Sugarbeet Research and Education Board
Technical Needs Meeting
November 9, 2017
Holiday Inn, Fargo, ND

The following are notes from the meeting by topic area across factories / cooperatives. Please discuss directly with Coops or factory representatives if there is confusion about notes.

Cercospora leaf spot

- SMBSC (Southern Minnesota Beet Sugar Cooperative) Cercospora leaf spot is our number one concern. By early October, 20% brown fields, even with average of 6 applications, resistance monitoring program is very important. Efficacy trials, we need new products or combinations of products. We need to better understand effects of spray adjuvants on fungicide efficacy. Are the current recommendation of 100psi and 20 gallon/acre of water the best application practices? Are there cultural practices that could help manage CLS? Biology/physiology work that has the potential to help manage this disease.
- MD (Minn Dak-Farmers Cooperative) expand the use of molecular tools, development, inoculum, test new biologicals for efficacy, evaluation of tank-mixes, continued emphasis on chemo-sensitizing agents, age of sugarbeet effects, effects of tree-rows on Cercospora, protected areas, strategies to find disease sooner, younger plants vs. older plants,
- Moorhead – spray tips, are there more effective spray tips for Cercospora sprays, made 4 to 5 sprays
- Hillsboro – less pressure, 4 sprays, water rate for appropriate spray cover
- Crookston – more education on tank-mixes, 2 to 6 sprays, limited response to application number, when does loss occur, does respiration increase when sugarbeet in heavy Cercospora infested areas are in the pile
- East Grand Forks- is tank-mixing necessary, provide meeting updates, formulate and easier to use Mancozeb formulation or teach Mancozeb spray quality
- Drayton – Cercospora prediction model failure. The model reported 14 days with severe infection in 2015 but fields had minimum effects from Cercospora. There were 4 days of severe readings in 2016 (all in July), yet the worst Cercospora since 1998. 2017 had 1 day of severe day. Are there other models? Datum (sp) prediction model, seemed to work North but not in MD Coop, extremely dry so sprays may not have benefited. Continue to search/test for new fungicides. Spray quality research, what are the correct tips and water rates for most effective control. What about plant breeding approaches to Cercospora? Lower the acceptability score for Cercospora natural tolerance in new varieties
- American Crystal Sugar (ACS) excitement about Dr. Bolton's program, are there new products; alternative CLS control options? For example, product formulation, tank mix compatibility, and adjuvant testing opportunities. Support CLS DIV model temperature adjustment analysis (CLS developing early at lower air temps), age of beet on CLS; how to manage age. Continuation of resistance monitoring from Dr. Secor's laboratory, timing of when to make the first application.

Insects

- Dr Boetel work on combinations is working
- Crookston, wireworm issues, especially in fields not treated with insecticides
- Dr. Boetel-seed treatment failure for control of springtails at MonDak, Lorsban is on borrowed time

- SMBSC- more alfalfa for dairy seems to be increasing lygus bug infestation
- ACS- Neonicotinoid and organophosphate (Chlorpyrifos) chemistry alternatives. Use of UAV for Insect damage assessment

Weeds

- Moorhead – precipitation is often hard to time. Is there a calendar date approach for acetamide application, waterhemp, need to look at Treflan and Sonalan for waterhemp control, help farmers determine when and how to use their Betamix
- Hillsboro- waterhemp is starting to show but there is awareness, more kochia and biotypes are glyphosate resistant, Stinger tank-mixed for common ragweed control was commonly used in 2017. Is the program correct, 2 sprays by 2 ounces?
- MinnDak – waterhemp, PRE, POST and combinations in a systms approach, lambsquarters work, promote rotational crop control of weeds, cultivator research, use of Nortron, HSMOC is expensive, is there an alternative? Liquid vs. dry AMS efficacy, prepare for palmer amaranth by testing in PA areas such as Nebraska
- SMBSC – POST emerge ethofumesate program. What is the best program and what rates? Are there alternative products/rescue strategies for when Betamix is gone? Weed control projects need to include/be compatible with spring-seeded nurse crops. Best Management Practices for palmer amaranth control in sugarbeet.
- Drayton- Weed resistance education is our greatest concern going forward. Common ragweed was the most prevalent resistant weed. Waterhemp also is moving into the area. We need to keep strong focus on preemergence and in-season alternative products to Roundup. Strong emphasis on production areas that don't have issues to help curb any future weed resistance breakouts. Common ragweed; Stinger education,
- EGF – More waterhemp being seen in the Stephen/Argyle, continued recommendations of spray mix and spray programs to offset spread of waterhemp. Common ragweed exploded in EGF, tank mix options and spray program options in rotational crops and sugarbeet. Education on control in soybean; education on tank-cleanout
- ACS – Ethofumesate at rates greater than 12 oz., POST use, efficacy, safety, and carryover. Phenmedipham/desmedipham utilization in systems approach for glyphosate resistant weeds. Palmer amaranth preparedness, UAV – for weed identification. Ethofumesate cuticle thinning especially as it relates to auxin herbicides. Spray tank cleanout education

