

Agricultural demonstration of Practices and Technologies (ADOPT)

FINAL REPORT

20180491

Corn Varieties for Silage Demonstration

**Funded by: The Saskatchewan Ministry of Agriculture under the Canada-
Saskatchewan Canadian Agricultural Partnership bi-lateral agreement**

January 2020

Project Identification

1. **Project Title:** Corn Varieties for Silage Demonstration
2. **Project Number:** 20180491
3. **Producer Group Sponsoring the Project:** Saskatchewan Forage Council
4. **Project Location(s):** Canada-Saskatchewan Irrigation Diversification Centre. 901 Mackenzie St. S. Outlook, SK.
5. **Project start and end dates (month & year):** May 2019 – December 2019
6. **Project contact person & contact details:**

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Objectives and Rationale

7. **Project objectives:**
 - The objective of this project was to evaluate corn varieties suitable to growing conditions in the Lake Diefenbaker Area for silage quality and yield potential under irrigation and dryland management. Results of the irrigated portion of this trial will be added to a variety performance data base and is included in the *Crop Varieties for Irrigation* publication.
 8. **Project Rationale:**
 - Growing corn for silage or winter grazing is a potential alternate winter feeding strategy for Saskatchewan beef producers. Variety selection is an integral component of ensuring success when growing corn, and producers must know which varieties are available locally and how those varieties perform under local growing conditions.
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Methodology and Results

9. Methodology:

The trial was established at Broderick, SK. on medium to moderately coarse-textured lacustrine soil, classified as a Bradwell loam to silty loam. Twelve corn varieties were planted on 75cm (30 inch) row spacing. Each plot consisted of two corn rows. A seeding rate of 79,071 plants/ha (32,000 plants/ac) was targeted for irrigated production. A seeding rate of 69,187 plants/ha (28,000 plants/ac) was targeted for dry land production. Seed for each individual plot was packaged according to individual seed weights and adjusted for estimated per cent germination. All seed received from suppliers was treated. Nitrogen fertilizer was side banded at a rate of 70 kg N/ha as urea (46-0-0) and phosphorus fertilizer was side banded at a rate of 20 kg P-2O5/ha as 12-51-0 during the seeding operation. Trials were established on potato stubble that had residual soil nitrogen levels of 150 kg N/ha. Weed control consisted of spring pre-plant and a post emergence application of glyphosate, the dry land trial also received an in-season application of Buctril M (bromoxynil/MCPA ester) at the 5-6 leaf stage. All silage plots were harvested on October 11th with a Hegi forage harvest combine. Combine fresh weights were recorded and subsamples taken for moisture and feed value determinations. Unfortunately, after subsamples were dried and dry weights determined samples were inadvertently deposited therefore feed quality determinations could not be conducted.

10. Results

The corn heat unit (CHU) rating of varieties in the trial ranged from 2150 to 2450. (Table 1) The Outlook area received 2336 CHU during the 2019 growing season. Precipitation during the growing season was below normal. (Table 2).

Based on 2019 yield data, the varieties that performed the best were *PS 2210VT2P RIB* (irrigated) and *P7958AM* (Dryland).

This project will be highlighted at extension meeting in winter and spring of 2020. The irrigated portion of this trial will become part of the *Crop Varieties for Irrigation Publication*.

Table 1. Corn Varieties Included in Silage Corn Variety Demonstration

Variety	Company	Corn Heat Unit Rating	Germination %	Kernel Weight (gm/1000)
DKC29-89 RIB	Dekalb	2275	94	295
DKC32-12 RIB	Dekalb	2450	94	288
DKC34-57 RIB	Dekalb	2575	94	300

PS 2210VT2P RIB	DLF Pickseed	2225	100	332
PS 2320 RR	DLF Pickseed	2300	100	360
LR 9474 VT2PRIB	Legend	2225	95	330
LR 9573 VT2PRIB	Legend	2200	95	240
LR 9579 RR	Legend	2350	95	242
LR 9676 VT2PRIB	Legend	2275	95	252
LR 99S77 RR	Legend	2300	95	288
P7527AM	Corteva/Pioneer	2150	95	209
P7958AM	Corteva/Pioneer	2275	95	231

