



November 2023

Dear ACSC Sugarbeet Grower:

The 2023 official coded variety performance trials included 13 yield trials and 10 disease nurseries planted at a total of 18 sites by American Crystal Sugar Company (ACSC). Seven additional disease/insect nurseries were planted by third party cooperators. Thanks are extended to the dedicated Technical Services staff involved in the official trial plot care, harvest, and data analysis.

### Results

Results from the Official Variety Trial sites were excellent overall. Planting dates were around ten days later than typical but stands in the trials were good at most locations. Eleven sites were used for variety approval calculations. The Averill site was abandoned due to very poor stand establishment from soil crusting. Several sites had moisture stress during the growing season, but rainfall toward the end of the growing season created some challenging harvest conditions. Wet, heavy soil along with some smaller roots at Humboldt, MN resulted in some harvest loss which increased variability and reduced reliability of the data, so results from Humboldt were not used in approval numbers. Rhizoctonia crown and root rot was minimal in 2023. Revenue calculations in 2023 are based on a hypothetical \$50.09 payment (5-year rolling average) at 17.5% sugar and 1.5% SLM not considering hauling or production costs.

Fusarium ratings are from naturally infested sites at Moorhead and Sabin, MN. Rhizoctonia crown and root rot ratings are from inoculated nurseries at Crookston and Saginaw, MI (BSDF). Aphanomyces root rot ratings are from the naturally infested nursery at Shakopee (KWS), MN. The Red River Valley sites were too dry to develop Aphanomyces disease pressure. As a result, there are no yield results under Aphanomyces conditions for 2023. Cercospora leafspot ratings are from inoculated nurseries at Foxhome and Randolph (KWS), MN and Saginaw, MI (BSDF) as well as a non-inoculated nursery at East Grand Forks, MN. Cercospora ratings from all four sites were highly correlated, but ratings from Randolph (KWS) were not included in approval numbers as hail damage put an end to the plot in late July before severity of disease could increase. Root aphid ratings are from a greenhouse assay at Shakopee, MN (KWS). The Longmont, CO root aphid nursery (Magno) had high rainfall and soil moisture resulting in little to no root aphid pressure.

2023 harvest conditions were challenging at some locations, but beets dug well at most locations. Soil moisture levels were dry at the beginning of harvest, but widespread rainfall in late September made conditions more difficult at later harvested sites. Wet, heavy soil conditions at Humboldt would not allow the lifter to dig deep enough to get smaller roots present at that site leading to harvest loss.

The 2023 data have been combined with previous years' data and results are enclosed. Bolter data is presented as the number of bolters observed at a location for each variety. Results for the yield trials from individual sites are available on the internet.

Conventional trials were not planted in the 2023 OVT trials. Conventional varieties that were approved for 2020-2023 sales are permitted to continue in 2024 sales.

These results and additional information for individual growing sites are available on the World Wide Web at [www.crystalsugar.com](http://www.crystalsugar.com). More detailed information will be available later in the Sugarbeet Research and Extension Reports ([www.sbreb.org](http://www.sbreb.org)). Additional data including individual yield trial results and agronomic procedures are also on the ACSC web site.

### Attached are the following pages of information:

1. List of varieties approved for sale to ACSC growers
2. Multi-year performance of RR varieties from all sites
3. Performance of RR varieties under Aphanomyces conditions (data only from 2020)
4. Performance of conventional varieties from three sites (2017-2019)
5. Disease ratings for all nurseries (varieties tested in 2023)
6. Root Aphid rating/evaluation
7. Trial sites, disease observations and agronomic information from all trial locations
8. Seed treatments applied to seed used in the official coded variety trials

## Plot Procedures

Yield trials were planted to stand at 4.5 inches. Starter fertilizer (10-34-0) was applied in-furrow (3 GPA in 6 GPA total volume) in all yield trials. Plots were planted crosswise (90°) to the cooperators' normal farming operations, where possible. Plot row lengths for all official trials were maintained at 46 feet with about 40 feet harvested (25 feet harvested at Climax due to removal of gaps from a planter malfunction). Planting was performed with a 12-row SRES vacuum planter. The GPS controlled planter gave good single seed spacing which facilitated emergence counting. Seed companies had the option of treating seed with an Aphanomyces seed treatment, insecticide and a Rhizoctonia seed treatment fungicide. Emergence counts were taken on 24 feet of each plot. Multiple seedlings were counted as a single plant if they emerged less than one inch apart. The stands in all yield trials were refined by removing doubles (multiple seedlings less than 1.5 inch apart) by hand but were not further reduced.

Roundup Powermax 3 with Class Act (surfactant) and full rates of fungicides were applied using a pickup sprayer driven down the alleys. Two applications of Roundup (25 oz) were made at the 2-4 and 6-10 leaf stages. A third application of Roundup (20 oz) was made at Reynolds and Foxhome at row closure. Hand weeding was used where necessary. All yield trials were treated with AZteroid in-furrow at planting (5.7 oz) and Quadris in a band during the 6-10 leaf stage (10 oz) for Rhizoctonia control. Treatments used for Cercospora control in 2023 included Inspire XT/Manzate Max, Agri Tin/T-Methyl, Proline/Manzate Max, Manzate Max, and Priaxor/Agri Tin. Ground spraying was conducted by ACSC technical staff using 20 GPA and 75-80 psi.

