How sustainability is influenced by Soil Health

No-Till Beets and

Published by The Amalgamated Sugar Company LLC

Harvest 2019

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p. 26
The Sugarbeet is a publication of The Amalgamated Sugar Company LLC. The magazine is prepared by the Sugarbeet Quality Improvement (SBQI) Department to provide growers with up-to-date information on growing and harvesting sugarbeets. The magazine is also published to help upgrade the standards of the U.S. beet industry by providing a reliable source of information for agronomists, sugar company personnel, students, and others interested in this vital food crop.

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The Sugarbeet is a publication of The Amalgamated Sugar Company LLC 1951 South Saturn Way, Suite 100 Boise, ID 83709 208.383.6500

Please address all communications to: Managing Editor, The Sugarbeet, 1951 South Saturn Way, Suite 100 Boise, ID 83709, or by emailing calder@amalsugar.com.

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This issue of the Sugarbeet Magazine explores how Amalgamated Sugar is implementing its recently updated Mission and Vision.

Mission - To produce real sugar for the informed consumer and improve the economic experience for our member-growers and employees.

Vision - To enhance the enjoyment and function of food by producing real sugar in the most technologically advanced and socially responsible manner.

The Real Deal
Sugar (sucrose) extracted from sugarbeets and sugar cane is the real deal. At a time when Americans are inundated with “zero sugar” claims, Amalgamated Sugar is encouraging consumers to embrace a more thoughtful and informed approach to sugar intake.

The U.S. Dietary Guidelines recommend that Americans limit added sugars (a much broader category than pure sucrose) to no more than 10 percent of calories per day. Data from 2015-16 shows Americans consume 12.6 percent of calories per day from added sugars. Reducing overall added sugars intake to recommended levels is well within reach without drastic sugar detoxes or other yo-yo style deprivation diets. Sugarbeets and sugar cane are the most efficient ways for farmers to grow real sugar, a completely pure and simple carbohydrate that contains no additives or preservatives of any kind.

Amalgamated Sugar will continue to actively support all efforts to educate consumers about the role real sugar plays in a simple, enjoyable, and balanced diet.

The Economic Experience
In addition to making real sugar for informed consumers, our fundamental reason for existence is to improve the well-being of our grower-members, our employees and the communities they serve. We are a grower-led organization that embraces a culture of continuous improvement. Our Board and Management Team is highly engaged in improving production and efficiency in a way that maximizes benefits to the owners who grow and harvest the sugarbeets and the employees that produce the real sugar. We are extremely proud of our cooperative culture – where the economic benefits flow directly to the very people who do the hard work and who believe in our mission and vision.

Technology and Social Responsibility
We equate technological advancements with social responsibility. On the farm, we embrace genetic engineering because we know for a fact that it is better for the environment, allowing us to produce a higher yielding, higher quality, and more productive crop using less fertilizer, chemicals, fuel, land and water. In our factories, we embrace molasses desugarization and other technologies that have been developed by our subsidiary Amalgamated Research LLC because improving overall extraction reduces our use of energy and improves our environmental footprint. And because the benefit of these continuous process improvements flow directly to our members and employees, we do not hesitate to make capital improvements that improve our economic and environmental platforms.

Relevancy
Today’s sugarbeet and sugar cane companies are highly technical economic engines that produce real sugar for consumers who understand the benefits of a simple, enjoyable and balanced diet. We hope you enjoy this edition of The Sugarbeet magazine as we rededicate ourselves to our updated Mission and Vision.

Our Mission and Vision In Action
"We are a grower-led organization that embraces a culture of continuous improvement."

Amity Technology
Solutions
Easy to operate Automatic and manual adjustment with touch screen
Sensor constantly monitors average beet height to ground level

Active Height Control
Finding experienced labor during sugar beet harvest is challenging. With Amity Technology’s new Active Height Control, your defoliator is now part of the solution. Sensors on the scalper bar are engineered to adjust to changing dynamics in ground level and beet height giving you uncompromised defoliation at the push of a button!

Trust Amity Technology for your sugar beet harvest solutions!

by John McCreedy, President and CEO
DELIVERING MEMBER VALUE

by Pat Laubacher, Vice President of Agriculture

As you may have already read in this issue, John McCreedy has introduced our updated Mission and Vision statements. I would like to take this opportunity to share with you how the Agriculture Department views our important contribution to the Mission – “Improving the economic experience of our Members.” Everything we do as a Department should be aligned with improving the economic experience for our Members. Or, said another way, every decision we make should consider the impact on the beet payment. We focus on delivering Member value in four key areas:

- **Sugarbeet Quality Improvement (SBQI)** research and education. In addition to managing eight Official Variety Trial sites, SBQI is now internally managing five disease nurseries and participating in three external programs. With the addition of Davey Olsen, our Soils Agronomist, we are now conducting fertility research and actively working on educating and informing our Crop Consultants in order to provide better fertility recommendations.

- **Effective Crop Consultant engagement.** We have a great team of Crop Consultants, and each of them is charged with providing the highest level of service to our Members. I am proud of the way they have stepped up to the challenge of accountability and service to our Members. We are now attracting top talent into our ranks representing many different agronomic disciplines.

- **Data driven technology.** Decisions informed by good data continue to drive improved performance both from our Agriculture Department and our Members. We are in the third year of developing our industry leading AgriData mobile app. We have integrated sustainability, pest and disease, chemical and water usage data collection for 2019 to further monitor and improve overall cultural practices of Members. For the 2019 harvest, Members will have real-time insight into how much return dirt they are delivering for each load. Using this real-time information, Members will have the data they need to make necessary harvest adjustments, reducing the amount of dirt in our piles and ultimately the quantity sent to our factories.

- **Harvest and storage management.** Lastly, our collective focus on harvest and storage management is driving real value to each Member. Improved storage drives reduced pile shrink and sugar losses. Over the past four years we value this improvement at $1.66/ton each year to each Member. Heat during harvest is a huge challenge, and our Members’ willingness to comply with the heat policy results in economic benefit for the entire Cooperative.

I wish all our Growers a safe and successful 2019 harvest.
Regular Maintenance

As our union employee recognition gains traction in the factories, we’d also like to recognize our Agriculture Maintenance personnel who work hard to make things happen in the field.

by Matt Wheeler, Agriculture Operations Manager
photos by Matt Wheeler and Clarke Alde

In researching previous articles about the Agriculture Maintenance crew I found the most recent to be a series of articles recognizing each maintenance shop and its crew in the Fall 2004, Fall 2005 and Fall 2006 editions. I think a little insight to more recent initiatives of Agriculture Maintenance and the great work that is being accomplished, as well as recognizing those that are currently a part of it, is long overdue.

