for Michigan sugarbeet cropping; however, for accurate prediction of top N using an active sensor, some tissue sampling will be necessary to calibrate the sensor. This calibration may be necessary on a field-by-field basis, or at the least by variety planted since top greenness is quite variable among varieties. Additional research is planned, at a larger field-scale, to attempt to address some of these issues.

THE DAYS OF HORSE DRAWN PLOWS ARE GONE

By Geoff Van Sickle, Technical Products Consultant, Farm Depot

The days of horse drawn plows are gone. The days of two cylinder tractors are gone. The days of trying to manually control your farm equipment are fading fast. It just keeps getting better all of the time! The dawn of a new era is here and catching on like wildfire for today's farming operations. From the east coast to the west coast, the latest buzz is all about guidance solutions. From basic light bars and simple steering solutions to sub-inch accuracy using RTK technology, there is certainly a solution package that can benefit your operation. With ag dealers, such as the Farm Depot in Caro, Michigan, supplying the technical know-how, products from industry leaders, and even installing and maintaining RTK base stations in their surrounding areas, it has never been easier to tap into the true potential of your operation. Numerous studies have shown that the many benefits of having guidance include lower input cost, improved machinery efficiencies, ability to be productive in adverse conditions, less operator fatigue, less soil compaction, and solutions for labor shortages. Guidance also provides a means of applying variable rates and applications, mapping fields and data/record keeping.

Numerous studies have shown that the many benefits of having guidance include lower input cost, improved machinery efficiencies, ability to be productive in adverse conditions, less operator fatigue, less soil compaction, and solutions for labor shortages.

So let's break it down. Starting with the lower end user products to provide steering and field mapping, Farm Depot recommends either the EZ-Guide Plus light bar/receiver or the EZ-guide 500 light bar/receiver combo's in conjunction with the EZ-Steer to provide a simple, affordable steering solution to almost any ag equipment with power steering. It can also be expanded to provide automatic sprayer boom section control and autopilot interface, providing NMEA position data. Both systems have simple menu instructions and function buttons, have terrain compensation, and come standard with an integrated, high accuracy GPS receiver using WAAS differential. All this can be purchased starting under $6,000.

Moving up the ladder in productivity, we can use one of the larger more powerful monitors coupled with an external antenna/receiver to provide yield mapping. This system can also control everything from seed placement to pesticide and fertilizer application rates to spray boom height, with a color touch screen for easy navigation. This advanced system makes a great hub for today's precision farming operations. This

system coupled with an autopilot steering platform kit connected to the hydraulics of the unit, can provide six- to eight-inch accuracy using WAAS satellite signals. A subscription to a corrected signal such as Omni-star can improve accuracy to two to four inches. This will usually run in the $15,000 to $16,000 range plus subscription fees.

For the absolute best accuracy available for today's precision operations, you will need what is referred to as RTK or Real Time Kinematic, which is a highly precise technique that results in one inch year-to-year accuracy. RTK requires two specialized GPS receivers and two radios, one each in the rover vehicle and one each in a base station generally covering a six- to eight-mile radius of the base station. Some dealers, such as the Farm Depot in Caro, Michigan, have installed an array of base stations in their area to help the local operations in obtaining an RTK corrected signal, keeping the cost down for the individual operations having to purchase, install, and maintain their own base station. A top-of-the-line full auto pilot system will usually have a price tag in the $20,000 range, with an annual RTK subscription fee.

Additional peripherals include planter control for precise seed placement eliminating double planting at end rows, point rows and around terraces, and prevent yield loss due to lodging and nutrient competition. With planter control, there is no need to slow down to accurately raise and lower the planter at the end rows, and makes night planting easier. Also available are liquid and granular control options, providing lower application cost by eliminating waste, reducing skips, reducing crop damage and improving environmental stewardship.

Rounding out our guidance options are the many software programs available from the various manufacturers of precision equipment, allowing us to collect data from soil sampling, boundaries, application coverage and hybrid/variety maps, so you can analyze data to determine how field activities affected yield across the field. The different software packages will vary in price depending on performance and features.

To learn more about precision guidance applications, benefits, and available products contact:

- Farm Depot, Caro, MI. (989) 673-6172 or www.farmdepot.biz
- Technology providers
  - Trimble
  - Ag Leader
- University Researchers
  - Dr. Jess Lowenberg Deboer
- Neighbors

CORN EXAMPLE:

Total acres planted	1,000 acres
Percent overlap reduced	2%
Cost per bag of seed	$150/bag
Acres covered per bag	2.5 acres
Total acres of overlap reduced	1,000 acres x 2% = 20 acres
Seed cost per acres	$150/bag div.by 2.5 acres/bag = $60/acre
Seed savings	20 acres x $60/acre = $1200

SITE SPECIFIC VARIABLE RATE TECHNOLOGY

By Ron Marker, Advanced Agronomy Manager, Cooperative Elevator Company

The use of variable rate application of soil conditioners and fertilizer has continually grown in popularity during the past decade. This is mainly due to increased yield and more efficient use of the nutrients required to produce a better crop. The Cooperative Elevator Company alone has site specifically sampled and variable rate applied over 100,000 acres. It has also soil sampled and applied over 25,000 acres for a second rotation.

