

MEMORANDUM

TO: *Prairie Recommending Committee for Pulse and Special Crops*
FROM: A. Vandenberg, A. Vargas, S. Banniza, S. Boechler, J. Horner, S. Wagenhoffer, B. Barlow, Y. Liu, D. Raymond, K. Mikituk and D. DeSilva
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DATE: February 05, 2025

SUBJECT: Request for Support for Registration of Black Lentil Line CDC23.09S

Lentil line CDC23.09S was tested for three years in the Specialty Lentil Trials from 2022-24. Agronomic and disease performance data summaries in those trials are included in the accompanying Tables 1, 2 and 3. CDC23.09S is tolerant to imidazolinone herbicide. Table 1 (9 site years) indicates the yield of CDC23.09S is 186% of the black market class check Indian Head and 114% higher than the small red check CDC Maxim. For reference to the current small red coop check, the Saskatchewan Variety of Grain Crops publication lists CDC Nimble as being 109% of CDC Maxim. Cotyledon colour, for CDC 23.09S is red similar to that of CDC Maxim and CDC Nimble. Flowering time, maturity, plant height are similar to CDC Maxim and consistently earlier than Indian Head. The seed coat of CDC23.09S is black, similar to Indian Head. Seed thickness is greater than that of Indian Head, providing efficiencies in de-hulling and reducing mechanical damage during handling.

Strengths: High yield compared to Indian Head and CDC Maxim.
Thicker seed compared to Indian Head making CDC23.09S more efficient in the dehulling process.
Tolerant to imidazolinone herbicide.

Neutral: Similar agronomic and maturity characteristics compared to the checks.

Weakness: No noticeable improvement in disease resistance

Figure 1. Visual comparison of CDC23.09S, Black check Indian Head and CDC Nimble included for comparison.



Table 1. Three year summary of agronomic performance for Black lentil(BK) CDC23.09S in the 2022-2024 Specialty lentil trial

Market class	Line	Cotyledon Colour	2022-24 Mean	Yield		Seed weight (g/1000)	Days to flower	Days to mature	Lodging (1-5)	Plant height (cm)	% seed over 12/64th round	% seed over 6.5/64th slotted
				% of IH	% of Maxim							
SR	CDC Maxim	red	1596	164	100	38	54	89	1.3	36	64	30
BK	Indian Head (IH)	yellow	976	100	61	20	54	93	2.0	38	1	0
BK	CDC 23.09S	red	1816	186	114	32	56	90	1.5	37	21	11
Mean			1463	150	92	30	55	90	1.6	37	29	14

[] indicates number of sites
Market Classes: SR-small red; FG-french green

Table 2. Two year Seed diameter and seed thickness summary for CDC 23.09S

Market Class	name	Seed diameter distribution % on roundhole 64th inch screens							Seed thickness distribution % on slotted screens						
		>15/64	>14/64	>13/64	>12/64	>11/64	>10/64	>9/64	>8/64	>7.5/64	>7/64	>6.5/64	>6/64	>5.5/64	>5/64
SR	CDC Maxim	0	4	20	41	25	8	2	0	1	5	24	31	28	11
BK	Indian Head	0	0	0	1	3	16	80	0	0	0	0	16	42	42
BK	CDC 23.09S	0	0	2	19	40	30	9	0	0	1	10	39	34	16
GRAND MEAN		0.1	1.2	7.3	20.2	22.8	18.1	30.4	0.0	0.3	2.0	11.4	28.4	34.7	23.1
CV		324.6	209.5	86.2	32.2	29.1	61.0	25.6	227.8	138.7	79.6	38.7	36.0	47.8	82.4
LSD		0.2	2.8	12.1	18.1	17.4	19.0	6.9	0.1	0.9	4.1	12.8	21.9	26.5	28.1

Table 3. Two year disease summary for Black lentil CDC23.09S in the 2023-24 Specialty Market class lentil trial

Market class	Line	Ascochyta				Anthracnose					
		2023		2024		2023		2024		2024 Race 1	
		Mean (%)	*Sign	Mean (%)	*Sign	Race 1 Mean (%)	*Sign	Race 0 Mean (%)	*Sign	2024 Race 1 Mean (%)	*Sign
SR	CDC Maxim	--	--	6.875	LM	--	--	--	--	95.0	A
BK	Indian Head	41.25	BCDE	16.3	GHIJKLM	25.6	C	90	ABCD	22.9	G
BK	CDC 23.09S	27.5	E	14.375	HIJKLM	88.8	A	95.0	A	91.9	A
SG	Eston	58.75	A	53.8	A	95.0	A	95.0	A	95.0	A
SG	CDC Viceroy			29.4	DEF					45.0	F
SR	CDC Redberry	32.5	D	13.1	HIJKLM	95.0	A	91.3	ABC	86.9	AB
ESR	CDC Robin			11.9	HIJKLM					31.3	G
LR	CDC KR-1	40.0	BCD			86.9	ABCDE	88.8	BCD		
SB	CDC SB-2	34.4	CD	11.9	HIJKLM	53.8	G	92.5	AB	57.9	DE
LG	CDC Greenstar			10.6	IJKLM					91.3	A
	LR-59-81							34.4	G		
	CV	26.5		44.0		6.9		5.2		10.0	

*Significance (Sign) Entries with a letter in common are not significantly different from each other.

