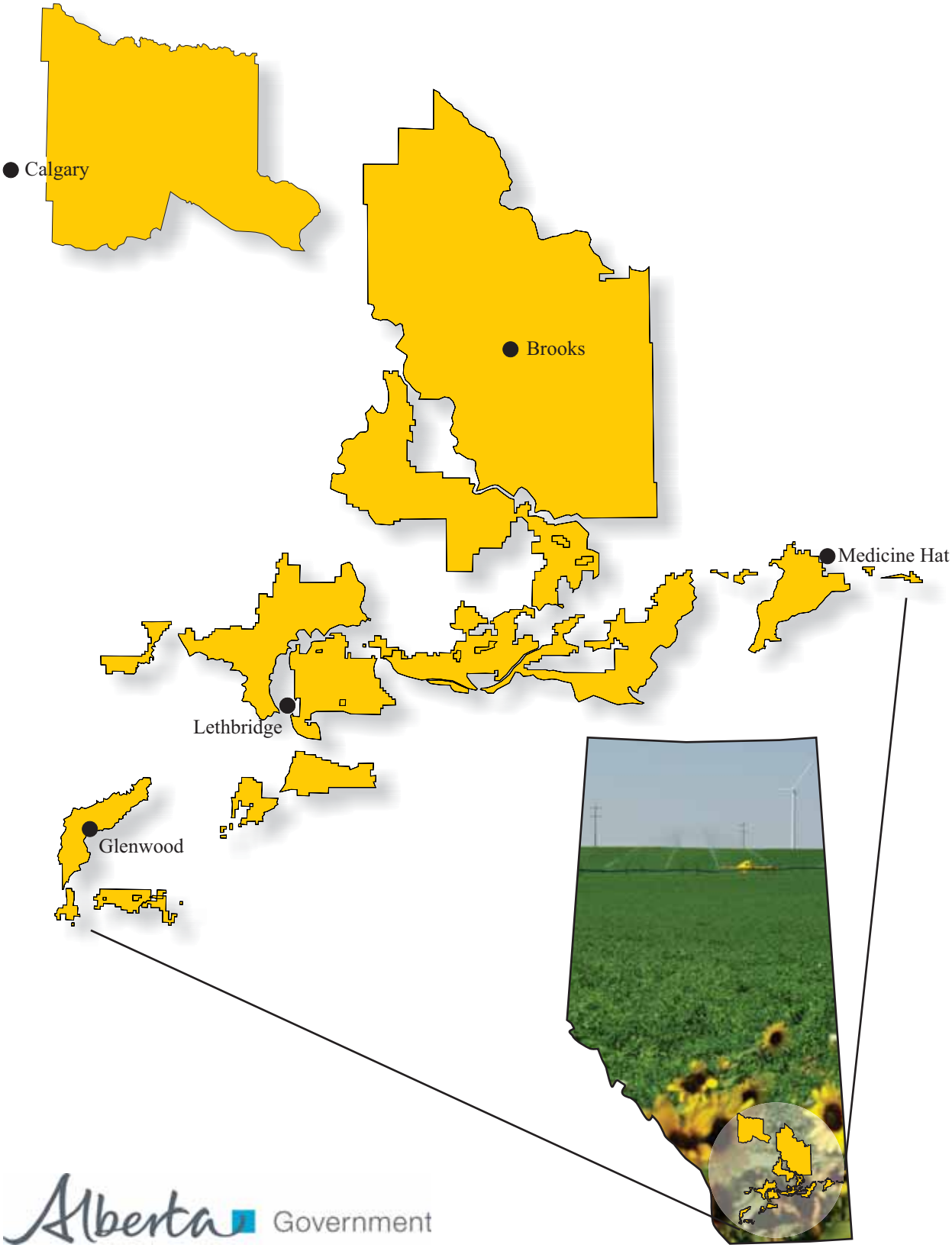
Alberta Irrigation Information
2013



Alberta Government

ALBERTA IRRIGATION INFORMATION

FACTS AND FIGURES FOR THE YEAR 2013

BASIN WATER MANAGEMENT BRANCH

IRRIGATION AND FARM WATER DIVISION

JUNE 2014

This report is prepared by Alberta Agriculture and Rural Development. The purpose of this booklet is to provide a statistical overview of irrigation information and data relating primarily to the thirteen irrigation districts situated in southern Alberta, but also includes information about irrigation across the whole province.

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Table 1. Details of Crops Grown within the 13 Irrigation Districts in 2013

CROP TYPE		AID			BRID			EID			LID			LNID			MID			MVID			RCID			RID			SMRID			TID			UID			WID			TOTAL ACRES
		assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	
		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		
CEREALS	Barley	513		667	19,510	934		20,556			366	273		16,689			2,032	1,469					116			6,269	1,092		18,886	4,145	1,322	5,859	353		2,100	1,938		8,841	7,328		**121,258**
	CPS Wheat				303			2,093						1,113															88		28	204			303	970		4,013	2,236		**11,350**
	Durum Wheat				7,419			1,294						6,749															25,298	894	536	983	14			45			25		**43,257**
	Grain Corn				6,672	47		4,670																					7,369	152	23	1,830	9					348			**21,120**
	Hard Spring Wheat			76	55,908	1,272		55,493						12,168			2,966	273			125					6,548	2,048		69,956	4,067	3,021	15,314	90		1,503	1,609		3,615	3,229		**239,281**
	Malt Barley					54		95																						110								135			**394**
	Oats				896	25		1,328						376												73			705	195	21	927			10	9		130	156		**4,851**
	Rye							135						1,413																							130			**1,678**
	Soft Wheat	66			930	11		1,496						425															3,956	23	152	809						130	268		**8,266**
	Triticale				404			1,465			54			2,312			80												1,195	18	11	282									**5,821**
	Winter Wheat				2,638	13		2,252									237	40								728			12,734	538	583	1,765			2,613	470		1,243	30		**25,870**
FORAGES	Alfalfa - Two cuts				5,145	15		31,832																					5,567	1,517	258							7,362	3,862		**55,558**
	Alfalfa - Three cuts				1,315	50		1,754																					1,427		26										**4,571**
	Alfalfa Hay	626		103	4,349	346		3,636			500	621	200	22,391			4,253	730		309	919		654			11,116	854		13,201	792	669	4,717	213		3,366	1,471		758	581		**77,376**
	Alfalfa Silage				445			2,677						3,836												130			1,768	246	234	158									**9,494**
	Barley Silage				1,736			2,302						37,463			125									1,721	51		7,573	1,153	349	691			1,335	150		1,799	1,379		**57,827**
	Barley Silage (underseeded)							318																					931	19	71										**1,339**
	Brome Hay				617	744								806															296	37	113										**2,613**
	Corn Silage				5,665	57		13,412						24,155												1,544			14,582	1,157	545	3,606						130			**64,853**
	Grass Hay	863		131	1,031	174		8,152			195	605	80	3,667			214	90		46	454				60		235		3,157	1,997	748	197	125		643	113		1,557	1,227		**25,762**
	Green Feed				630	68		3,577									154				565						30		473	113	34	444				10			133		**6,230**
	Milk Vetch				20																																					**20**
	Millet							417																																		**417**
	Native Pasture				351	122		2,628					25	301															2,995	1,211	402	135	231		2,649	1,113		1,293	1,653		**15,108**
	Oats Silage				321			142																					20												**483**
	Sorghum/Sudan Grass																												203			132									**335**
	Tame Pasture	217		64	11,214	662		42,986			389	375	818	4,739			1,349	389			942				80	2,779	1,991		5,524	3,501	1,032	2,841	1,649		1,360	494		3,305	2,596		**91,294**
	Timothy Hay				1,594	51		625			135			5,191															4,282	80	139	2,050	20		1,336	133		400	35		**16,072**
	Tritcale Silage																												635	19	30										**684**
OIL SEEDS	Canola	830			18,902	1,636		33,752						24,484			2,467	685		253						7,933	130		42,593	2,528	1,425	2,869			4,819	2,927		9,861	5,209		**163,302**
	Flax				5,266	514		13,152						1,145			250	60								245	90		6,321	197	95	515									**27,849**
	Mustard													80												149			111	83	10	1									**434**
SPECIALTY CROPS	Alfalfa Seed				7,388			16,438																					239												**24,065**
	Canola Seed				12,283	211		9,951																					17,819	267	3	5,940									**46,474**
	Caraway Seed																																									**0**
	Carrots							202																					10												**212**
	Catnip																												522												**522**
	Chick Peas																												260												**260**
	Dill							125																					656												**781**
	Dry Beans				11,376	4		3,553																					27,307	460	178	3,006									**45,884**
	Dry Peas				2,936	300		3,294						239												505	140		2,755	228	392	288			569	132		596	856		**13,202**
	Faba Beans				1,564			1,210																					906			66									**3,746**
	Fresh Corn (sweet)				127			10																					1,312		16	1,553									**3,018**
	Fresh Peas				568			45																					900	149		2,745									**4,407**
	Grass Seed				789												239	178											123						34			210			**1,573**
	Hemp				1,924	72		344																					3,031	662	32										**6,065**
	Lawn Turf													612												42			738	84		78			15			2,202	432		**4,203**
	Lentils							68																					136												**204**
	Market Gardens				45	58		47						48												22			291	22		7				3		229	75		**847**
	Mint				340			1,375																					3,258	7											**4,980**
	Nursery							434						7												35			198	198		22						1,045	538		**2,477**
	Onions																												5			797									**802**
	Potatoes				11,554	214		2,533						1,360															14,929	190	13	10,299			5						**41,097**
	Pumpkins																															199									**199**
	Safflower				276			115																																	**391**
	Seed Potatoes				135			1,388																					130			256						562	140		**2,611**
	Small Fruit				31												20												27	58			4								**140**
	Soy Beans				484			685																					1,402		4	135									**2,710**
	Sugar Beets				11,119			706						2,712															9,203	109	12	3,821									**27,682**
	Sunflower				558			1,161						31															130			317									**2,197**
OTHER	Miscellaneous	170			47	97								4,044											191				420	621	222	129	43		59	15					**5,887**
	Non Crop								34		97	45	70																35	434	263							12	181		**1,341**
	Summer Fallow				595	128			662																				3	31	464	15	67			75			76		**2,116**
	Unknown (not reported)			50			16,318						5			458						85										4,002							13,652	**34,570**
Total assessment roll acres		**3,285**	**0**	**1,091**	**217,420**	**7,866**	**16,318**	**295,923**	**696**	**0**	**1,736**	**1,919**	**1,198**	**178,566**	**0**	**458**	**14,386**	**3,914**	**0**	**608**	**3,005**	**85**	**770**	**0**	**331**	**39,839**	**6,661**	**0**	**338,588**	**28,309**	**13,474**	**76,002**	**6,820**	**0**	**22,718**	**11,675**	**0**	**49,879**	**32,245**	**13,652**	
		4,376			**241,604**			**296,619**			**4,853**			**179,014**			**18,300**			**3,698**			**1,101**			**46,500**			**380,371**			**82,822**			**34,393**			**95,776**			**1,389,427**

Table 2. Summary of Crops Grown within the 13 Irrigation Districts in 2013

CROPS	IRRIGATION DISTRICTS													TOTAL ASSESSMENT ROLL ACRES
	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	
Cereals	1,322	97,023	90,877	693	41,245	7,097	125	116	16,758	156,023	28,439	11,569	31,857	**483,144**
	30.2%	40.2%	30.6%	14.3%	23.0%	38.8%	3.4%	10.5%	36.0%	41.0%	34.3%	33.6%	33.3%	**34.8%**
Forages	2,004	36,722	114,458	3,943	102,549	7,304	3,235	794	20,451	79,126	17,209	14,172	28,070	**430,036**
	45.8%	15.2%	38.6%	81.2%	57.3%	39.9%	87.5%	72.1%	44.0%	20.8%	20.8%	41.2%	29.3%	**31.0%**
Oil Seeds	830	26,318	46,904	0	25,709	3,462	253	0	8,547	53,362	3,385	7,746	15,070	**191,585**
	19.0%	10.9%	15.8%	0.0%	14.4%	18.9%	6.8%	0.0%	18.4%	14.0%	4.1%	22.5%	15.7%	**13.8%**
Specialty Crops	0	64,356	43,684	0	5,009	437	0	0	744	89,369	29,533	757	6,858	**240,747**
	0.0%	26.6%	14.7%	0.0%	2.8%	2.4%	0.0%	0.0%	1.6%	23.5%	35.7%	2.2%	7.2%	**17.3%**
Other*	220	17,185	696	217	4,502	0	85	191	0	2,491	4,256	149	13,921	**43,914**
	5.0%	7.1%	0.2%	4.5%	2.5%	0.0%	2.3%	17.3%	0.0%	0.7%	5.1%	0.4%	14.5%	**3.2%**
TOTAL ASSESSMENT ROLL ACRES	**4,376**	**241,604**	**296,619**	**4,853**	**179,014**	**18,300**	**3,698**	**1,101**	**46,500**	**380,371**	**82,822**	**34,393**	**95,776**	**1,389,427**

Note: Assessment roll acres include "irrigation", "terminable" and "annual" acres
*Other includes unknown or not reported crops

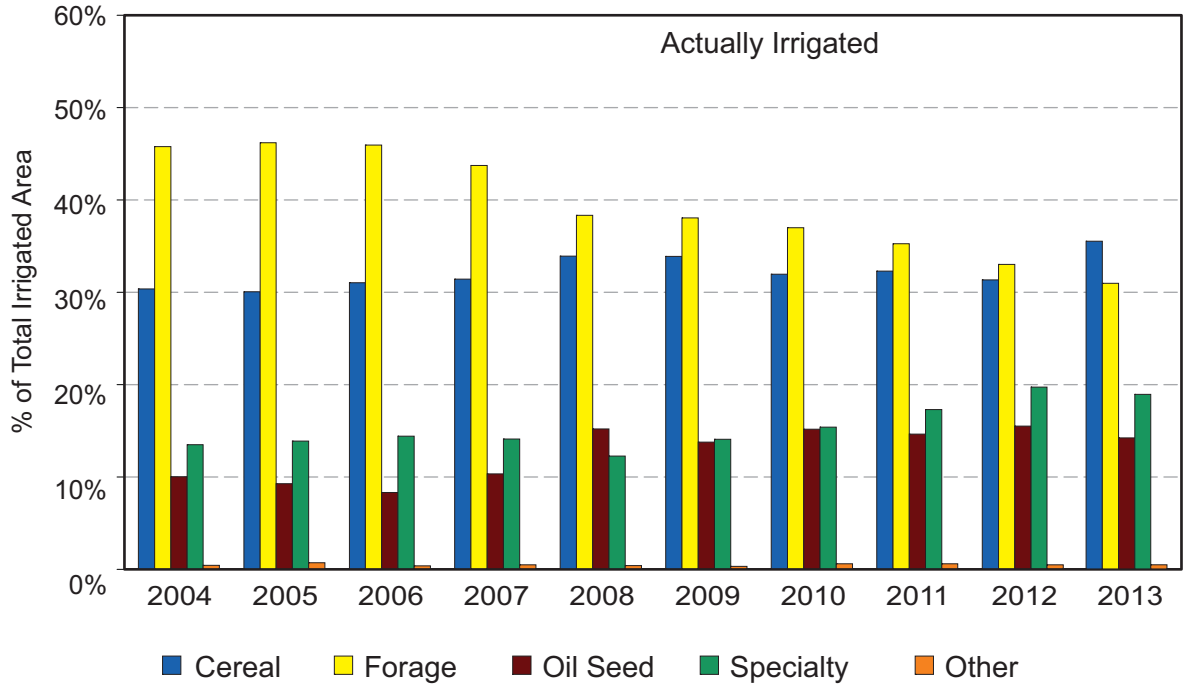


Figure 1. Irrigated Crops within the 13 Irrigation Districts in Southern Alberta (2004 - 2013)

Note: Starting in 2011, acreage data for canola seed (canola grown for seed production) was collected. It is included in the specialty crop category.