Table 2. Seasonal vs Long-Term Precipitation & Cumulative Corn Heat Units (CHU) CSIDC Outlook Weather Station				
Month	2019 mm (inches)	30 Year Average mm (inches)	% of Long-Term	Cumulative CHU
May	13.2 (0.5)	46.0 (1.8)	29	195
June	90.2 (3.6)	67.0 (2.6)	135	730
July	43.8 (1.7)	57.0 (2.2)	77	1378
August	39.2 (1.5)	46.0 (1.8)	85	1940
September	38.2 (1.5)	33.0 (1.3)	116	2336
Total	224.6 (8.8)	249.0 (9.8)	90	

Table 4. Agronomic Data of Irrigated Silage Corn, 2019

Hybrid	Dry Yield (T/ha)	Dry Yield (T/ac)	Plant Stand (plants/ac)	Harvest Whole Plant Moisture (%)	10% Anthesis (days)	50% Silking (days)
DKC29-89 RIB	16.06 bcd	6.50	28666 b	65.0	80	81
DKC32-12 RIB	17.85 ab	7.22	29677 b	63.2	80	83

DKC34-57 RIB	16.55 bc	6.70	29453 b	67.1	82	84
PS 2210VT2P RIB	18.69 a	7.56	34736 a	63.5	80	84
PS 2320 RR	14.82 cde	6.00	27429 bc	64.0	79	81
LR 9474 VT2PRIB	17.94 ab	7.26	27429 bc	60.4	79	83
LR 9573 VT2PRIB	13.35 e	5.41	22033 d	60.9	76	78
LR 9579 RR	14.18 de	5.74	23832 cd	66.6	81	85
LR 9676 VT2PRIB	14.18 de	5.74	27430 bc	62.3	76	77
LR 99S77 RR	14.72 cde	5.96	26980 bc	64.3	75	78
P7527AM	17.06 ab	6.91	29116 b	61.9	80	83
P7958AM	17.04 ab	6.90	28104 b	61.7	78	80
LSD (0.05)	1.92	0.78	3683	1.9	1.95	2.3
CV (%)	8.3	8.3	9.2	2.1	1.7	2.0

Table 5. Agronomic Data of Dry Land Silage Corn, 2019

Hybrid	Dry Yield (T/ha)	Dry Yield (T/ac)	Plant Stand (plants/ac)	Harvest Whole Plant Moisture (%)	10% Anthesis (days)	50% Silking (days)
DKC29-89 RIB	7.90 a	3.20	27654 ab	66.3	92	93
DKC32-12 RIB	7.63 ab	3.09	26193 ab	65.7	88	89
DKC34-57 RIB	7.71 a	3.12	24057 bcd	68.3	93	94
PS 2210VT2P RIB	7.94 a	3.21	30577 a	67.0	93	94
PS 2320 RR	7.43 abc	3.01	21359 cde	63.5	87	89
LR 9474 VT2PRIB	6.81 cd	2.76	23944 bcd	63.4	92	93
LR 9573 VT2PRIB	6.40 d	2.59	20347 de	62.2	87	90
LR 9579 RR	6.39 d	2.59	18211 e	66.5	95	97
LR 9676 VT2PRIB	6.83 bdc	2.76	23944 bcd	61.5	85	89
LR 99S77 RR	7.53 abc	3.05	25069 bc	67.9	86	89
P7527AM	6.57 d	2.66	26418 ab	62.6	91	93
P7958AM	8.03 a	3.25	25630 bc	64.4	88	90
LSD (0.05)	0.82	0.33	4433	1.9	5.5	4.6
CV (%)	7.8	7.8	12.6	2.0	4.3	3.5

