

Sugarbeet Technical Needs for 2019 Season
Holiday Inn and Convention Center, Fargo, ND
November 14, 2018

1. Sugarbeet leaf diseases. Cercospora leaf spot. CLS was a significant production challenge in each COOP. Spray program was providing CLS control until Labor Day, when sugarbeet plants began to lose their color
 - a. Need for continued / improved baseline sensitivity testing, i.e. 2018 crop and 2018 samples submitted to the lab and 2019 recommendations. Evaluate and clarify resistance scales, i.e. is >10 truly resistant to triazoles.
 - b. Systems approach to control. Need to test varieties and chemistry in a systems approach. Base trial variety close to commercial production (4.5 KSW or lower). Use cultural-based best practices.
 - c. Continue the development of molecular tools for resistance identification and quantification. In-field and in-season quantification.
 - d. Need to continue to source local populations of inoculum for in-field research experiments.
 - e. Tank-mixes incorporating all labeled chemistry classes. Test compatibility of mixtures.
 - f. Evaluate products for accelerated registration in sugarbeet. Screen non-labeled products; think outside of the box.
 - g. Evaluation of new biologicals for CLS control in sugarbeet. Combine use of biologicals with chemistry or a systems approach for CLS control in sugarbeet.
 - h. Alternative CLS control options. Cultural practices such as plowing, crop buffers on boundaries to reduce spore movement
 - i. Spray quality research. Water volume, nozzles and spray pressure to optimize efficacy. Determine rain fastness and fate of product following rain. Does adjuvant provide greater rain fastness? How do we correctly position sticker/spreader with protectant and/or systemic-based fungicides? There is data from Michigan indicating 'MasterLock' adjuvant improves plant coverage. How do adjuvants binds ai and cuticle?
 - j. Reevaluation of current CLS Prediction Model. Are the assumptions that went into the model realistic in today's environment. Is CLS developing earlier or at lower air temperatures? Compare to other commercially available algorithms.
 - k. Need to determine if there is an active ingredient or other treatment effective on spores. This would be applied at harvest or after harvest to reduce spore survival.
 - l. Determine if there a CLS transgenic event that we may potentially register in sugarbeet?
 - m. Spore trap. Collect spores to determine product sensitivity.
 - n. Integration and evaluation of chemosensitization and RNAi into a management program.
 - o. Screen other approaches; evaluation of SAR and ISR compounds.
 - p. Layby product in one year for control of CLS the following year.
 - q. Does age of the sugarbeet influence CLS development / severity?
 - r. Drones/reflectivity to forecast CLS. Early-season detection methodologies via UAVs
 - s. Does time of day application make a difference? Is there a difference in CLS control with day and night application?
 - t. Does in-season defoliation between rows improve CLS control?
 - u. Does bordering fields improve CLS control? Consider early / first sprays on borders in late June / early July depending on environment.
2. Sugarbeet leaf diseases, Alternaria.
 - a. Showing up in SMBSC and Ada area in ACS. Variety specific to date.
3. Sugarbeet root maggot. Larvae /maggots were observed earlier in the season than

expected. Conversation that the geographical area of infestation and overall population might be growing. Seed treatment did not work as effectively as in past seasons and growers are switching back to use of Counter insecticide.

- a. Evaluate new actives for root maggot control.
 - b. Evaluate varieties alone as compared with varieties with chemical for root maggot control
 - c. Are there neonicotinoid chemistry alternatives?
 - d. Are there organophosphate chemistry alternatives? Loss of Lorsban would be devastating.
 - e. There is evidence packing soils decreased root maggot larvae. Dr. Boetel indicated packed soils /field would not be the favorite environment for flies to lay eggs.
 - f. Evaluate timing of land preparation. Fall land preparation (grower) vs. spring land preparation (researcher).
 - g. GDD predication model. Does the model need a refresh? Model works well but can it be improved with new technology and predictive weather forecast?
 - h. Other insect pests discussed were lygus bug. Increased incidence of alfalfa near the dairy industry in west central Minnesota may have increase lygus bug infestation in sugarbeet. Lorsban and Asana are the most commonly used products for controlling lygus in sugarbeet.
4. Weed Management. Southern MN. Reduced canopy meant late season waterhemp escapes and plenty of seed production that will affect 2019 crops. Waterhemp continues to be the most important overall weed control challenge in sugarbeet. Common ragweed, kochia and lambsquarters follow.
- a. Need to develop a new postemergence product or a product to replace Betamix for postemergence pigweed control in sugarbeet.
 - b. Does PRE or PPI ethofumesate precondition glyphosate resistant weeds for increased control of pigweed?
 - c. Ethofumesate carryover to rotational crops. We completed an extensive experiment in 2018 but some are challenging the outcome of the rotational crop experiments. Redesign the experiment to apply ethofumesate on bare soil. Incorporate and observe carryover to wheat, corn and soybean.
 - d. Palmer amaranth. Continue the Nebraska experiments to prepare for Palmer amaranth in sugarbeet in eastern North Dakota and Minnesota.
 - e. Cultivation. Continue to evaluate cultivation in an integrated weed management system.
 - f. Adjuvants. Is HSMOC required in tank-mixes with oil and water-based products? Growers are using HSMOC based products, but they have a higher price point than other products.
 - g. There was Stinger carryover to soybean in 2018. What is the recommended Stinger rate and when is best application timing?
 - h. Create promotional and educational materials for alternating herbicide chemistries in crops grown in sequence with sugarbeet.
 - i. Demonstration plots to promote Liberty Link, Roundup and Xtend system in sequence with sugarbeet.
5. Root diseases in sugarbeet, Rhizomania
- a. Genetic resistance is working but there are only two genes, RZ1 and RZ2. We need to prepare for the future to be sure there are products when we need them.
 - b. Create methods for use of UAV to identify hotspots in fields.