I began my career with Amalgamated Sugar in August of 2006. I was no stranger to the Company or the Cooperative, having been a past shareholder myself while growing up in Raft River, ID. When the opportunity came available to work in the Agriculture Department as the Operations Manager, I was ecstatic to come back to an industry that is close to my roots and to work that is being accomplished, as well as recognizing those that are currently a part of it, is long overdue.

When talking with Board Members, Growers and others about our Company, I find it important for them to understand how broad of an organization we are and what we are comprised of. Over the last four years, our Growers have produced and delivered on average over 7 million tons of sugarbeets for processing at our three factories in Paul, Twin Falls and Nampa. To manage this level of production, the Company now operates 125 sugarbeet pilers across 71 receiving stations, spanning 484 miles east to west (Blackfoot to Sunheaven 3) and 376 miles north to south (Sunheaven 2 to Golden Valley).

The span of this operation is immense, and the requirement to receive the crop every year in a narrow window is critical. To add to this, our fleet of pilers sit idle for ten months out of the year, then we flip the switch and expect them to run full-bore for the remaining two months. Working together with the District Agriculture Managers and the Crop Consultants, we prioritize repairs and upgrades based on projected acres and delivered tons for each receiving station and piler. Maintaining and continuously improving our fleet is no small undertaking, and there are several initiatives we are focusing on:

- Basic maintenance and repair (M&R). This consists of the normal replacement of bearings, rollers, chain, sprockets and belting, and includes repairing structural failures, electrical and hydraulic issues and the like.
- Cross conveyor upgrades. Cross conveyors are the newer-style unloading hoppers that trucks empty their loads into. These are replacing the high back up truck ramps, as the cross conveyor is easier to get into position on, accommodates nearly all truck configurations, and reduces weight on the hopper bell. This leads to more efficient truck unloading and increased run time.
- Sliding cross conveyors upgrades. First trialed in harvest 2018, this upgrade allows the cross conveyor to move independently from the piler. By doing this, the piler can advance 3’ while a truck is still unloading into the cross conveyor. Once the piler has moved and the truck is done unloading, the cross conveyor slides forward 3’ while a truck is unloading on the other side. This effectively eliminates the need to stop the piler from unloading to advance 3’, having the potential to increase runtime by 20% or more.
- Dirt screen rebuilds. These upgrades oftentimes remove old methods of cleaning that are inefficient or ineffective at cleaning dirt from sugarbeets. Rebuilding screens to a single 15 to 20 degree slope improves dirt cleaning while improving throughput, and also reduces sugarbeet damage, both of which improve the storage conditions and maximize sugar recovery.

As the Agriculture Operations Manager, I oversee the Agriculture Maintenance crew I work that is being accomplished, as well as recognizing those that are currently a part of it, is long overdue.

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Piler rebuilds. These major upgrades occur less frequently than the above priorities simply due to the labor required to accomplish the work. When multiple components and structures begin to fail, it’s often easier and cleaner, to strip it to the frame and start over. In most cases, a piler rebuild consists of two new cross conveyors, a new hopper and incline section, a new dirt screen and dirt chute, and a new return dirt belt for weighing and loading return dirt onto dirt trucks.

To accomplish this expansive list of work each year on our large fleet of pilers, the Company staffs five Maintenance Supervisors across seven shops. The Supervisors are responsible for managing and scheduling their crews, managing their budget and spending, and maintaining and prioritizing the list of needed upgrades and improvements on their pilers and at their receiving stations.

The Maintenance Supervisors oversee thirty-eight Mechanics, five Electricians and three Machinists, all of which are full-time employees. Their responsibilities vary greatly, but all are integral to the grower and needed to accomplish the annual maintenance, repair and upgrades to our pilers and receiving stations.

As you can see by our roster of current employees and their years of service with the Company, there is a significant amount of knowledge and skill in our maintenance department, not to mention some truly dedicated individuals. Even as I task them with larger improvements, higher quality standards and greater expectations, they complete their work and then some. They have embraced new ideas and ideas from their counterparts and look to gain efficiencies everywhere. I am truly grateful for their years of service, their dedication to the Company, to the needs of our Growers, and to the crews they are a part of.

Brief statistics of Agriculture Maintenance across Amalgamated Sugar:

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<tr>
<th>Shop</th>
<th>Stations</th>
<th>Pilers</th>
<th>Mechanics</th>
<th>Electricians</th>
<th>Machinists</th>
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<td>71</td>
<td>125</td>
<td>38</td>
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</table>

As the Agriculture Operations Manager, I oversee the Agriculture Maintenance crews as well as coordinate and budget the revolving five-year Capital Spending Plan for the Agriculture Department. Having accountability for all the Agriculture Maintenance Shops has allowed for greater collaboration and more consistent initiatives across all districts, with the primary objective of standardizing and implementing best practices company-wide.
Burley Crew pictured left to right: Shane Rucker, Ramses Campos, Brad Bohon, Blaine Searle, Randy Lindsay, Rick Zimmerman, Ben Puentes, Kent Bristol, Shane Goodfellow and Steve Fortier. Front row: Chris Harrison, Petronilo Manriguez, Larry Story, Lynn Mitchell, Jared Studer and Gerardo Vega. Don Fenstermaker not pictured.

Twin Falls Crew pictured left to right: Bill Hempstead, Lamar Scott, Jeremy Quam, Storm Brito, Randy Hunsaker, Wes Stucki, Vince Trent, Leroy McCaughey, Randy Drake and Dylan Differding.

Nampa Crew pictured from left to right: Ted Nichols, Reyes Hernandez Jr., Clay Sutton, Ryan Koeater, Rett White and Bob Bonche.

Hermiston Crew pictured from left to right: Bobby Donoho and Steve Wornell.