Roundup Ready varieties with commercial seed were planted in four-row plots with six replicates. The RR experimental entries were planted in two-row plots with four replicates.

All plot rows were measured for total length after approximately 3.5 feet at each end were removed at the end of August, with skips greater than 60 inches being measured for adjustment purposes. Harvest was performed with one custom six-row harvester with increased cleaning capacity. All harvested beets of each plot were used for yield determination while one sample (approximately 20 lbs) was obtained from each plot for sugar and impurity analysis. Quality analysis was performed at the ACSC Technical Services quality lab in Moorhead.

Varieties were planted in nurseries in Minnesota, Michigan, and Colorado to evaluate varieties for disease and insect susceptibility. ACSC adjusts the Cercospora, Aphanomyces, Rhizoctonia and Fusarium nursery data each year to provide a consistent target for variety approval criteria.

*Before purchasing seed, please check to make sure the varieties you are buying are on the **current approved list**. In accordance with the grower contract, the cooperative has the option to refuse beets of a non-approved variety. If you have questions, please contact the ACSC Technical Services Center or your ACSC Agriculture Department.*

Sincerely,



Jason Brantner  
Official Trial Manager



Alec Deschene  
Beet Seed Analyst



Jon Hickel  
Official Trial Supervisor



Nick Weller  
Official Trial Coordinator

Attachments

Table 1. Varieties Meeting ACSC Approval Criteria for the 2024 Sugarbeet Crop

<b>Roundup Ready®</b>	<u>Full Market</u>	<u>Aph Spec</u>	<u>Rhc Spec</u>	<u>High Rzm</u>	<b>2019 Conventional</b>	<u>Full Market</u>	<u>High Rzm</u>
BTS 8018	Yes	Yes		Hi Rzm	Crystal R761	Yes	Hi Rzm
BTS 8034	Yes	Yes		Hi Rzm	Crystal 620	Yes	Hi Rzm
BTS 8156	Yes	Yes		Hi Rzm	Crystal 840	Yes	Hi Rzm
BTS 8205	New	New	New	Hi Rzm	Crystal 950	Yes	Hi Rzm
BTS 8226	New	New	New	Hi Rzm	Hilleshög HM3035Rz	Yes	Rzm
BTS 8242	New			Hi Rzm	SX 8869 Cnv	Yes	Hi Rzm
BTS 8270	New	New		Hi Rzm	SV 48777	Yes	Hi Rzm
BTS 8927	Yes	Yes		Hi Rzm			
Crystal 022	Yes	Yes	Yes	Hi Rzm			
Crystal 130	Yes	Yes		Hi Rzm			
Crystal 137	Yes	Yes		Hi Rzm			
Crystal 138	Yes	Yes	Yes	Hi Rzm			
Crystal 260	New	New	New	Hi Rzm			
Crystal 262	New	New	New	Hi Rzm			
Crystal 269	New	New		Hi Rzm			
Crystal 793	Yes	Yes		Hi Rzm			
Crystal 912	Yes	Yes	Yes	Hi Rzm			
Crystal 913	Yes	Yes		Hi Rzm			
Hilleshög HIL2317	Yes	Yes+		Hi Rzm			
Hilleshög HIL2366	Yes			Rzm			
Hilleshög HIL2368	Yes		Yes	Hi Rzm			
Hilleshög HIL2386	Yes		New	Hi Rzm			
Hilleshög HIL2389	Yes	Yes		Hi Rzm			
Hilleshög HIL2441	No	New	New	Hi Rzm			
Hilleshög HIL2442	New		New	Hi Rzm			
Hilleshög HIL2487 (MA942)	New	New		Hi Rzm			
Hilleshög HIL9920	Yes	Yes+		Hi Rzm			
Maribo MA717	Yes			Hi Rzm			
Maribo MA902	Yes		Yes	Hi Rzm			
Maribo MA943	New			Hi Rzm			
SV 203	Yes	Yes+		Hi Rzm			
SV 265	Yes			Hi Rzm			
SV 285	Yes	Yes+		Hi Rzm			
SX 1815	Yes			Hi Rzm			
SX 1818	Yes			Hi Rzm			
SX 1898	Yes	Yes+		Hi Rzm			

Aph Spec = variety meets Aphanomyces specialty requirements  
Rhc Spec = variety meets Rhizoctonia specialty requirements  
Hi Rzm = may perform better under severe Rhizomania.  
New = newly approved

Roundup Ready® is a registered trademark of Monsanto Company.