Disease checks are shaded:

Eston-susceptible to Ascochyta and Anthracnose race 1

Robin, Redberry, Viceroy and KR-1resistant to Ascochyta and Anthracnose race 1

Greenstar resistant to Ascochyta and moderately susceptible to Anthracnose race 1

LR-59-81 resistant to Anthracnose race 0

Disease testing was conducted indoors

Table 4. Yield (KG/HA) performance summary of black (BK) lentil CDC23.09S

Market class	Line	check	2022 LSEYT				2023 LSEYT				2024 LSEYT		Yield % of	
			Suther land	Rosth ern	Moos e Jaw	Elrose	Rosth ern	Suther land	Suth erlan d	Lucky Lake	MEAN	Indian Head	CDC Maxim	
SR	CDC Maxim	check	1913	848	1275	1490	1095	1940	2501	2050	1250	1596	164	100
BK	Indian Head	check	1183	852	707	--	396	1818	1949	286	621	976	100	61
BK	CDC 23.09S		2509	1054	1562	1622	855	2369	3264	1832	1278	1816	186	114
Mean			1868	918	1182	1556	782	2042	2571	1389	1050	1463	150	92
LSD (0.05)			432.3	141.4	238.8	143.1	198.9	532.1	371.5	284.9	184.8			
CV (%)			11.9	8.3	10.8	5.1	12.5	13.9	7.2	9.5	8.8			

Table 5. 2022 Agronomic performance data by location for Black lentil CDC23.09S

Market class	Line	Days To Flower (DTF)				Height (HT)			Days To Maturity (DTM)					Lodging (1-5)			Seed Weight							
		Suth	Rosth ern	Elrose	MEAN	Suth	Rosth ern	Mean	Suth	Rosth ern	Elrose	Moose Jaw	MEAN	Suth	Rosth ern	MEAN	Suth	Rosth ern	MEAN					
SR	CDC Maxim	57	56	59	57				36	34	35		97	93	90	86	91		1.5	1.0	1.3	41	42	41
BK	Indian Head	-	-	-					37	34	35		103	97	91	87	94		1.5	1.0	1.3	19	20	20
BK	CDC 23.09S	60	60	62	61				37	38	37		97	92	89	89	92		1.3	1.0	1.1	34	35	35
Mean		59	58	60	59				37	35	36		99	94	90	87	92		1.4	1.2	1.3	31	32	32
CV (%)		2.0	1.4	1.1					7.3	7.0			1.5	1.4	1.4	1.7			18.0	23.7		2.2	2.7	
LSD (0.05)		2.0	1.4	1.2					4.8	4.4			2.6	2.2	2.1	2.7			0.4	0.5		1.4	1.7	

Market Classes: SR-small red; BK-black

Table 6. 2023 Agronomic performance data by location for black (BK) lentil CDC23.09S

Market class	Line	Days To Flower			Days To Maturity			Height (HT)			Seed Weight												
		Rosth ern	Suth	MEAN	Rosth ern	Suth	Mean	Rosth ern	Suth	Mean	Rosth ern	Suth	MEAN										
SR	CDC Maxim	50	47	49				90	90	90				35	37	36				40	42	41	
BK	Indian Head	54	-	54				95		95				37	45	41				22	23	23	
BK	CDC 23.09S	52	49	50				91	90	90				40	37	39				32	32	32	
Mean		52	48	51				92	90	92				37	40	38				31	32	32	
CV (%)		1.0	2.5					1.5	2.5				4.0	7.1									
LSD (0.05)		0.9	2.1					2.4	3.7				2.6	4.6									

Market Classes: SR-small red; BK-black

Table 7. 2024 Agronomic performance data by location for black (BK) lentil CDC23.09S

Market class	Line	Days To Flower (DTF)					Height (HT)		DTM		Lodging (1-5)			Seed Weight								
		Suth	Rosth ern	Elrose	Lucky Lake	MEAN	Rosth ern	Lucky Lake	Lucky Lake	Rosth ern	Lucky Lake	Mean	Suth	Lucky Lake	MEAN							
SR	CDC Maxim	55	58	55	54	55			38		85		1.8	1.0	1.4				35	32	33	
BK	Indian Head	very late							38		89		2.5	3.0	2.8				16	16	16	
BK	CDC 23.09S	60	60	54	56	57			36		87		2.3	1.5	1.9				28	28	28	
Mean		57	59	54	55	56					87		2.2	1.8	2.0				27	25	26	
CV (%)		1.6	1.1	2.1	1.6				9.7		1.3		21.5	28.0								
LSD (0.05)		1.6	1.2	2.0	1.5				6.2		1.9		0.8	0.9								

Market Classes: SR-small red; BK-black