If we consider how our predecessors farmed years ago, we shouldn't be surprised with the success of site specific variable rate technology. In the past, field sizes were smaller and each field was treated differently according to its soil type or condition. For example, the fields closest to the barns received more manure; therefore, not requiring as much commercial fertilizer. Or, the field that had a sandier soil type was treated differently than the field which had clay or loam type soils. As farm sizes grew, so did the equipment used to till, plant, and harvest them. This made it necessary to increase field sizes. Fence lines were removed and multiple fields were consolidated into larger fields. These larger fields were then being fertilized based on average soil samples due to the fact there was no better way available. So in a way, we have returned to the site specific practices of our predecessors, because we now have the technology to support it.

Through the use of GPS antennas in conjunction with computer technology, we now are able to log sample data and create the prescriptions needed to apply soil conditioners and fertilizers where they are needed. Initially, this was done by breaking the fields into small square grids. These grids were anywhere from one to ten acres. The data from each grid was used as individual fields. Lime was added to balance the soil pH levels and fertilizers were applied based on projected removal less the amount available, according to the lab results. Later, using GPS generated yield maps, EC readers (Veris), digitized soil maps and satellite imagery, soil variability zones were created and soil samples were taken more strategically to produce even more accurate test results. This was done because soil types do not necessarily fit into square grids.

With the rising costs of commodities, fuel and fertilizer, site specific soil sampling is providing a quick return on the investment. Fields with more variability are the quickest pay off. By reducing fertilizer in areas with higher soil test levels or lower yield potential and increasing rates where yield potential is higher, you will maximize your investment. Another way site specific technology is making a big impact on increased crop production is by controlling the addition of conditioning agents to the soil. First is adjusting soil pH for optimum plant growth. Many soils contain adequate nutrients but they are not available for plant use if the soil pH levels are out of balance. The optimum soil pH for growing sugarbeets is 7.0. If your soil test shows pH levels below this, we apply lime to adjust the soil pH upward. You will also notice that your herbicides will work better after pH adjustments are made. The second is correcting the base saturation ratios of calcium, magnesium and potassium. The desired ratio of base saturation percentages should be approximately 82 percent calcium, 15 percent magnesium and 3 percent potassium. High calcium levels can reduce the availability of phosphorus. High magnesium levels could restrict the availability of potassium and you may notice poor drainage or increased compaction in these areas. Calcium can be applied to address high magne-

sium ratios. Magnesium can be applied to correct the high calcium ratios. Applications of these conditioners could make corrections for as long as ten to twelve years.

Most fertilizers can be applied for multiple years if applied at the appropriate time and tilled into the soil. This can allow the purchase of fertilizers when prices are lower and can reduce multiple application costs. Some application equipment has the capability of applying multiple products in one pass. This also reduces application costs as well as soil compaction.

VARIABLE RATE NITROGEN IN SUGARBEETS

At the Cooperative Elevator Company, we have been providing variable rate nitrogen application since 2003. We have used yield data in conjunction with the CEC soil test to determine yield goals and predict nitrogen removals. This along with credits given for soil test organic matter has seemed to work well as we have not noticed any yield drag in side by side comparisons with flat rate nitrogen. Credits for manure, side dress application or a previous crop of soybeans are available also. We are using results from the Sugarbeet Advancement research to determine the optimum economical rate of nitrogen for sugarbeets. Hopefully, by doing this we can help our customers produce the highest level of quality sugarbeets.

ENVIRONMENTAL BENEFITS OF SITE SPECIFIC VRA TECHNOLOGY

Being located near the largest source of fresh water in the United States is a big responsibility. This is something to be taken very seriously when considering the possibility of excess applications of phosphates or nitrogen. With variable rate technology we reduce the possibilities of this happening. This factor alone should encourage all to get involved with good stewardship of our earth.

What is coming next in site specific technology? Almost anything seems possible. One thing for sure, as long as we keep pressing forward there will be change. Someone is always looking for ways to improve on what we are doing today and that is what makes this business exciting. I, for one, am glad to have been involved with it and would encourage producers to take advantage of what is available today.

Variable rate application equipment.

GPS soil sampling equipment.

Soil sampling.

BEETCAST

By Corey Guza, Ph.D., Agronomist

The original testing of BeetCast as a Cercospora leafspot model was conducted in the Akron, Reese, and Frankenmuth areas of Michigan. Generally, applying fungicides every 55 disease severity values (DSVs), proved to be the most effective and economical time to apply fungicides for managing leafspot; however, applying fungicides at 55 DSV intervals did not seem to fit as well in some areas such as Croswell and north of Bay City. For the past three years, BeetCast research has been concentrated in those areas. Data from these trials has been used to create a Cercospora risk management map illustrating the risk of Cercospora leafspot disease for the Michigan Sugar Company growing region (Figure 1). This map can also be found on the BeetCast website (www.michiganbeets.com) along with additional information related to the disease.

