Description of WIX10305-4 Oat Line

WIX10305-4 has been tested in the Wisconsin State Trials since 2015 where 6-8 locations statewide evaluate some advanced lines with released varieties. Additionally, WIX10305-4 has been tested in the Uniform Early Oat Performance Nursery (UEOPN) since 2017 with the nursery being grown at 15 locations in the north-central United States and Canada. These nurseries evaluate the performance of lines for grain yield, agronomic characteristics, disease resistance, and grain quality. WIX10305-4 has performed well in all those trials.

WIX10305-4 is a high yielding oat line with performance over average for yield in the Midwest. Yields of 96, 108, and104 bushels per acre in were obtained on average the 2019, 2020, and 2021 seasons evaluated in the UMOPN trials. Additionally, three-year averages from 2019-2021 of 129.9 and 96 bushels per acre were obtained in Arlington and Madison respectively. It has a medium to high test weight, being in the top 25% for TW in most trials with a three-year average above 38 pounds per bushels in most locations evaluated in the Wisconsin State Trials.

WIX10305-4 has intermediate flowering time with heading date like Ron, five days later than Antigo, and two days earlier than Deon. WIX10305-4 is similar in height to Warrior, being seven inches shorter than Esker and five inches shorter than Antigo with an average plant height of 27 inches in the 2019, 2020 and 2021 trials. Lodging is similar to Warrior and less than Esker and Esker 2020, being in the top of lines with less logging in average. It is resistant to crown rust and showed medium to low crown rust infection levels in most trials.

WIX10305-4 has a pedigree of WIX9248-2/WIX9192-2 The final cross was made in the spring greenhouse at Madison in 2003.

WIX10305-4 is most similar to the previously existing cultivar Esker with similar, heading date, and plant characteristics such as dehulling efficiency. However, WIX10305-4 is superior to Esker in grain yield, test weight, lodging and disease resistance.

In field trials in the upper Midwest, XXXX has shown Moderate resistance to the prevalent races of **crown rust**, while Esker has been more susceptible. When Esker was released in 2004, it was resistant to the prevalent races of crown rust at the time. The performance evaluation trials evaluate disease resistance every year, rating each cultivar on a scale of 1-9 with a lower number indicating better disease resistance. Ratings are expressed here as means for each location, across locations, and the mean over three years (2019, 2020, and 2021).

Table 1. Crown rust disease resistance (scale of 1-9) of Antigo, Esker, Esker2020, and XXXX in two locations (i.e. Arlington and Madison) evaluated in three years (2019, 2020 and 2021).

	Arlington				Madison				Overall			
Variety	2021	S.E.	3-year [a]	S.E.	2021 [a]	S.E.	3-year [a]	S.E.	2021 [a]	S.E.	3-year [a]	S.E.
Antigo	8.5[b]	0.5	6.4 [b]	0.4	7.2 [ab]	0.6	4.3 [ab]	0.7	5.0 [b]	0.7	3.9 [a]	0.7
Esker	7.5 [b]	0.5	7.0 [b]	0.4	5.9 [ab]	0.6	5.0 [b]	0.7	5.1 [b]	0.7	4.3 [a]	0.7
Esker2020	4.5 [ab]	0.5	4.3 [ab]	0.6	5.0 [a]	0.6	3.3 [ab]	0.7	3.8 [a]	0.7	3.3 [a]	0.7
X10305-4	6.0 [ab]	0.5	4.0 [a]	0.4	5.0 [a]	0.8	2.7 [a]	0.7	4.3 [a]	0.8	3.3 [a]	0.7
Entries	240		720		240		720		1233		3115	
Replications	4		4		4		4		4		4	
Trial mean	4.7		4.3		4.6		3.1		3.5		3.0	
S.E.	0.08		0.05		0.09		0.05		0.04		0.02	

In field trials in the upper Midwest, XXX shows a high **grain yield performance** while Esker, Esker2020 and Antigo had a medium-high yield. Grain yield is expressed as the mean for each location (*i.e.* Arlington, Alma, Madison, Spooner) in 2021, three-year means for each location and overall performance in bushels per acre.

Table 2. Grain yield (bushels per acre) performance of Antigo, Esker Esker2020 and XXX in four locations in Wisconsin evaluated in three years.

