

Growing Sugarbeet in Minnesota and North Dakota

Thomas Peters

**North Dakota State University and
University of Minnesota**



UNIVERSITY OF MINNESOTA



NDSU NORTH DAKOTA
STATE UNIVERSITY

Peters, Bio

- Grew up on a dairy farm in central Minnesota
- Attend college at the Univ. of Minnesota, Univ. of Nebraska, and North Dakota State University
- Twenty-five years experience at Monsanto Company; biotechnology and regulatory
- NDSU Plant Sciences Department in 2014
- Position is a partnership between NDSU and UMN
- My research and outreach priorities are a systems approach to weed management in fields planted to sugarbeet



Ryan Buetow wins big money!

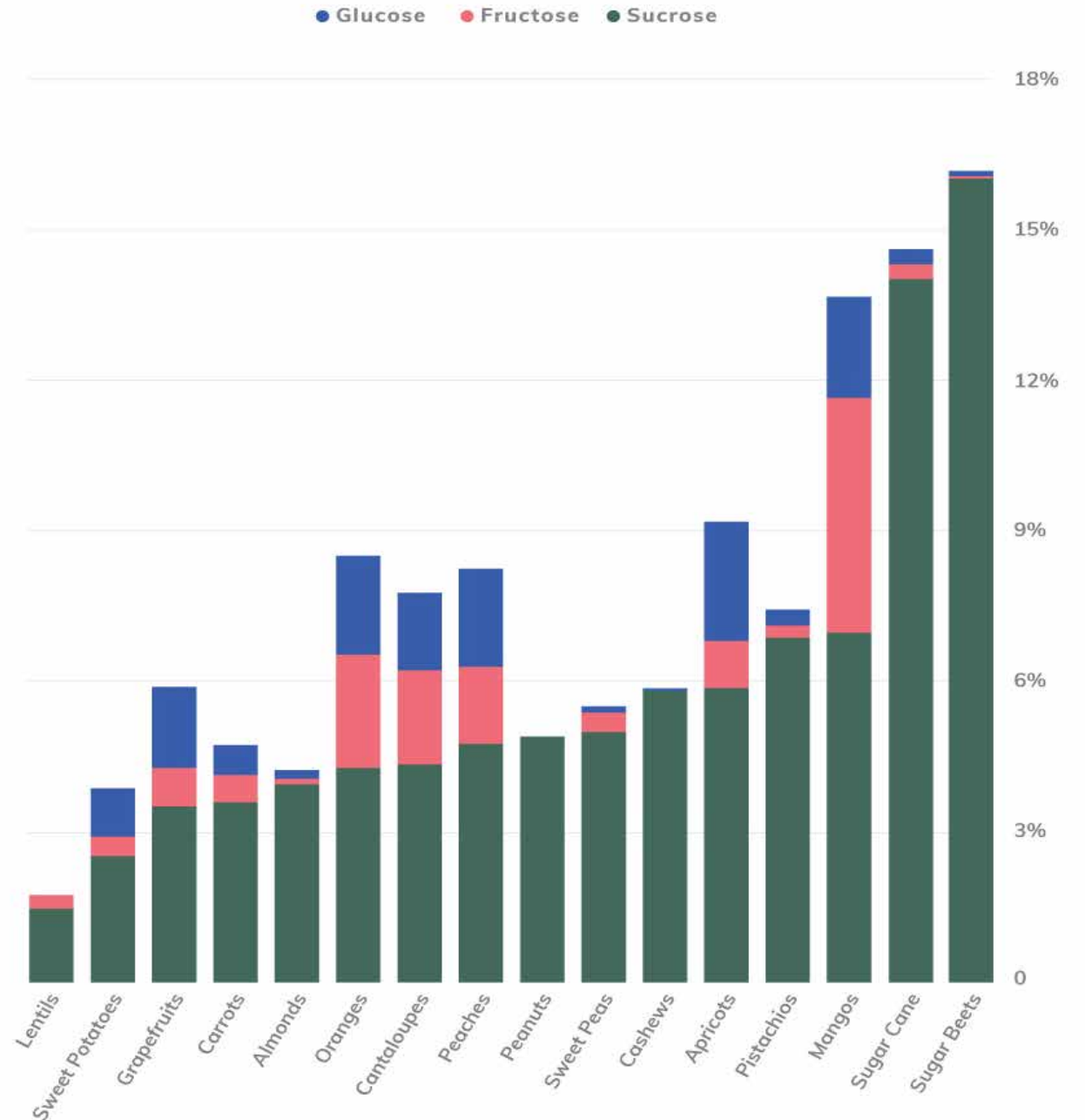
- Ryan bought a lottery ticket on a whim in June 2025
- Ryan has dreamed of farming. So he bought 1,000 acre farmland
- Ryan has heard Peters speak about sugarbeet and was fascinated... and decided he will become a sugarbeet farmer using his new found prosperity
- Presentation is about starting with sugarbeet as it is different from other commodities
- Production challenges with growing sugarbeet



Sugar/sucrose occurs naturally in fruits, vegetable, and nuts

- All green plants make sugar during photosynthesis
- Sugarbeet and sugar cane have the greatest quantity of sugar

Source: USDA ARS Nutrient Data Laboratory, Food Composition Database.



