Technical Needs Meeting
November 19, 2019

Border member attendance: Albert Sims; Chad Westrom, Eric Erdman, Jim Murn, Kevin Kutzer, Mark Bloomquist, Mike Metzger, Pat Osowski, Todd Geselius, Trent Eidman, Joe Hastings, Mohamed Khan, Frank Casey, Tom Peters (ad hoc committee member)

My notes are by topic area. Some of my notes indicate the individual leading the discussion.

Cercospora Leaf Spot (CLS) in sugarbeet.

- Mark Bloomquist reported better CLS control in SMBSC field than the previous years. He stated growers sprayed 6-7 times but indicated some fields were sprayed less, usually due to concerns about cost of inputs.
- Mark suggested inconsistency in spray quality including spray volume, nozzle selection, spray pressure and adjuvants. Mark indicated greenhouse experiments might be an effective way to screen these variables and perhaps using a surrogate for control to measure differences.
- Eric Erdmann indicated he read Master Lock (adjuvant) might antagonize CLS control from certain fungicides including Mancozeb. Mentioned he did not see this on his farm.
- Question about aerial applied fungicides for CLS vs. ground application. Mark indicated aerial application is required to ensure timely spray applications when conditions are not appropriate for aerial application.
- Mark acknowledged skips or gaps with aerial application including corners of fields, around building or power lines and hypothesized if these areas of fields might be where infection builds (Typhoid Mary).
- Comment was made education is as important as research and acknowledged ground application at less than 10 GPA and comparing 3 GPA to 5 GPA spray volume using airplane.
- Todd Geselius mentioned adjuvant research focused on droplet spectrum with fungicides in other geographical areas including pine-tar (resin) based products. He acknowledged some SMBSC growers have had good success with these adjuvant products with fungicides in central Minnesota.
- Mike Metzger added that a common practice in Minn-Dak Farmers Coop is to 'picture frame' the field with fungicides applied to small (young) beets early in the season (mid-June time frame or well before row closure). He indicated beets stayed green longer.
- Mike went on to remark about Viviana Rivera's (Secor's Lab) observation about growth on plates in the refrigerator suggesting we may need to reexamine when spores begin to form and the temperature conditions (hot and cold) when they form. Mike suggested it might be time to reexamine the model (W. W. Shane and P.S. Teng) for today's environment.
- Joe Hastings observed CLS in September in fields clean of CLS in summer and fall. Joe mentioned research in other areas including tillage and age of beet vs. onset of CLS.
- There was mention of EBDC / Triazole fungicide tank-mix compatibility (I don't have good notes to indicate the point about compatibility).
- Metzger mentioned performance of new sugarbeet varieties (gen II) in OVT trials. These varieties will be available in 2021.
- Someone suggested research using gen II CLS varieties in a leaf spot management system including fungicides and all of the other practices we are using in production.
- Mohamed confirmed that gen II varieties performed well in his experiments in 2019. Mohamed also mentioned some leaf burn from resin-based products with fungicides in greenhouse testing

- There were other comments about 'spore killer' techniques and pH adjustment with certain fungicides
- Joe Hastings commented resistance screening should include the new fungicide, mefentrifluconazole

Alternaria leaf spot

- More common in Michigan and much harder to find a pattern in MN and ND.
- Joe Hastings mentioned a field / area near Ada, MN with Alternaria leaf spot. Mohamed indicated the variety used in the Ada field was Alternaria sensitive.

White Mold in sugarbeet

- Mohamed Khan observed white mold in sugarbeet for the first time in Richland County ND.

Insects in Sugarbeet

- Joe Hastings reported the root maggot area is growing. He emphasized the important of Counter and Lorsban in insect management in sugarbeet and reminded us Lorsban is banned in California.
- Pat Osowski indicated more concern about maggots in EGF factory district. He mentioned the need for education reminding growers of mode of action of insecticides and their fate in the event there is no rain or insufficient rain to make insecticides available for soil borne insects.
- Joe added Springtail is a second important insect and a second use for OP insecticides. Joe suggested the importance to continue to search for alternatives for root maggot and springtail control. He mentioned / reminded us of how random springtail are and questioned the possibility to develop a predictive model.
- Mark Bloomquist indicated lygus bugs in sugarbeet are more common with the increase in alfalfa fields supporting the dairy industry in central Minnesota. Mark advocated for research to develop thresholds and continued research for lygus control.

Weed Management

- Chad Westrom commented on reports of weed resistance to various components of future triple stack varieties and strategies in sugarbeet growing regions to manage / prevent the onset of weed resistance. He acknowledged glyphosate resistant weeds but indicated dicamba or glufosinate resistant weeds would be a severe setback for sugarbeet growers already dealing with difficult to control weeds.
- Chad asked about the timelines for triple stack hybrids (2025) and if timelines could be accelerated. Peters indicated regulatory work will begin in 2020.
- Mark Bloomquist indicated the adoption of the soil applied herbicide program for waterhemp control but reminded us of the vulnerability of the program to weather misfortune including insufficient and excessive rainfall. He indicated the need for research to identify POST broadleaf control solutions (both herbicide and non-herbicide) in sugarbeet. He advocated for the 'whole farm' approach or focus in weed management in all fields and not just weeds in the sugarbeet field.
- Trent Eidman indicated he observed glufosinate acting much slower in 2019 compared to previous years (Trent, I suggest slower performance was due to poor conditions at application including cool temperatures and overcast skies at application. Liberty likes heat, sun and humidity to optimized weed control.
- There was conversation about more kochia in the countryside (probably glyphosate resistant kochia) and the need to reevaluate programs for kochia control in sugarbeet with ethofumesate soil applied or POST.
- A comment was made of our precarious position with Stinger and ragweed control. Yes, control is excellent, but we need to find a second effective herbicide.