In 2007, BeetCast trials conducted in Hope (Table 1) and Croswell (Table 2) illustrate the value of timely leafspot applications even with low levels of disease. Results from these trials were consistent with trials conducted in 2006. Beginning fungicide applications

TABLE 1

BeetCast Cercospora Leafspot Trial
Hope, MI - 2007

Treatment	# Applic[1]	CLS rate 0-9[2]	RWSA	Tons/ Acre	RWST	% Suc	% CJP
55/55	2	1.41	6453	26.23	246.8	17.21	93.90
70/55	2	2.16	6042	25.18	239.9	16.71	93.88
80/55	2	2.50	5959	24.36	244.3	16.88	94.19
1 Spray Program	1	2.62	5516	22.32	247.9	17.08	94.27
Untreated	0	3.70	4856	20.57	232.4	16.21	93.90
LSD 5%		0.277	ns	ns	ns	ns	ns

TABLE 2

BeetCast Cercospora Leafspot Trial
Croswell, MI - 2007

Treatment	# Applic[1]	CLS rate 0-9[2]	RWSA	Tons/ Acre	RWST	% Suc	% CJP
55/55	2	1.00	7763	29.56	262.9	18.19	93.91
80/55	2	1.00	7631	29.25	260.7	18.09	93.81
70/55	2	1.29	7726	30.15	256.3	17.71	94.07
1 Spray Program	1	1.58	7218	28.57	252.8	17.65	93.60
Untreated	0	3.29	6636	25.48	260.8	18.07	93.85
LSD 5%		0.08	226	0.82	4.3	0.24	0.27

[1] *Number of fungicides.*

[2] *CLSrate 0–9: Visual Rating Scale, 0 = no disease, 3.5 = Beginning of Leaf Dessication and 9 = Complete Dessication. Economic Damage Begins at a CLS Rating of Approximately 2.5 to 3.0.*

at 70 to 80 DSVs were nearly as good as starting at 55 DSVs as long as a second fungicide application was made when an additional 55 DSVs accumulated; however, a single fungicide application made after 80 DSVs resulted in increased leafspot infection and lower yield.

Disease management recommendations should be adjusted based on sugarbeet variety. Crystal 355 has significantly greater resistance to Cercospora leafspot than all other varieties and can be treated differently in a leafspot management program. In 2007, at Croswell, a single fungicide application at 80 DSVs or less provided adequate leafspot control for that variety; however, special approved varieties such as the nematode tolerant variety 1643N or the Roundup Ready® variety Crystal R827 require a more aggressive Cercospora leafspot management strategy. These varieties should have a fungicide applied starting between 45 and 55 DSVs and subsequent applications should be made every 35 DSVs.

Aside from daily Disease Severity Value, Growing Degree Day and rainfall information, BeetCast can also provide hourly temperature and rainfall data. A pilot project in 2007 was successful in providing on-demand weather information for making harvest decisions. A study was also conducted examining soil temperature and beet temperatures for topped and untopped beets, illustrating the advantage of keeping the topper close to the harvester.

Michigan Sugar Company and Weather Innovations, Inc. (the providers of BeetCast), continue to look for ways to add value to the BeetCast system. Michigan State University has been using data from BeetCast to test a disease model for wheat. In 2007, the wheat disease model appeared to be successful; however, additional testing may need to be conducted before the model is commercially available.

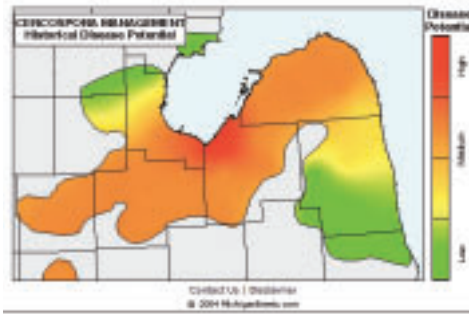


Figure 1. Cercospora leafspot risk management map, as found on the BeetCast website (www.michiganbeets.com).

2007 SCHOLARSHIP AWARDS

(Following is a correction from the Fall 2007 Newsbeet.)

Cody Kurzer

The Bayer CropScience Youth Scholarship was awarded to Cody Kurzer. Cody's parents are Raymond and Candra Kurzer. Cody graduated from Unionville-Sebewaing Area High School with a 3.753 grade point average. He plans to attend Michigan State University to pursue a career in agronomy or chemical engineering.

Cody has been involved in many extracurricular activities in his school, church and community. He has been a member of FFA for four years and has participated in the Sugarbeet Project for nine years, winning both Premier and Prestige awards. Cody is a member of the National Honor Society and has been on the High School Honor Roll.

Congratulations to Cody on earning the Bayer CropScience Youth Scholarship.

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ROUNDUP READY SUGARBEETS WITH 2•2•22

2 LEAF SUGARBEETS

2" WEEDS

22 OZ. RATE
FOR YOUR FIRST APPLICATION OF
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**SIMPLE STEPS TO START THE SEASON RIGHT –
REMEMBER 2•2•22 FOR YOUR ROUNDUP READY SUGARBEETS.**

* Maximum in-crop total of 96 oz./acre of Roundup WeatherMAX or Roundup PowerMAX can be applied. A maximum single application rate of 32 oz./acre can be applied to large or difficult-to-control weed species.

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grower IN THE NEWS

MAXWELL SEED FARMS

By Bob Hardy, Agriculturist, West District

In 2006, I was asked to find a cooperator in the Hope area to help us with some research to fine tune our BeetCast program with the goal of economizing the application of our leafspot materials. We knew that leafspot was not showing as early in the western part of the Michigan growing region as it was in the eastern part.

I solicited the help of Maxwell Seed Farms for this endeavor. Maxwell Seed Farms is comprised of Dirk, Clay, and Scott Maxwell. The brothers farm nearly 3,000 acres mostly in Hope Township (Midland County), Beaverton (Gladwin County), and the east side of I-75 between Bay City and Saginaw. During planting and harvest, they utilize the help of several part-time employees.