Sugarbeet acreage....not that much

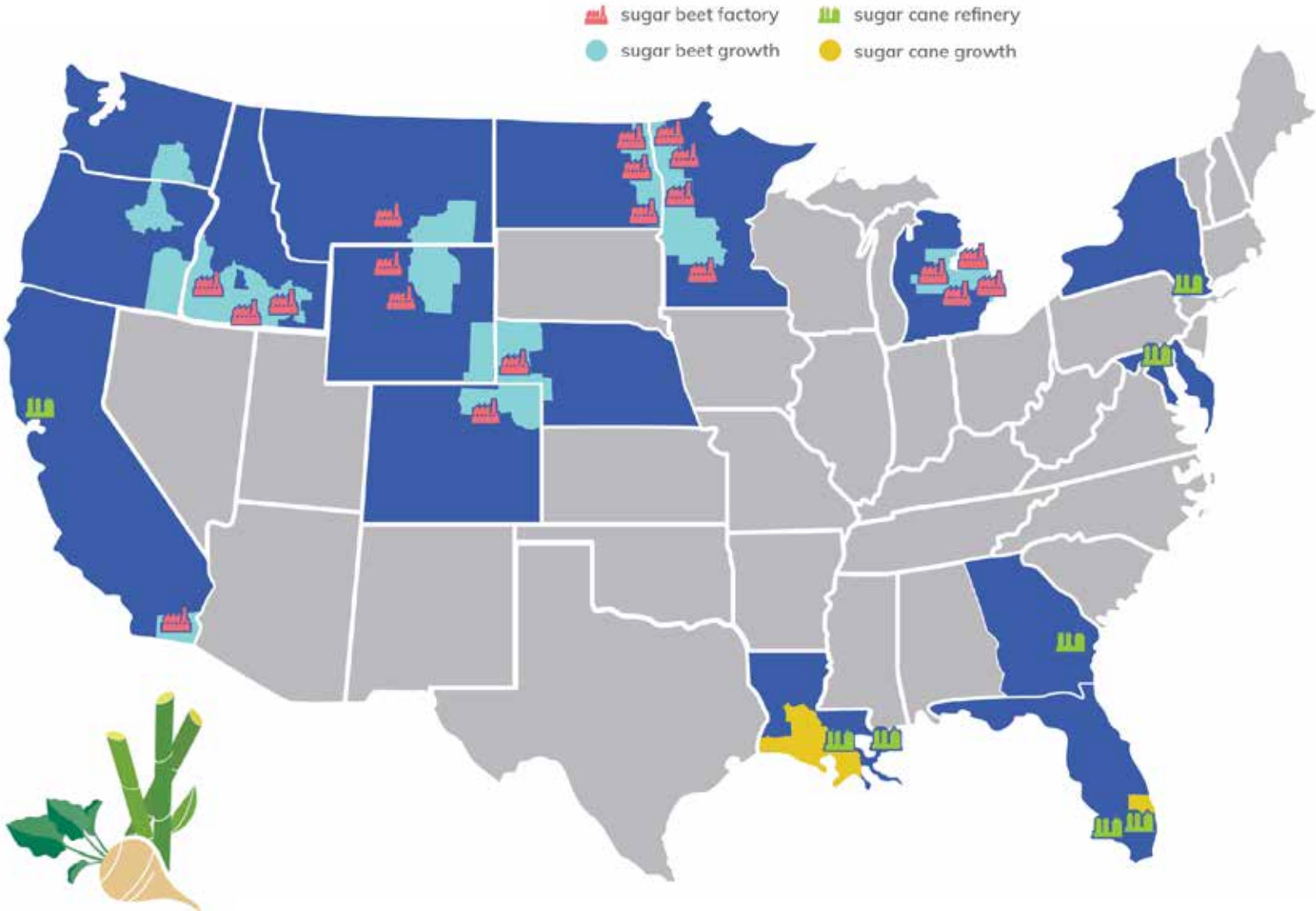
Planted acreage

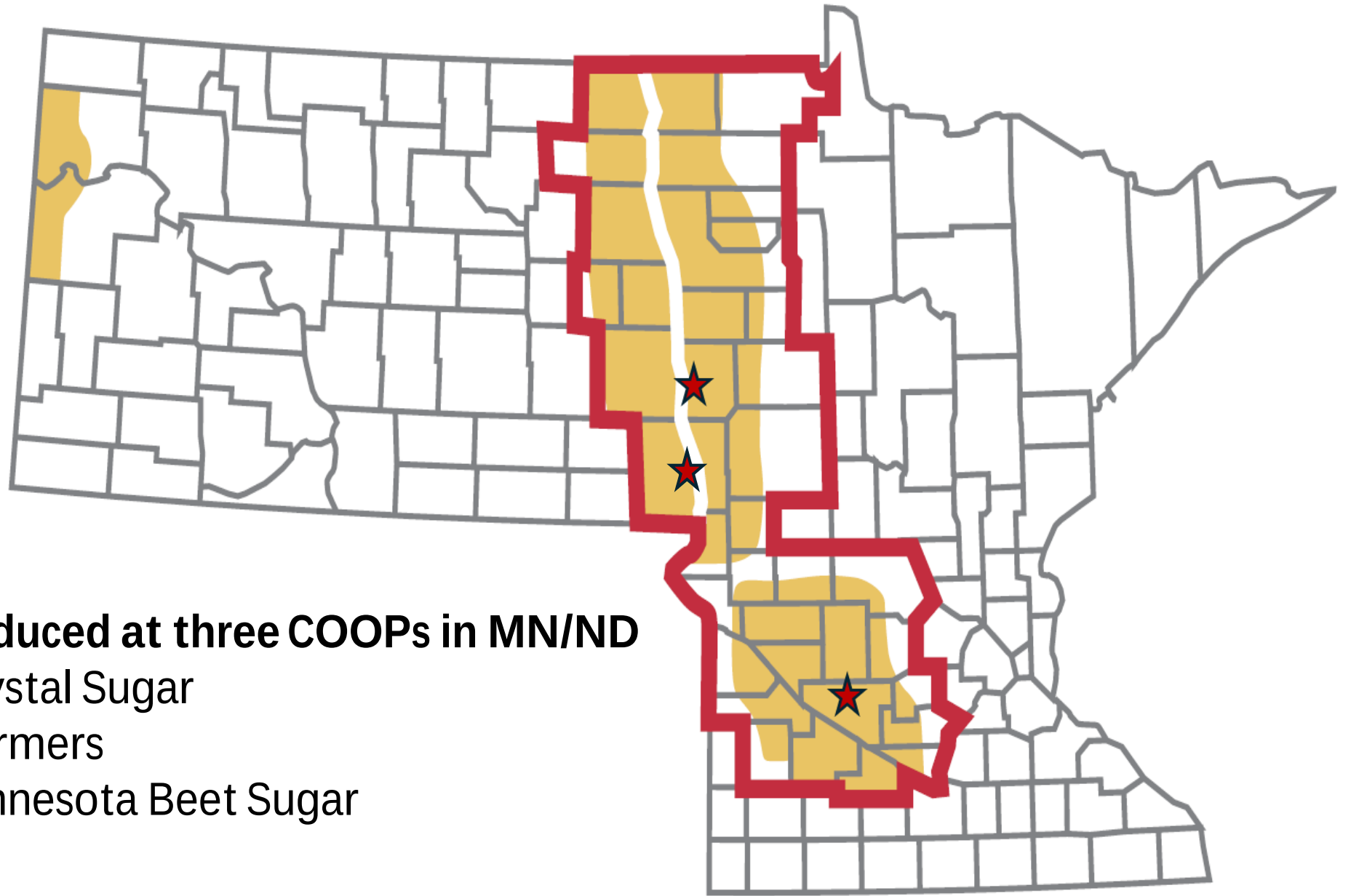
• Sugarbeet	1,162,800
• Wheat	46,743,000
• Corn	92,692,000
• Soybean	87,555,000



Sugarbeet production across the nation

State	Planted Acres
Minnesota	420,000
North Dakota	214,000
Idaho	167,000
Michigan	144,000
Nebraska	46,100
Montana	42,900
Wyoming	32,100
Colorado	29,400
California	24,800
Oregon	9,100
Washington	1,800





Sugarbeet produced at three COOPs in MN/ND

- American Crystal Sugar
- Minn-Dak Farmers
- Southern Minnesota Beet Sugar

What is a Coop?