Table 6. Irrigated vs Dry Land Silage Corn, 2019

Production System or Hybrid	Dry Yield (T/ha)	Dry Yield (T/ac)	% Yield Increase of Irrigated vs Dry Land	Plant Stand (pl/ac)	Harvest Whole Plant Moisture (%)	10% Anthesis (days)	50% Silking (days)
Production System							
Irrigated	16.04	6.49	121	27907	63.4	78	81
Dry Land	7.26	2.94		24450	65.0	90	92
LSD (0.05)	1.52	0.61		2219	1.6	3.3	2.6
CV (%)	8.8	8.8		10.8	2.1	3.4	2.9
Hybrid							
DKC29-89 RIB	11.98 bc	4.85	103	28160	65.6	86	87
DKC32-12 RIB	12.74 ab	5.15	134	27935	64.5	84	86
DKC34-57 RIB	12.13 bc	4.91	115	26755	67.7	87	89
PS 2210VT2P RIB	13.31 a	5.39	135	32657	65.3	86	89
PS 2320 RR	11.13 cd	4.50	99	24394	63.8	83	85
LR 9474 VT2PRIB	12.37 ab	5.01	164	25687	61.9	85	88
LR 9573 VT2PRIB	9.88 e	4.00	109	21190	61.5	81	84
LR 9579 RR	10.28 de	4.16	122	21022	66.6	88	91
LR 9676 VT2PRIB	10.50 de	4.25	108	25687	61.9	80	83
LR 99S77 RR	11.13 cd	4.51	95	26024	66.1	81	83
P7527AM	11.82 bc	4.78	160	27767	62.3	85	88
P7958AM	12.54 ab	5.07	112	26867	63.1	83	85
LSD (0.05)	1.02			2828	1.3	2.9	2.5

Production System x Hybrid Interaction							
LSD (0.05)	S	S		NS	S	NS	NS

S = significant

NS = not significant

Table 4. Agronomic Data of Irrigated Silage Corn, 2019

Hybrid	Wet Yield (T/ha)	Dry Yield (T/ac)	Plant Stand (plants/ac)	Harvest Whole Plant Moisture (%)	10% Anthesis (days)	50% Silking (days)
DKC29-89 RIB	16.06 bcd	6.50	28666 b	65.0	80	81
DKC32-12 RIB	17.85 ab	7.22	29677 b	63.2	80	83
DKC34-57 RIB	16.55 bc	6.70	29453 b	67.1	82	84
PS 2210VT2P RIB	18.69 a	7.56	34736 a	63.5	80	84
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P7527AM	17.06 ab	6.91	29116 b	61.9	80	83
P7958AM	17.04 ab	6.90	28104 b	61.7	78	80
LSD (0.05)	1.92	0.78	3683	1.9	1.95	2.3
CV (%)	8.3	8.3	9.2	2.1	1.7	2.0

Table 5. Agronomic Data of Dry Land Silage Corn, 2019

Hybrid	Dry Yield (T/ha)	Dry Yield (T/ac)	Plant Stand (plants/ac)	Harvest Whole Plant Moisture (%)	10% Anthesis (days)	50% Silking (days)
DKC29-89 RIB	7.90 a	3.20	27654 ab	66.3	92	93
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LSD (0.05)	0.82	0.33	4433	1.9	5.5	4.6
CV (%)	7.8	7.8	12.6	2.0	4.3	3.5