In April 2006, I met with Clay at a sugarbeet field adjacent to the Hope piling ground near Edenville. When I arrived at the field, he had already planted 35 to 40 acres of this 100-plus acre field. After a couple moments, I noticed he had forgotten to put down his row marker. When he arrived at the east end of the field, Clay turned and started back, again, without a row marker. I soon learned what technology made this possible.

Maxwell Seed Farms purchased a new 24-row (30-inch) planter with a GPS auto-steer guidance system from John Deere during the Winter of 2005. This replaced two 12-row planters they had used in the past. The Maxwells had attended conferences pertaining to precision agriculture and were impressed with what growers were doing with the guidance systems. Clay explained that they felt they could implement precision agriculture and accomplish the same tasks with less equipment and better guidance.

Sugarbeet planting at Maxwell Seed Farms.

I was curious to see how Clay would match the BeetCast plot with the rest of the field. We emptied the seed from half the planter, refilled it with the two varieties for our research, and headed to the plot area. We went to the south end of the field, farthest from where he had planted before, and after three rounds we were within three to four inches of having our 30-inch interval on the final pass. I thought that was pretty impressive.

Clay claims the GPS auto-steer system, which cost about $20,000, should maintain four inches of pass-to-pass accuracy where the more accurate RTK system (an additional $10,000) has sub-inch accuracy. Both systems claim to benefit operators through less tension, less stress, and less fatigue. Planting accuracy after dark, during heavy winds, dust, rain, running into the sun and fog are no longer a problem. The guidance systems give farmers more time to watch the monitors and planter, not to mention enabling them to literally "eat on the run." The Maxwells also find auto-steer incredibly useful during sugarbeet harvest. Clay says he has less back pain, from the constant steering and turning, and feels he is a better operator throughout the campaign. The Maxwells also feel that they are slicing and leaving fewer beets in the field, because of the accuracy of auto-steer.

The Maxwells incorporate Swath Control on their 2007 Nitro

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MIKE HOUGHTALING

David Ganton, Agriculturist, West District

Mike Houghtaling is very passionate when talking about the sugarbeet industry. He truly loves growing sugarbeets, the only thing he loves to talk about more is technology.

Mike farms with his father, Kent and Uncle David, in Tuscola, Bay, Sanilac and Saginaw counties. Mike lives in Indiantown with his wife, Erin and, son, Phin. In addition to farming, Mike also runs a precision ag consulting and sales business, selling several hardware lines such as Ag Leader and Trimble and several software lines, like Farmworks and Mapshots. The business, P&C Ag Solutions, gives Mike a great excuse to test new ideas and gadgets on the farm. Mike is currently running auto-steer on nearly every operation, has a yield monitor on both the combine and the beet harvester, and is variable rate applying every plant nutrient.

Auto-steer obviously has a lot of benefits, but Mike likes it the most because it allows him to plant research plots more efficiently. The ability to skip a pass or several passes allows him to plant strips in a field, then change something on the planter, whether it is his variety, spacing, depth, fertilizer, or any number of other things Mike is testing on an annual basis. "It makes it a lot easier to do a plot. For instance, I can plant every other pass across a field, with no starter fertilizer, then fill up the tanks and go back and fill in the rest of the field." said Mike. The display that runs the auto-steer also has the added benefit of doing a lot of the recordkeeping. Mike makes a big deal of keeping meticulous records throughout the year so that he can analyze all of his on-farm plots quickly at the end of the year.

David, Mike and Kent Houghtailing

Getting accurate information from large scale, on-farm plots is difficult without a yield monitor. Mike believes the yield monitor on his sugarbeet harvester has paid for itself several times over. It allows him to collect the harvest data quickly without slowing down the operation. The yield monitor on the beet harvester utilizes a pair of load cells mounted on rollers in one of the conveyor chains. Mike will tell you it is amazingly accurate. Mike said, "We did a plot with Sugarbeet Advancement last year, so we had Steve's dump cart in the field all day weighing the strips. I was really surprised, every time we would compare the scale on the cart to the monitor on the digger, they were within 100 lbs of each other." Mike claims that the yield monitor can reduce harvest loss by measuring how adjustments to the harvester, such as digging depth and speed, can affect how many tons per acre go in the truck compared to how much is left in the field. "I can fine tune my digging depth and speed based on changing field conditions and have confidence I'm not sacrificing yield. The first year we ran it, I did several checks of speed and depth and found in certain conditions I needed to be digging deeper and slower than I thought, and in the next field I was able to shallow up and go faster. Every field is different," said Mike.

Variable rate fertilizer application has been the norm at Houghtaling's, since 1996. Over ten years of yield maps, thousands of soil cores and hundreds of on farm trials gave them the peace of mind that they

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MICHIGAN SUGAR OVER THE PAST TEN YEARS

A PERSPECTIVE FROM THE OPERATING SIDE OF THE BUSINESS

By Herb Wilson, Vice President of Operations

A brief review of major changes in our business and the factory operations over the past decade is a worthwhile exercise. It gives us an opportunity to step back and see where we were, where we have come, and what the future may hold.