	Arlington				Alma				Madison				Spooner				Overall			
Variety	2021	S.E	3-year [a]	S.E	2021 [a]	S.E	3-year [a]	S.E	2021 [a]	S.E	3-year [a]	S.E	2021 [a]	S.E	3-year [a]	S.E	2021 [a]	S.E	3-year [a]	S.E
Antigo	111.6 [b]	4.8	109.0 [b]	21.3	125.0 [b]	9.5	107.9 [a]	16.2	90.9	5.1	99.0 [a]	8.1	26.6 [b]	6.4	46.7 [b]	13.5	86.5 [b]	15.1	84.6 [b]	9.0
Esker	124.9 [b]	4.8	101.0 [b]	21.3	130.1 [b]	9.5	96.5 [b]	16.2	100.1	5.0	97.9 [a]	8.1	34.2 [b]	5.6	54.9 [b]	13.5	94.3 [b]	15.1	84.8 [b]	9.0
Esker2020	131.4 [a]	4.8	111.5 [b]	21.8	139.9 [b]	9.5	125.2 [a]	16.2	103.6 [a]	4.6	110.5 [a]	8.1	37.3 [b]	5.6	62.5 [a]	13.4	100.3 [a]	15.1	98.8 [a]	9.0
X10305-4	133.8[a]	4.8	129.9 [a]	21.3	155.7 [a]	9.5	113.1 [a]	16.2	91.0	5.6	96.0 [a]	8.5	55.5 [a]	5.6	59.6 [a]	13.5	99.9 [a]	15.2	89.0 [a]	9.0
Entries	240		720		160		320		240		720		160		320		1233		3115	
Replications	4		4		4		4		4		4		4		4		4		4	
Trial mean	122		97		134		103		109		107		36		59		96		88	
S.E.	0.13		0.41		1.01		0.85		0.69		0.60		0.85		0.70		0.42		0.25	

In field trials in the upper Midwest, XXXX is a top performer cultivar for **test weight**, while Esker is a medium to high cultivar. Test weight is expressed as the mean for each locations (*i.e.* Arlington, Alma, Madison) in 2021, three year (2019, 2020, and 2021) means for each location, and overall performance in pounds per bushel.

Table 3. Test weight (pounds per bushels) performance of Antigo, Esker, Esker2020, and XXX in eight locations in Wisconsin evaluated in three years.

	Arlington				Madison				Alma				Overall			
Variety	2021	S.E.	3-year[a]	S.E.	2021[a]	S.E.	3-year[a]	S.E.	2021[a]	S.E.	3-year[a]	S.E.	2021[a]	S.E.	3-year[a]	S.E.
Antigo	45.5[a]	0.9	40.5[a]	6.1	44.3[a]	1.0	45.2[a]	1.0	40.8[a]	0.4	43.2[a]	2.5	44.6[a]	1.0	43.2[a]	2.5
Esker	41.0[b]	0.9	33.6[b]	6.1	38.4[b]	1.0	39.1[b]	1.0	36.7[b]	0.4	36.5[b]	2.5	39.4[b]	1.0	36.5[b]	2.5
Esker2020	41.6[ab]	0.9	35.5[b]	6.1	39.5[b]	1.0	40.1[b]	1.0	36.0[b]	0.4	37.8[b]	2.5	39.8[b]	1.0	37.8[b]	2.5
X10305-4	46.7[ab]	0.9	38.3[a]	6.1	43.2[b]	1.1	40.6[b]	1.1	35.0[b]	0.4	38.2[b]	2.5	42.4[c]	1.1	38.2[ab]	2.5
Entries	240		720		240		720		160		240		1233		3115	
Replications	4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0	
Trial Average	42.1		36.8		39.0		40.0		37.4		38.6		39.8		38.6	
Trial Standard error	0.2		0.1		0.1		0.1		0.0		0.1		0.05		0.03	

In field trials in the upper Midwest, XXXX have similar heading date than Esker in most locations. Heading date is expressed as dias of June in Wisconsin for each location (*i.e.* Arlington, and Madison) in 2021, three year (2019,2020 and2021) means for each location, and overall performance in days of June.

Table 4. Heading data in days of June for Antigo, Esker, Esker2020 and XXXX in two locations in Wisconsin evaluated in the growing season 2019, 2020 and 2021.

	Arlington				Madison				Overall			
Variety	2021	S.E.	3-year [a]	S.E.	2021 [a]	S.E.	3-year [a]	S.E.	2021	S.E.	3-year [a]	S.E.
Antigo	9	1	18	9	9	1	15	1	17	5	21	5
Esker	10	1	20	9	12	1	18	1	20	5	24	5
Esker2020	10	1	19	9	9	1	16	2	18	5	23	5
X10305-4	10	1	23	9	11	1	20	2	21	5	27	5
Entries	240		720		240		720		440		1440	
Replications	4		4		4		4		4		4	
Trial mean	13		22		12		20		21		26	
S.E.	0.07		0.06		0.15		0.08		0.12		0.05	