Table 6. Irrigated vs Dry Land Silage Corn, 2019

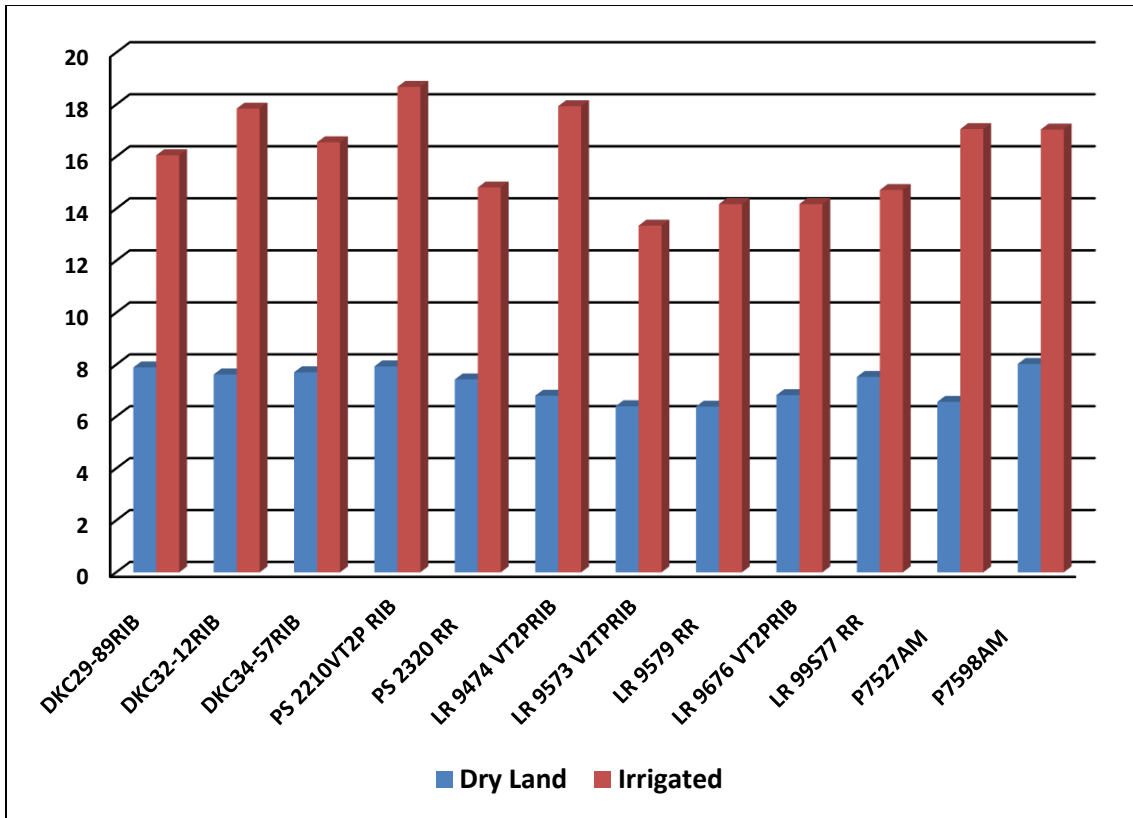
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Production System							
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LSD (0.05)	1.02			2828	1.3	2.9	2.5
Production System x Hybrid Interaction							
LSD (0.05)	S	S		NS	S	NS	NS

S = significant

NS = not significant

Figure 1. Irrigated vs Dry Land Dry Yield, 2019



11. Conclusions and Recommendations

The objective of this trial was to evaluate the suitability of corn varieties under irrigation in the Lake Diefenbaker region. This trial added to the small base of information on corn variety performance for silage in Western Canada. Several varieties performed strongly under local conditions.

12. Acknowledgments

Ministry support for the project was acknowledged through signage posted at the project site.

We would like to acknowledge Corteva/Pioneer, Legend Seeds, Dekalb, and DLF Pickseed for supplying seed for this project.

13. Appendices

Abstract

14. Abstract/Summary

Growing corn for silage or winter grazing is a potential alternative winter feeding method for Saskatchewan beef producers. Variety selection is an integral piece of ensuring success when growing corn. Producers need to know which corn varieties are available locally and how these varieties perform under local growing conditions. Data collection included plant population, corn heat

units (CHU) accumulated and dry matter (DM) yield. Based on dry matter yield, *PS 2210VT2P RIB* was the corn variety that performed best under irrigation in 2019. Irrigated dry matter yields varied from 5.41 to 7.56 T/acre. P7958AM was the corn variety that performed best under non-irrigated management. Dryland dry matter yields varied from 2.59 to 3.25 T/acre.