In 1998, Michigan Sugar Company was under the ownership of Imperial Holly Corporation. The four factories (Caro, Carrollton, Croswell, and Sebewaing) were capable of slicing 14,000 to 15,000 tons per day. Campaigns were short, typically 120 days or less for the preceding ten years, and beet acreage seemed limited. Cossette sugar content had been 15.5 percent to 16.5 percent and the total sugar production was, therefore, about five million hundredweight. Like most businesses, the overall cost of operations was increasing, but revenue sources were relatively static due to factory capacities and the limited operating periods. With the income from sugar, pulp, and molasses being shared between the company and the growers, a way had to be found to increase the sugar production and throughput. In an effort to explore alternate ways to increase income from sugar, the growers joined with the company to study the feasibility of installing a molasses desugarization system. Although the results of the study were technically positive, the payback period was too long for the large investment required.

In the years since 1998, the cost of labor has increased about 34 percent, operating supplies are up 40 percent, repair parts and materials up 43 percent, and energy is up by a whopping 250 percent. If nothing else had changed, it is difficult to imagine that we could have remained in business.

When Michigan Sugar Company was purchased by the growers in 2002, the board of directors and management immediately set out to determine what could be done to reduce costs, increase efficiencies and increase throughput for the new co-op. Fortunately, the very nature of a cooperative allowed for an increased and assured supply of beets to bolster factory throughput. On the factory side of the business, increasing energy efficiency and reducing the cost per unit of energy were identified as two of the key goals going forward. In subsequent strategy meetings over the years, factory reliability, extraction efficiency, and overhead expense have been added to the list of key goals for improvement. Longer campaigns would require that the factory systems and the process itself be strengthened to operate well with the increased operating days and attendant beet quality drop-off in the spring. The overlying long-term strategy for these goals was, and has continued to be, maximizing the return to the co-op shareholders.

In 2004, the growers for Monitor Sugar Company and Michigan Sugar Company took advantage of a unique opportunity to join together and acquire the Bay City factory. Among other business advantages, this combination allowed for increased operating flexibility, the addition of molasses desugarization to our operations and an expanded line of consumer product production capabilities.

In 2005, production operations at the Carrollton factory were ceased in order to better balance the company and focus on the lower cost facilities.

Today, we still operate four factories but are able to slice over 20,000 tons per day and process in excess of 3,700,000 tons of beets. Sugar production from beets has risen to well over 9,000,000 hundredweights, with an additional 700,000 hundredweights available from the desugarization process. Energy efficiency has improved dramatically with overall fuel usage per ton of beets processed, decreasing by about 30 percent since 1998. Maintaining and improving the extraction efficiency of the factories with longer operating periods and late season beet quality has been a key part of our plan for factory modifications. During this period, our commitment to environmental responsibility has also added to our viability going forward.

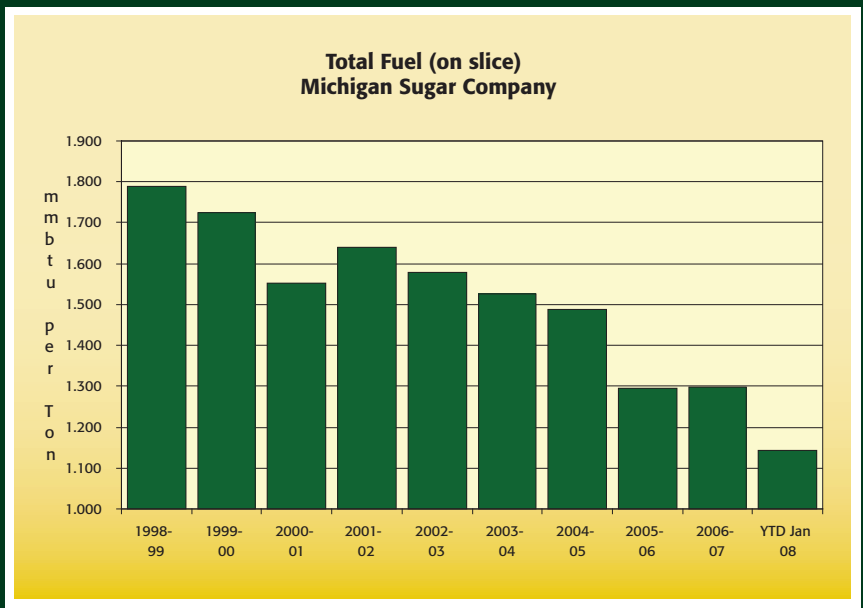
Listed below are some of the important factory projects and practices that have contributed to these results over the past ten years.

ENERGY EFFICIENCY AND COST

- Croswell diffuser (less water necessary per ton of beets)

- Boiler economizers at Sebewaing, Croswell, Caro, and Bay City
- Fifth effect evaporation system at Croswell
- Numerous heating surface improvements
- Improved pulp press maintenance practices
- Bay City steam dryer
- Pressed pulp sales
- Boiler burner systems to handle alternate fuels
- Use of anthracite coal in place of more expensive coke