- A farm, business, or organization that is owned and run jointly by its members,
 - share the profits or benefits
- There are 7 sugarbeet cooperatives in operation across the United States

Minn-Dak Farmers' Coop,
Wahpeton, ND



Benefits of the Co-op Ownership Model

A COOPERATIVE

1. Purpose is to provide a service to its members.
2. A union of persons.
3. Its control is democratic; each member has one share and therefore one vote regardless of their patronage level.
4. Ownership is in the hands of its members in the community who use the service.
5. Shares are held in name of members only and are not traded for speculation.
6. Any surplus is proportionally distributed to members according to their volume contributed.

OTHER BUSINESSES

1. Purpose is to generate profits for investors.
2. A union of capital.
3. Control is not equal; it is based on the number of voting shares held.
4. Ownership is in the hands of investors who may be located in another community, province or country.
5. Shares may be freely traded and fluctuate in value.
6. Any profits are distributed to owners according to their shares owned.

Capper – Volstead Act

- 2025 marked the 103rd anniversary of the Capper-Volstead Act
 - Senator Arthur Capper (R-KS)
 - Rep. Andrew Volstead (R-MN)
- The act authorized agricultural producers to form voluntary cooperative associations for purposes of producing, handling, and marketing farm products
- Relieved farmers of the Sherman Antitrust Act of 1890
- One of the most important agricultural laws ever passed for farmers

Capper – Volstead Act

- **Two main benefits:**
 - It provided limited antitrust immunity to farm coops
 - It enabled farmers to come together and collectively set a price for their production
- In order to be exempt from antitrust laws:
 - All voting members must have production
 - A coop must have one-member one-vote rule or limit amounts of dividends paid to 8 percent
 - More than half of the production that is collectively bargained must come from members themselves
- Enables farmers to have a MUCH larger market presence

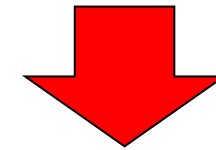
United Sugar Producer & Refiners

- Formed in 1994, United Sugars Corporation (rebranded as USPRC with the addition of Savannah Refinery) is a marketing cooperative currently supplying approximately 40% of the total U.S. sugar demand
- Products include:
 - Granulated Sugar
 - Brown Sugar
 - Powdered Sugar
 - Liquid Sugar



Midwest Agri-Commodities

- Midwest Agri markets, distributes, and finances well over 1.5 million tons of solid and liquid sugar beet products a year to North, South and Central America, along with European, African, and Asian countries
- Products include:
 - Beet Pulp Pellets
 - Beet Pulp Shreds
 - Beet Molasses
 - Raffinate
 - Betaine



MIDWEST AGRI



The Sugar Program

- The U.S. sugar program is designed to stabilize the domestic sugar market and support American sugar producers
- The overall goal of the program is to support the income of sugar producers while balancing the needs of consumers and maintaining a stable market
- The Sugar Program (policy) is contained in legislation known as the Farm Bill, which comes up for reauthorization every five years
- Critics of the program argue that the Sugar Program can lead to higher prices for consumers and inefficiencies in the market

How do I become a member of a Sugarbeet Coop?

- Must be involved in production
 - Purchase Shares
 - Lease/Rent Shares
- Responsibility of membership
 - Policies
 - Procedures
 - Stewardship
- Annual Requirement
- Grower Agreement
- Assigned an Agriculturist

ANNUAL 2021 REQUIREMENT

Between _____ (Grower)

Address _____ Zip _____

and

MINN-DAK FARMERS COOPERATIVE

The grower agrees to plant within the planting tolerance established by the Board of Directors to represent _____ shares of class A stock owned and/or leased by the grower. Acres to be planted are on the following described lands:

Contract Number	Receiving Station	Acres	Legal Description
_____	_____	_____	Quarter, Sec. _____, Twp. _____ County _____ State _____
_____	_____	_____	Quarter, Sec. _____, Twp. _____ County _____ State _____
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_____	_____	_____	Quarter, Sec. _____, Twp. _____ County _____ State _____

No agent of Minn-Dak Farmers Cooperative has any authority to change waive, or modify any of the terms or provisions of this annual requirement; and this requirement when signed, becomes an integral part of the Growers Agreement previously entered into between the grower and Minn-Dak Farmers Cooperative.