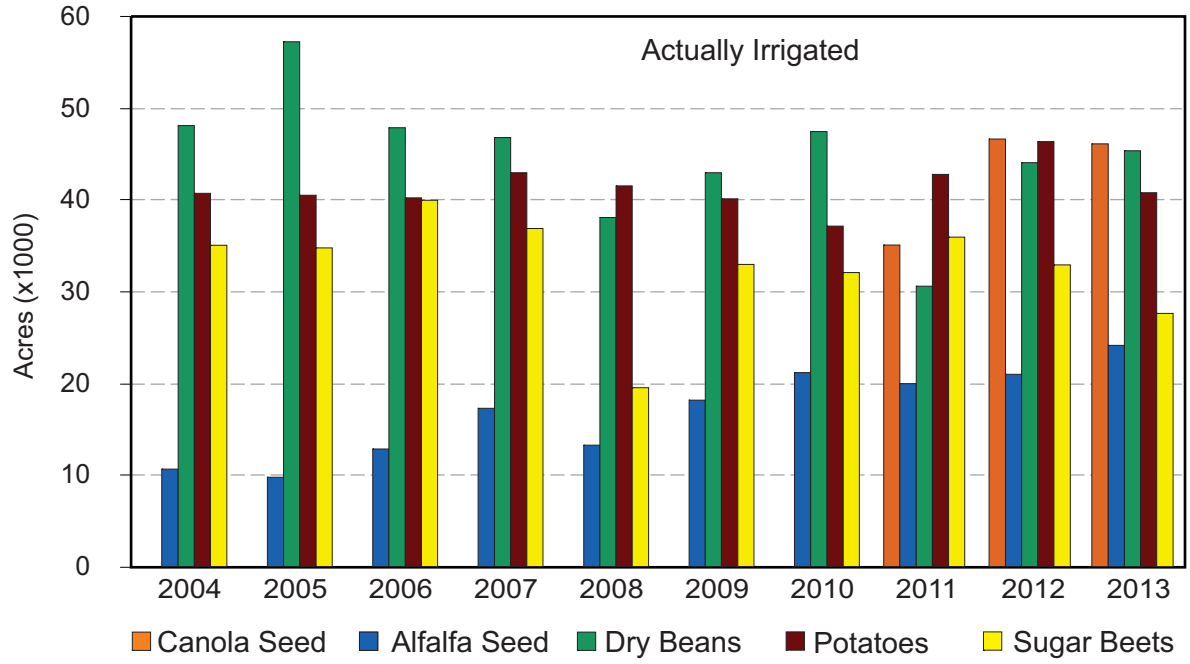


Figure 2. Acres of Five Major Irrigated Specialty Crops – Canola Seed, Alfalfa Seed, Dry Beans, Potatoes and Sugar Beets within the 13 Irrigation Districts in Southern Alberta (2004 - 2013)

Note: Starting in 2011, acreage data for canola seed (canola grown for seed production) was collected. It is included in the specialty crop category.

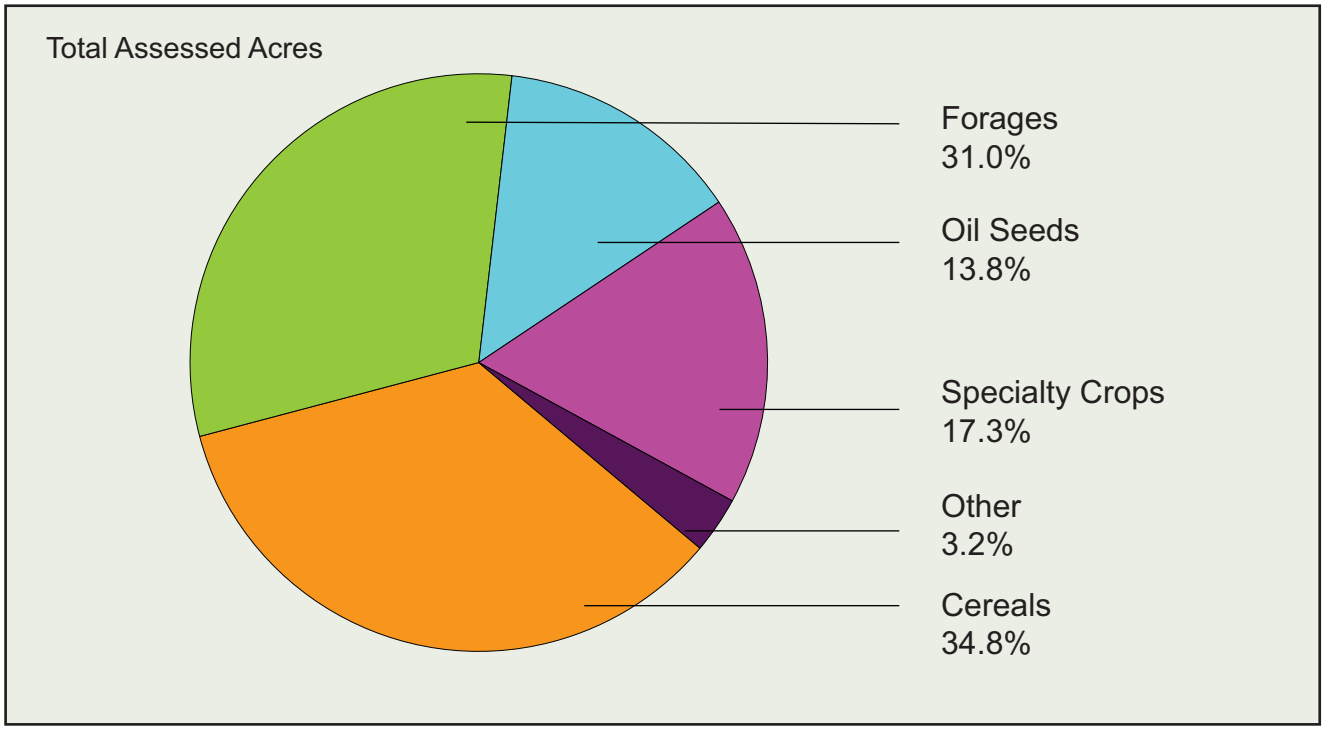


Figure 3. Crops Grown within the 13 Irrigation Districts in Southern Alberta in 2013

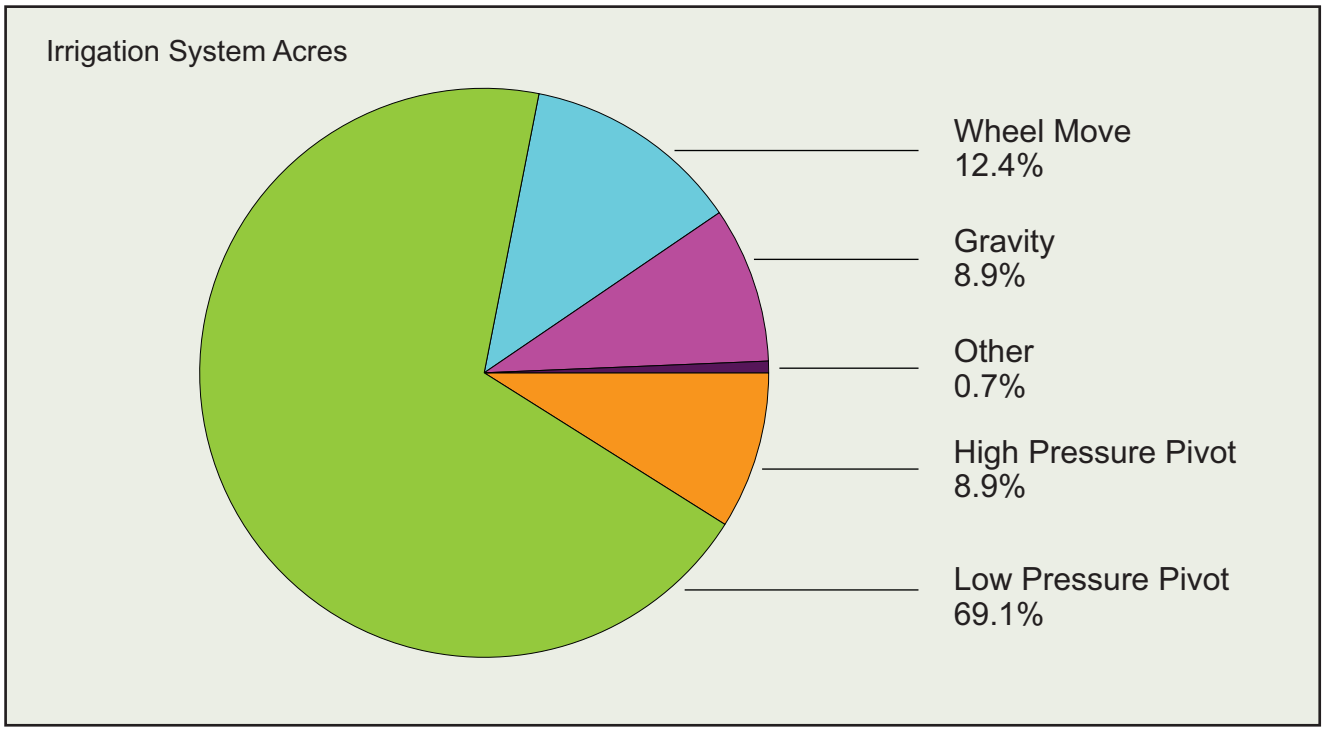
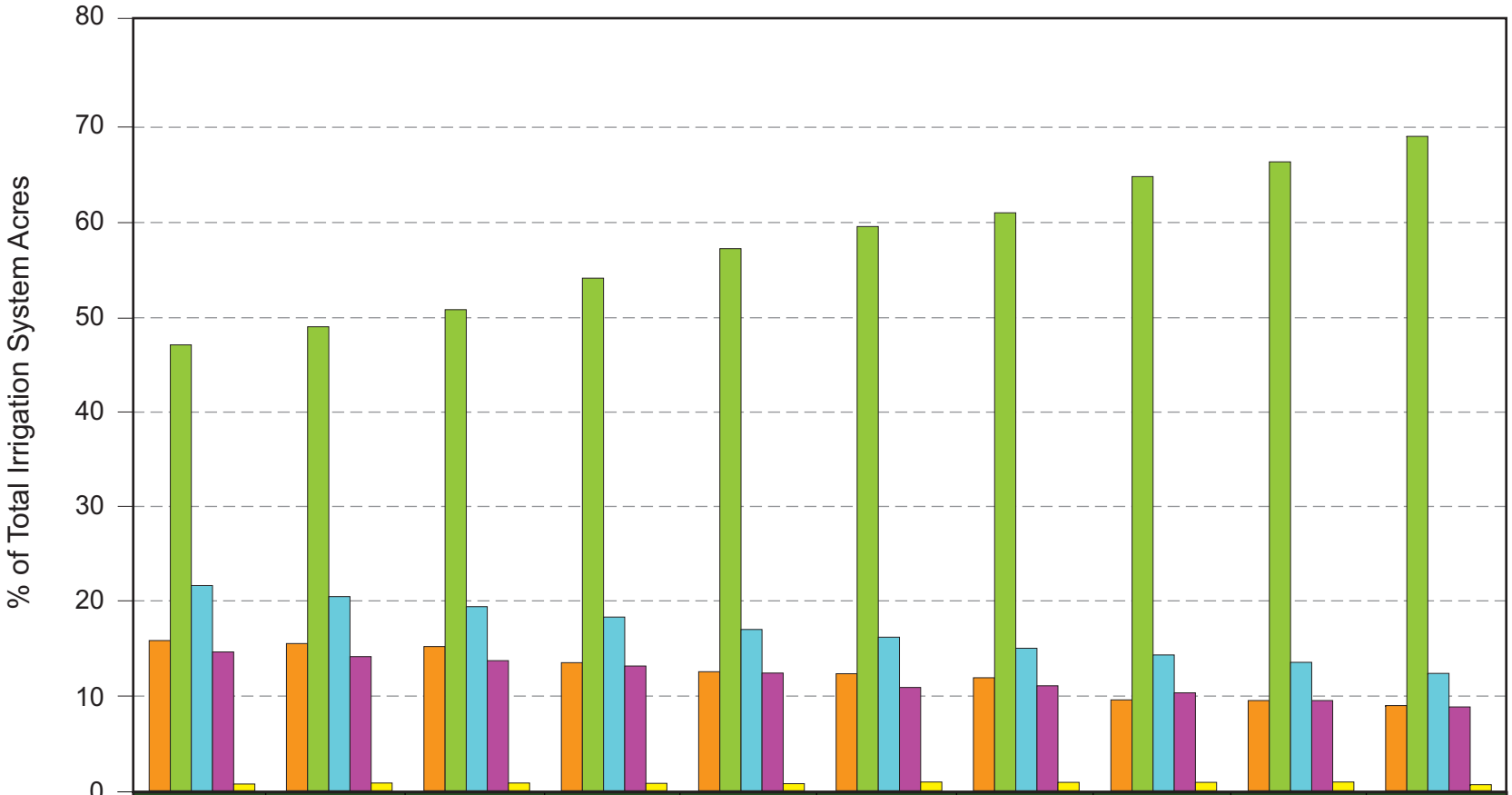