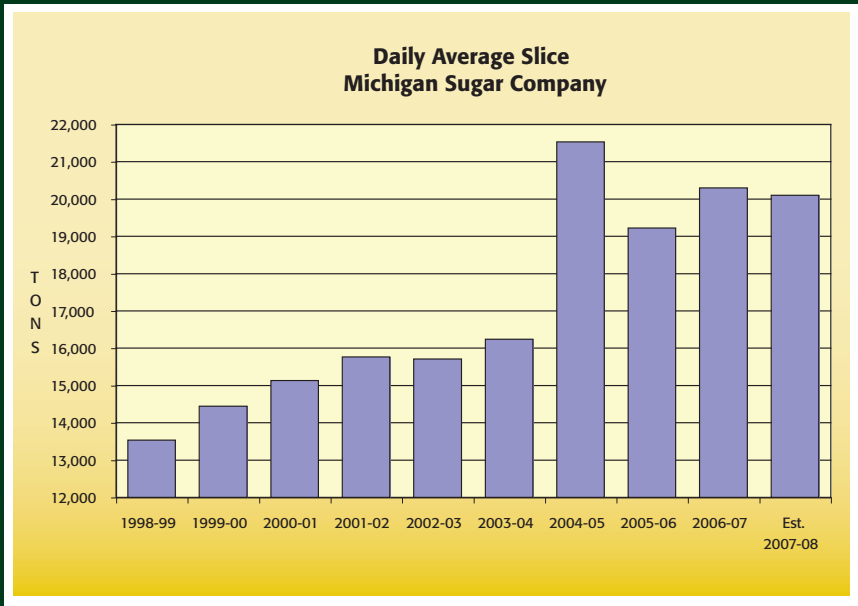
FIGURE 1



PROCESSING EFFICIENCY AND RELIABILITY

- Beet chip recovery systems at Caro and Croswell
- Milk of lime maturation system at Caro
- Additional white centrifugals
- Pre-limers at Sebewaing and Croswell
- Beet washing system at Croswell
- Coke and stone handling system
- Granulator at Sebewaing
- Putsch presses at Bay City
- Structural modifications to Bay City desugarization system

FIGURE 2



OVERHEAD COSTS

- Warehouse fire sprinkler systems to reduce insurance costs
- Safety equipment and programs to protect our employees and reduce the cost of accidents
- Consolidation of offices and staff

MICHIGAN SUGAR OVER THE PAST TEN YEARS

A PERSPECTIVE FROM THE OPERATING SIDE OF THE BUSINESS (CONT'D.)

ENVIRONMENTAL

- Numerous wastewater treatment modifications
- Coal boiler exhaust gas scrubbers

Longer campaigns have resulted in increased storage time for the beets. This, coupled with the unpredictable weather in Michigan, has brought on the need to protect the quality of the stored beets during the later part of the campaign. Recent investments in beet pile ventilation, installed and operated by the agricultural department, will help ensure that the factories have the opportunity to recover an increased quantity of sugar from the crop.

As we have increased the utilization of our assets and throughput by increasing the factory capabilities and the length of the operating season, we face new challenges due to the decreased time available for factory repairs, modifications, and preparations. Slicing campaigns have increased from four months to six months while the inter-campaign season has decreased from eight months to six months. At Sebewaing and Bay City, where we have continuing sugar production periods with stored juice and extract syrup from desugarization, repair periods are even more compressed.

All these accomplishments have been made possible by the growers' commitment to keep the factories viable and the hard work and innovative ideas of our engineers, managers and employees.

For the future, huge opportunities exist for better returns through higher sugar content and purity beets, continuing improvements in fuel efficiency, factory throughput and process efficiency.

FIGURE 3

MAXWELL SEED FARMS (CONT'D.)

continued from page 36

120-foot, self-propelled sprayer, with the AgLeader GPS system. They are able to spray only what needs to be sprayed with little to no overlapping, at speeds up to 15 mph. In the future, the addition of Swath Control to the planter will allow them to control overplanted areas, such as point rows. Being able to shut down one half, one third, or individual row units on the fly will be possible. Precision agriculture allows for savings on seed, fertilizer, chemical, fuel and time.

Locating and satisfying areas of the field that have special needs, such as additional fertilizer, have been made much easier with this GPS system. John Deere's Apex software program has allowed layered mapping of each field with the use of yield and soil test maps. These maps allow precision placement of variable rates of fertilizer throughout each field. They plan on continuing to add new tasks for their GPS and precision agriculture for the future. Who knows, maybe someday they will open up their cell phone to watch their tractor travel across the field.

MIKE HOUGHTALING (CONT'D.)

continued from page 37

are doing things right when applying plant nutrients on a variable rate basis. Mike has worked very closely with Star of the West. Star of the West has sampled and spread fertilizer on almost every field for Mike several times. Mike began working with them regarding variable rate fertilizer programs several years ago by soil sampling and consulting. Mike now does his own soil sampling and writes all of his own variable rate recommendations. He also provides this service for his neighbors.

On Mike's farm, all nitrogen is applied variable rate preplant as 28% UAN. Application rates are based on organic matter, CEC, historic yield capability, and K base saturation. All potash, sulfur and MAP is spread in the fall according to specific recommendations that Mike has developed. MAP is spread according to Phosphate soil test levels, with some extra being applied where pH is higher. Potash application rates are based on potassium soil tests, CEC and K base saturation. Mike pays very close attention to his K base saturation. "We are discovering that areas of the field with a higher CEC tend to have lower K base saturations, and most importantly a lower yield. When these are compared to areas of the field with high CEC and high K base saturation, yields are significantly higher. So we learned that a low K base saturation in high CEC soils are resulting in lower yield. We tried to combat this situation with higher rates of potash. We tried several locations with different rates, some with very high rates. We were disappointed that we didn't see a bigger bump in yield. Last year I tried doing higher rates of both potash and nitrogen in these lower yielding areas and we were surprised to see a nice yield increase. The poor areas on the map that normally match exactly with our low K base saturation zones virtually disappeared.", stated Mike. Mike has an idea that the increase when using both K and N is because the lower K base saturation zones have lower nitrogen use efficiency than areas with high K base saturation. This is something that Mike and his family will be doing trials with this coming year.