Created 11/03/2023

Roundup Ready® sugarbeets are subject to the ACSC RRSB Bolter Destruction Policy

++ 2nd Year of not meeting Specialty Approval of previously approved Specialty variety. According to Approval Policy, may be sold as Specialty in 2024

+ 1st Year of not meeting Specialty Approval of previously approved Specialty variety. According to Approval Policy, may be sold as Specialty in 2024



Table 3. Performance Data of RR 2023 Approved Varieties Under Aphanomyces Conditions (Relative to Susceptible Check)+++

Variety	Yrs Com	Aph SpC+	Rev/Ton++				Rev/Acre++				Rec/Ton			Rec/Acre			Sugar			Yield			Cerc. *		Aphan. *		Rhizoc. *		Fusarium *	
			2023^	2022^	2020	%Mn	2023^	2022^	2020	%Mn	2023^	2022^	2020	2023^	2022^	2020	2023^	2022^	2020	2023^	2022^	2020	23	2Yr	23	2 Yr	23	2Yr	23	2Yr
Number of locations →			0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	3	6	1	4	2	5	2	3		
<b>Previous Approved</b>																														
BTS 8018	2	Yes	--	--	40.59	107	--	--	982	119	--	--	303.9	--	--	7256	--	--	16.22	--	--	23.62	2.42	2.23	3.95	3.97	4.06	4.00	3.20	3.09
BTS 8034	2	Yes	--	--	35.57	94	--	--	887	108	--	--	286.7	--	--	7046	--	--	15.53	--	--	24.32	2.54	2.41	3.80	3.84	4.09	4.29	2.72	2.44
BTS 8156	1	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.53	2.48	3.97	4.09	3.93	4.08	2.80	2.55	
BTS 8927	3	Yes	--	--	43.12	114	--	--	985	120	--	--	312.6	--	--	7070	--	--	16.58	--	--	22.44	4.38	4.40	3.26	3.63	3.98	4.06	3.08	3.10
Crystal 022	2	Yes	--	--	44.07	116	--	--	1047	127	--	--	315.8	--	--	7422	--	--	16.80	--	--	23.24	4.97	4.79	3.66	3.84	3.85	3.98	3.43	3.32
Crystal 130	1	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.60	2.35	4.00	3.78	3.69	3.88	3.55	3.38	
Crystal 137	1	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.65	2.61	4.21	4.23	4.01	4.09	2.78	2.57	
Crystal 138	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.77	4.82	4.06	3.97	3.81	3.81	3.76	3.46	
Crystal 793	5	Yes	--	--	37.97	100	--	--	886	108	--	--	294.9	--	--	6732	--	--	15.80	--	--	22.43	4.20	4.15	4.31	4.07	4.35	4.54	3.40	3.22
Crystal 912	2	Yes	--	--	35.21	93	--	--	886	108	--	--	285.5	--	--	7041	--	--	15.44	--	--	24.35	5.00	4.91	3.41	3.43	3.50	3.39	3.82	3.74
Crystal 913	3	Yes	--	--	39.55	104	--	--	951	116	--	--	300.2	--	--	7129	--	--	16.06	--	--	23.53	3.91	3.82	4.05	3.92	4.19	4.21	3.37	3.25
Hilleshög HIL2317	3	No	--	--	36.66	97	--	--	741	90	--	--	290.5	--	--	5836	--	--	15.50	--	--	20.04	4.84	4.99	5.22	4.56	4.44	4.57	5.83	5.74
Hilleshög HIL2366	2	No	--	--	37.57	99	--	--	729	89	--	--	293.5	--	--	5656	--	--	15.66	--	--	19.18	5.02	5.01	4.68	4.50	3.99	3.95	5.07	4.95
Hilleshög HIL2368	1	No	--	--	40.99	108	--	--	693	84	--	--	305.2	--	--	5136	--	--	16.25	--	--	16.78	4.41	4.48	5.02	4.83	3.55	3.51	4.26	4.29
Hilleshög HIL2386	1	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.23	4.39	4.21	4.26	3.91	3.71	3.99	3.86	
Hilleshög HIL2389	1	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.51	4.60	5.42	4.60	4.45	4.19	5.50	4.92	
Hilleshög HIL9920	5	No	--	--	35.57	94	--	--	706	86	--	--	286.5	--	--	5606	--	--	15.37	--	--	19.33	5.15	5.04	5.49	4.91	4.42	4.50	6.03	5.84
Maribo MA717	5	No	--	--	34.86	92	--	--	731	89	--	--	284.0	--	--	5834	--	--	15.24	--	--	20.22	5.04	5.05	4.61	4.50	4.10	4.01	4.53	4.70
Maribo MA902	3	No	--	--	37.28	98	--	--	652	79	--	--	292.5	--	--	5126	--	--	15.61	--	--	17.57	4.66	4.80	5.77	5.18	3.87	3.72	4.37	4.33
SV 203	2	No	--	--	37.75	100	--	--	829	101	--	--	294.1	--	--	6380	--	--	15.78	--	--	21.48	4.78	4.76	7.15	5.70	4.25	4.22	5.20	5.38
SV 265	6	No	--	--	37.96	100	--	--	839	102	--	--	294.9	--	--	6388	--	--	15.77	--	--	21.30	4.65	4.56	7.47	5.89	3.86	3.91	5.92	6.00
SV 285	3	No	--	--	38.37	101	--	--	822	100	--	--	296.3	--	--	6301	--	--	15.89	--	--	21.15	4.83	4.78	7.39	5.87	4.28	4.40	5.82	5.65
SX 1815	1	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.74	4.91	6.15	5.22	4.35	4.24	5.60	5.46	
SX 1818	1	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.53	4.63	7.09	5.95	4.06	4.11	4.59	4.56	
SX 1898	3	No	--	--	37.53	99	--	--	855	104	--	--	293.4	--	--	6643	--	--	15.74	--	--	22.57	4.88	4.80	6.70	5.47	4.15	4.13	5.47	5.42
<b>Newly Approved</b>																														
BTS 8205	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.69	4.48	3.67	3.68	3.77	3.80	3.10	2.97	
BTS 8226	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.33	2.17	3.72	3.76	3.78	3.76	3.85	3.66	
BTS 8242	NC	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.48	4.41	4.25	4.36	4.07	4.04	3.95	3.69	
BTS 8270	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.43	2.20	3.90	3.88	3.67	4.00	3.46	3.26	
Crystal 260	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.15	2.10	3.84	3.86	3.46	3.58	3.38	3.22	
Crystal 262	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.36	4.39	4.61	4.01	3.31	3.35	3.83	3.55	
Crystal 269	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.38	4.49	3.62	3.55	3.90	4.05	4.11	3.74	
Hilleshög HIL2441**	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.85	3.93	4.18	4.05	3.89	3.75	4.11	4.05	
Hilleshög HIL2442	NC	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.10	4.24	4.73	4.78	3.90	3.80	4.43	4.55	
Hilleshög HIL2487 (MA942)	NC	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.74	4.65	4.06	4.13	4.29	4.24	4.72	4.86	
Maribo MA943	NC	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.44	4.36	4.80	4.50	4.18	4.11	4.55	4.36	
AP SUS RR#5 (2020)					30.80	81			590	72			269.8			4984			14.75			18.00								
Mean of Aph Specialty Varieties					39.44	104			946	115			299.9			7100			16.06			23.42								
Trial mean (includes AP SUS RR#5)					37.86	100			823	100			294.5			6310			15.78			21.20								