Burley Position Years of Service
Shane Rucker Agriculture Maintenance Supervisor 28
Blaine Searle Assistant Agriculture Repair Foreman 44
Don Fenstermaker Senior Agriculture Mechanic 40
Rick Zimmerman Senior Agriculture Mechanic 33
Randy Lindsay Agriculture Machinist 33
Petronilo Manriguez Agriculture Mechanic 22
Gerardo Vega Agriculture Mechanic 22
Larry Story Janitor 22
Brad Bohon Agriculture Mechanic 13
Kent Bristol Agriculture Mechanic 11
Jared Studer Agriculture Mechanic 8
Shane Goodfellow Agriculture Mechanic 7
Chris Harrison Agriculture Mechanic 7
Dustin Goodfellow Agriculture Mechanic 7
Steve Fortier Agriculture Mechanic 3
Ramses Campos Agriculture Mechanic / Electrical Apprentice 3
Ben Puentes Agriculture Electrician 1

Recent Departures
Steve Knopp Agriculture Maintenance Supervisor 41 (Ret. Feb 2017)
Bill Timmons Agriculture Electrician 29 (Ret. Jun 2017)
Tom Shell Agriculture Mechanic 22 (Ret. Apr 2018)
Scott Jensen Agriculture Mechanic 20 (Ret. Aug 2017)

Twin Falls Position Years of Service
Randy Drake Agriculture Maintenance Supervisor 37
Bill Hempstead Agriculture Mechanic 37
Wes Stucki Senior Agriculture Mechanic 25
Lamar Scott Agriculture Mechanic 25
Randy Hunsaker Agriculture Mechanic 24
Vince Trent Agriculture Mechanic 22
Jeremy Quam Agriculture Machinist 20
Leroy McCaughey Agriculture Electrician 9
Dylan Differding Agriculture Mechanic 7
Storm Brito Agriculture Mechanic 2

Recent Departures
Guadalupe “Lupie” Bill Senior Agriculture Mechanic 38 (Passed away Oct 2018)
Gary Elder Senior Agriculture Mechanic 38 (Ret. Mar 2018)

Mountain Home Position Years of Service
Scott Sisson Agriculture Maintenance Supervisor 36
Devin Boyer Senior Agriculture Mechanic 9
Mitchell Smith Agriculture Mechanic 2

Nampa Position Years of Service
Scott Sisson Agriculture Maintenance Supervisor 36
Eddy Middleton Agriculture Electrician 36
David Gifford Agriculture Mechanic 9
Derek Childers Agriculture Mechanic 8
Brady Pierce Agriculture Mechanic 7
Jake Munkle Agriculture Mechanic 4

Recent Departures
Jim Davenport Senior Agriculture Mechanic 22 (Ret. Jun 2017)
Jeff Brown Senior Agriculture Mechanic 29 (Ret. Apr 2019)

Nyssa Crew pictured from left to right: Ted Nichols, Reyes Hernandez Jr., Clay Sutton, Ryan Koeater, Rett White and Bob Bonche.

Nampa Crew pictured from left to right: Bill Hempstead, Lamar Scott, Jeremy Quam, Storm Brito, Randy Hunsaker, Wes Stucki, Vince Trent, Leroy McCaughey, Randy Drake and Dylan Differding.

Mountain Home Crew pictured left to right: Mitchell Smith and Devin Boyer.

Hermiston Crew pictured from left to right: Bobby Donoho and Steve Wornell.
Common Political Action Committee (PAC) Myths

by Jessica McAnally, Communications Specialist

It can be difficult to understand what exactly a political action committee (PAC) does, especially at a time when politics are such a divisive and polarizing topic. How politicians fund their campaigns ends up broadcast across all media channels. People become concerned about the role of money in US government. Sometimes the biggest role of someone involved with PACs is that of the myth buster – sharing what PACs aren’t just as much as what they are. The following are some common myths with corresponding facts on what a PAC is and does.

"PACs are just a way for a company to pay off politicians."

It is against the law for companies to contribute directly to federal candidates. Since the members of an organization or employees of a company have a sizable stake in the issues that affect their organization/company, they combine their individual resources through a PAC and send contributions to candidates who are supportive of issues that impact the organization/company. The employees of a company or the members of an organization are making these political contributions.

"PAC money is spent on contributions to political candidates’ campaigns."

PAC money is spent on contributions to political candidates’ campaigns. How that money is spent is reported to the Federal Election Commission (www.fec.gov) to prevent any misuse of funds.

"PACs only support one party/candidate."

Most corporate and organizational PACs are non-partisan. PACs typically support one issue or a set of issues, and contribute to Democrats, Republicans, and Independents who share that viewpoint.

"PAC contributions are buying a vote."

PAC contributions don’t buy votes. PACs are limited to contributing $5,000 per candidate per election cycle. The average winning candidate for the House of Representatives spends over $1.5 million, while the average winning Senate candidate spends more than $10 million per election.

"PAC spending is ‘dark money.’"

Every dollar a PAC raises or spends is reported to the Federal Election Commission. These reports are published online and are publicly available to review at www.fec.gov.

"PAC or Super PAC – it’s all the same thing."

Super PACs are not the same as other PACs. Anyone can contribute any amount to a Super PAC, and that money is used to run ads and engage in advocacy for an issue or candidate that is NOT coordinated with the campaign. A Super PAC cannot contribute directly to a candidate.

If you have any questions relating to PACs, please contact Jessica McAnally at jmcanally@amalsugar.com.

Update: Mini-Cassia’s New Boiler Project

by Scott Winn, Director of Engineering

M

ini-Cassia was approved to install a new boiler to replace the existing Erie City Boiler originally installed in 1963. The Erie City Boiler was becoming unreliable and suffered several unplanned outages in both Crop Years 2016 & 2017. These unplanned outages resulted in approximately five additional days of campaign operations, and $2.4MM in additional operating expenses.

Total estimated repair costs for the older Erie City boiler were estimated at nearly $3MM. The new boiler is a “package” boiler built by Rentech and the overall project cost is budgeted at $7.5MM.

The new modern Rentech boiler brings many benefits to the Mini-Cassia facility. One of the major benefits it includes is increasing slice performance through improved reliability and evaporation rates. Mini-Cassia is projected to have a slice rate of 17,900 tons per day for Crop Year 2019. The new boiler is also more fuel efficient with lower emissions for additional environmental benefits. It will provide slightly higher steam generation capacity at higher temperatures (superheated steam) to improve the evaporation rate of water for the production of thick juice. Testing, tuning, and commissioning are scheduled to take place in September with full benefits to factory operations this upcoming campaign.

The two halves of the field above were planted with the same variety on the same day. The field was treated identically except for the use of the Little Dikers™ at planting on the south half, resulting in an additional 4 tons per acre at the end of the year.