Figure 4. On-farm Irrigation Methods within the 13 Irrigation Districts in Southern Alberta in 2013

Table 3. On-farm Irrigation Method Summary within the 13 Irrigation Districts in Southern Alberta in 2013

IRRIGATION METHOD		AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	Individual Method Total	Total Acres Covered
HIGH PRESSURE PIVOT SPRINKLER	Pivot High Pressure		20,080	28,066	459	8,246	2,186		67	4,568	9,551	9,544	2,641	20,592	**106,000**	**119,449**
	Pivot High Pressure - Corner arm		1,388	2,820		4,435				67	1,491	790		639	**11,630**	
	Linear - High Pressure		138	217		818				100		84		462	**1,819**	
	percent of district -----	0.0%	9.6%	10.5%	12.8%	7.6%	11.9%	0.0%	8.7%	10.6%	3.0%	12.9%	7.8%	26.6%	**8.9%**	
LOW PRESSURE PIVOT SPRINKLER	Pivot Medium Pressure		1,142	4,098		1,636				360	3,486				**10,722**	**923,391**
	Pivot Medium Pressure - Corner Arm		448	248		301					288				**1,285**	
	Pivot Low Pressure	675	144,673	158,749	576	49,728	7,700		477	18,361	262,754	43,032	14,193	34,570	**735,488**	
	Pivot Low Pressure - Corner Arm		30,920	14,046		62,922				1,332	43,649	13,899	1,181	4,406	**172,355**	
	Linear - Low Pressure		128	1,390		271				125	1,159	220	80	168	**3,541**	
	percent of district -----	20.9%	78.7%	60.3%	16.1%	65.0%	42.1%	0.0%	61.9%	45.1%	84.9%	71.0%	45.4%	48.0%	**69.1%**	
WHEEL MOVE	Wheel Move -Two Laterals	1,763	6,453	18,448	1,694	20,349	4,961	507	226	13,085	31,758	8,800	1,791	9,422	**119,257**	**165,561**
	Wheel Move - Four Laterals		4,275	6,178		24,324	140			2,582	3,768	2,097	237	2,703	**46,304**	
	percent of district -----	54.5%	4.8%	8.3%	47.3%	25.3%	27.9%	14.0%	29.4%	35.0%	9.7%	13.5%	6.0%	14.9%	**12.4%**	
GRAVITY	Gravity - Developed - No Control		12,581	49,648		1,129	3,119			2,682	1,258	911	1,335	200	**72,863**	**118,307**
	Gravity - Undeveloped - Flood	208	2,937	11,559	748	881		3,106		1,037	6,131	997	12,430	5,410	**45,444**	
	percent of district -----	6.4%	6.9%	20.7%	20.9%	1.1%	17.0%	86.0%	0.0%	8.3%	2.0%	2.4%	40.4%	6.9%	**8.9%**	
OTHER	Volume Gun - Stationary										141	10		164	**315**	**8,784**
	Volume Gun - Traveller		55	285		144					39	22		565	**1,110**	
	Solid Set (underground sprinkler)	47		8	92	532				95	254			353	**1,381**	
	Hand Move (sprinkler above ground)	528	68	551	5	929	174			285	1,012	115	147	427	**4,241**	
	Micro - Spray - Sprinkler					41				42	39	15	15	96	**248**	
	Micro - Drip - Trickle						20			7	119			1,328	**1,474**	
	Other Application Use	11													**16**	
	percent of district -----	18.1%	0.1%	0.3%	2.8%	0.9%	1.1%	0.0%	0.0%	1.0%	0.4%	0.2%	0.5%	3.6%	**0.7%**	
	Total System Acres	**3,232**	**225,286**	**296,311**	**3,579**	**176,685**	**18,300**	**3,613**	**770**	**44,728**	**366,897**	**80,536**	**34,050**	**81,505**		**1,335,492**



		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
High Pressure Pivot	Acres	204,342	201,601	198,011	176,421	164,072	160,665	156,784	126,864	126,430	120,124
Low Pressure Pivot		607,014	635,880	660,168	705,260	747,187	773,538	802,173	856,707	879,651	922,716
Wheelmove		279,183	265,897	252,831	239,140	222,247	210,606	198,043	189,410	179,837	165,561
Gravity		189,033	183,811	178,411	171,487	162,063	141,885	145,879	136,709	126,217	118,307
Other		9,347	10,600	10,579	10,380	9,870	11,935	11,826	11,626	12,444	8,785

Figure 5. Irrigation Method Summary within the 13 Irrigation Districts in Southern Alberta (2004 - 2013)

Table 4. Assessment Roll Acres within the 13 Irrigation Districts

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	TOTAL
76	3,081	139,665	219,405	4,430	109,629	9,069	3,720	2,069	28,350	262,231	66,423	33,358	52,190	933,620
77	3,081	147,795	224,967	4,430	111,735	9,480	3,720	1,319	31,626	274,301	68,178	33,617	68,549	982,798
78	3,104	153,120	227,202	4,431	111,947	10,737	3,717	1,776	31,570	284,151	68,815	33,651	71,603	1,005,824
79	3,104	150,160	227,254	4,477	111,924	10,797	3,710	1,776	31,524	287,329	69,828	33,546	74,525	1,009,954
1980	3,104	164,889	229,110	4,477	112,562	10,797	3,710	1,776	33,681	293,126	70,368	33,544	76,029	1,037,173
81	3,096	174,641	230,553	4,457	113,845	10,963	3,710	1,776	35,385	299,548	70,819	33,417	79,633	1,061,843
82	3,127	179,613	239,651	4,423	114,919	11,647	3,710	1,716	39,130	301,446	71,529	33,383	81,864	1,086,158
83	2,916	181,174	244,099	4,440	116,745	12,357	3,710	1,776	39,148	313,728	72,623	33,448	81,480	1,107,644
84	3,051	183,529	244,243	4,440	117,869	13,047	3,710	1,776	41,729	319,712	72,971	33,534	82,974	1,122,585
1985	3,399	185,034	246,658	4,460	118,883	14,218	3,710	1,319	44,990	328,063	73,063	33,854	84,245	1,141,896
86	3,444	189,202	247,804	4,460	126,307	14,579	3,690	1,210	44,950	331,493	73,314	34,336	83,924	1,158,713
87	3,444	190,263	249,372	4,479	128,867	14,885	3,690	1,210	44,407	334,285	73,654	34,450	85,405	1,168,411
88	3,435	192,424	252,432	4,709	131,565	15,030	3,690	1,210	44,196	339,091	73,602	34,615	86,198	1,182,197
89	3,500	194,977	256,353	4,729	133,620	15,569	3,700	1,210	44,144	342,451	74,898	34,818	87,242	1,197,211
1990	3,500	199,980	260,523	4,742	135,632	15,099	3,728	1,210	44,044	349,849	74,568	34,769	88,480	1,216,124
91	3,527	201,070	263,889	4,762	137,719	16,665	3,728	1,210	44,305	350,108	77,740	34,687	88,112	1,227,522
92	3,519	202,499	269,462	4,800	139,688	16,391	3,734	1,210	44,279	351,393	78,177	34,868	87,949	1,237,969
93	3,519	204,466	270,008	4,780	138,095	16,775	3,737	1,210	44,229	353,039	78,412	34,772	87,453	1,240,495
94	3,519	205,983	272,024	4,780	141,517	16,785	3,727	1,210	44,219	353,466	78,629	34,438	86,725	1,247,022
1995	3,519	207,652	273,848	4,780	143,608	17,908	3,727	1,210	43,678	356,618	78,676	34,428	86,942	1,256,594
96	3,519	209,560	276,405	4,760	147,241	18,169	3,727	1,210	44,315	358,399	79,069	34,506	87,258	1,268,138
97	3,519	209,686	279,966	4,760	150,843	18,300	3,713	1,210	44,810	360,659	79,788	34,353	86,284	1,277,891
98	3,519	210,690	280,573	4,769	153,365	18,300	3,722	1,210	45,533	360,780	80,455	34,352	86,771	1,284,039
99	3,609	211,152	281,107	4,769	154,886	18,300	3,722	1,210	45,751	367,161	81,984	34,352	88,131	1,296,134
2000	3,609	210,352	281,720	4,763	157,825	18,300	3,722	1,210	45,888	369,771	82,257	34,329	87,236	1,300,982
01	3,611	209,927	281,710	4,763	163,878	18,300	3,712	1,210	46,235	370,925	82,261	34,329	87,924	1,308,785
02	3,611	214,279	282,516	4,763	163,870	18,300	3,712	1,210	46,304	371,319	82,284	34,423	96,512	1,323,103
03	3,611	214,585	282,961	4,763	164,288	18,320	3,712	1,210	46,304	372,114	82,562	34,423	96,646	1,325,499
04	3,611	216,533	283,625	4,763	175,568	18,320	3,712	1,210	46,296	372,979	82,515	34,093	96,535	1,339,760
2005	3,608	219,733	283,706	4,763	175,628	18,320	3,561	1,210	46,296	372,619	82,533	34,081	96,415	1,342,473
06	3,608	221,677	284,074	4,763	175,636	18,320	3,561	1,101	46,306	372,618	82,527	34,025	96,100	1,344,316
07	3,699	231,713	284,419	5,205	175,913	18,300	3,654	1,101	46,306	372,996	82,804	34,044	96,091	1,356,245
08	3,699	233,869	285,086	5,126	176,069	18,300	3,700	1,101	46,293	373,162	82,600	34,069	96,079	1,359,153
09	3,699	233,438	294,612	4,706	176,201	18,300	3,700	1,101	46,303	373,092	82,569	34,325	96,045	1,368,091
2010	4,389	233,925	290,429	4,793	176,282	18,300	3,700	1,101	46,302	373,018	82,728	34,370	95,628	1,364,965
11	4,390	234,014	294,373	4,848	176,187	18,300	3,617	1,101	46,302	374,408	82,773	34,382	95,754	1,370,449
12	4,376	234,327	294,620	4,840	177,593	18,300	3,616	1,101	46,402	373,835	82,750	34,382	95,788	1,371,930
13	4,376	241,604	296,619	4,853	179,014	18,300	3,698	1,101	46,500	380,371	82,822	34,393	95,776	1,389,427

Notes: Assessment roll acres include "irrigation", "terminable" and "annual" acres. Only "irrigation" and "terminable" acres are considered in district expansion limits. In 2013, irrigation districts reported 6,478 annual acres.