+++ 2020 Data from Climax, Perley, and Grandin

++ 2023 Revenue estimate based on a \$50.09 beet payment (5-yr ave) at 17.5% crop with a 1.5% loss to molasses, 2022 Revenue estimate based on a \$46.80 beet payment and 2020 Revenue estimate based on \$45.12 beet payment. Revenue does not consider hauling or production costs.

+ Yes indicates varieties that have met the current Aphanomyces Specialty requirement for 2023 with a 2yr rating ≤ 4.2 or previously met Aphanomyces Specialty requirement maintaining a 3 year rating ≤ 4.5

^ Lack of uniform Aphanomyces pressure at any of the OVT sites prevented collection of Aphanomyces Yield Data for 2023 and 2022

%Mn=Percent of 2020 trial mean (including susceptible check AP SUS RR#5)

\*\* Does not meet Full Market Approval. Meets Aphanomyces and/or Rhizoctonia Specialty Approval.

\* 2023 Aphanomyces ratings from Shakopee MN (res.<4.2, susc>4.8). Cercospora ratings from Saginaw MI, Foxhome MN, and East Grand Forks, MN (res.<4.4, susc>5.0). Fusarium ratings from Moorhead MN and Sabin MN (res.<3.0, susc>5.0).

Rhizoctonia ratings from Crookston MN and Saginaw MI (res.<3.8, susc>5). Hi may perform better under severe Rhizomania.

\* 2022 Aphanomyces ratings from Shakopee MN, Glyndon MN, and Perley MN (res.<4.2, susc>4.8). Cercospora ratings from Randolph MN, Foxhome MN, and Saginaw MI (res.<4.4, susc>5.0). Fusarium ratings from Moorhead MN and Sabin MN (res.<3.0, susc>5.0).

Rhizoctonia ratings from Crookston MN, Moorhead MN, and Saginaw MI (res.<3.8, susc>5).

Table 4. Performance Data of Conventional Varieties During 2017, 2018, 2019 Growing Seasons (All Locations Combined) +++

Variety	Yrs Com	Rev/Ton ++					Rev/Acre ++					Rec/Ton		Rec/Acre		Sugar		Yield		Molasses		Emergence *		Bolters ^		Cerc. *		Aphan. *		Rhizoc. *		Fusarium *		Rzm *
		19	2 Yr	2Y%	3Yr	3Yr%	19	2 Yr	2Y%	3Yr	3Yr%	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	19	2 Yr	
		Number of locations -->					3	8	14	3	8	14	3	8	3	8	3	8	3	8	3	8	3	8	3	6	2	3	3	6	2	4		
Crystal 620	NC	41.74	47.24	97	49.48	99	1394	1631	118	1656	104	311	326	10403	11312	16.59	17.38	33.7	34.9	1.07	1.06	54	67	0	0	3.95	4.13	4.7	4.2	5.1	4.6	2.5	3.0	Hi
Crystal R761	10	38.62	43.53	89	46.06	92	1375	1582	115	1618	101	299	313	10742	11457	16.18	16.86	36.0	36.7	1.21	1.19	61	72	0	0	4.98	4.85	4.4	4.3	4.9	4.6	3.0	3.6	Hi
Crystal 840	NC	39.30	45.48	93	30.32	60	1288	1585	115	NA	--	302	320	9916	11173	16.23	17.10	33.1	35.1	1.15	1.10	52	65	0	0	4.18	4.25	4.0	3.9	4.7	4.4	2.7	3.1	Hi
Hilleshög HM3035Rz	13	43.77	49.17	101	50.89	101	1294	1379	100	1405	88	318	333	9439	9422	16.91	17.65	29.9	28.5	1.02	1.00	72	71	0	0	4.42	4.32	5.1	5.2	4.4	4.2	4.1	4.3	Rzm
Seedex 8869 Cnv	NC	40.88	45.47	93	48.33	96	1374	1617	117	1658	104	307	320	10388	11418	16.40	17.00	33.9	35.8	1.02	1.00	64	74	0	1	4.52	4.59	4.8	4.8	5.1	4.9	3.5	3.7	Hi
SV 48777	NC	45.18	50.25	103	52.63	105	1452	1634	118	1656	104	323	337	10342	10954	17.08	17.78	31.8	32.5	0.94	0.93	63	73	0	0	4.10	4.33	4.9	5.0	5.0	4.7	4.3	4.4	Hi
Crystal 950	NC	41.21	--	--	--	--	1430	--	--	--	--	309	--	10719	--	16.49	--	34.7	--	1.06	--	62	--	0	--	4.72	--	4.8	--	4.8	--	2.9	--	Hi
Benchmark var. mean		44.35	48.87		50.20		1427	1381		1595		320	332	10330	10887	17.07	17.68	32.4	33.0	1.08	1.09	66	75											