Applications include: planters, cultivators, toolbars, & grain drills

Contact us for a quote

208.339.1855
littlediker@gmail.com
www.littlediker.com

Built in Idaho by American Craftsman, the Little Diker™ will not only help prevent wind & water erosion, but will also provide a substantial return on your investment for years to come!

Side-by-side trial
Look to Hilleshög Seed for industry-leading disease packages.

2019 NYSSA-NAMPA-TASCO SCHOLARSHIP RECIPIENT

by Terry Cane, Senior Agriculturalist

Each year the Nyssa-Nampa Sugarbeet Growers Association in conjunction with Amalgamated Sugar, award one or two, $1,000 scholarships. To qualify, individuals must be the son or daughter of a Snake River Sugar Co-op Member. They should be a current high school senior that is actively involved in agriculture, school and civic activities. Applicants must be pursuing higher education in an agricultural related field of study.

Ryan Nielson

This year’s recipient is Ryan Nielsen of Parma. Ryan is the son of Larry & Sherri Nielsen. He is a 2019 graduate of Parma High School with a GPA of 3.75, ranking 18 in a class of 70. Ryan has been active in varsity tennis for the last four years from which he has received numerous awards and recognitions, and he has won the state championship three times. He has also been active in several school and civic organizations including National Honor Society, Business Professionals of America, Leo’s club and several sport camps.

Ryan plans to attend BYU Idaho where he will major in Animal Science and plans to become a large animal veterinarian after serving a 2-year church mission.

Ryan was raised on a third-generation farm where he learned the value of hard work, perseverance, generosity, gratitude and being passionate. Watching and learning from his dad as he took care of the family farm was an inspiration to him even at an early age.

Congratulations to Ryan Nielson as the 2019 Nyssa-Nampa-TASCO Scholarship Recipient.

Nampa Agricultural Team Welcomes New Members

by Zach Leukenga, Crop Consultant

With the retirement of George Schroeder, who was with the company for 34+ years and the attrition of other employees, we are pleased to welcome three new members to the Nampa District Agricultural team. The following have been recently hired and each bring unique talents and qualities that will add to the to the strength of the Nampa Agricultural team.

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John and Emily Grist

Emily Grist is one of our new Crop Consultants. She and her husband, along with their two children, recently moved to Idaho from Georgia. She loves activities that have to do with anything outdoors which include hunting, fishing, kayaking and rock climbing. She has a Bachelor of Science in Agriculture with a minor in Horticulture from the University of Georgia. She then continued her education at the University of Georgia where she achieved her Master of Science degree in Wildlife Biology. Her prior work experience in the poultry industry where she managed poultry growers for the past five years will make her a great asset to the team. Emily will be serving the Growers in Weiser, Buckingham, Apple Valley areas as well as the Nyssa Factory. She brings a strong work ethic and eagerness to learn about sugarbeets along with a vast educational background to the team.

Ed and Stacy Fisher

Stacy Fisher is the new Nampa District Agricultural Clerk. Stacy joined the team in March, right in the middle of contracting. She loves anything to do with horses and family. She competes in local rodeos participating in the barrel and pole events. She likes our fast-paced work environment and loves to problem solve while working with staff to make things easier, more efficient and effective. Stacy recently said, “I am very familiar with many of our growers from previous friendships, acquaintances and prior employment. Amalgamated Sugar is the perfect fit for my interests and experience.”

Jake Hennessy

Jake Hennessy will be the Crop Consultant serving Growers in Jamieson, Luse, Vale and Payette areas. He is a native to Idaho, having grown up in Mountain Home, Idaho. Jake has a Bachelor of Science degree in Biology from College of Idaho. He also has a Master of Science degree in Entomology from University of Idaho. He enjoys spending his free time with friends and family in the great outdoors. He is excited to join the Amalgamated Sugar Agricultural team where he hopes to put his knowledge to work serving others while working toward common goals. He is very driven to perform and strives to achieve the best in all that he does.

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Jake Hennessy

Amalgamated Sugar is excited for these three to join our Agricultural staff. Their skills and mindset will be indispensable as we continually strive to be a staff who provides world-class support to the Member-Growers of our Cooperative. To them we say, “Welcome”.

By Terry Cane, Senior Agriculturalist
No-Till Beets: Different, Convenient, Rewarding

by Reid Bowen, Senior Agriculturalist

A new technology develops in farming it typically allows many changes to take place. Roundup Ready® sugarbeets are a great example of one of these technologies that has allowed for a great many changes. One such change allowed to come about through the use of Roundup Ready® technology is that of the use of reduced or no tillage in sugarbeets. Slowly, no-till sugar beet production has been picking up steam in many parts of the Company. This system of production opens the door to many benefits, including cost savings and improvements in soil health. Often these changes are slow to be adopted for a myriad of reasons. Some are happy with how they run things currently and some don’t believe it will work for them because of a lack of knowledge or they worry about the risk of the unknown.

Whatever the reason, this article will attempt to share knowledge about no-till sugar beets and address some concerns that may exist by sharing experiences from two growers that have experience raising no-till beets.

Brian Carlquist farms over 200 acres of sugar beets in the Hazleton area with his father, Lynn.

REID: How many years have you been no-tilling sugar beets?

BRIAN: We have been no-till farming beets for four years. The last three years, all our beets have been no-till.

REID: Why did you decide to try no-till beets?

BRIAN: We have always had problems with crusts and losing our soil moisture. After hearing you talk about how you were able to save moisture and have comparable yields in a no-till field, Dad (Lynn) thought that we should try a field.

REID: Do you think switching to no-till has saved you money?

BRIAN: Yes, compared to when we did conventional tillage, we saved around $100 an acre. We would plow, roll harrow and sometimes bed in the fall. Then we would roll harrow again in the spring. At times, we would have to roll harrow the beds because the ground had gotten so hard. Then in the summer, we’d dammer dike. Now we run the flex harrow once through the straw in the fall, then we plant in the spring.

REID: What problems have you had with no-till?

BRIAN: The biggest problem has been getting out seed trench closed. There are spots that we worry about getting good seed-to-soil contact. Voles can be a little bit of a problem at times. This year I think that I only saw one vole den.

REID: Has no-till farming increased any of your costs?

BRIAN: Yes, because we spend more time and money trying to control voles.