Root diseases

- EGF0-use of imagery to map, prediction model based on inoculum level, more clarity on timing of application, reinforce impact of targeting the plant vs. targeting soil with sprays, reinforce timing of application, method and placement of application, fertilizer with azoxystrobin
- Crookston – generic azoxystrobin that mixes with fertilizer, in-furrow vs. seed treatments, rhizomania continues to be in the back of heads, south of Crookston
- Hillsboro – effects of lime as amendment for rihizoctonia
- Drayton- proper timing for azoxystrobin application, should POST spray be a planned tool or an optional tool in the system? There is confusion on application timing (2 to 8 leaf), soil temperature, growth stage, and days after planting. Does cultivation increase rhizoctonia? What about surprises when beets look healthy on the surface but have rhizoctonia below; occurs from the bottom up? Does lime (amendment) suppress rhizoctonia? The Farmer doesn't realize there is rhizoctonia until harvest, disease coming from the bottom towards the surface. In-furrow application vs. t-band? Generics azoxystrobin plus fertilizer?

- ACS- 4 to 5 weeks after planting, sensor development, knowing when to turn on sensor for susceptible varieties. Rhizoctonia sensor development to measure, map, and manage disease content.
- Ashok/UofMN- seed treatment working, so delaying the post or band
- MinnDak – 100% rhizoctonia treated seed, evaluate seed treatments is not research money well-spent, not to use them but the comparison between them. More emphasis on timing of application, best application method, soil amendments, lime, biological, other, the use of UABs for timing. Have we evaluated the competitor to Tachigaren?
- SM- Best management practices for Rhizoctonia root rot. This can involve any combination of seed treatment, in-furrow fungicide application, post-emerge fungicide application, and resistant varieties. Rhizoctonia biology/physiology work that has the potential to help in the management of this disease. Is there a way to know when to use each tool, seed treatment, in-furrow?

Rhizomania

- SM- In 2017, SMBSC saw more patches with foliar rhizomania conditions. Samples were taken from 12 of these fields and sent to Dr. Charlie Rush. All samples tested positive for resistance breaking strains of rhizomania. Variety tolerance is our only tool currently. We need increased tools against this disease as the disease is changing; variety tolerance is only tool

Fusarium

- Moorhead – Research to optimize control, yield and sugar. Are there options other than variety? Currently control comes at an economic cost, better Fusarium control comes as a penalty for sugar.

Sugar Content

- Group conversation. Is it all about weather? Research with previous crop since it is a challenge to get sugar following soybean? Tonnage and quality loses following soybean and corn. Develop protocols for best practices for Growers emphasizing increase sugar content, i.e. specific for soil types, fertilizer program, seed spacing, rotational crops. Encourage “high sugar content” varieties on headlands or fields planned to be dug for prepile. More emphasis on sugar with new varieties if sugar is indeed the emphasis. Experiment of highest sugar varieties of all companies and managed for high sugar % over tons. Nitrogen management? Less deep N today than in the past. SM is especially concerned with sugar. Physiology research to promote sugar content and accumulation. Sprays that add sugar, micronutrients such as zinc with Cercospora to increase sugar (last year someone was ‘pedaling’ boron to increase sugar, manganese before that. Physiology, such as vascular rings, can you change the physiology? Not convinced it is all about environment.

Storage

- ACS-Three priorities: a) CLS effect on storage (respiration and other losses); b) dehydrated beets in storage (respiration and other losses); and c) sugarbeet storage enhancement (post-harvest or pre-harvest products)
- USDA members commented about the difficulty to conduct experiments.
- SM- Can we quantify payback for rapid cooling piles

Cover Crops

- Scotty- Spoke of oil seed crop called winter camolina following sugarbeet. Brassica species, plant after sugarbeet, overwinters, reduces N loss. The kicker is market the crop, although supply chain has not been optimized. Camolina is not a host for soybean or sugarbeet cyst nematode.