+++ 2019 Sites include Grand Forks, Scandia, and Bathgate

+++ 2018 Sites include Casselton, Ada, Grand Forks, Scandia, and St. Thomas

+++ 2017 Sites include Casselton, Hendrum, Grand Forks, Scandia, St. Thomas, and Humboldt

++ 2019 Revenue estimate is based on a \$44.38 beet payment (5-yr ave) at 17.5% sugar and 1.5% loss to molasses. 2018 Revenue estimate is based on a \$46.40 beet payment and 2017 Revenue estimate is based on a \$48.49 beet payment.

\* Emergence is % of planted seeds producing a 4 leaf beet.

^ Number of bolters observed across locations.

\* 2019 Aphanomyces ratings from Shakopee MN (res<4.4, susc>5.0). Cercospora ratings from Randolph MN, Foxhome MN & Saginaw MI (res<4.5, susc>5.0). Fusarium ratings from Moorhead MN (res<3.0, susc>5.0).

Rhizoctonia from Moorhead MN, Crookston MN, and Saginaw MI (res<3.8, susc>5). Hi may perform better under severe Rzm.

\* 2018 Aphanomyces ratings from Shakopee MN and Georgetown MN (res<4.4, susc>5.0). Cercospora ratings from Randolph MN, Foxhome MN & Saginaw MI (res<4.5, susc>5.0). Fusarium ratings from Moorhead MN (res<3.0, susc>5.0).

Rhizoctonia from Moorhead MN and Saginaw MI (res<3.8, susc>5).

Created 11/06/2023

Table 5. ACSC Official Trial Disease Nurseries 2021-2023 (Varieties tested in 2023)  
Cercospora, Aphanomyces, Rhizoctonia & Fusarium