REID: Has your yield or quality changed with no-till?

BRIAN: Our yields have gone up. In the spring, you think your beets don’t look as good as your neighbors. Then in the fall the tons are the same or better than the neighbors. The same goes for our sugar quality.

Ted Tateoka farms 317 acres of sugar beets between Paul and Hazleton with 154 of those acres being no-till.

REID: How many years have you no-tilled sugar beets?

TED: This is my second year.

REID: Why did you decide to try no-till beets?

TED: The thing that I think is the most important is timing. There is some ease with no-till such as not having to dammer dike, but timing is important. If you do not kill the cover crop at the right time it can create a problem.

REID: Do you think switching to no-till has saved you any money?

TED: No, because of the cover crop seed came along with the cover crops. TED: The biggest problem has been having the seed trench closed. There are spots that we worry about getting good seed-to-soil contact. Voles can be a little bit of a problem at times. This year I think that I only saw one vole den.

REID: Has no-till farming increased any of your costs?

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TED: Our yields have gone up. In the spring, you think your beets don’t look as good as your neighbors. Then in the fall the tons are the same or better than the neighbors. The same goes for our sugar quality.

TED: Do you think switching to no-till has saved you any money?

TED: No, because of the cover crop seed and the fertilizer needed for the cover crop I am not spending any more money than I would on conventional farming. The real benefit to me is improving soil health and creating more of a crop rotation. I think this will pay off more in the long run.

REID: How do you apply your fertilizer?

TED: Some nitrogen, phosphorous and potassium is applied before the cover crop. Then in the spring a pop-up starter with nitrogen and phosphorous is put down with the planter. The last application is a top-dressed nitrogen.

REID: What problems have you had with no-till?

TED: The real reason I no-till is because I wanted to increase soil organic matter. I was also looking to help establish a better stand in white dirt. I have a short rotation of beets and barley on a few of my fields. I wanted to create more of a rotation with the cover crop and no-till came along with the cover crops.

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Neonicotinoids (neonics) are a class of systemic insecticides similar to nicotine and include seed treatments such as clothianidin, imidacloprid, and thiamethoxam which are widely used on sugarbeets. These chemicals are less toxic to birds and mammals than other insecticides and their application to the seed pellet allows for low application rates that provide pest-specific control.

The first neonic, or rather, its precursor, was discovered in 1970 at Purdue University. This compound acted in a similar way as the known and naturally occurring nicotine and was hailed as a safer alternative to the widely used organophosphate and carbamate insecticides. It took 15 years for neonics to reach the market. In 1985, Bayer patented imidacloprid as the first commercial neonicotinoid insecticide. It was followed by clothianidin and thiamethoxam in the early 2000’s. In 1994, imidacloprid received full registration in the United States and until today it is still one of the most widely used compound in the United States.

Uncontested for nearly 14 years, imidacloprid came up for review by the Environmental Protection Agency (EPA) in 2008. However, growing public concerns about adverse ecological effects of neonics fueled a myriad of lawsuits targeting the re-registration of these products. Concerns included the potential decline of honey bee colonies, the effects of neonics on non-target beneficials and the loss of bird populations due to the reduction of insect populations that served as their food source. Other neonics, including clothianidin and thiamethoxam, were considered for review in 2012 with an estimated project completion date of 2018 for all reviewed neonics.

Driven by earlier suspensions of neonics in Germany (2008 & 2009 - corn and rapeseed), Italy (2011 - all seed treatments), and France (2011 - sunflower and corn), the European Union (EU) along with other countries implemented more stringent regulations in 2013 on the use of neonics. By then, only the use of neonics as a seed treatment, soil application (granules) and foliar treatment in crops not attracting pollinators or bees was allowed. Five years later in 2018, the EU completely banned the use of clothianidin, imidacloprid and thiamethoxam on all outdoor crops and only certain cultures grown under greenhouse conditions were exempted.

Presently, the verdict for US sugarbeet growers is still out. Snake River Plain sugarbeet growers are still able to obtain and plant sugarbeet seeds treated with neonics. However, several states in the United States have already restricted the use of neonics, and as of early 2019, EPA removed 12 products containing other neonicotinoids from the market.

The future of the neonic class of insecticides is uncertain despite their safety on non-target insects, their low exposure potential to growers and low application rates when used as a seed treatment. A future ban would force sugarbeet growers and growers of other commodities to revert back to older, less effective chemistries (if still available). Lack of insect control would lead to reduced yields and would also require more frequent application of foliar insecticides. Non-target and beneficial insects like bees and other pollinators would be exposed to an increased load of non-selective insecticides.

More frequent applications would also significantly deter sustainable farming practices that require more passes through the field.

Please educate family, friends, and the general public about the benefits of neonics and the potential unintended consequences if our industry is required to revert back to older chemistries. Also, reach out to your congressional representatives and emphasize the importance of neonics for the sugarbeet industry and agricultural sustainability.

Above: The aftermath of a wireworm infestation as young sugarbeet seedlings are chewed off at or near ground level. Top right: Sugarbeet root aphid on sugarbeet root.
The previous article walked us through the beet handling process up to diffusion and pulp pressing. It ended with a product known as Raw Juice leaving the Cossette Mixer. As stated previously, this juice contains many impurities that must be removed to allow for the best sugar extraction. This is the purpose of the purification process.

Raw Juice consists of three elements; water, sugar and non-sugars. The non-sugars can be categorized into two groups, removable non-sugars (RNS) and non-removable non-sugars (NRNS). As expected, there is nothing that can be done to purify the juice of the NRNS, so the primary focus is to remove as many RNS as possible to produce the highest quality juice.

The purification process in sugarbeet refining requires Milk of Lime (MOL, calcium hydroxide), and the first steps actually take place in the lime kiln (pictured on center fold). Here, a process called calcining occurs where coal is burned to heat limestone (calcium carbonate) to approximately 2000 °F. At this temperature, a reaction occurs in which carbon dioxide (CO2) is driven out of the rock, creating lime (calcium oxide). The CO2 is captured off the top of the kiln and used further downstream in the purification process. The lime is mixed with sweetwater, or thin juice, to create MOL.