By _____ Grower _____
Minn-Dak Farmers Cooperative

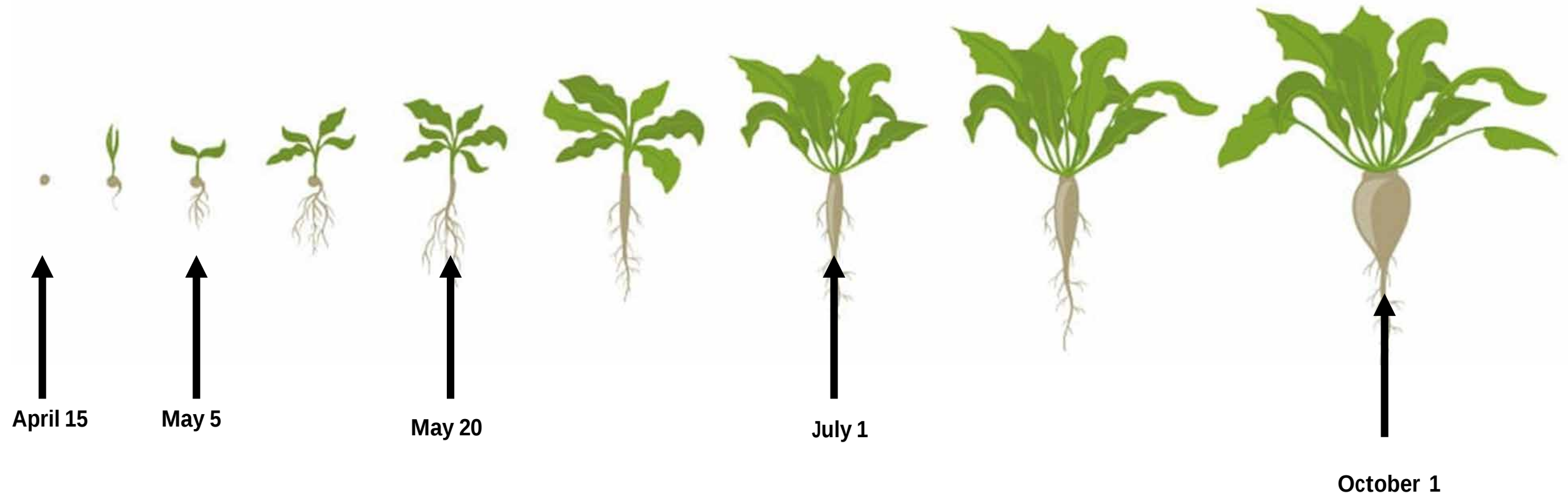
Dated _____ Grower _____

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Shares are bought and sold

- I checked with a broker and found ACSC shares traded from \$3,800 to \$4,400 per share this winter
- A share provides the opportunity to grow one acre of sugarbeet

Growing sugarbeet



Crop sequence across region and Cooperative

Sugarbeet production in Minnesota and North Dakota

South – Southern Minnesota Beet Sugar Cooperative

- Corn, soybean, corn, sugarbeet – most common
- Soybean, corn, corn, sugarbeet – second most common

Mid – Minn-Dak Farmers Cooperative

- Corn, soybean, corn, sugarbeet

North – American Crystal Sugar Company

- Corn, soybean, wheat, sugarbeet
- Wheat, soybean, wheat, sugarbeet
- Wheat, wheat, sugarbeet

Production Topics

- Sugarbeet stand
- Weed management
- Soil-borne and foliar disease control
- Nurse and cover crops

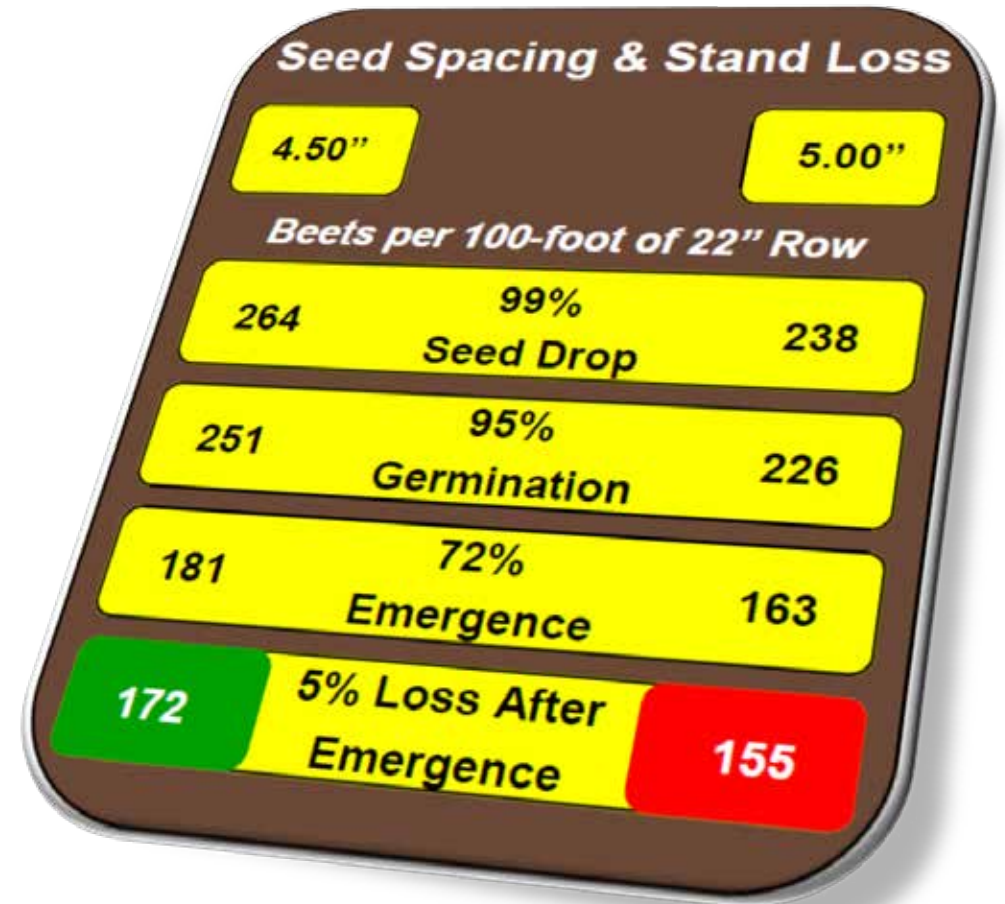




Target is 150 to 200 plants per 100 feet row. Seeding at 5-inch spacing does not equate to acceptable stands

22-inch rows (23,760 foot of row per acre)

- Planting - 4.5 inches (63,360 plants per acre)
- Harvest - 180 Beets per 100 Foot of Row (42,240 plants)



Planting protocol

- Fall chisel plow and nitrogen application
- May have fall secondary tillage
- Spring phosphorus, nurse crop and final tillage
- Plant sugarbeet 1.00 to 1.25 inch deep the same day as tillage