- Mike Metzger asked if Peters intended to continue cultivation work.

Rhizoctonia Root Rot

- There was a suggestion for research comparing in-furrow and POST fungicides for rhizoctonia root rot.
- Mike Metzger indicated development of a field index to categorize fields based on rhizoctonia root rot mortality and intensity of disease management.
- There was a suggestion to screen root diseases against the gen II sugarbeet varieties.

Aphanomyces

- Mike Metzger reported more Aphanomyces in Minn-Dak in 2019 perhaps due to wet weather especially late spring and early summer than previous years. Mark and Todd added more Aphanomyces in southern Minnesota too.
- Mohamed indicated a new Tachigaren formulation that makes less dust performed well in 2019.

Rhizomania

- John Weiland reminded us we have genetic resistance to rhizomania that mostly works although there are small patches in field with symptoms. Why? Why is rhizomania resistance not building.
- John indicated we need a backup strategy in the event genetic solutions crash.
- Mike Metzger asked if we knew if there was benefit to spent lime to slow rhizomania. John indicated he would not be surprised if lime worked the same with Aphanomyces and rhizomania but was not sure.

Fusarium yellows

- Trent indicated more fusarium in sugarbeet fields in 2019 than previous years, possibly associated with warm wet weather and late planted sugarbeet.

Production

- Pat asked about variety screening on saline soils. There was consensus some varieties are better than others in saline soils. Pat also wondered if some varieties were more efficient at removing salt from soil or stated another way, have lower sugar levels than other varieties.

Equipment.

- There was a question if anyone studied new planter technology and accessories to planters including closing wheels, down-force, etc. There was consensus this type of research is better suited for commercial scale equipment and perhaps anecdotal observation than small plot.
- Conversation on pros and cons of when research should be conducted (April vs late May or end of planting). Jason indicated it was his experience that differences are more difficult to quantify when planting is delayed since soil temps speed germination and emergence.

Increasing Sugar

- Trent indicated variable plant technology and what features of the field might use higher populations. Trent also suggested high population might equate to high sugar.
- Mike mentioned how laboratory instrumentation like Near Infrared Technology referenced to the field and location within field might enable us to better understand factors leading to decreased sugar
- Amit Chatterjee indicated the relationship between sulfur and iron management on increasing sugar by decreasing impurities.

Storage

- A harvest limitation is the availability of people and equipment to get beets to the factory or piling station in the shortest amount of time. Mike Metzger contrasted lift and transfer to truck and piling station compared to lift, cart and pile at the end of the field for a duration then repile

and transfer to the factor. He asked about the trade-offs and suggested the need for studies to evaluate respiration.
- There was a comment about breeding a beet that stores better
- Clamps. A pile of beets at the end of the field that are later removed to either the factory or the piling location.

Nurse / Cover Crops

- Trent started the conversation by stating he tried to seed rye on the open part of the sugarbeet field (prepile) and not harvested portion of the field. There was good rye stand on the open areas but very poor stand on the part of the field with a sugarbeet crop at seeding. Trent suggested the seed probably was buried with harvest.
- Trent added the purpose of cover crops is to protect the soil from loss due to winter erosion.
- It was stated wind erosion is important both in fall leading into winter and in early spring or before spring tillage.
- Amit indicated result from a timing of seeding experiment. Seeding in late June vs. July. He believes seeding in June robs N and affects root yield. He did not observe loss of root yield with July seeding, however, it was more difficult to establish cover crops with certain species.
- Interest rye or winter wheat that overwinter. Pros and cons to each.
- There was a question about cover crops that absorb nutrients and then release nutrients after they die from frost.
- It was stated it is complicated; timing of N release, timing of thaw and effect of nutrient

Soil Health

- Joe suggested we quantify the sugarbeet root material (lateral, hair roots etc.) left in the soil after harvest to establish amounts and the benefits to: 1) soil structure; 2) residue; 3) OM; and 4) microbial activity.
- Spore survival, no-tillage vs. conventional fields.

Soil Fertility

- Acknowledgement of the importance of the manure work due to the increasing number of large livestock operations in west central and western Minnesota.
- 'Magic products' Time and money to test to prove or disprove.
- How does N management affect sugarbeet quality? Are beets that are turning color in August more susceptible to CLS?
- 3rd party N recommendations. Compare Ag-Vice or Centrol recommendations to university N recommendations
- N Modeling software such as Climate Corp. What are they saying and are there recommendations consistent with university recommendations?

Off-Target Pesticide

- Mike suggested we write a technical bulletin on tank-cleanout including tank-cleaners
- There was an inquiry if the tin fungicides damaged soybean. John indicated fungicides are used in soybean for certain diseases.

Drainage

- Education about tile drainage. Use of lift stations.
- Lots of questions including cost, spacing and design
- Where does the water go? Does the community have a plan for disposing of excessive water?
- Does tile lift in the profile when the gates are closed?

Nematodes

- Why is the sugarbeet cyst nematode not a problem in MN and ND
- Continue to survey

- There certain places where there seems to be nematodes every year
- Model and develop thresholds for nematodes that are indigenous. Are they causing production challenges?

Media

- Do we need to spend money on the pocket guide each year, especially since we have an app?
- Let's print fewer pocket guides
- NDAWN. NDSU needs more staff to meet the needs for NDAWN due to programming and data security challenges.
- Satellite technology not affected by cloud cover.