Table 5. Acres Actually Irrigated within the 13 Irrigation Districts

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	TOTAL
1960	440	71,392	189,761	1,542	71,006	5,000	2,789	200	15,200	179,477	29,448	16,536	12,000	**594,791**
61	1,800	80,603	189,421	1,542	73,637	6,000	2,760	200	18,300	157,300	30,747	23,095	23,000	**608,405**
62	2,177	83,259	190,866	4,187	73,317	7,000	2,760	200	18,500	155,500	36,029	28,465	30,000	**632,260**
63	2,315	87,267	192,324	4,511	63,000	7,250	2,789	200	18,500	170,000	33,902	27,012	25,000	**634,070**
64	2,523	86,034	193,381	4,511	70,575	7,500	2,789	200	18,000	170,000	39,015	19,376	24,000	**637,904**
1965	2,523	44,507	194,824	4,511	22,778	3,000	2,789	1,500	15,000	165,000	26,005	9,805	2,750	**494,992**
66	2,523	40,423	195,905	4,523	19,196	4,000	2,789	1,050	16,000	165,000	25,904	12,725	3,100	**493,138**
67	2,523	71,936	196,549	4,523	47,962	5,000	2,789	1,250	17,000	160,000	38,235	11,866	12,870	**572,503**
68	2,523	82,876	198,352	4,523	56,993	4,400	2,789	900	15,200	154,336	45,420	10,109	10,000	**588,421**
69	2,523	79,980	198,248	4,523	35,902	4,500	2,789	900	15,000	124,879	45,980	10,228	13,500	**538,952**
1970	2,523	77,580	199,729	4,523	49,783	5,000	2,789	1,000	15,000	134,982	50,094	15,019	15,000	**573,022**
71	2,424	81,018	166,219	4,343	60,207	5,500	2,789	1,100	15,000	149,444	52,185	14,417	16,000	**570,646**
72	2,400	82,928	175,915	4,305	58,817	5,750	2,000	675	15,000	147,884	52,470	11,061	17,000	**576,205**
73	2,400	98,185	183,279	4,305	80,995	5,600	3,720	800	15,000	176,120	58,826	22,233	19,000	**670,463**
74	2,424	108,021	188,657	4,305	90,085	6,000	3,737	700	18,000	190,017	60,981	11,710	22,000	**706,637**
1975	2,400	116,155	179,095	4,430	92,850	6,000	3,000	600	21,500	171,883	44,606	4,952	34,036	**681,507**
76	2,400	125,380	201,438	4,600	96,661	9,070	2,910	700	22,680	213,085	59,116	13,355	39,824	**791,219**
77	2,500	131,492	208,785	4,430	97,829	7,000	2,000	350	30,000	232,072	64,115	15,000	43,525	**839,098**
78	2,400	127,236	204,192	4,430	93,562	6,000	2,775	578	31,060	198,755	56,940	8,671	33,329	**769,928**
79	2,500	133,517	213,837	4,476	100,487	8,000	2,900	623	31,264	249,232	62,635	13,899	46,570	**869,940**
1980	2,500	134,493	212,524	4,476	95,979	8,000	2,900	600	19,137	251,914	63,202	12,607	43,986	**852,318**
81	2,500	140,300	216,200	4,476	90,552	8,650	2,783	0	19,462	259,564	66,206	15,064	28,389	**854,146**
82	1,200	152,144	216,620	3,000	104,533	8,500	3,154	650	25,169	268,916	67,305	10,054	41,996	**903,241**
83	1,200	168,461	231,125	3,000	108,141	9,000	3,154	650	28,055	288,969	68,474	12,734	46,638	**969,601**
84	1,200	173,334	238,000	3,000	102,301	10,200	3,154	600	34,728	300,071	69,847	12,313	46,638	**995,386**
1985	2,933	174,087	244,763	3,664	114,635	13,000	3,184	700	36,286	305,560	70,133	12,620	49,666	**1,031,231**
86	2,933	174,903	246,916	3,600	113,663	13,000	3,184	700	36,008	307,875	69,928	13,146	48,000	**1,033,856**
87	2,200	178,482	245,514	4,076	119,562	12,400	3,321	700	36,008	305,964	69,413	12,526	46,984	**1,037,150**
88	2,500	173,400	241,494	3,900	124,555	13,436	3,100	500	36,496	316,223	69,581	14,536	52,950	**1,052,671**
89	1,962	181,106	249,623	3,900	127,330	13,555	2,000	0	35,766	323,400	70,278	11,693	52,153	**1,072,766**
1990	2,446	183,147	253,261	4,500	127,439	14,000	2,500	0	36,911	338,274	73,329	11,523	49,000	**1,096,330**
91	2,473	182,932	246,083	4,200	130,989	15,000	2,880	650	32,847	319,745	73,169	11,548	48,300	**1,070,816**
92	2,519	182,543	256,342	4,200	131,305	15,240	2,880	0	36,788	324,477	74,229	15,499	43,889	**1,089,911**
93	0	184,463	259,778	0	67,565	0	0	0	0	262,718	66,158	0	40,007	**880,689**
94	1,940	187,247	259,942	4,200	133,803	11,425	3,277	734	36,291	330,949	73,949	14,255	47,335	**1,105,347**
1995	765	192,328	263,576	1,000	100,589	3,250	3,300	643	16,473	289,173	72,108	5,035	39,130	**987,370**
96	2,145	196,055	271,075	4,277	143,147	14,341	3,355	734	39,662	339,098	74,766	14,135	68,710	**1,171,500**
97	2,476	197,904	274,880	4,600	145,061	13,479	3,600	794	39,484	342,234	76,083	19,205	62,448	**1,182,248**
98	1,930	198,197	274,942	4,600	122,379	11,189	3,228	1,055	32,259	342,758	76,872	17,276	67,643	**1,154,328**
99	1,870	198,060	277,723	4,735	145,782	14,723	3,510	1,210	38,966	355,988	79,166	17,407	51,032	**1,190,172**
2000	2,361	199,873	278,956	4,763	154,300	15,427	3,510	0	42,062	352,372	79,206	19,741	64,414	**1,216,985**
01	3,155	201,859	279,354	4,763	160,657	17,520	3,510	0	39,326	339,666	76,653	21,708	71,158	**1,219,329**
02	2,422	202,807	281,070	4,763	162,624	14,717	3,510	1,149	37,221	342,053	76,245	20,364	75,635	**1,224,580**
03	2,386	202,974	280,624	4,763	162,779	15,579	3,510	1,194	42,210	351,257	76,884	22,660	67,540	**1,234,360**
04	2,386	203,007	283,625	4,763	175,406	14,489	3,510	800	38,461	353,085	76,277	21,735	54,666	**1,232,210**
2005	2,361	206,452	282,267	4,763	175,206	13,044	3,510	800	36,611	346,596	77,522	20,780	56,186	**1,226,097**
06	2,361	208,378	280,753	4,763	175,184	13,232	3,510	0	41,156	335,269	76,765	22,771	43,136	**1,207,278**
07	2,361	201,286	284,419	4,763	174,673	14,676	3,509	600	42,573	345,935	77,068	22,021	40,716	**1,214,600**
08	2,361	206,284	280,691	4,763	175,886	13,420	3,509	0	38,617	352,564	77,132	21,735	48,126	**1,225,088**
09	2,361	211,578	285,191	4,706	174,487	14,866	3,500	800	40,174	352,104	77,571	23,383	64,196	**1,254,916**
2010	150	182,483	235,371	0	174,518	5,688	500	374	17,481	340,078	72,989	17,333	48,700	**1,095,665**
11	2,961	202,478	294,569	4,714	175,683	12,774	500	770	37,163	346,079	75,048	21,003	42,270	**1,216,012**
12	2,797	208,217	294,748	4,625	177,593	14,175	535	878	39,560	338,439	76,775	22,655	52,483	**1,233,480**
13	3,285	217,417	295,923	1,736	178,697	14,386	608	770	39,839	338,588	76,002	22,708	49,791	**1,239,750**

Note: Data from 1920 to 1959 available upon request.

Table 6. Irrigation Districts Annual Water Rates ($ per assessed acre per year)

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID
86	$6.00	$10.00	$7.25	$7.50	$12.50	$6.00	$5.20	$6.00	$6.50	$13.00	$11.00	$3.25	$7.47
87	$6.00	$10.00	$7.50	$7.50	$12.50	$6.00	$5.20	$6.00	$6.50	$13.00	$11.00	$3.25	$7.47
88	$7.00	$10.00	$7.50	$8.00	$12.50	$6.00	$5.20	$6.00	$6.50	$13.00	$12.00	$3.25	$7.70
89	$7.00	$10.00	$8.00	$8.00	$13.50	$6.00	$6.20	$6.00	$6.50	$13.25	$12.00	$3.50	$8.00
1990	$8.00	$10.00	$8.50	$8.00	$13.50	$6.00	$6.20	$6.00	$6.50	$14.00	$12.00	$3.75	$11.00
91	$8.00	$10.00	$8.50	$7.00	$13.50	$6.00	$6.20	$6.00	$6.50	$14.00	$12.00	$4.00	$13.00
92	$8.00	$11.00	$8.50	$7.00	$14.00	$6.00	$6.20	$6.00	$6.50	$14.00	$12.00	$4.25	$13.50
93	$8.00	$11.00	$8.50	$7.00	$14.00	$6.00	$6.20	$6.00	$6.50	$14.25	$12.00	$4.50	$13.50
94	$8.00	$12.00	$8.50	$7.00	$14.00	$6.50	$6.20	$6.00	$7.00	$15.25	$12.00	$4.50	$14.75
1995	$8.00	$13.00	$8.50	$8.00	$14.00	$7.00	$8.00	$8.50	$7.00	$16.15	$12.00	$4.50	$14.75
96	$8.00	$13.00	$8.50	$8.00	$14.00	$7.00	$8.00	$8.50	$7.50	$16.15	$12.00	$6.50	$15.25
97	$8.00	$13.00	$7.50	$8.00	$14.00	$7.00	$8.00	$8.50	$7.50	$16.15	$12.00	$6.75	$15.25
98	$8.00	$13.50	$7.50	$8.00	$14.00	$7.50	$8.00	$8.50	$8.50	$16.65	$12.00	$7.00	$16.25
99	$8.00	$14.50	$7.50	$8.00	$14.00	$7.50	$8.00	$8.50	$8.50	$17.00	$12.00	$7.25	$16.25
2000	$8.00	$14.50	$7.50	$8.00	$14.00	$7.50	$8.00	$8.50	$8.50	$17.50	$12.00	$7.50	$16.25
01	$8.00	$14.50	$7.50	$8.00	$14.00	$7.50	$8.00	$8.50	$8.50	$17.90	$11.00	$7.50	$16.25
02	$8.00	$14.50	$7.50	$8.00	$14.00	$7.50	$8.00	$6.00	$8.50	$16.90	$11.00	$7.75	$16.25
03	$9.00	$15.00	$0.00	$10.00	$14.00	$8.00	$8.00	$13.58	$8.50	$17.90	$11.00	$8.25	$16.25
04	$9.00	$14.50	$0.00	$11.00	$14.00	$8.00	$8.00	$13.58	$9.50	$17.90	$11.00	$8.25	$16.25
2005	$9.00	$14.50	$0.00	$11.00	$14.00	$8.50	$10.00	$13.58	$9.50	$17.90	$11.00	$8.25	$16.25
06	$9.00	$14.50	$0.00	$11.00	$14.00	$8.50	$10.00	$15.00	$9.50	$18.50	$11.00	$8.25	$16.25
07	$9.00	$14.50	$0.00	$11.00	$14.00	$9.00	$10.00	$18.00	$9.50	$18.75	$8.00	$8.25	$16.25
08	$10.00	$14.50	$0.00	$11.50	$14.00	$9.00	$12.00	$21.00	$9.50	$18.75	$8.00	$8.50	$16.25
09	$10.00	$15.00	$0.00	$11.50	$14.00	$9.00	$12.00	$22.50	$9.50	$19.00	$8.00	$8.50	$16.25
2010	$10.00	$15.00	$0.00	$11.50	$14.00	$9.50	$12.00	$21.50	$9.50	$20.00	$8.00	$8.50	$16.25
11	$10.00	$15.00	$0.00	$11.50	$14.00	$9.50	$12.00	$20.50	$9.50	$20.00	$8.00	$8.50	$16.25
12	$11.00	$16.00*	$0.00*	$11.50*	$14.00*	$11.00*	$12.00	$20.50	$10.00*	$20.00*	$8.00*	$9.00	$16.25*
13	$11.00	$16.00*	$0.00*	$11.50*	$14.00*	$11.00*	$12.00	$20.50	$10.00*	$20.00*	$8.00*	$11.00	$18.00*

Note: * Some districts levy additional surcharges. The 2013 rates were:

- AID – $2.00 per acre for pipeline delivery in Township 2
  – $3.00 per acre for pipeline delivery in Township 3
- BRID – $0.70 per acre inch for volumes used on flood parcels over the annual water allocation (sprinkler parcels may not use more than the allocation)
- EID – $6.00 per acre if served from H Cowoki, 03 East Branch, Springhill, or Rolling Hills Reservoir pressure systems
- LID – $3.00 per acre for pipeline delivery
- LNID – $0.30 per psi for pressure pipeline
  – $5.00 per acre inch for volumes over the annual allocation
- MID – $4.00 per acre for pipeline delivery; $1.00 per 10 psi
- RID – charges vary for pipeline and pressure delivery
  – $100 per acre inch for volumes over the annual allocation
- SMRID – $100 per acre inch for volumes over the annual allocation
- TID – $50 per acre inch for volumes over the annual allocation
- WID – $0.31 per psi; $0.50 per acre for automated screen cleaning

Some districts have centralized pump stations delivering pressurized water to individual farm turnouts.
In these cases, the irrigators served by that pump station are charged for the energy used and often an additional maintenance charge.

Table 7. Gross Annual Diversions To Alberta Irrigation Districts

	OLDMAN RIVER BASIN										BOW RIVER BASIN			
DISTRICT	**AID**	**LID**	**LNID**	**MID**	**MVID**	**RCID**	**RID**	**SMRID**	**TID**	**UID**	**BRID**	**EID**	**WID**	**TOTALS**
WATER SOURCE	diversion from Belly River	diversion from Belly River	diversion from Oldman River	diversion from Belly, Waterton, St. Mary Rivers	diversion from Belly River	diversion from Gros Ventre Ck.	diversion from SMRID main canal	diversion from Belly, Waterton, St. Mary Rivers	diversion from SMRID main canal	diversion from Belly, Waterton Rivers	diversion from Bow River	diversion from Bow River	diversion from Bow River	
EXPANSION LIMITS (acres)	5,000	6,000	227,000	18,300	4,240	1,210	46,500	412,000	92,200	34,400	260,000	311,000	95,000	1,512,850
WATER LICENCE ALLOCATION (acre-feet)	9,000	12,000	334,450	34,000	8,000	3,000	81,000	722,000	158,000	66,210	450,000	762,000	158,400	2,798,060
YEAR	VOLUME OF WATER DIVERTED (acre-feet)													
81			132,955	8,869		264	22,162	379,075	108,427	12,242	359,000	577,969	108,630	1,709,593
82			142,683	13,068		3,551	27,697	332,337	91,998	19,133	303,000	481,258	129,712	1,544,437
83			150,790	14,363		1,354	14,955	361,537	97,674	24,078	347,000	580,299	146,737	1,738,787
84			177,543	18,857		67	17,544	492,674	101,643	25,093	361,000	657,640	162,140	2,014,201
1985	5,020	8,500	184,029	18,533	4,250	3,827	27,302	425,500	95,751	24,193	358,722	655,188	158,897	1,969,712
86	4,074	6,858	182,159	14,114	3,212	1,832	22,045	406,536	101,597	20,106	311,000	680,592	131,333	1,885,458
87	4,392	5,644	181,934	14,649	3,180	1,321	40,559	426,434	98,621	19,958	309,000	639,928	129,712	1,875,332
88	6,910	9,398	222,936	22,918	6,066	256	60,531	563,621	121,668	30,462	423,000	730,274	171,868	2,369,908
89	4,613	3,517	198,789	12,338	2,750	122	30,728	504,255	78,396	18,372	333,000	605,148	122,416	1,914,444
1990	3,754	5,328	191,899	13,555	3,290	298	32,000	467,244	98,572	16,133	380,907	689,178	128,091	2,030,249
91	3,556	4,468	184,737	12,712	2,662	1,775	30,702	391,634	94,956	17,003	334,792	629,872	147,547	1,856,416
92	2,170	11,216	136,925	15,695	4,118	0	36,210	441,745	101,122	18,628	336,878	625,650	135,387	1,865,744
93	2,126	1,824	61,753	4,848	988	3,300	13,574	218,375	59,278	8,107	210,340	423,551	114,309	1,122,373
94	4,110	4,319	179,663	13,895	3,325	758	28,328	415,162	103,028	16,827	364,126	559,476	132,104	1,825,121
1995	1,802	1,548	110,114	4,248	861	208	19,953	390,285	79,818	7,710	302,305	602,098	116,254	1,637,204
96	4,035	4,892	206,206	12,506	2,660	1,085	45,527	498,483	127,436	19,832	328,182	615,478	117,065	1,983,387
97	6,051	5,193	188,378	12,564	1,529	1,760	38,043	455,300	115,582	20,364	343,380	593,782	116,740	1,898,666
98	4,874	5,331	157,758	9,671	2,323	1,726	33,834	405,000	116,300	14,895	303,565	638,500	142,367	1,836,144
99	3,485	11,415	196,906	25,178	2,499	1,700	42,960	411,532	105,208	20,900	298,524	426,788	88,410	1,635,505
2000	6,000	11,240	263,413	35,375	6,700	0	58,202	451,700	140,046	37,200	417,897	675,238	156,400	2,259,411
01*	3,952	7,593	308,236	21,173	6,814	0	40,207	325,700	94,770	27,526	413,780	685,000	160,000	2,094,751
02	2,938	9,835	112,143	10,788	3,033	N/A	23,552	466,700	53,324	21,283	333,541	430,000	149,577	1,616,714
03	4,598	7,964	201,812	20,711	5,889	N/A	49,723	330,600	86,500	32,500	279,798	459,700	128,700	1,608,495
04	3,440	5,425	166,276	12,391	2,660	N/A	28,224	367,500	64,399	21,600	230,817	417,370	114,000	1,434,102
2005	4,000	6,243	134,088	8,859	2,067	1,190	27,046	316,200	72,487	13,717	182,819	318,000	120,400	1,207,116
06	3,681	5,341	165,752	14,114	3,987	0	37,049	334,100	82,448	20,390	210,741	335,210	72,000	1,284,813
07	3,235	6,330	235,330	18,238	3,600	N/A	47,322	394,700	100,907	31,801	256,518	417,830	68,000	1,583,811
08	3,584	6,389	178,750	12,659	2,609	200	34,348	381,200	85,829	21,054	238,000	409,400	85,000	1,459,022
09	2,651	5,378	179,945	14,885	2,138	200	45,705	370,100	97,532	17,506	295,557	435,650	120,829	1,588,076
2010	1,938	2,383	71,950	5,351	1,013	116	21,900	201,700	53,135	7,264	156,116	210,500	65,850	799,219
11	2,902	8,028	132,388	15,233	2,393	530	32,534	286,000	84,909	19,073	151,700	310,100	85,985	1,131,775
12	2,761	3,973	176,683	20,720	2,558	0***	35,200	340,800	88,309	19,039	260,000	343,200	103,862	1,397,105
13	3,446	4,101	139,035	17,210	2,297	2,319	39,723	314,600	77,371	18,598	240,000	383,400	99,473	1,341,573
Percent of Licence (2013)	38.3%	34.2%	41.6%	50.6%	28.7%	77.3%	49.0%	43.6%	49.0%	28.1%	53.3%	50.3%	62.8%	47.9%
**Average Volume	3,796	6,196	166,773	14,373	3,154	1,047	32,827	380,959	92,434	20,014	300,711	522,608	123,627	1,668,518