Code	Description	<4.5 Cercospora >5.0					<4.2 Aphanomyces >4.8					<3.82 Rhizoctonia >5.0					<3.0 Fusarium >5.0					High Rzm
		23	22	21	2 Yr	3 Yr	23	22	21	2 Yr	3 Yr	23	22	21	2 Yr	3 Yr	23	22	21	2 Yr	3 Yr	
<b>Previously Approved</b>																						
550	BTS 8018	2.42	2.03	2.31	2.23	2.25	3.95	4.00	4.52	3.97	4.16	4.06	3.93	3.83	4.00	3.94	3.20	2.98	3.22	3.09	3.13	Hi Rzm
558	BTS 8034	2.54	2.28	2.56	2.41	2.46	3.80	3.89	3.24	3.84	3.64	4.09	4.49	3.88	4.29	4.15	2.72	2.16	2.71	2.44	2.53	Hi Rzm
538	BTS 8156	2.53	2.43	2.48	2.48	2.48	3.97	4.21	3.64	4.09	3.94	3.93	4.24	3.81	4.08	3.99	2.80	2.30	2.72	2.55	2.61	Hi Rzm
528	BTS 8927	4.38	4.42	4.48	4.40	4.43	3.26	4.00	4.51	3.63	3.93	3.98	4.13	3.68	4.06	3.93	3.08	3.11	4.00	3.10	3.40	Hi Rzm
521	Crystal 022	4.97	4.60	4.97	4.79	4.85	3.66	4.03	4.79	3.84	4.16	3.85	4.10	3.53	3.98	3.83	3.43	3.22	3.50	3.32	3.38	Hi Rzm
510	Crystal 130	2.60	2.10	2.38	2.35	2.36	4.00	3.57	4.23	3.78	3.93	3.69	4.08	3.57	3.88	3.78	3.55	3.22	3.22	3.38	3.33	Hi Rzm
562	Crystal 137	2.65	2.57	2.53	2.61	2.58	4.21	4.25	3.13	4.23	3.86	4.01	4.18	3.53	4.09	3.91	2.78	2.35	2.25	2.57	2.46	Hi Rzm
502	Crystal 138	4.77	4.87	4.74	4.82	4.79	4.06	3.87	4.19	3.97	4.04	3.81	3.81	3.52	3.81	3.71	3.76	3.16	3.75	3.46	3.55	Hi Rzm
509	Crystal 793	4.20	4.10	4.13	4.15	4.15	4.31	3.82	3.74	4.07	3.96	4.35	4.73	4.36	4.54	4.48	3.40	3.03	2.80	3.22	3.08	Hi Rzm
547	Crystal 912	5.00	4.81	5.13	4.91	4.98	3.41	3.44	3.95	3.43	3.60	3.50	3.28	3.77	3.39	3.52	3.82	3.66	4.11	3.74	3.86	Hi Rzm
549	Crystal 913	3.91	3.73	4.10	3.82	3.92	4.05	3.79	4.39	3.92	4.08	4.19	4.23	3.94	4.21	4.12	3.37	3.13	3.68	3.25	3.39	Hi Rzm
553	Hilleshög HIL2317	4.84	5.13	4.57	4.99	4.85	5.22	3.91	5.01	4.56	4.71	4.44	4.71	4.76	4.57	4.64	5.83	5.65	6.06	5.74	5.85	Hi Rzm
520	Hilleshög HIL2366	5.02	5.00	5.01	5.01	5.01	4.68	4.32	5.81	4.50	4.94	3.99	3.92	3.98	3.95	3.96	5.07	4.83	4.65	4.95	4.85	Hi Rzm
511	Hilleshög HIL2368	4.41	4.56	4.66	4.48	4.54	5.02	4.63	5.25	4.83	4.97	3.55	3.46	2.92	3.51	3.31	4.26	4.33	4.44	4.29	4.34	Hi Rzm
542	Hilleshög HIL2386	4.23	4.54	4.30	4.39	4.36	4.21	4.31	5.98	4.26	4.83	3.91	3.51	4.20	3.71	3.87	3.99	3.73	4.26	3.86	3.99	Hi Rzm
522	Hilleshög HIL2389	4.51	4.69	4.85	4.60	4.68	5.42	3.78	3.86	4.60	4.35	4.45	3.92	3.99	4.19	4.12	5.50	4.34	4.75	4.92	4.86	Hi Rzm
507	Hilleshög HIL9920	5.15	4.92	4.75	5.04	4.94	5.49	4.33	4.65	4.91	4.82	4.42	4.58	4.70	4.50	4.57	6.03	5.66	5.45	5.84	5.71	Hi Rzm
504	Maribo MA717	5.04	5.05	4.68	5.05	4.92	4.61	4.39	6.75	4.50	5.25	4.10	3.92	4.31	4.01	4.11	4.53	4.87	5.11	4.70	4.84	Hi Rzm
539	Maribo MA902	4.66	4.95	4.63	4.80	4.75	5.77	4.59	6.96	5.18	5.77	3.87	3.57	3.80	3.72	3.75	4.37	4.30	4.50	4.33	4.39	Hi Rzm
543	SV 203	4.78	4.74	4.75	4.76	4.76	7.15	4.24	4.35	5.70	5.25	4.25	4.19	4.34	4.22	4.26	5.20	5.55	5.99	5.38	5.58	Hi Rzm
503	SV 265	4.65	4.46	4.30	4.56	4.47	7.47	4.30	4.95	5.89	5.58	3.86	3.96	4.17	3.91	4.00	5.92	6.08	5.65	6.00	5.89	Hi Rzm
515	SV 285	4.83	4.72	4.78	4.78	4.78	7.39	4.35	4.48	5.87	5.41	4.28	4.53	4.26	4.40	4.36	5.82	5.47	6.26	5.65	5.85	Hi Rzm
554	SX 1815	4.74	5.07	4.78	4.91	4.86	6.15	4.28	4.19	5.22	4.88	4.35	4.12	4.40	4.24	4.29	5.60	5.32	4.82	5.46	5.25	Hi Rzm
530	SX 1818	4.53	4.72	4.86	4.63	4.71	7.09	4.82	5.56	5.95	5.82	4.06	4.16	4.41	4.11	4.21	4.59	4.54	5.26	4.56	4.80	Hi Rzm
537	SX 1898	4.88	4.72	4.76	4.80	4.79	6.70	4.25	4.97	5.47	5.31	4.15	4.12	4.34	4.13	4.20	5.47	5.38	5.67	5.42	5.51	Hi Rzm
<b>Newly Approved</b>																						
540	BTS 8205	4.69	4.27	--	4.48	--	3.67	3.69	--	3.68	--	3.77	3.82	--	3.80	--	3.10	2.85	--	2.97	--	Hi Rzm
527	BTS 8226	2.33	2.00	--	2.17	--	3.72	3.79	--	3.76	--	3.78	3.74	--	3.76	--	3.85	3.47	--	3.66	--	Hi Rzm
561	BTS 8242	4.48	4.35	--	4.41	--	4.25	4.47	--	4.36	--	4.07	4.00	--	4.04	--	3.95	3.42	--	3.69	--	Hi Rzm
533	BTS 8270	2.43	1.97	--	2.20	--	3.90	3.87	--	3.88	--	3.67	4.33	--	4.00	--	3.46	3.06	--	3.26	--	Hi Rzm
529	Crystal 260	2.15	2.05	--	2.10	--	3.84	3.89	--	3.86	--	3.46	3.70	--	3.58	--	3.38	3.06	--	3.22	--	Hi Rzm
555	Crystal 262	4.36	4.43	--	4.39	--	4.61	3.42	--	4.01	--	3.31	3.38	--	3.35	--	3.83	3.27	--	3.55	--	Hi Rzm
557	Crystal 269	4.38	4.60	--	4.49	--	3.62	3.48	--	3.55	--	3.90	4.20	--	4.05	--	4.11	3.36	--	3.74	--	Hi Rzm
541	Hilleshög HIL2441**	3.85	4.01	--	3.93	--	4.18	3.91	--	4.05	--	3.89	3.62	--	3.75	--	4.11	4.00	--	4.05	--	Hi Rzm
526	Hilleshög HIL2442	4.10	4.39	--	4.24	--	4.73	4.83	--	4.78	--	3.90	3.70	--	3.80	--	4.43	4.68	--	4.55	--	Hi Rzm
536	Hilleshög HIL2487 (MA942)	4.74	4.57	--	4.65	--	4.06	4.20	--	4.13	--	4.29	4.18	--	4.24	--	4.72	5.01	--	4.86	--	Hi Rzm
562	Maribo MA943	4.44	4.28	--	4.36	--	4.80	4.21	--	4.50	--	4.18	4.04	--	4.11	--	4.55	4.18	--	4.36	--	Hi Rzm