They plan to use a Greenseeker, from Ntech Industries, to evaluate nitrogen efficiency spatially on a field scale. The device mounts to your tractor or sprayer and measures the "greenness" of the plants as you drive across the field. The strip trials will be done in fields that have a high degree of K base saturation spatial variability. If a flat rate of N is applied across the field, areas with high N use efficiency should be "greener." Mike hopes to determine if this relationship between K and N efficiency is real and whether he is able to manage it for higher yield and quality.

Mike likes to think he is ahead of the cutting edge of technology, he refers to this as the "bleeding edge of technology." One thing is for sure, whatever technology is on the horizon you can bet he is excited to play with it and determine if it can help result in a higher yielding and quality sugarbeet crop. Mike is always ready to discuss new ideas. You can contact him by email houghta3@msu.edu if you are interested in learning more about any of the exciting things he is doing on his farm.

SUGARBEET YOUTH PROJECTS

CARO YOUTH SUGARBEET PROJECT

The Caro Youth Sugarbeet Project began last winter with the signing of a grower agreement to plant sugarbeets and an assignment of one acre to the youth participants from their parents' contract.

Several club meetings were held throughout the year by the individual club leaders and culminated in an informational tour and test day. The event was held at the Blumfield piling ground and included informational stops for weed identification and observance of Cercospora leafspot. This was something new and it included West and Central District participants. A lunch was served after the tour and test. Everyone seemed to like the format, so we may try it again next year.

The Tuscola County Fair was held the week of July 22. Forty-eight participants displayed three uniform sugarbeets to be judged. At the time, the sugarbeets had good size and shape with very long tap roots. Was this an indication of the good crop to come?

The youth group received a great guided tour of the Bay City factory and for some, it was the first time they had toured one of the plants.

The group also enjoyed a fun outing on June 29, by attending a Great Lakes Loons baseball game in Midland. They enjoyed a barbequed meal, pavilion seating and were given complementary Loons souvenir baseballs. It was a fun time enjoyed by all.

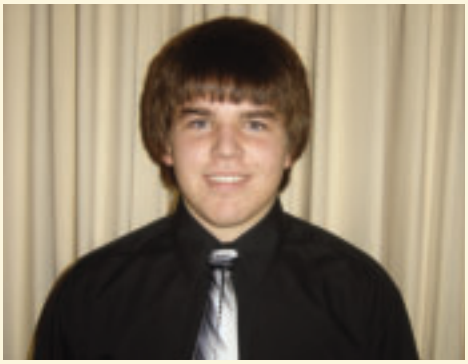
Kendra Mossner

Joe Bublitz

Haley Zwerk

Nathan Bednarski

The year came to close after the harvest with a makeup interview at the Caro Ag office on November 26 and a banquet on Dec 3. The banquet was held at the Brentwood. Ten participants received Premier Awards; Michael Bednarski, Eric Shian, Landon Zwerk, Eric Houghtaling, Courtney Reinbold, C.J. Bednarski, Jennifer Mossner, Rebecca Bierlein, Kara Schluckbier and Andrew Houghtaling. Top honors went to four Prestige Award winners; Kendra Mossner (parents John and Connie), Joe Bublitz (parents Curt and Ann), Haley Zwerk (parents Marty and Ann), and Nathan Bednarski (par-



Jesse Grekowicz

Travis Volmering

Jacqueline Kirsch

ents Carl and Lisa).

All participants received a duffle bag, with Premier growers receiving a leather portfolio with calculator, a small cooler and a 35mm camera. Prestige winners received a computer USB memory drive and a rolling backpack.

Everyone involved with the youth project had a good year.

EAST DISTRICT SUGARBEET YOUTH PROJECT

The East District held their Sugarbeet Youth Project Awards Banquet in Sandusky on January 7, 2008. There were 38 participants in this season's project resulting in eight Premier Award recipients and three Prestige Award recipients. The banquet was held at Woodland Hills Country Club in Sandusky. Entertainment was provided by Dave Kujat, featuring solo saxophone and contemporary music. The music was enjoyed by all in attendance.

Harbor Beach High School senior, Jesse Grekowicz, was the master of ceremonies for the evening. All participants received a Pioneer Sugar duffle bag.

Those receiving Premier Awards were: Janelle Kirsch, Scott Grekowicz, Lisa Volmering, Adam Maurer, Ashley Talaski, Rebecca Gentner, Heidi Grekowicz and Katie Gentner. The Premier Award was a Michigan Sugar Company portfolio and a small Pioneer Sugar cooler.

Receiving top honor Prestige Awards and recognition were Jesse Grekowicz (parents Chris and Michelle), Travis Volmering (parents Dan and LaDonna), and Jacqueline Kirsch (parents Mike and Kathy). The Prestige Award was a Pioneer Sugar backpack (with wheels and pull handle) and a computer USB memory drive.

SUGARBEET YOUTH PROJECTS (CONT'D.)

Eric Sneller

David Maust

Jesse Maust

SEBEWAING PRESTIGE WINNERS

The youth banquet for the Sebewaing district took place on December 17. From the members of our district, three participants were chosen as Prestige Growers. The youth project members answered questions about the sugarbeet industry in their interviews. These individuals are Eric Sneller, David Maust, and Jesse Maust.