Notes: – Data are obtained from Alberta Environment and Sustainable Resource Development for AID, LID, MVID, RCID, and UID, and from Irrigation Districts for BRID, EID, LNID, MID, RID, SMRID, TID, and WID.
– RCID has a second supply from Ross Creek, but data has not been consistently recorded at that location.
– Diversion data represent the gross diversion into and through the works of the districts and include volumes used directly for irrigation purposes, reservoir filling and the water supplied or licensed to municipal, domestic, other agricultural, industrial and environmental uses.
– *Water rationing in effect for MID, RID, SMRID, and TID in 2001.
– ** Average Volume 1976 - 2013
– ***RCID had zero diversion in 2012 since the diversion structure was under construction; 562 ac-ft was delivered for irrigation from Cavan Lake.

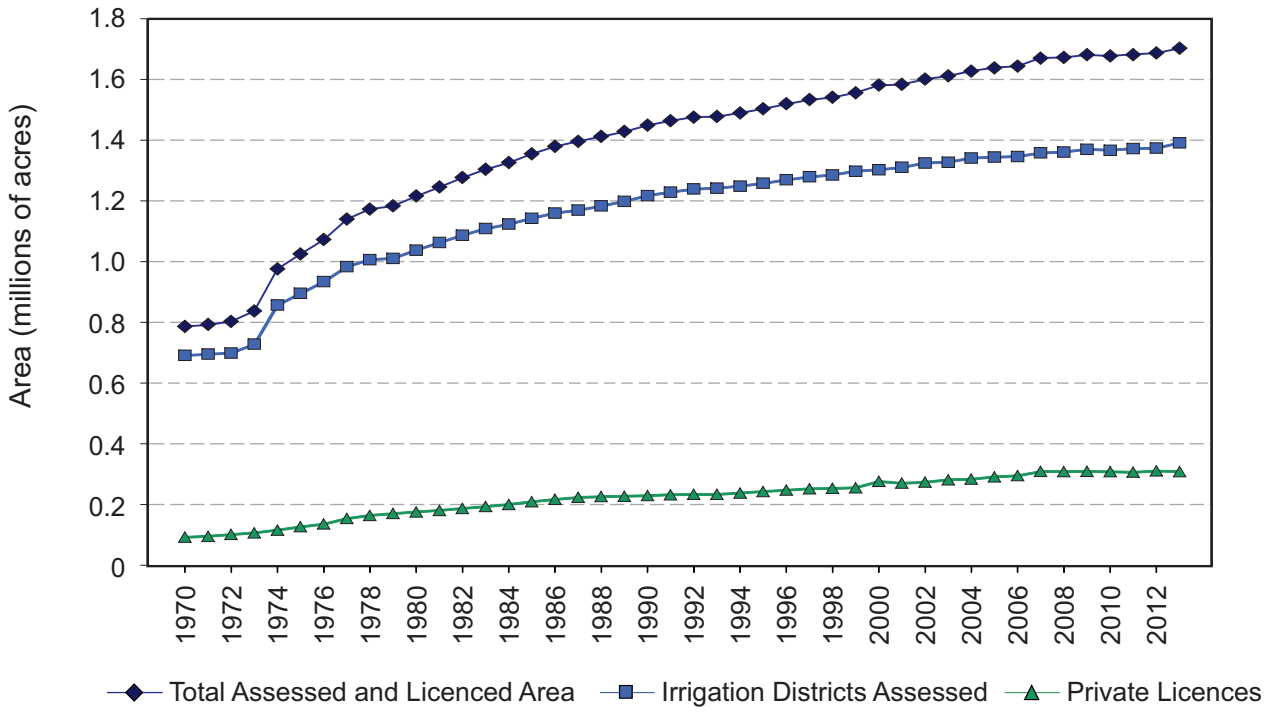


Figure 6. Growth in Irrigation in Alberta (1970 - 2013)

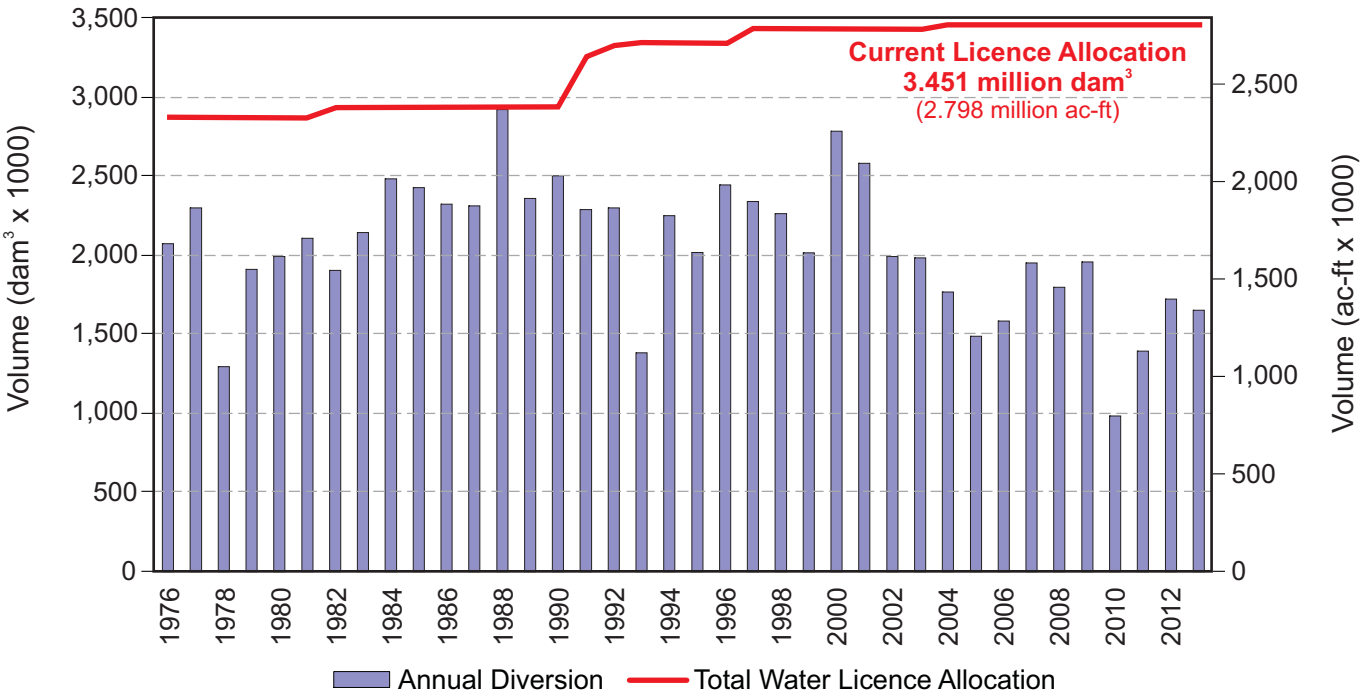


Figure 7. Irrigation Districts Gross Annual Diversions (1976 - 2013)

Note: Diversion data represent the gross diversion into and through the works of the irrigation districts and include volumes used directly for irrigation purposes, reservoir filling and the water supplied or licensed to municipal, domestic, other agricultural, industrial, environmental uses and water delivered to private licence holders through a conveyance agreement with the private licence holder.

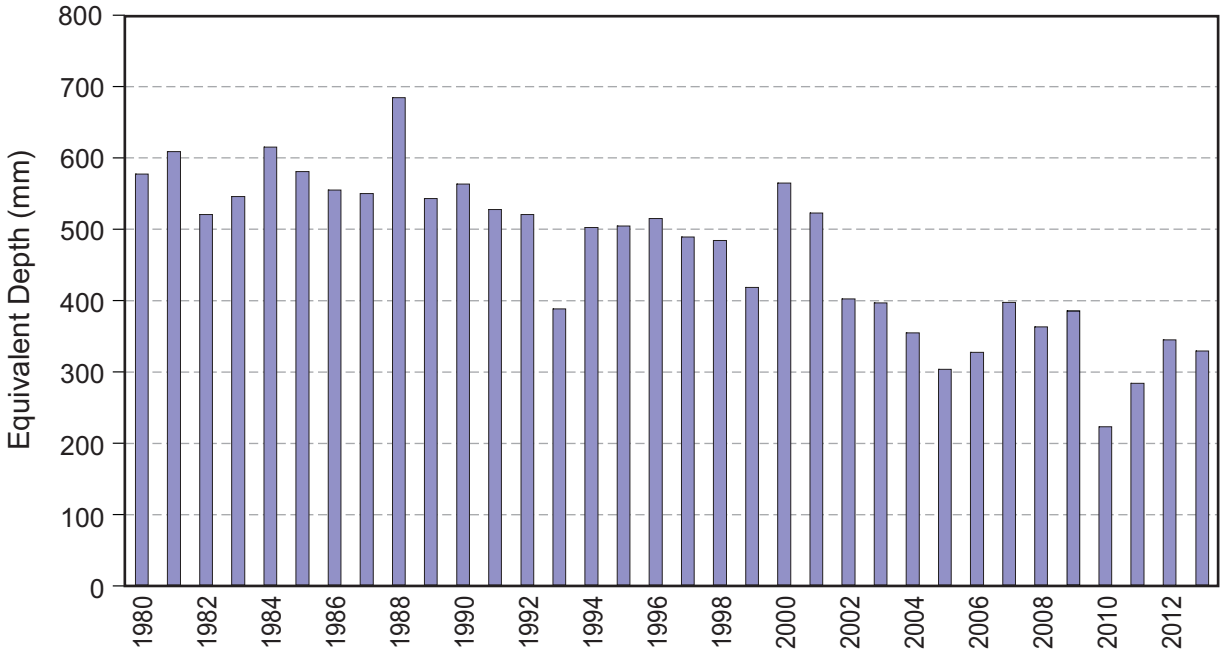


Figure 8. Irrigation Districts Gross Diversion Equivalent Depth (1980 - 2013)

Note: Irrigation district equivalent depth is the annual gross diversion of water (into the works of all 13 irrigation districts), divided by the area actually irrigated. However, this "depth" also includes water which may have accounted as net gains in reservoir storage, water diverted for other uses such as domestic, municipal, other agricultural, industrial, recreational and habitat enhancement purposes.