\*\* Does not meet full market approval. Meets Aphanomyces and/or Rhizoctonia Specialty approval.

Green font ratings indicate specialty or good resistance.

Red font ratings indicate level of concern for some fields.

-- indicates data not available

Created 11/02/2023

Table 6. Root Aphid Ratings for RR Varieties During 2022 & 2023 Growing Seasons (All Locations Combined) Approved for Sale to ACSC Growers in 2024

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Table 7. Planting & Harvest Dates, Previous Crop and Disease Levels for 2023 ACSC Official Trial Sites +

Yield Trials Location	District / Trial Type	Cooperator	Planting Date	Harvest Date	Preceding Crop	Soil Type	Diseases Present *						Comments
							Aph	Rhc	Rzm	Fus	Maggot	Rt Aphid	
Casselton ND	Mhd/Hlb	Todd Weber Farms	5/5	9/12	Wheat	Medium/Light	N	L	N	N	N	N	Planting errors, some gappy stands from crusting
Averill MN	Mhd/Hlb	Tang Farms	5/18	Abandon	Wheat	Medium/Light	N	N	N	N	N	N	Abandoned due to very poor stand
West of Perley MN (ND)	Mhd/Hlb	TD Hoff Partnership	5/22	9/8 & 9/11	Soybean	Heavy	L	M-V	N	N	N	N	Some cutworm and Rhizoctonia damage
Halstad MN	Mhd/Hlb	Peter Steen	5/15	10/12	Wheat	Medium	N	N	L	N	N	L-M	Excellent overall
Reynolds ND	Mhd/Hlb	Hong Farms	5/13	9/13	Wheat	Medium/Light	N	N	N	N	N	L	Some gappy stands
Climax MN	EGF/Crk	Knutson Farms	5/4	9/14	Wheat	Medium/Light	N	L	N	N	N	N	Planter gaps near ends of plots removed prior to harvest
Grand Forks ND	EGF/Crk	Drees Farming Association	5/12	9/18	Wheat	Medium/Light	N	N	N	N	L	N	Moisture stress across trial area
Scandia MN	EGF/Crk	Deboer Farms	5/14	10/9	Wheat	Medium	N	N	N	N	N	N	Hail damage even across trial area
East Grand Forks MN	EGF/Crk	Mark Holy	5/15	9/15	Fallow	Medium	N	N	N	N	N	N	On fallow ground, some light late Cercospora
Stephen MN	Dtn	Jensen Farms	5/11	10/3	Wheat	Medium/Heavy	N	N	N	N	N	N	
St Thomas ND	Dtn	Baldwin Farms	5/16	9/27	Wheat	Medium/Light	N	N	N	N	L	N	~7 inches of rainfall June 24-25
Humboldt MN	Dtn	Prosser/Kuznia Beets	5/10	9/30	Wheat	Heavy	N	L	N	N	N	N	Abandoned due to harvest loss
Bathgate ND	Dtn	Shady Bend Farm	5/16	9/29	Wheat	Medium	N	N	N	N	N	N	