The Raw Juice first goes through a liming process beginning with preliming, which takes place in the prelimer. This is an open rectangular tank that is divided into six sections with adjustable baffles. An agitator runs horizontally along the bottom of the vessel to aid in mixing and avoid settling of solids. Raw Juice enters on the front end of the prelimer and MOL at the opposite end, flowing countercurrent to each other. The baffles are adjusted to obtain specific pH targets for each cell. Different non-sugars will precipitate (a solid substance being formed by chemical reactions with MOL) at different pH environments. The purpose of the liming process is to build a high alkalinity, which will neutralize acids formed in the purification process.

The flow from the prelimer goes to the cold limer where more MOL is added. From this point the sugar solution is called limed juice and is pumped through a series of heat exchangers to heat the juice for hot liming. In the hot limer, MOL is once again added to increase the alkalinity of the juice. At high temperatures, certain non-sugars are degraded to acids and neutralized by the lime. Limed juice then proceeds to carbonation, which is the reaction of CO2 to form insoluble calcium carbonate compounds.

The carbonation stage occurs in two steps, first and second carbonation. Here the CO2 that was burnt off the limerock in the lime kiln is bubbled into the bottom of the carbonator. The CO2 reacts with the calcium in the juice to form the calcium carbonate, which is what was initially fed to the lime kiln in the form of limestone. Precipitated non-sugars from the liming process are adsorbed on to the calcium carbonate particles as they form.

The carbonated juice then flows out of the carbonation vessel into a clarifying tank. Here the particles formed in first carbonation are allowed time to settle, which is called “break” (see center picture). To aid this process, a polymer is added to the juice as it leaves first carbonation. The polymer is a charged long chain molecule that attracts the small calcium carbonate molecules, creating a larger particle size, which will settle more rapidly and filter more easily. The solids (called mud) that settle to the bottom of the clarifier are pumped to first carbonation filtration to be removed from the process and recover juice that is with it. This filtration step is accomplished with membrane filter presses. These filters are made up of plates of alternating type, pressure and membrane. All plates are recessed in the middle to create a void where solids can collect as the mud slurry runs through the filter. The plates are covered with cloths that allow juice to pass through but retain the mud particles. Once the voids between the plates are full of mud, compressed air inflates the membrane plates, which presses out most of the remaining juice. The mud cakes (below) are washed with water then dried and conveyed out to the spent lime.
Above: An opened pressure leaf filter.

- Softening: The beads are similar in size to a BB. The picture is enlarged.
- Resin beads used in softening: The picture is enlarged as the beads are similar in size to a BB.
- Lime piles: Located outside the factory where spent lime is conveyed and deposited.
- Resin beads: Used in the softening process.
- Lime piles: The picture is enlarged as the beads are similar in size to a BB.

Steel pressure leaves are covered with filter cloths and inserted into the ports on the bar. As juice flows into the bottom of the filter, particles are retained by the filter cloth and the juice passes through the leaves and out of the vessel via the hollow bar.

Now that the juice has been filtered it needs to go through a softening process to remove the final amounts of calcium. This is done to protect the molasses separators downstream, and it also provides a secondary benefit of reducing potential for scaling in the evaporators.

Softening is done using a bed of resin beads (opposite page, upper right). This bed sits on the bottom of a vessel called a softener cell. The softening system is comprised of multiple cells that the juice flows through simultaneously. The resin has an affinity for different ions (a charged atom or molecule) depending on the pH of its environment. At higher pH levels or basic conditions, the resin has a strong affinity to calcium ions (Ca\(^{2+}\)).

Thin Juice has a basic pH around 9, so the calcium ions attach to active sites on the resin beads. As juice continuously moves through the cell fewer active sites are available. Eventually, the resin needs to be "recharged" to make these active sites available again, this is known as regeneration. It is done by taking the cell offline and pumping dilute sulfuric acid through the resin bed. The acid creates a low pH environment in which the resin has a higher affinity for hydrogen ions (H\(^+\)). The Ca\(^{2+}\) is released from the active sites, and the H\(^+\) attach. The Ca\(^{2+}\) reacts with the sulfuric acid to form calcium sulfate (gypsum), which is sent to the diffusion towers to be used as a free pulp pressing aid. Once the cell has been regenerated, it is put back online and the process is repeated.

Once softened, the juice goes through a quick sulfitation step, in which a small amount of sulfur dioxide gas is added. The sulfur dioxide acts as a color inhibitor for juice in evaporation, long term storage and through the remaining sugar end processes.

The Thin Juice is now ready to be concentrated. Thin Juice consists of approximately 80% water. A large amount of this water must be removed for proper and efficient crystallization and long-term storage. The juice is concentrated using multiple effect evaporators, which use steam to evaporate water from the juice. In this process, steam for the first evaporator is supplied by the boiler and the water vapor made from boiling the juice is used for boiling in the next evaporator downstream. Juice is further concentrated as it moves down the evaporator train. By the time it reaches the end, it is approximately 30% water and is now called Thick Juice (see Figure at top of page). Thick Juice is the primary feed to the sugar end of the process where it will be crystallized and made into white sugar.

At all Amalgamated Sugar factories, the beet end produces more Thick Juice than the sugar end can crystallize, so the extra is sent out to large juice tanks for storage. There, it will wait to be brought back into the mill to be processed during the juice run operation after campaign is over.
When it comes to Crystal brand beet seed, it's all about the sugar because there's no other seed up to do what you do best – produce maximum sugar.

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WANTS TO BE WHEN IT GROWS UP.

Every fall, an unwritten law drives us to clean our yards. Leaves are raked, bagged and removed, on a nearly daily basis, until no more leaves are left on the trees which could cover our lawns or even worse, blow over to the neighbors. Corn stalks are cut down and saved for Halloween or Thanksgiving before they follow the fate of the leaves. Finally, flower beds and vegetable gardens are cleaned and prepared for the new gardening season by removing old plants and turning under any remaining trash and debris.

Why? Because we were taught this way? Because we want our yards to look nice? Or because we are afraid that the old leaves could smother our lawn or the remnants in the beds could carry diseases and pests? No matter the reason, we perform one of the main pillars of pest control: sanitation. Sanitation is the act of removing and destroying diseased and infected plants from our gardens. This helps to minimize the spread of pests and to reduce the overall severity of an outbreak. We also remove or destroy potential inoculum and insects which could infect our plants in the next growing season.