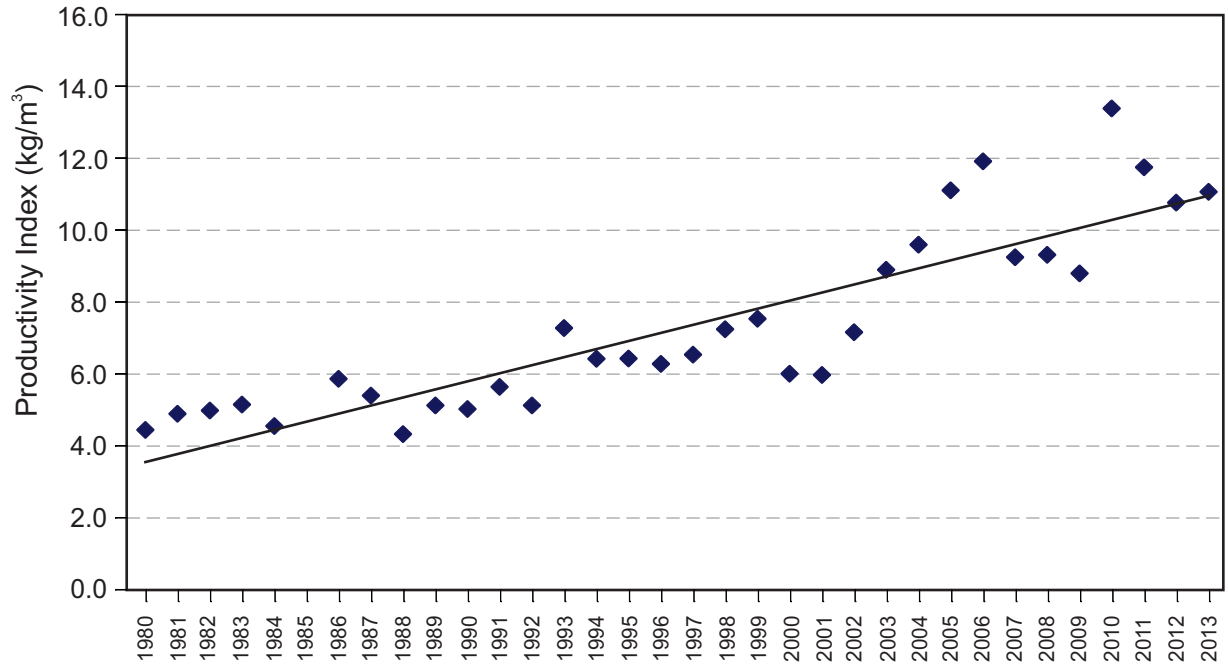
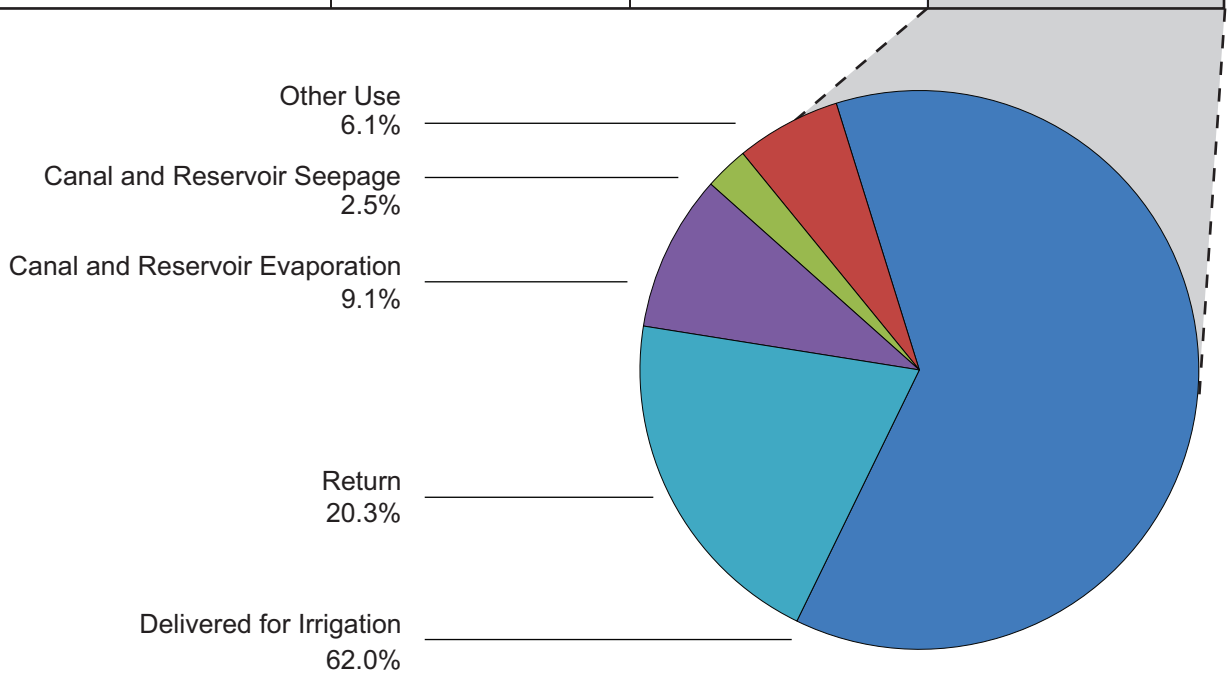


Figure 9. Irrigation Districts Water Use Productivity (1980 - 2013)

Note: Commodity yield per unit area divided by the volume of irrigation water diverted per unit area provides a measure of productive output per unit of irrigation water used. The historical yields of sugar beets (as reported by the Alberta Sugar Beet Growers), the historical yields of potatoes (as reported by the Potato Growers of Alberta) and the historical yields of soft white spring wheat (as provided by the Alberta Soft Wheat Growers) are tallied and then divided by the respective reported annual gross water diversions to the 13 irrigation districts to derive a "Productivity Index".

Table 8. Irrigation Districts Water Balance

Water Balance Category	OLDMAN RIVER BASIN	BOW RIVER BASIN	IRRIGATION DISTRICTS
Gross Diversion	618,700	722,900	1,341,600
Storage	1,600	6,000	7,600
TOTAL DISTRICT USE	**617,100**	**716,900**	**1,334,000**
Delivered for Irrigation	395,800	431,700	827,500
Other Use	23,100	58,000	81,100
Canal & Reservoir Seepage	14,100	19,600	33,700
Canal & Reservoir Evaporation	46,400	74,600	121,000
Return	137,700	133,000	270,700
TOTAL DISTRICT OPERATIONS	**617,100**	**716,900**	**1,334,000**



Note: 1. Irrigation district reported values were used
2. Where district reporting was incomplete, Alberta Agriculture and Rural Development calculated an estimate
3. All volumes are in acre-feet

Glossary

Gross Diversion - Volume of water diverted from a lake or the river system by irrigation districts

Storage - Volume of water removed from irrigation district reservoirs for use (a negative value indicates an increase in reservoir storage volume)

Total District Use - Total volume of water from diversion and storage used

Delivered for Irrigation - Net volume of water supplied for irrigation purposes

Other Use - Volume of water supplied for other uses including municipal and industrial

Canal & Reservoir Seepage - Water lost from reservoirs and through delivery system from seepage

Canal & Reservoir Evaporation - Water lost from evaporation from the surface of irrigation district canals and reservoirs

Return - Volume of water returned to the river system

Total District Operations - Total volume of water used for irrigation districts operations comprised of water delivered for irrigation, other use, seepage and evaporation, and water returned

Table 9. Conveyance Infrastructure by Type of Works within the 13 Irrigation Districts in 2013

Irrigation District	REHABILITATED										UN-REHABILITATED		Total Conveyance Works (km)
	Membrane-Lined Canals		Pipelines - Closed		Pipelines - Open		Concrete - Lined Canals		Earth Canals		Un-Rehabilitated Canals		
	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	
AID	4.5	11.9%	22.7	60.0%	0.2	0.6%	0.0	0.0%	1.0	2.6%	9.4	24.9%	**38**
BRID	148.8	14.9%	485.5	48.6%	11.0	1.1%	16.7	1.7%	202.6	20.3%	134.8	13.5%	**999**
EID	321.3	16.8%	1075.1	56.2%	37.7	2.0%	0.0	0.0%	192.4	10.1%	284.4	14.9%	**1,912**
LID	2.0	3.6%	29.5	53.9%	0.3	0.5%	0.0	0.0%	12.1	22.0%	10.9	19.9%	**55**
LNID	56.8	7.6%	444.6	59.2%	12.7	1.7%	45.4	6.0%	71.8	9.6%	120.0	16.0%	**751**
MID	1.2	1.2%	59.2	58.7%	1.5	1.5%	0.3	0.3%	33.7	33.5%	4.9	4.8%	**101**
MVID	0.0	0.0%	15.1	38.2%	1.8	4.6%	0.0	0.0%	17.4	43.8%	5.4	13.5%	**40**
RCID	0.0	0.0%	12.2	100.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	**12**
RID	0.0	0.0%	130.7	55.3%	7.5	3.2%	0.0	0.0%	79.8	33.8%	18.4	7.8%	**236**
SMRID	69.3	3.8%	910.1	50.4%	15.3	0.8%	67.2	3.7%	448.4	24.8%	294.2	16.3%	**1,805**
TID	58.2	17.0%	177.3	51.7%	15.1	4.4%	6.8	2.0%	69.2	20.2%	16.0	4.7%	**343**
UID	15.6	6.7%	78.8	33.8%	29.2	12.5%	0.2	0.1%	45.3	19.4%	63.9	27.4%	**233**
WID	50.5	4.8%	190.2	17.9%	38.9	3.7%	5.3	0.5%	186.8	17.6%	590.6	55.6%	**1,062**
Total	**728**	**9.6%**	**3,631**	**47.9%**	**171**	**2.3%**	**142**	**1.9%**	**1,360**	**17.9%**	**1,554**	**20.5%**	**7,587**
											Headworks Owned by Alberta Environment and Sustainable Resource Development		**339**
											Total Length of Conveyance System in Southern Alberta (km)		**7,926**

NOTE: Rehabilitated infrastructure includes new works and those works re-constructed through:
– the Irrigation Rehabilitation Program (IRP) 1969 - 2013
– Alberta Environment and Sustainable Resource Development's headworks improvement program
Totals only include irrigation conveyance works, ie. does not include domestic water supply

Table 10. Irrigation District Infrastructure by Length and Replacement Cost in 2013

IRRIGATION DISTRICTS	CONVEYANCE WORKS		MAJOR STRUCTURES		DRAINAGE WORKS		TOTAL of ALL WORKS	
	length (km)	replacement cost ($'000)	number of units	replacement cost ($'000)	length (km)	replacement cost ($'000)	length (km) / structures	replacement cost ($'000)
AID	38	$10,909	0	$0	19	$521	**57 / 0**	**$11,430**
BRID	999	$375,554	22	$97,753	720	$15,239	**1,719 / 22**	**$488,545**
EID	1,912	$716,576	61	$349,421	1,921	$31,618	**3,833 / 61**	**$1,097,615**
LID	55	$13,135	0	$0	5	$116	**60 / 0**	**$13,250**
LNID	751	$262,618	2	$2,880	256	$7,213	**1,007 / 2**	**$272,711**
MID	101	$26,870	0	$0	162	$4,991	**263 / 0**	**$31,861**
MVID	40	$14,225	0	$0	1	$44	**41 / 0**	**$14,269**
RCID	12	$2,165	1	$135	22	$849	**34 / 1**	**$3,150**
RID	236	$61,104	0	$0	207	$10,261	**443 / 0**	**$71,365**
SMRID	1,805	$667,708	48	$335,617	411	$10,651	**2,216 / 48**	**$1,013,977**
TID	343	$134,339	12	$14,168	73	$4,481	**416 / 12**	**$152,989**
UID	233	$76,011	11	$16,206	57	$1,216	**290 / 11**	**$93,434**
WID	1,062	$352,291	13	$18,180	884	$21,427	**1,946 / 13**	**$391,898**
DISTRICT TOTALS	**7,587**	**$2,713,505**	**170**	**$834,361**	**4,738**	**$108,627**	**12,325 / 170**	**$3,656,493**

NOTE: Drainage works include both open channels and pipelines.
Total of All Works length values include the summation of conveyance and drainage works.

Table 11. Summary of Irrigation District Water Licence Allocations

Irrigation District	Other Purposes* (ac-ft)	Total Licensed Volume (ac-ft)
AID	700	9,000
BRID	2,380	450,000
EID	5,000	762,000
LID	1,000	12,000
LNID	39,068	334,450
MID	740	34,000
MVID	n/a	8,000
RCID	n/a	3,000
RID	4,500	81,000
SMRID	12,000	722,000
TID	8,000	158,000
UID	1,000	66,210
WID	3,500	158,400
Total	**77,888**	**2,798,060**

Note: Other purpose uses of water volumes licensed to irrigation districts include non-irrigation uses such as municipal, rural water supply, agricultural, commercial, industrial, rural residential, management of fish/wildlife, habitat enhancement and recreation.

* Water volumes allocated to other purposes are included in the total licensed volumes.

Table 12. Summary of Condition Assessments (All Works by Replacement Cost)

Works Category	Good ($'000)	Fair ($'000)	Poor ($'000)	TOTAL ($'000)
Conveyance	$1,807,414	$789,719	$116,372	$2,713,505
Drainage	$22,710	$65,930	$19,988	$108,628
Major Structures	$535,333	$291,816	$7,212	$834,361
TOTAL	**$2,365,457**	**$1,147,465**	**$143,572**	**$3,656,494**
Proportion	64.7%	31.4%	3.9%	100%

Note: Condition assessments ratings are determined based on criteria in the Irrigation Works Condition Evaluation Guidelines. Construction and material costs are updated approximately every five years. The last valuation was completed in 2012.

Table 13. Irrigation District Reservoirs

Location	Reservoir	Approximate Date of Impoundment	Live Storage (dam^3)	Live Storage (acre-feet)
Bow River Irrigation District	Badger	1985	57,120	46,300
	'D' Reservoir	2005	350	280
	'H' Reservoir	1953	2,790	2,260
	Lost Lake	1973/1987*	5,060	4,100
	'PFRID' Reservoir	2005	570	480
	Scope	1953	12,930	10,480
	Total storage		78,810	63,890
Eastern Irrigation District	Bantry # 1	1968	1,090	880
	Bantry # 2	1967	4,150	3,360
	Cowoki Lake	1937	8,370	6,780
	Crawling Valley	1984	94,300	76,450
	'J' Reservoir	1949/1966*	1,460	1,180
	Kitsim	1980	19,470	15,790
	Lake Newell	1914	315,300	255,610
	One Tree	1935	5,660	4,590
	Rock Lake	1956	3,990	3,240
	Rolling Hills	1940/2003*	40,640	32,950
	Snake Lake	1997	18,620	15,100
	Tilley "A"	1972	33,300	27,000
	Total storage		546,350	442,930
Lethbridge Northern Irrigation District	Park Lake	1928	1,440	1,170
	Picture Butte	1936	1,490	1,210
	Vandenburg	1992	120	90
	Total storage		3,050	2,470
Raymond Irrigation District	Corner Lake	1925	500	400
	Craddock	1925	620	500
	Factory Lake	1925	370	300
	Total storage		1,480	1,200
St. Mary River Irrigation District	Bullshead	1954	130	100
	Chin	1954	207,370	163,120
	Cross Coulee	1954	2,090	1,700
	Forty Mile	1987	100,430	81,420
	Murray	1954	30,630	24,830
	North East	1954	2,820	2,290
	Raymond	1954	1,810	1,470
	Sauder	1953/1982*	45,240	36,680
	Seven Persons	1953	900	730
	Sherburne	1952	12,190	9,880
	Stafford	1954/1982*	21,790	17,670
	Yellow Lake	1952	18,130	14,700
	Total storage		443,520	359,560
Taber Irrigation District	Fincastle	1952	3,770	3,060
	Horsefly	1950	6,370	5,170
	Taber Lake	1955	6,410	5,190
	Total storage		16,560	13,420
United Irrigation District	Cochrane Lake	1923	3,100	2,540
Western Irrigation District	Chestermere	1944	5,090	4,130
	Langdon	1979	7,750	6,280
	Total storage		12,840	10,410
Grand Total			**1,105,740**	**896,430**