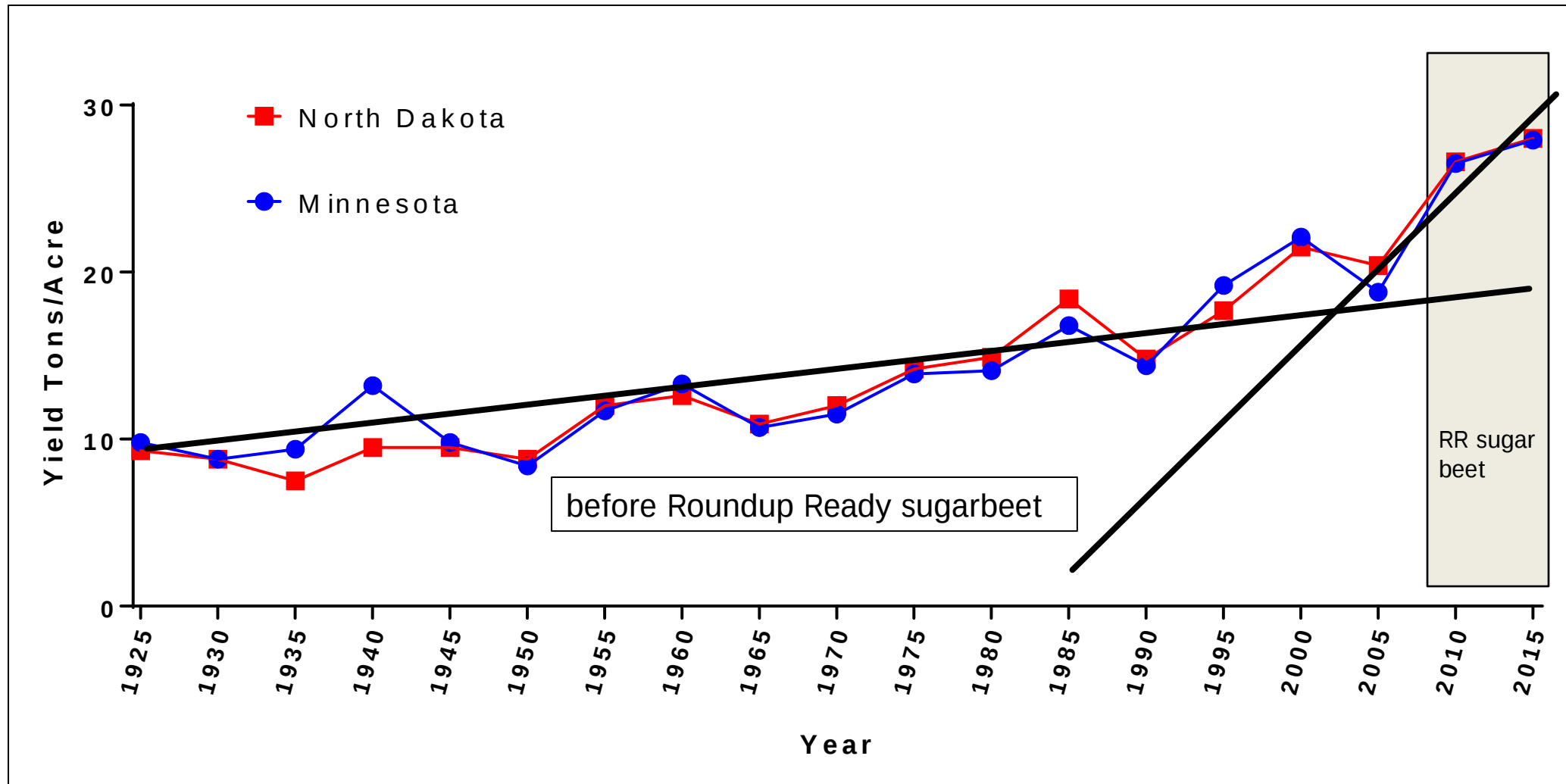
Micro-Rates

- Mixtures of three or four products
- Application at sublethal rates
- Application on 5 to 7 day intervals
- 3, 4, or 5 POST applications

✦ AI Overview

The "micro-rate" system for sugarbeet herbicide application, developed by Dr. Alan Dexter at North Dakota State University, is **a program designed to maximize weed control while reducing herbicide costs and crop injury**. The program uses low rates of herbicides in combination with a methylated seed oil (MSO) adjuvant, applied multiple times.  Journal of Plant Protection Research

Sugarbeet yield across years, 1924 to 2015



USDA-NASS data, 1924 to 2015

Weed control challenges in sugarbeet

Development new herbicides

- 14 unique herbicides
- 21 total herbicides
- 9 unique actives
- 8 SOA
- 1 is being phased out (Betamix)
- 1.1 million acres...and decreasing



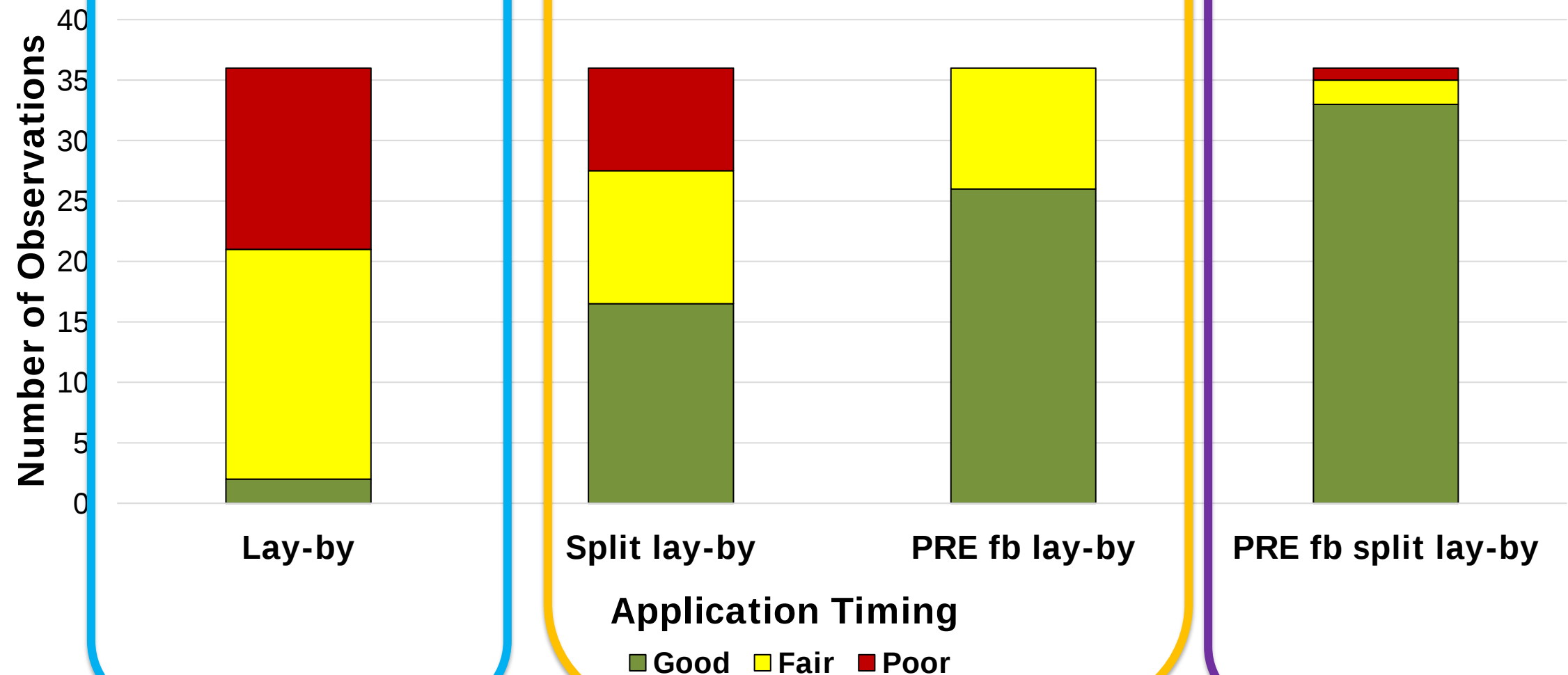
Effective weed control in the crop sequence is required to control weeds in sugarbeet