- c. Determine if there is benefit from lime on Rhizomania vector.
- 6. Root diseases in sugarbeet Rhizoctonia. Rhizoctonia continues to be a struggle to control in some districts.
 - a. More interest with in-furrow application since farmers are selecting varieties with greater CLS resistant that are more rhizoctonia sensitive. There was conversation that seed treatments are not performing as well when paired with weaker genetics.
 - b. How does AZteroid in furrow compare with Quadris POST (and repeat POST) or seed treatment? Sentiment was there are production challenges with making two POST Quadris sprays.
 - c. AZteroid use with and without seed treatments. In place of seed treatment.
 - d. There was conversation about the FMC 3RIVE 3D system. Use the FMC system in-furrow for more effective use of the ai (as per system for insect control)?
 - e. Brassica species were discussed as an alternative management strategy for Rhizoctonia root rot control. There is literature that green manure from the Brassica spp. crops contain significant amounts of glucosinolate which in the presence of myrosinase hydrolyze into numerous compounds including isothiocyanates, which are structurally similar to the synthetic fungicide methyl isothiocyanate. In experiment, seeding previous cover crop with brown mustard (*Brassica juncea* L.) and crushing and incorporating brassica biomass into the ground at flowering stage gave 45% rhizoctonia control compared with bare soil.
 - f. Does spent lime effect vector?
 - g. Need a firm recommendation on rhizoctonia control. For example, with seed treatment when to spray Quadris?
 - h. Use of UAVs to monitor.
- 7. Root diseases in sugarbeet, Aphanomyces
 - a. Evaluate new seed treatment fungicides, alone and in combination with Tachigaren.
- 8. Root diseases in sugarbeet, Fusarium
 - a. Variety selection is working well.
- 9. Root diseases in sugarbeet, Erwinia
 - a. There may be more of it than we originally thought based on harvest chop stands
- 10. Production Challenges, identify ways to increase % sucrose
 - a. Does sulfur increase sucrose?
 - b. Role of cover crops in sugarbeet production system. There is evidence cover crops seeded at 6-8 leaf stage increased sucrose compared with no cover crops. Why? Is benefit related to soil fertility?
 - c. Role of sunlight. Is there a measurement of sunlight that can be correlated to sugar? What is the role of smoke / haze from Canada wildfires on sugar?
- 11. . Sugarbeet storage
 - a. What are the effects of CLS on storage (respiration & other losses)?
 - b. What are the effects of dehydrated beets in storage (respiration & other losses)
 - c. Sugarbeet storage enhancement (post-harvest or pre-harvest products)
- 12. Cover Crops / Soil Health. Develop a system for establishing cover crops to reduce erosion in the sugarbeet.
 - a. There is ongoing research to determine cover crop density to reduce erosion. There are many questions related to tillage / establishment. Do cover crops protect against foliar diseases?

- b. Create a cover crop system. Cover crops in corn or wheat fields leading into sugarbeet; cover crops in sugarbeet fields after harvest. Farmers are using complicated seed mixtures.
 - c. What affect do residual weed control programs have on establishing cover crops in-season? After harvest? For example, do soil applied herbicides used in sugarbeet or corn affect cover crops interseeded at the 6 to 8 leaf stage (sugarbeet) or (corn)?
 - d. Best rye varieties have better cold tolerance and stronger allelopathic characteristics.
 - e. Rye has allelopathic affects. Does that help or hurt beets?
13. Tillage
- a. Research combining strip tillage and cover crops. Conversation was large replicated strips vs. small plots used in previous research.
 - b. Do cover crops suppress weeds, waterhemp?
14. Equipment
- a. Need data to support claims from equipment manufactures. Evaluation of Active Down Force; evaluation of new JD Exact Emerge high speed planter; evaluation of new case Early Riser planter; ground-truthing of 20/20 Seed Monitor with E-set planter; evaluation of closing wheel options.
 - b. High speed planters?
 - c. SMBSC is looking for ways to get better stands on corn ground
15. Sprayer cleanout
- a. List of cleaners that work best for each active ingredient
16. Soil Fertility /Soil nutrient management / Soil Health. Increase use of manure in fields before sugarbeet since the onset of large dairies has create excessive amounts of manure. There are different types of manures, dairy, swine, turkey manure; liquid separation.
- a. Evaluation of deep-banded nutrient in row in precision ag systems.
 - b. Expand nitrogen side-dressing evaluation and education. Fertilize for 120 stand count and then side-dress for 180 beet stands.
 - c. Koch industry products – N stabilizer? Are N stabilizers beneficial (urea, anhydrous; spring application will be urea) when applied in fall?
 - d. Water quality from tiles. SMBSC well tiled. ACSC 10% tiled.
 - e. MN nitrogen rule. Affect of regulation on fall application of N in sugarbeet.
 - f. Products / methods / practices to ‘wake up’ beets under stress of sand syndrome
17. Sand syndrome and nematodes.
- a. Random, nearly impossible to research properly.
18. Nematodes
- a. Continue tare dirt survey
 - b. Establish economic thresholds for species identified in the RRV
19. Electronic communication
- a. Continue work on mobile app.