Eric Sneller (parents Darwin and Kathy) is a senior at Laker High School. Besides his FFA activities, he has participated in soccer. He will be attending Michigan State University majoring in animal science and will also study agronomy.

David Maust (parents Clifford and Marie) is a senior at Laker High School. In addition to his FFA activities, David participated in soccer and tennis during high school. He is undecided on his college choice at this moment, but he would like to study medicine or biology. He is also a member of the Youth for Christ Cornerstone singing group.

Jesse Maust (parents Calvin and Gladys) is a junior at Laker High School and is a member of the soccer team. He is also a member of the Youth for Christ Cornerstone singing group.

WEST DISTRICT

The West District held their annual Youth Project Awards Banquet on January 9 at the Trillium Banquet Center in Saginaw. There were 36 student participants this past year resulting in eight Premier Grower Award recipients and two Prestige Grower Award recipients. Over 80 people attended the banquet including the participants, parents, company personnel and special guests.

Those receiving the Premier Grower Awards were Alyssa Brown, Kyle Crumbaugh, Logan Crumbaugh, Lance Frahm, Timothy J. Frahm, Amy Hecht, Kelly Hecht and Steven Merrell. Participants receiving the top honor of the Prestige Grower Award were Bryce Frahm (parents Eric and Theresa) and Hunter Hrabal (parents Kurt and Cynthia).

This year's scoring for the award winners was based on a written test, interviews with company personnel, project book and written story, District Agricultural Day attendance, and county fair participation. All participants received a duffel bag for their efforts. The Premier Grower Award winners received a cooler, camera and a portfolio, while the Prestige Grower Award winners received a roller backpack and a computer USB memory stick.

The evening's entertainment was provided by comedian and game show host, Scotty. Everyone

Hunter Hrabal

Bryce Frahm

had an evening of fun, tasty food, and good conversation.

This past summer, participants had an informative and educational day at the Blumfield piling ground and the Research Center. Students received information on Rhizoctonia, nematodes and Cercospora. The Summer Fun Day was held in Midland at a Great Lakes Loons baseball game.

ray's RAMBLINGS

OUR AMAZING ABILITY TO "READJUST" KEEPS US ON "TARGET"

By Ray VanDriessche, Director of Community & Government Relations

Past experience has shown that no matter how careful we were with handling a gun during the last hunting season or how well it was stored away, it doesn't take much of a bump to throw the scope out of focus. In the fall of the year as deer hunting approaches, a seasoned hunter will sight in their gun well in advance of the season opener to see if the scope is functioning properly and hitting the target within the "bulls eye." Shooting two to three shots at a target allows the shooter to establish a firing pattern, see where the bullet is hitting; high, low, left or right, and make adjustments to the scope in hopes of hitting within the "bull's eye." Did you ever wonder why the "bull's eye" is a two-inch circle and not a small dot in the center of the target? Expert shooters realize that no matter how good of a shot they are, hitting a small dot every time is impossible, because of constant variables; including wind velocity, range of the shot, weather, a slight variance in the shell itself and the fact that the hunter can move or flinch as the shot is fired.

There are also hunters who go out hunting with the thought in mind that the gun was "right on the money" a year ago when they used it so why shouldn't it be now. This last group of hunters may be missing the "big one" this fall, because they did not take into consideration things that may have happened since they last shot the gun a year ago. When they miss the shot, they often blame the gun, or want to throw the scope away, never thinking that they did not take the time to sight it in and readjust the focus if necessary.

In many ways, what we experience and the decisions we make in everyday life are like "taking a shot at a moving target" and we occasionally experience a "bump" which can affect our focus. This is especially true when it comes to the business we are in as farmers and now as owners of Michigan Sugar Company. There are many "variables" in agriculture over which we have little control, such as weather, commodity markets and many of our input costs; however, there are some "variables" where we can and do make a difference. We do this on the farm by "focusing in" on certain agricultural practices or particular crops which have performed well in our rotation in the "long range" such as sugarbeets. We also take into consideration current changes and try to "sight in" on what the future will hold for us with all the "focus" on biofuels now. As a result of the biofuel mandates by the government, commodity market prices in one year's time have hit historically high levels. At the same time, the biofuels industry is experiencing uncertainty, due to high feedstock costs and an ever increasing number of failed or cancelled alternative fuels projects making it even more important than ever to prepare for those bumps, which can throw us "off target."

It is evident, with Michigan Sugar Company having just celebrated its 100-year anniversary, that sugarbeets do not have to take a backseat to any other crop. Shareholders of the Cooperative have been careful not to "lose sight" of the fact that they invested in Michigan Sugar Company, because over the "long range," returns for sugarbeets were "on the money" when other commodities couldn't even come close to the target. Given the current environment, shareholders and management of Michigan Sugar Company alike are looking "longer range" in an effort to stay "focused and on target." Making "long-range" projections is extremely important, but it also means that no matter how focused we are, we will occasionally miss our "target" or projection. Like the sharpshooter who takes the time to adjust and refocus so as not to throw away a perfectly good gun, our shareholders have done the same with respect to their investment in the Cooperative.

The willingness and "foresight" to take advantage of new technology and opportunities and overcome challenges is a testimony to the amazing ability of shareholders and company personnel to "readjust, focus, and stay on target." With updated factories setting new production records and a number of shareholders seeing yields in the 30-ton range, it is evident sugarbeets will keep us "right on the money" for the next 100 years.

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