Acres glyphosate resistant waterhemp identified as the most important weed control challenge in sugarbeet

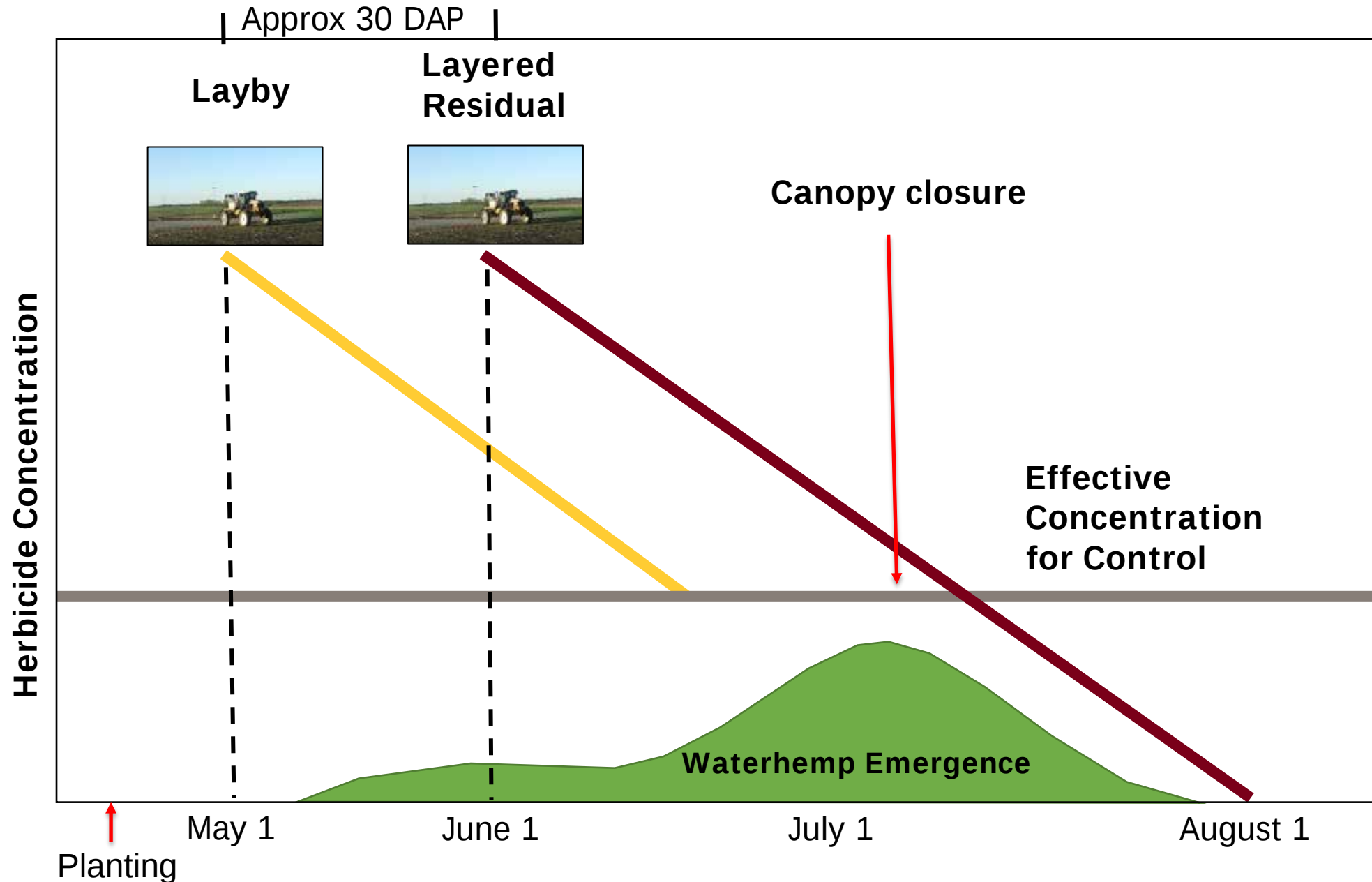
Year	Total sugarbeet acres	Waterhemp acres	% waterhemp acres
2011	693,700	76,300	11
2013	676,200	87,900	13
2014	642,900	231,400	36
2018	610,000	256,200	42
2019	635,000	373,100	59
2023	624,658	381,163	61
2025		451,888	71



Waterhemp control across application timing, summed across herbicides, locations and years



Layered Herbicide Concept



Peters' is proposing...

Herbicide	Previous Rate	Suggestion for 2026	Maximum use rate	Application timing
	fl oz/A	fl oz/A	fl oz or pt/A	Sgbt stage
Outlook / Outlook	12/12	16 to 21	24	12-If
S-meto / S-meto	16 / 16	20 to 24	2.6 ^a	60d PHI
Acetochlor/ acetochlor ^b	40 to 48 / 40 to 48	48 to 64	8	8-If

^aPOST maximum use rate. Dual Magnum applied in the fall or PRE is incremental

^b Warrant or Enversa

I also am considering Zidua (not labeled in sugarbeet) and Treflan layby in sugarbeet