- SM-Farmers are asking for technical information to interseed rye into sugarbeet canopy. For example, when to plant, seeding rate (seed with a spinner and harvest incorporates). How tall does it get in the canopy?
- ACS- Spring (nurse) crops: cost of delayed removal, excess population, removal tactics

Instrumentation and Industry Apps

- MD-Farm QA, model for Cercospora, local programs are stronger, should the NDAWN network be enhanced?

Soil Health

- Abbey-Soil health is establishing on farm goals and then changing farming practices to accomplish goals. Cover crop growth and how it affects preparation for sugarbeet planting, rye for moisture management, not an advocate for turnips as they don't winter kill and impact next crop
- SM-Partnering. Do we have collaboration with the Soil Health Institute (Gasch), Corn Growers and Soybean Growers network? (Wick) Best management practices for strip tilling of sugar beets into corn and soybean stubble.
- Moorhead- Spatial study of cover crops, applicability of SM results in the north, radishes and turnips as nematode trap crops, but do they contribute to diseases?

Defoliation

- A roto-beeting system that considers crop residue. Is our equipment too aggressive?

Sugarbeet Stand

- Support continues for planter test stand
- MD- Exact-emerge planters
- SM- Planter attachments. There are many different planter attachments being marketed and claimed to work on sugar beets. Active down force on sugar beet planters. Does this provide better stands and yields?
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Dicamba/ Off target movement

- Richardson, manage inversion, volatility
- Damage in sugarbeet? Continued education of recommended practices to reduce drift potential as well as sprayer contamination potential.
- ACS-Spray quality education/outreach including sprayer cleanout, drift reduction practices, sprayer calibration and optimum fungicide nozzle pressure, output volume, and nozzle type

Soil Fertility

- Drayton- N rate based on soil type, different rate depending on soil type
- EGF-In season banding/side dress vs foliar and timing of each. Should Growers apply in season earlier or at least soil sampling earlier, for example, late May, or at a certain leaf stage? Does late, June/early July, side dressing negatively affect sugar % at harvest What about application method; inconsistent application issues in-season, want more even/uniform, weather related, side dress machines, vs. using a sprayer. Is there value to lagoon water to fertility like lime? Any way to combine lagoon water and lime for a liquid application of lime?
- Crookston- Why research, lets mine N rate data to get a recommendation, use what we have
- Hillsboro-Data reported from VRT fields is an as average, is it the best to report averages? VRT with no absolute value
- ACS – Pressed mud (high strength N) management options for factory operations, UAV - Nutrient deficiency – target for side dressing in-season

- SM- There have been 6 large dairies (6,000+ cows) built in our growing area over the past 6-8 years. These dairies separate the manure and use the solids as bedding for the cows and apply the liquid portion to fields. The increase in dairies has led to more fields in a sugar beet rotation receiving this manure. Does this manure source act like liquid swine manure? What is the potential nitrogen mineralization from this manure source? What are the long-term effects on sugar beet production from repeated manure applications? Tissue sampling of sugar beets. Are the current sufficiency ranges accurate? What are adequate levels of nutrients in the leaves at various sampling timings? Non-traditional soil amendments create confusion. Is there anything being marketed that works. Environmental issues about tile lines, beets effect on limiting effluent (since they pull deep N)
- MD- use of drones, integration of mineralization, sand syndrome, chisel vs. moldboard, starter fertilizer affects, explore tillage,
- Crookston- are they georeferencing for trial placement?
- Moorhead- Ditch cleanout soil eliminates sand syndrome,
- Amit- algorithm for different soils by using historical data, different coating products to protect N launches, not effect on %sugar but less loss

Nematode

- ACS- sugarbeet is not here, leave as a survey option
- MD- threshold testing in the greenhouse,

Electronic media, apps, website, etc.

- MD- Continue to move toward electronic communication. The printed version of the Sugar Beet Production Guide is always asked for by growers every year. We normally run out of these guides. Very few growers take the large Research Reports. The printed version of the Research Report can be discontinued and placed on the website.
- MD-drone is an education tool. How should on-farm data be used? LAI to measure results, thermal data to see if there is a signature difference,

Other Topics

- SM- Environmental. The contents of water coming out of tile drain systems are an issue that continues to be brought up. There is no sugar beet data from a drainage system study in a controlled environment that we are aware of. We would like to see long-term, well thought out trial site established to obtain water quality information on sugar beets and other rotational crops as well as help establish BMP's.
- MD- Survey – sample size is too small, data are useful for legal matters. Christian (Crookston) reinforced grower data. Reminder survey could be done by Agriculturalist, representing his/her acreage.