Taking the step from our backyards and into our fields, we continue with sanitation or a form thereof. Herbicide applications minimize and control weeds, which reduces competition for nutrients, water and light, while minimizing the potential for harboring insects. In seed crops (wheat, potatoes, etc.), we remove diseased plants or individuals with undesired traits. However, our sugarbeet fields are too large for the possibility of removing individual beets that are infected with Cercospora leaf spot, powdery mildew, or Rhizoctonia root rot. At this point, we have to make the best use of other tools we have at our disposal, mainly the use of fungicides, to control the spread and severity of these diseases.

Crop Residue management for disease prevention

by Oliver T. Neher, Manager of Sugarbeet Quality Improvement and Plant Health photos by Clarke Alder

Every setback of using fungicides, or pesticides in general, is the potential for pesticide resistance in the target organism. Especially the reduced availability of different active ingredients, and with that, the ‘overuse’ of an individual pesticide group can rapidly lead to resistance. A good example of this is the development of fungicide resistance in Cercospora Leaf Spot (CLS). Cercospora beticola, the causal organism of CLS, is a destructive fungal pathogen affecting the foliage of sugarbeets.

This pathogen was initially observed in growing areas such as Michigan and the Red River Valley where it has greatly elevated temperatures, but never to the extent and with the associated losses like the other growing areas have seen. However, in recent years, CLS was observed more frequently in the Magic and Treasure Valleys.

The move to more overhead irrigation and a rise in July and August temperatures have led to a more widespread occurrence of CLS with an associated increase in losses. Growers did not specifically treat against CLS since infections were most likely controlled by fungicide applications made to control powdery mildew. However, the repeated exposure of C. beticola to those chemicals lead to the developed fungicide resistance. Since no new fungicides are on the horizon and our varieties are lacking strong tolerance against CLS, how can we control or manage a disease that is resistant to fungicides?

In certain cases, avoiding the use of a specific fungicide such as triphenyltin hydroxide (Super Tin, TPTM) for a prolonged period of time, can help to restore the efficacy of this fungicide. Meanwhile, we need to rely on cultural practices like irrigation management and extended crop rotation. Another possibility is sanitation or the removal of infected plant debris. It is not practical to remove leaves infected with C. beticola during the season, however timely disking, or even better, plowing harvested fields to bury any leftover crop residue including infected leaf material should be considered.

We are all aware of the costs associated with plowing and the less sustainable nature of this practice. But considering six to eight fungicide applications made in the Red River Valley, which are still not highly effective, a pass with the plow suddenly seems to be economical. Currently, we only have a few management options for CLS, with burying infected leaf debris being the most effective one. So why not treat our sugarbeet fields like we treat our backyards and let’s get rid of the infected leaves.

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Healthy Soils: The foundation of a sustainable sugarbeet industry.

by Davey Olsen, Soils Agronomist

It is no surprise that some of our largest sugar customers are becoming more interested in how our sugar is farmed, processed and delivered. They want to know that our sugar is produced in a sustainable manner. Their customers in turn are demanding this level of sustainable accountability. This reflects the world at large, where consumers are placing an increasing emphasis on sustainability of farming and food production systems.

Sustainable sugarbeet farming is built upon practices that maintain or improve soil health. From practices that improve soil water infiltration, lower soil-borne disease pressure, improve fertilizer use efficiency, reduce weed pressure, and minimize fertilizer and pesticide runoff, the soil plays a central role in sustainable and productive sugarbeet farming systems.

As stewards of the soil, growers have a responsibility to adopt farming practices which maintain, conserve or improve our soil resource. Central to this is an understanding of how farming decisions impact soil chemical, physical, or biological health. Growers are largely aware of the importance of healthy soils for profitable farming, and there is widespread grower interest in improving soil health.

Soil Health

Soil health describes the ability of soil to deliver productive and profitable sugarbeet crops by performing key functions mediated through its physical and chemical characteristics in combination with the activity of soil biota.

The soil is a complex and dynamic resource, upon which our entire sugarbeet farming system relies. Fundamentally, soil is an interface of chemical, physical, and biological properties and processes that are constantly working to provide all of the ecosystem functions that our sugarbeet plants need for good health and optimum productivity. These include; good water infiltration, nutrient availability, disease suppression, and ideal tilth for root growth. A healthy soil is a soil in equilibrium. In other words, the chemical, physical, and biological properties are balanced in such a way to deliver optimum conditions for plant growth. As managers of the land our farming practices impact this soil balance, for better or worse. Sustainability is all about maintaining and promoting this soil balance through the types of on-farm practices we choose in our farming systems.

When the chemical, physical, or biological balance is upset soil health suffers and sugarbeet productivity is impacted. For example, moisture stress, nutrient stress, and soil compaction can all predispose young plants to damaging diseases such as Aphanomyces or Rhizoctonia. Whereas, a healthy soil (a soil in balance) hosts a diverse microbiology community where beneficial organisms predate pathogens and where soil conditions such as good air flow and water content make the soil less favorable to pathogens. Healthy soils also promote strong and vigorous plants which are better able to resist disease.

Soil physical structure can be greatly damaged by compaction. When soil aggregates are crushed, pore spaces collapse leading to reduced water infiltration, poor drainage, poor root growth, impaired biological health and increased disease. Compacted soil greatly increases the incidence and severity of Rhizoctonia root rot. One of our most serious sugarbeet diseases, Rhizomonia, is most severe in areas with poor soil structure and inadequate drainage. Because there are no resistant varieties for this disease, promoting good soil health through sound irrigation and cultivation practices is critical to the control of this disease.

Benefits of Healthy Soil

Importantly, healthy soils are resilient soils. They are more able to buffer against periods of stress, such as disease incursions, drought, or periods of waterlogging. This enables them to rebound more quickly from these types of disturbances.

Below are some examples of the economic benefits of maintaining and improving soil health.

• Better plant growth, quality, and yield.
• Reduced risk of yield loss during periods of environmental stress (e.g., heavy rain, drought, pest or disease outbreak).
• Better field access during wet periods.
• Reduced fuel costs by requiring less tillage.
• Reduced input costs by decreasing losses, and improving use efficiency of fertilizer, pesticide, herbicide, and irrigation applications.

Practices to promote soil health:

• Alleviate compaction. Consider fall bedding to reduce compaction otherwise caused by working the soil in the wet spring.
• Promote good soil structure. Minimize aggressive tillage to conserve soil aggregates. Consider no-till or strip tillage where appropriate. Good soil aggregation promotes increased water infiltration, water drainage and root growth.
• Manage soil moisture. Ensure correct irrigation timing and volumes. Over-irrigation promotes disease while ideal moisture at harvest reduces soil compaction, aids the lifting of beets and minimizes tare.