Note: all reservoirs are off-stream storage sites

* denotes year of reservoir enlargement

Table 14. Provincially Owned and Operated Reservoirs

Source Supply for:	Reservoir	Approximate Date of Impoundment	Live storage (dam^3)	Live storage (acre-feet)
Bow River Irrigation District	Little Bow	1920	21,080	17,090
	McGregor	1914	351,060	284,600
	Travers *	1954	104,640	84,830
	Total Storage		476,780	386,520
Lethbridge Northern Irrigation District	Keho	1920	95,640	77,530
	Oldman River *	1991	490,180	397,390
	Total Storage		585,820	474,920
Ross Creek Irrigation District	Cavan	1950	4,630	3,750
Mountain View, Leavitt, Aetna	Payne	1942	8,690	7,040
St. Mary Project (SMRID, MID, TID, RID)	Jensen	1948	19,000	15,400
	Milk River Ridge	1957	127,300	103,200
	St. Mary *	1951	369,310	299,400
	Waterton *	1965	111,200	90,150
	Total Storage		626,800	508,150
Other Multi-purpose	Chain Lakes *	1966	14,680	11,900
	Twin Valley Dam *	2003	60,700	49,210
	Pine Coulee	1998	51,000	41,350
	Women's Coulee	1949	360	290
	Total Storage		126,740	102,750
Grand Total			**1,829,450**	**1,483,140**

Note: * denotes on-stream storage reservoir

Table 15. Hydroelectric Plants Associated with Water Distribution Works

Location	Commission Date	Owner	Capacity (megawatts)
Oldman Reservoir	2003	ATCO Electric	32
Waterton Reservoir	1992	TransAlta	3
Belly River Chute	1991	TransAlta	3
St. Mary Reservoir	1992	TransAlta	2
Taylor Coulee Chute (Jensen Reservoir)	2000	TransAlta	13
Raymond Reservoir	1994	Irrican	21
Chin Chute (Chin Reservoir)	1994	Irrican	11
SMRID - Main Canal Drops #4, #5 and #6	2004	Irrican	7
Total			**92**

Table 16. Private Water Licences for Irrigation in Alberta

There are 2,893 individual irrigation projects, outside of the 13 irrigation districts, irrigating approximately 310,255 acres in Alberta. These projects vary in size from 1 acre to over several thousand acres of agricultural or horticultural production. Each of these projects is licensed to an individual, a group of producers or to private or public lands (ie. golf courses or parks). The agricultural feasibility of these projects is reviewed by Alberta Agriculture and Rural Development and the licencing is regulated by Alberta Environment and Sustainable Resource Development.

RIVER BASIN	Total Acres Irrigated	No. of Licences 1 to 100 ac.	No. of Licences 101 to 300 ac.	No. of Licences over 300 ac.	Total No. of Licences
ATHABASCA RIVER	**1,985**	**43**	**6**	**0**	**49**
MILK RIVER	**18,801**	**97**	**43**	**14**	**154**
NORTH SASKATCHEWAN RIVER	**27,067**	**314**	**55**	**15**	**384**
PEACE RIVER	**3,364**	**67**	**9**	**0**	**76**
SOUTH SASKATCHEWAN RIVER					
- Bow River	26,096	148	58	17	223
- Little Bow River	32,119	129	72	25	226
- Lower Oldman River	14,591	23	25	13	61
- Red Deer River	49,086	415	90	20	525
- South Saskatchewan River	47,220	532	80	24	636
- Upper Oldman River	7,658	64	20	4	88
- Waterton / Belly / St. Mary Rivers	52,067	133	69	20	222
- Willow Creek	30,201	154	79	16	249
South Saskatchewan River Total	**259,255**	**1,598**	**493**	**139**	**2,230**
2013	**310,255**	**2,119**	**606**	**168**	**2,893**
2012	312,230	2,122	600	172	2,894
2011	308,435	2,135	602	167	2,904
2010	309,778	2,153	605	166	2,924
2009	310,821	2,158	607	165	2,930
2008	310,272	2,161	602	166	2,929
2007	310,733	2,157	601	166	2,924
2006	296,964	2,150	579	159	2,888
2005	293,055	2,138	572	154	2,864
2004	285,276	2,113	575	152	2,840
2003	283,254	2,108	571	149	2,828
2002	275,599	2,100	567	141	2,808
2001	272,353	2,085	558	143	2,786
2000	277,826	2,076	555	140	2,771
1999	257,258	1,863	509	137	2,509
1998	255,192	1,884	501	138	2,523

Notes: – upper Oldman reach is defined as upstream of the Belly River confluence
– lower Oldman reach is defined as downstream of the Belly River confluence
– 25,000 acres from the Waterton / Belly / St. Mary Rivers category is for the Blood Tribe Agricultural Project
– does not include irrigation licences issued to irrigation districts in southern Alberta
– data are obtained from Alberta Environment and Sustainable Resource Development
– licence authorization as of January 2013

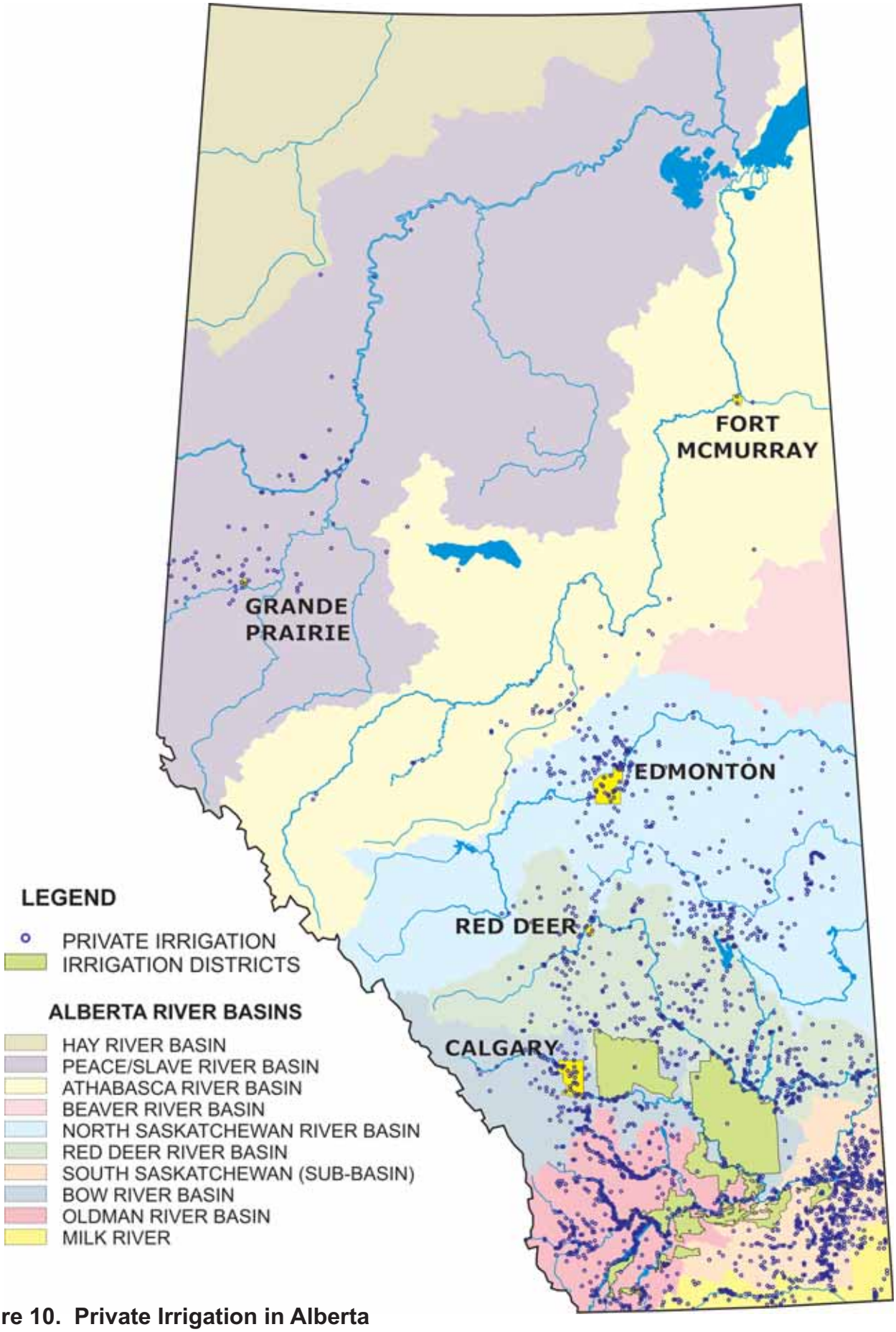


Figure 10. Private Irrigation in Alberta

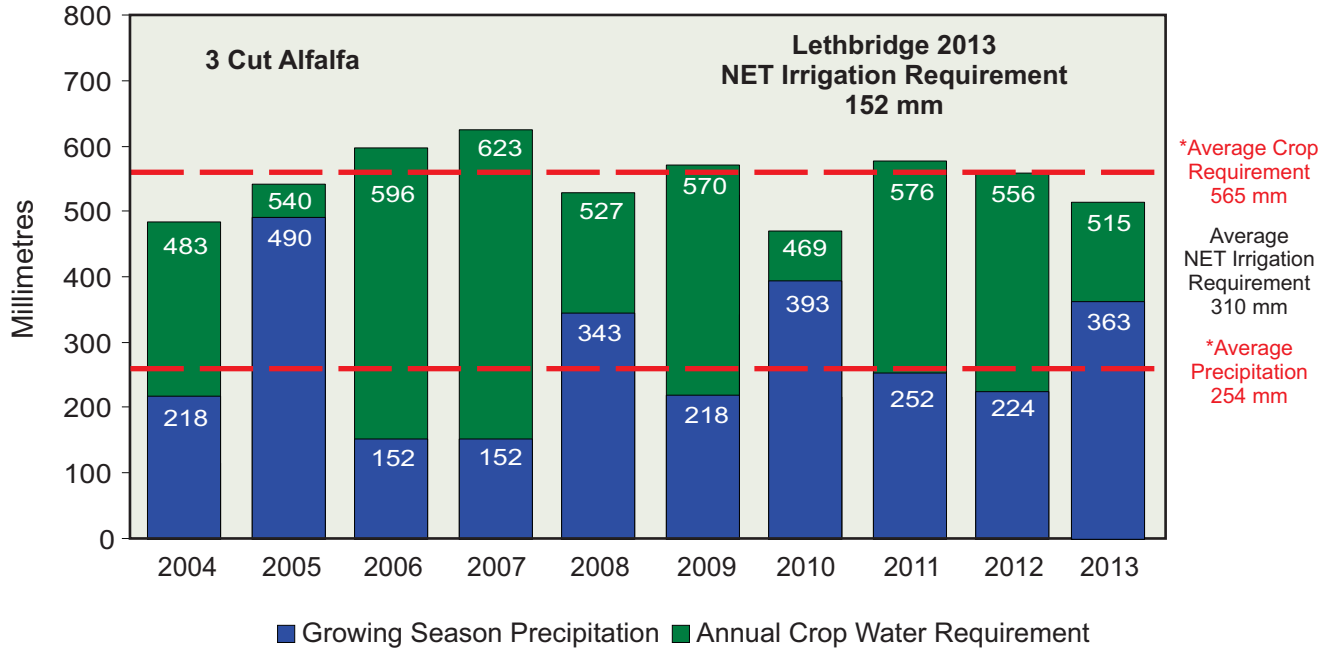


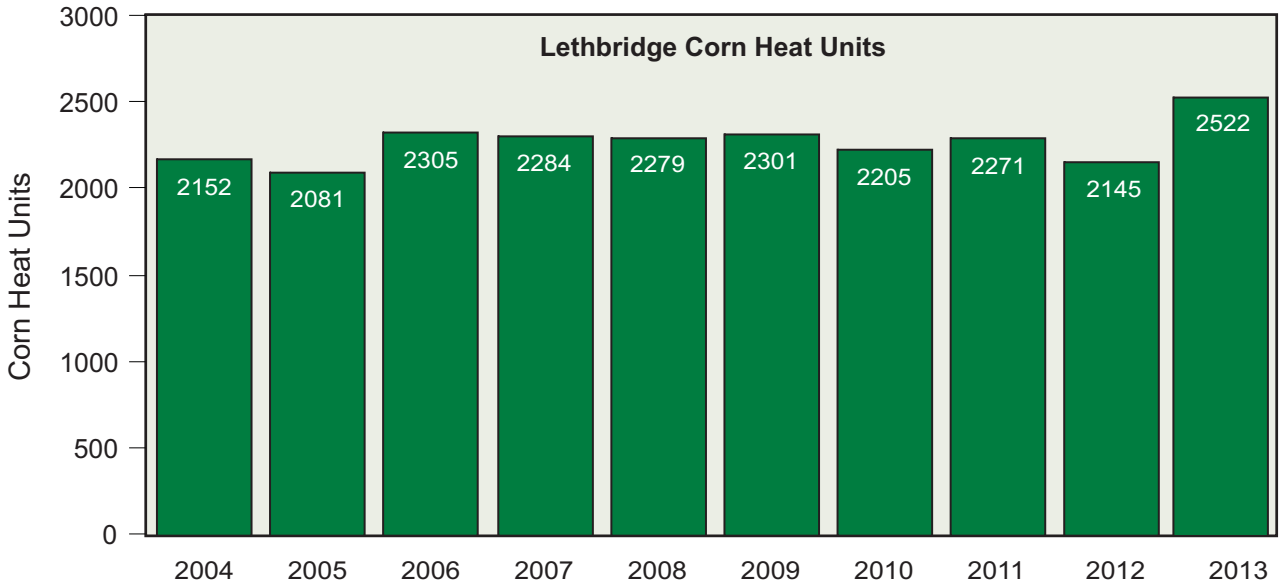
Figure 11. Lethbridge Optimum Crop Water and Net Irrigation Requirements (2004 - 2013)

Note: The high water use crop, 3 cut alfalfa is used in these examples because this crop's annual growing season closely coincides with the annual irrigation season.