Cercospora leaf spot of sugarbeet

Fungal disease caused by *Cercospora beticola*

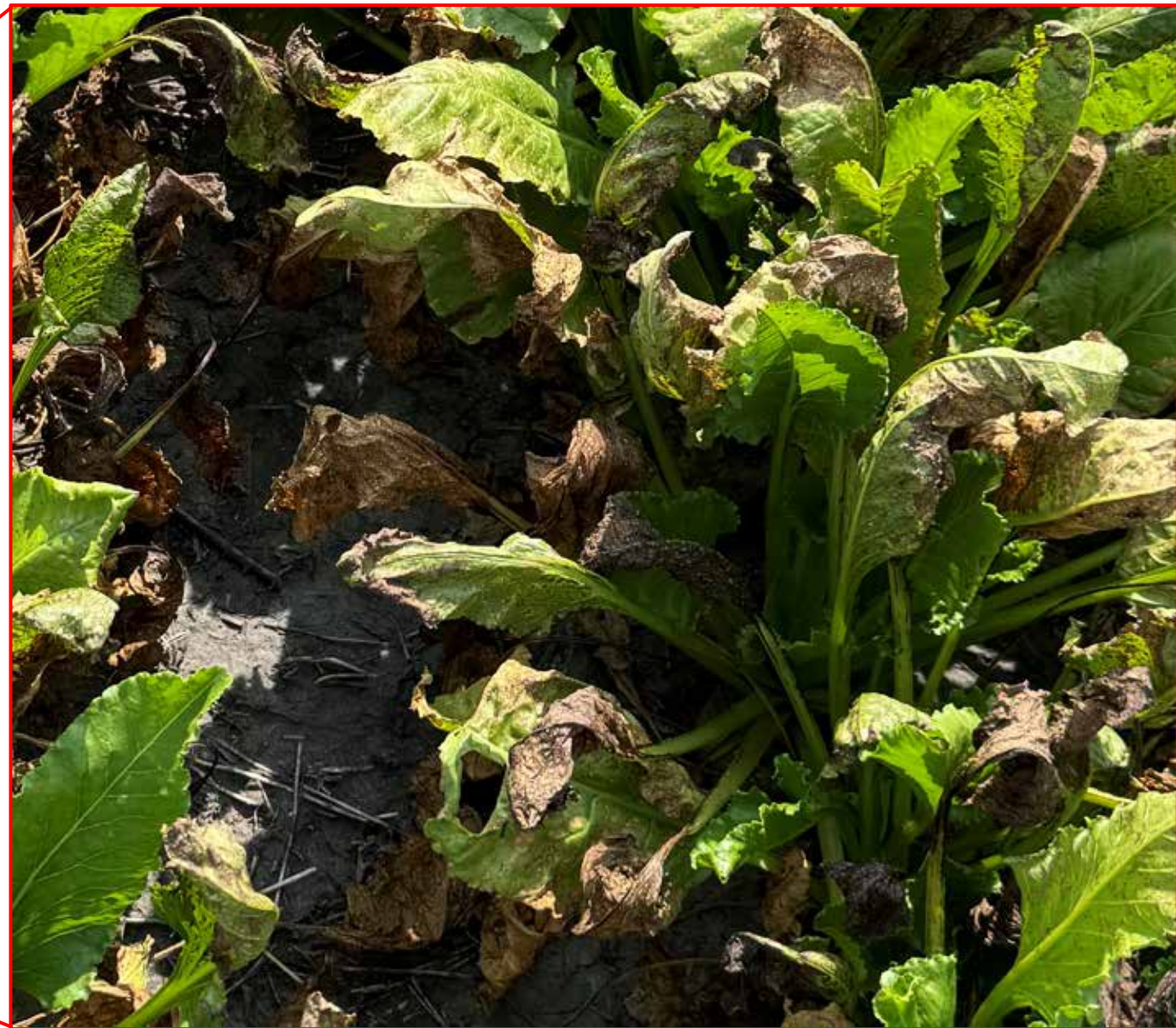
Symptoms:

- Circular spots 1/8" – 3/16" diameter
- Light to dark tan centers, brown or purple borders
- Spots may overlap veins





Photos: M. Khan, E. Branch





Current best practices for CLS fungicides

1. Initiate fungicide program prior to symptom development (at or before row closure)
2. Tank mix multisite partners – two or more active ingredients every time
3. Keep intervals between applications at approximately 10-14 days
4. Ensure adequate spray coverage (medium droplet size, 20 gallons per acre)



Current best practices for CLS fungicides

Tank mixing combines modes of action to reduce risk of fungicide resistance developing in *C. beticola*

one of these “heavy lifters”	plus a “tank mix partner”
Tin (tri-phenyl tin hydroxide, FRAC 30)	Benzimidazole (FRAC 1)
DMI (“-azole”, FRAC 3)	EBDC / mancozeb (FRAC M 03)
*QoI (pyraclostrobin, FRAC 11)	Copper (FRAC M 01)
Rotate among “heavy lifters” for 5-7 total applications late June-September	



Spring 2017, east of Moorhead on I-94

Wheat seeded as a spring seeded nurse crop with sugarbeet, Wilkin County, 2014



- Spring seeded oat, wheat or barley
- 1/3 to 2/3 bushel per acre
- Terminate nurse crops at the 4- leaf stage
- Beets don't compete with grass crops
- Small-grains carcasses protect beets after termination



The Effect of Timing of Wheat Cover Crop Removal on Sugarbeet Yield and RSA, Peters et al., 2015 – SBREB 46:34-40

Sugarbeet stage at wheat termination (# of leaves)	Wheat height at termination (inches)	Yield (tons/Ac)	RSA lbs/Ac
No cover crop	n/a	35.3 ab	11,051 ab
2	2	36.0 a	11,253 a
3	4	36.6 a	11,173 ab
4	6	35.5 ab	10,929 abc
5	8	33.8 b	10,373 c
6	10-12	34.0 b	10,644 bc
LSD (0.10)		1.6	542