Disease Trials Location	District / Trial Type	Cooperator	Planting Date	Rating Date	Preceding Crop	Soil Type	Diseases Present *						Comments
							Aph	Rhc	Rzm	Fus	Maggot	Rt Aphid	
Moorhead Fus-N MN	Fus Nurs	Nelson Farms	5/23	Multiple	Wheat	Medium/Heavy	N	N	N	M-V	N	N	Moderate Fusarium
Sabin Fus-S MN	Fus Nurs	Krabbenhoft & Sons Farm	5/17	Multiple	Wheat	Medium/Light	N	N	N	V	L	N	Heavy Fusarium pressure
Mhd Rhc-E MN	Rhc Nurs	Jon Hicckel	5/23	Abandon	Soybean	Heavy	N	L	N	L-M	N	N	Abandoned due to lack of Rhizoctonia severity
Mhd Rhc-W MN	Rhc Nurs	Jon Hicckel	5/23	Abandon	Soybean	Heavy	N	L	N	L-M	N	N	Abandoned due to interference from Fusarium
NWROC MN	Rhc Nurs	Maureen Aubol	5/17	8/7	Soybean	Medium/Heavy	N	M	N	N	N	N	Nice range of Rhizoctonia symptoms
Saginaw MI	Rhc Nurs	Linda Hanson	5/10	8/29-9/1	--	--	N	V	N	N	N	N	Severe Rhizoctonia pressure
Shakopee MN	Aphanomyces	Patrick O'Boyle	5/10	8/29	--	--	M-V	L	N	N	N	N	Nice range of moderate Aphanomyces symptoms
Glyndon MN	Aphanomyces	Ryan Brady	5/23	Abandon	--	Light	N-L	L	N	M	N	N	Lack of soil moisture to develop Aphanomyces
West of Perley MN (ND)	Aphanomyces	TD Hoff Partnership	5/22	Abandon	Soybean	Heavy	L	M-V	N	N	N	N	Lack of soil moisture to develop Aphanomyces
Climax MN	Aphanomyces	Knutson Farms	5/17	Abandon	Wheat	Medium/Light	N	N	N	N	N	N	Lack of soil moisture to develop Aphanomyces
Longmont CO	Root Aphids	Ryan Brady	--	Abandon	--	--	--	--	--	--	--	--	Lack of root aphid pressure from excess soil moisture
Foxhome MN	Cercospora	NDSU/Kevin Etzler	5/18	Multiple	Wheat	Medium	N	N	N	N	N	N	Moderate to severe Cercospora pressure
Saginaw MI	Cercospora	Linda Hanson	4/27	Multiple	--	--	N	N	N	N	N	N	Very nice Cercospora pressure
Randolph MN	Cercospora	Patrick O'Boyle	5/3	Multiple	--	--	N	N	N	N	N	N	Five ratings through July 20 and hail damage in late July; not used for approval numbers
Averill MN	Cercospora	Tang Farms	5/18	Abandon	Wheat	Medium/Light	N	N	N	N	N	N	Abandoned due to very poor stand
East Grand Forks MN	Cercospora	Mark Holy	5/15	Multiple	Fallow	Medium	N	N	N	N	N	N	Non-inoculated trial, used for approval numbers

+ Fertilizer applied in accordance with cooperative recommendations.

\* Disease notes for Aphanomyces, Rhizoctonia, Rhizomania, Fusarium, Root Maggot and Root Aphids were based upon visual evaluations (N=none, L=light, M=moderate, V=severe, NA=not observed)

Table 8. Seed Treatments Used on Varieties in Official Variety Trials in 2023

Description	Years in Trial	Years Comm.	Fungicide Seed Treatment			Insecticide (Springtails & Maggots)	Priming (Emergence)
			(Damping-off)	(Rhizoctonia)	(Aphanomyces)		
<b>Previous Approved</b>							
BTS 8018	4	2	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
BTS 8034	4	2	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
BTS 8156	3	1	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
BTS 8927	5	3	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
Crystal 022	4	2	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 130	3	1	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 137	3	1	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 138	3	NC	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 793	7	5	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 912	5	2	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 913	5	3	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Hilleshög HIL2317	5	3	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL2366	4	2	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL2368	4	1	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL2386	3	1	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL2389	3	1	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL9920	7	5	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Maribo MA717	7	5	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Maribo MA902	5	3	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
SV 203	4	2	Apron XL Maxim	Zeltera	Int Sol	NipsIt	Xbeet®
SV 265	8	6	Apron XL Maxim	Zeltera	Int Sol	NipsIt	Xbeet®
SV 285	6	3	Apron XL Maxim	Zeltera	Int Sol	NipsIt	Xbeet®
SX 1815	3	1	Apron XL Maxim	Zeltera	Int Sol	NipsIt	Xbeet®
SX 1818	3	1	Apron XL Maxim	Zeltera	Int Sol	NipsIt	Xbeet®
SX 1898	5	3	Apron XL Maxim	Zeltera	Int Sol	NipsIt	Xbeet®
<b>Newly Approved</b>							
BTS 8205	2	NC	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
BTS 8226	2	NC	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
BTS 8242	2	NC	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
BTS 8270	2	NC	Allegiance Thiram	Kabina	Tach 35	Poncho Beta	Ultipro
Crystal 260	2	NC	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 262	2	NC	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Crystal 269	2	NC	Allegiance Thiram	Kabina	Tach 45	Poncho Beta	Xbeet®
Hilleshög HIL2441**	2	NC	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL2442	2	NC	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Hilleshög HIL2487 (MA942)	2	NC	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®
Maribo MA943	2	NC	Apron XL Maxim	Vibrance	Tach 45	Cruiser Maxx	Xbeet®

\*\* Does not meet Full Market Approval. Meets Aphanomyces and/or Rhizoctonia Specialty Approval.