Below: Promoting healthy soil includes several different functions including managing soil moisture. Ensuring correct irrigation timing and volumes will not only lead to a healthy crop, but will cut down on things like disease and compaction. Right: Another way to alleviate compaction is to minimize trips through the field through practices such as no-till where applicable and deemed appropriate.

AS STEWARDS OF THE SOIL, GROWERS HAVE A RESPONSIBILITY TO ADOPT FARMING PRACTICES WHICH MAINTAIN, CONSERVE OR IMPROVE OUR SOIL RESOURCE.
Our varieties show excellent:

- Emergence
- Quality
- Yield
- Vigor

- Crop rotation: Plant disease-resistant varieties and ensure a 4-year rotation. Prevent disease buildup and promote healthy soil populations. Crop rotation with common and non-host crops prevents disease problems.

- Residue management: Conserve, maintain, or improve soil organic matter. Manage residues to maintain healthy soil biology and fertility. Organic matter fuels the soil ecosystem, improving physical and chemical properties.

- Nutrient balance: Apply fertilizer at rates consistent with Grower Guidebook recommendations. It is important to recognize soil constraints that limit crop productivity, farm sustainability, and environmental quality. Management practices can be adjusted to alleviate these problems.

- Common soil constraints include:
  - Soil compaction
  - Weed pressure
  - Poor aggregation
  - High pathogen pressure
  - Low water and nutrient retention
  - Salinity and sodicity
  - Heavy metal contamination

The interaction between land management and the inherent attributes of the soil determines the ability of the soil to perform these key functions and the resilience to continue to do so after extreme events. It is these interactions that ultimately determine the health of a soil under a given land use. A healthy sugar beet soil has biological, chemical, and physical properties that promote the health of the beet plants while also maintaining or improving environmental quality.

Our industry has played a key role in farming communities and families across Southern Idaho and Oregon for more than 100 years. As we look toward the future, adopting sustainable farming practices that improve soil health will be essential if we are to continue to thrive as an industry in a world increasingly concerned with how we grow and deliver our sugar.
High yields topped what would be two outstanding crop years, however between the celebrations of bountiful harvests the 2017 crop stumbled and averaged only 16.48 percent sugar. So, what happened in 2017? Ask any farmer and a common theme of weather is what changed that year, but what are we doing as a Cooperative and as growers to do everything possible to control the variables that are within our control?

One of three Amalgamated Sugar initiatives is to achieve an average 18 percent sugar content by year 2020. How do we get there when one of the biggest questions and variables plaguing growers is what kind of spring it will be and when to start planting to achieve or surpass the initiative of 18 percent sugar content, regardless of how the weather turns out. The proactive approach our Member-Growers and Agricultural Department take with good field practices, pile management and harvest policies are shown by the successful campaigns of the past and continuing to improve and build upon these practices. New strategies and practices are made each year as we learn from each other about what it takes to be the best sugarbeet company in the nation.

Putting beets into storage in the right condition is paramount to long-term viability and quality. Throughout winter storage and pose an issue for higher respiration and sugar loss due to the biennial plant trying to stay alive. This respiration can also be seen during muddy harvest conditions as the piles cannot breathe and heat up drastically the longer they are in storage. On the opposite spectrum, frost during harvest can damage the root tissue and when put into a pile deteriorates at a faster rate. This is why the Cooperative, with the support of the Member-Growers, have implemented harvest policies stating no delivery of beets above 59°F pulp temperature and when ambient temperature is below 28°F. Ventilation system technology has been utilized at some stations to manage pile temperatures and allow for the possibility of a longer storage campaign. During harvest, consultants monitor and coordinate with growers to reduce the amount of dirt and beet tops brought into storage piles. During the winter storage they walk the tops of piles to scout for excessive respiration and mold and manage shipping them accordingly. The harvest policies and efforts of all involved were developed to help everyone think long-term and is an all-inclusive effort to deliver “cool, clean and disease-free beets.”

By controlling the variables at our disposal, we combat against Mother Nature to set ourselves up for another successful year and a sustainable future.

Putting beets into storage in the right condition is paramount to long-term viability and quality.
beets topped like these interfere with proper factory operation and reduce sugar extraction.

Improperly topped beets

careful topping results in bigger PROFITS

beets topped like this increase your tare

beets topped like this decrease your tonnage

A Properly topped beet

Editor's Note: The flashback article is intended for entertainment purposes. The content and original formatting of the articles to include pictures remains unaltered from their original state as often as possible. As high quality scans are sometimes difficult for maintaining "readable quality", often the formatting is mimicked as closely as possible to preserve originality. The written word is never changed. This flashback is from the September 1940 issue.
Nampa Senior Agriculturist Retires after 34 Years with Amalgamated Sugar

George Schroeder, Senior Crop Consultant in the Nampa District, is retiring at the end of 2019 after 34+ years with Amalgamated Sugar.

George was born and raised in northeastern Colorado near the town of Sterling. He obtained his Agricultural Business degree from Northeastern Junior College in Sterling, Colorado. For 15 years, he farmed in northwestern Kansas with his father-in-law raising sugar beets, corn, beans, grain, sunflowers and wintering cattle on corn stalks. All beets were contracted and delivered to Great Western Sugar’s Goodland, Kansas processing plant until 1985 when the company could not pay growers for the previous year’s beet crop.

George came to work for Amalgamated Sugar on September 1, 1985 after answering an advertisement found in a sugar beet magazine. He states that he has worked every receiving station in the Nampa district, with the exception of the Marsing station. His longest stretch has been at the Bowmont station which he has been a part of for over 27 years. When he first came to work, he was handed "bible sheets," and a set of keys to a ranger pickup and told to get to work.

Being in the fields, working with growers and making a difference is what George has enjoyed most. The people, Agriculture Staff and Management have been great over the years and he feels very blessed to have been a part of this industry and this Company.

George, along with his wife Carol, plan to spend more time at their cabin, riding the ATV and enjoying their grandchildren. Best wishes to George as he enters this new chapter of his life.

Amalgamated Sugar

2018 Retirees

compiled by Justin Muecke, Crop Consultant

Thank you for your dedicated service to the Amalgamated Sugar Company LLC. Our high quality employees are what propel us forward and allows us to maintain a competitive presence now and into the future. We wish you all the best of luck.