Fall Seeded Cover Crop Ideas



80 ft intervals



Cereal rye broadcast at 15 lb/a with fertilizer



Seeded diagonally

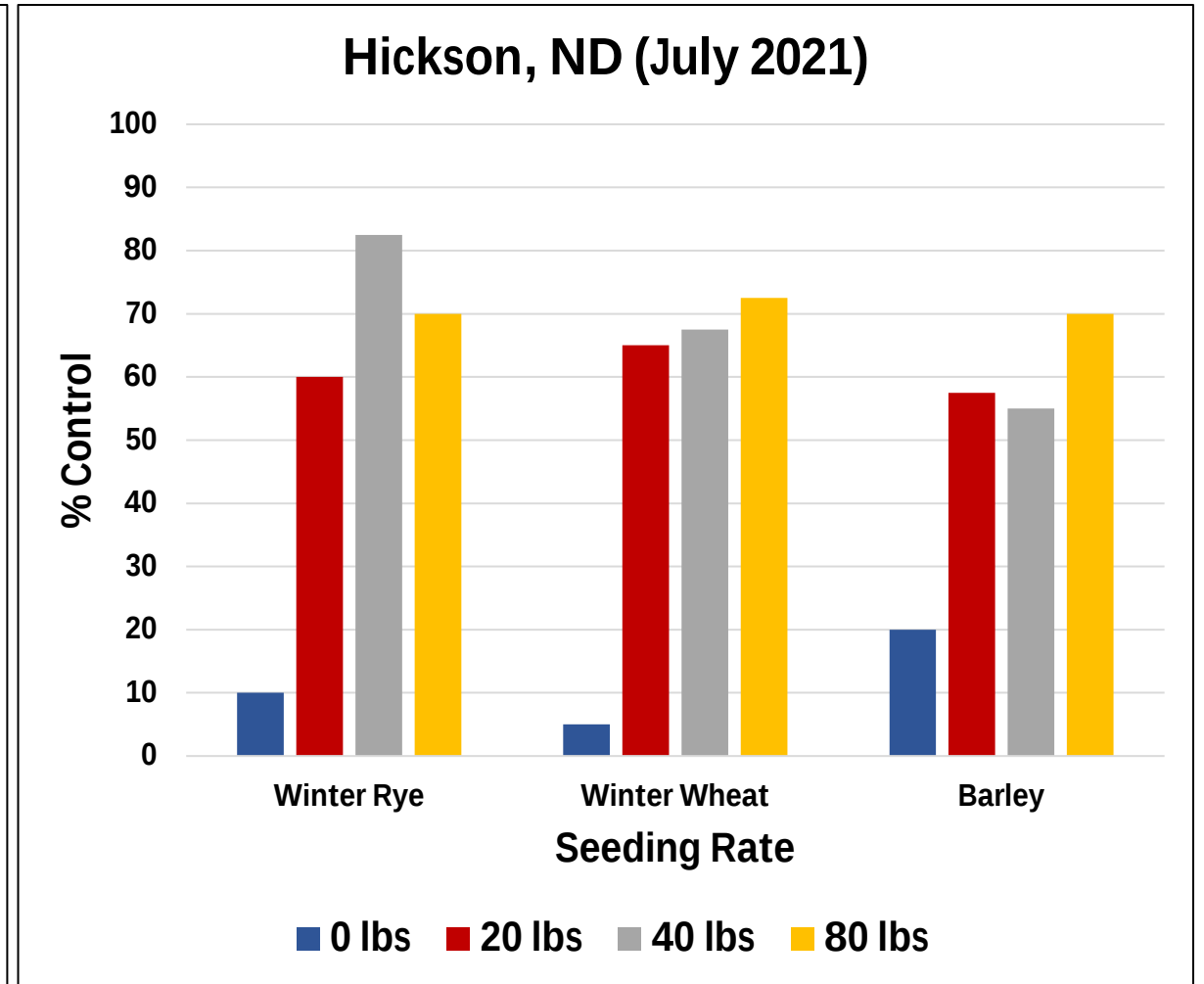
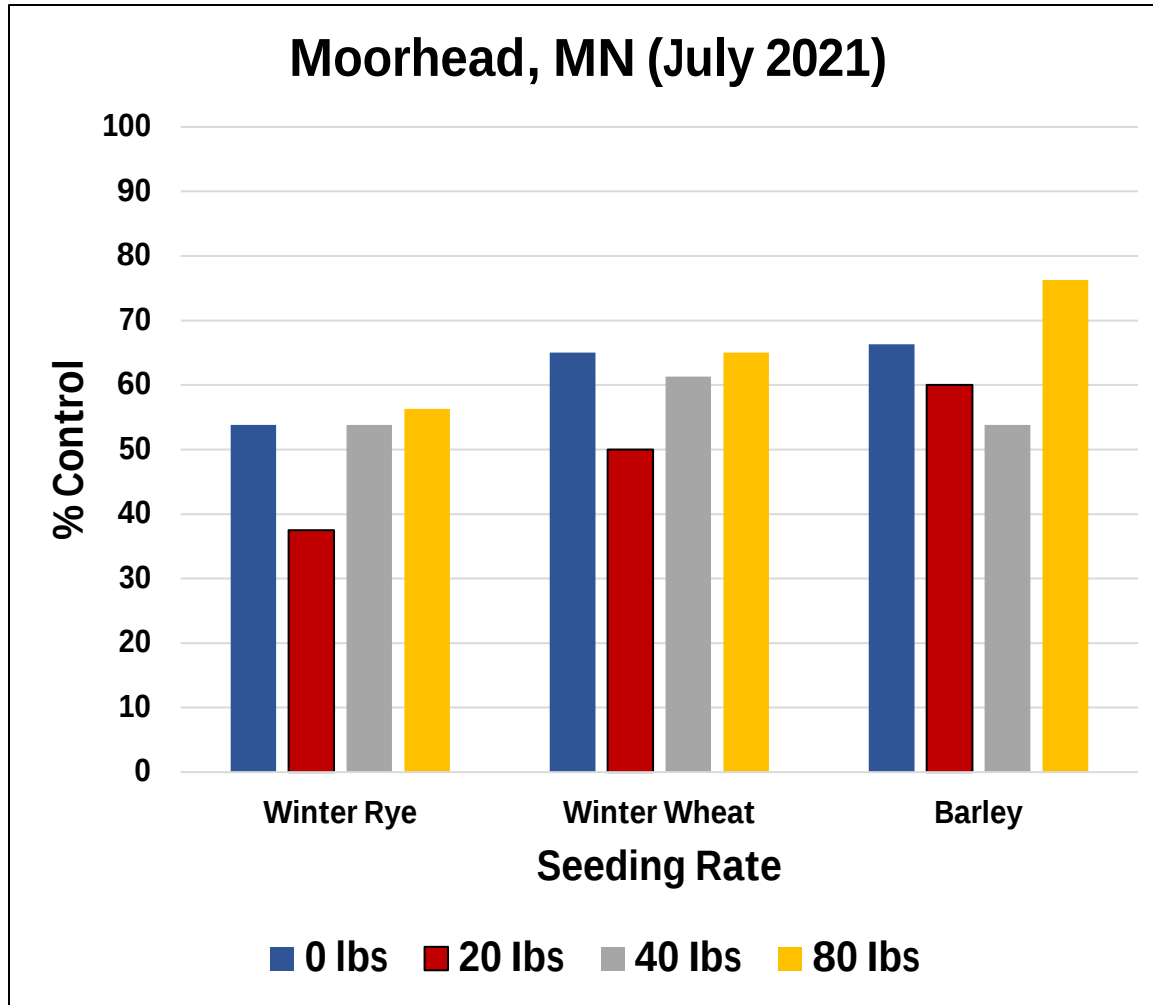


Seeded in Fall in-between rows

Can fall-seeded cover crops integrated with herbicides suppress waterhemp? Some evidence, but not at seeding rates in soybean.



Visible Percent Waterhemp Control



Thank you for your continued support

Tom Peters

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