The difference between the total crop water requirement and total precipitation is the NET irrigation requirement.

*The average crop requirement and average precipitation are from the period 1997 to 2013.

Seasonal precipitation from May 1 to September 30.



Note: Total Corn Heat Units (CHU) starting May 15 until first frost (-2°C)

Figure 12. Lethbridge Corn Heat Units (2004 - 2013)

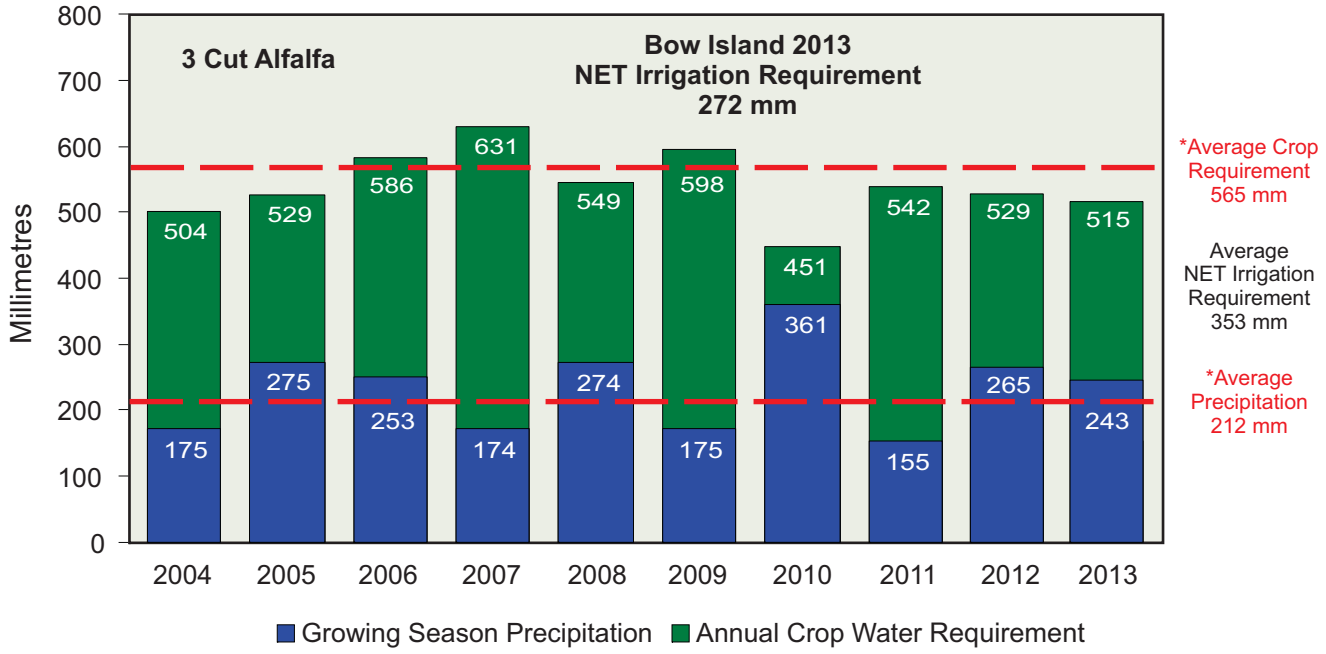


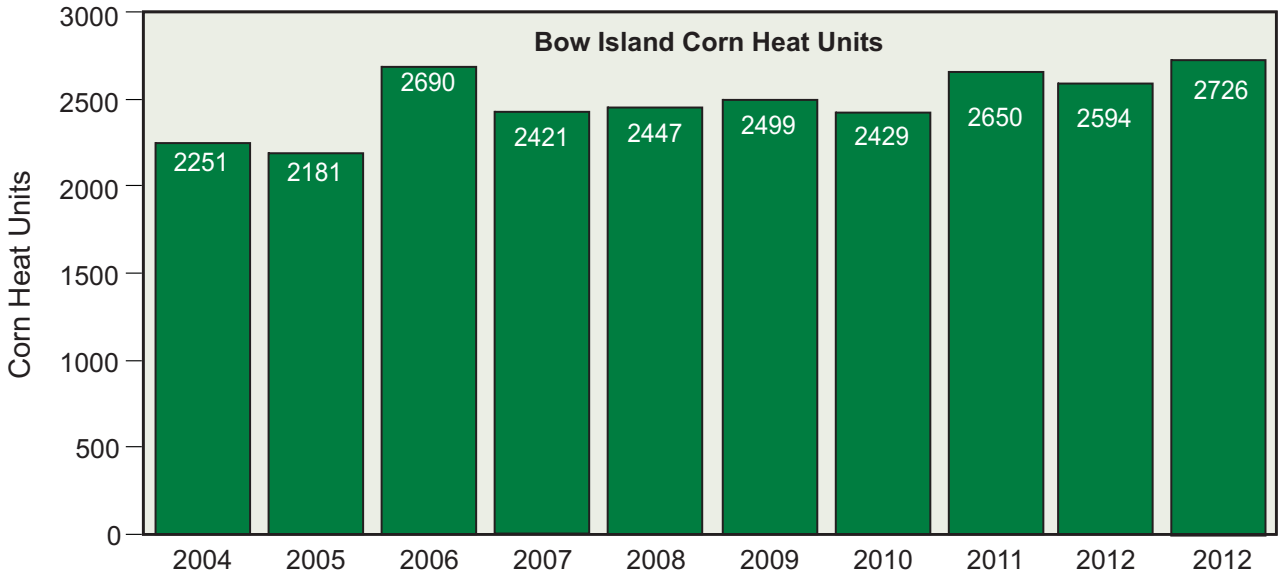
Figure 13. Bow Island Optimum Crop Water and Net Irrigation Requirements (2004 - 2013)

Note: The high water use crop, 3 cut alfalfa is used in these examples because this crop's annual growing season closely coincides with the annual irrigation season.

The difference between the total crop water requirement and total precipitation is the NET irrigation requirement.

*The average crop requirement and average precipitation are from the period 1997 to 2013.

Seasonal precipitation from May 1 to September 30.



Note: Total Corn Heat Units (CHU) starting May 15 until first frost (-2°C)

Figure 14. Bow Island Corn Heat Units (2004 - 2013)

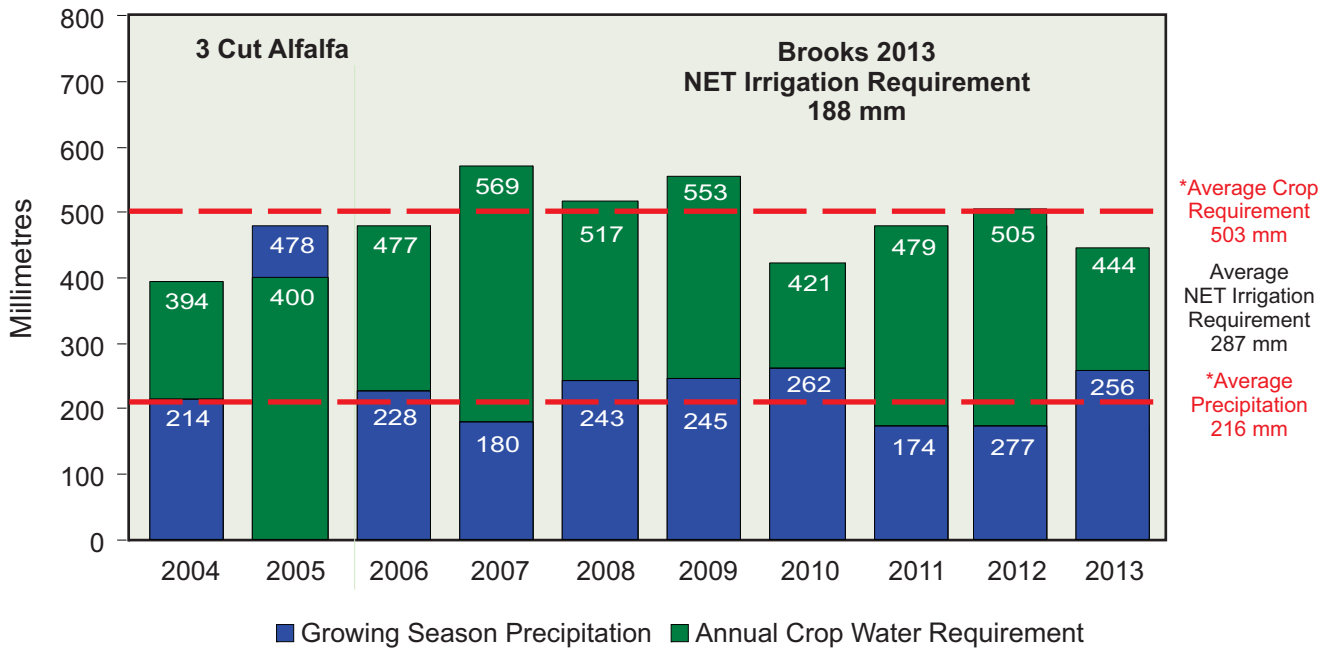


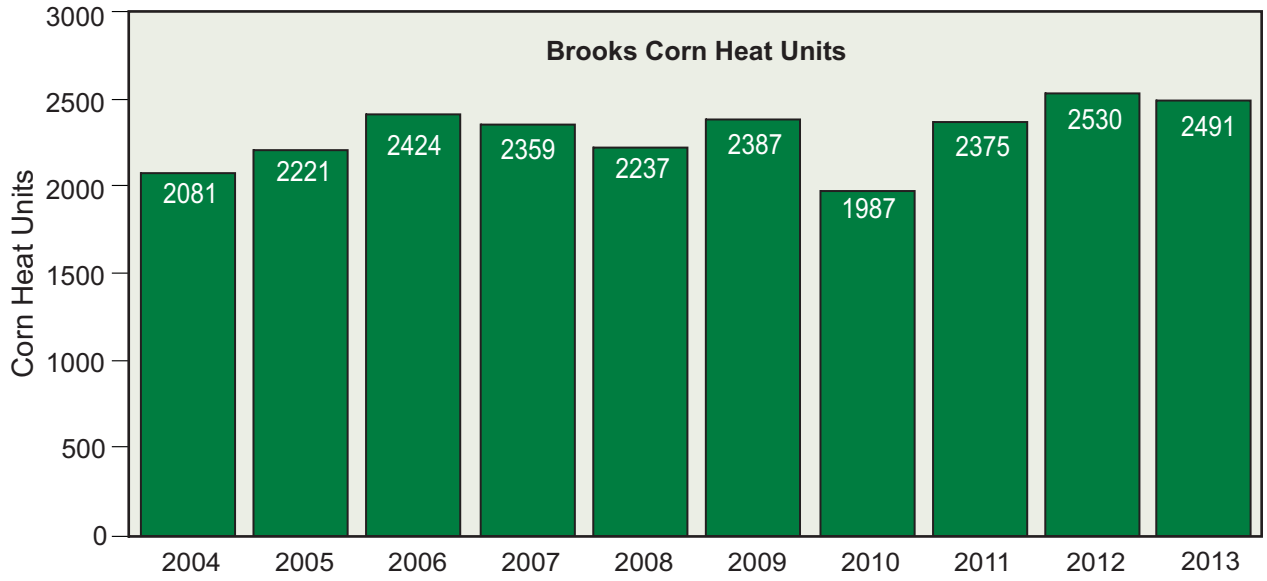
Figure 15. Brooks Optimum Crop Water and Net Irrigation Requirements (2004 - 2013)

Note: The high water use crop, 3 cut alfalfa is used in these examples because this crop's annual growing season closely coincides with the annual irrigation season.

The difference between the total crop water requirement and total precipitation is the NET irrigation requirement.

*The average crop requirement and average precipitation are from the period 1997 to 2013.

Seasonal precipitation from May 1 to September 30.



Note: Total Corn Heat Units (CHU) starting May 15 until first frost (-2°C)

Figure 16. Brooks Corn Heat Units (2004 - 2013)

Table 17. Historical Rainfall in Southern Alberta (April 15 to October 15)

AREA	MAXIMUM RAINFALL (mm)	MINIMUM RAINFALL (mm)	NORMAL RAINFALL* (mm)	**2013 RAINFALL (mm)**	**2013 % OF NORMAL**
Lethbridge	534 (1978)	71 (2001)	279	**385**	**138%**
Bow Island	439 (1993)	112 (2001)	256	**258**	**101%**
Brooks	484 (2005)	87 (2001)	241	**275**	**114%**

Note: * Normal rainfall 1970 - 2013

Table 18. Historical Corn Heat Units in Southern Alberta (May 15 to First -2° C Frost)

AREA	MAXIMUM CHU (2004-2013)	MINIMUM CHU (2004-2013)	LAST TEN YEAR AVERAGE*	**2013 CHU**	**2013 % OF LAST TEN YEAR AVERAGE**
Lethbridge	2522 (2013)	2081 (2005)	2254	**2522**	**112%**
Bow Island	2726 (2013)	2181 (2005)	2489	**2726**	**110%**
Brooks	2530 (2012)	1987 (2010)	2309	**2491**	**108%**

Note: * Last ten year average 2004 - 2013

Table 19. Frost Free Period (0° C) in Southern Alberta

AREA	AVERAGE LAST FROST	AVERAGE FIRST FROST	AVERAGE FROST FREE DAYS*	**2013 LAST FROST**	**2013 FIRST FROST**	**2013 FROST FREE DAYS**	**2013 % OF NORMAL**
Lethbridge	May 18	Sept 19	124	**May 13**	**Oct 2**	**142**	**106%**
Bow Island	May 12	Sept 23	134	**May 14**	**Sept 27**	**136**	**102%**
Brooks	May 20	Sept 13	116	**May 5**	**Sept 24**	**142**	**111%**

Note: * Average frost free days 1971 - 2000

Table 20. Frost Free Period (-2° C) in Southern Alberta

AREA	AVERAGE LAST FROST	AVERAGE FIRST FROST	AVERAGE FROST FREE DAYS*	**2013 LAST FROST**	**2013 FIRST FROST**	**2013 FROST FREE DAYS**	**2013 % OF NORMAL**
Lethbridge	May 2	Sept 29	150	**May 2**	**Oct 3**	**154**	**104%**
Bow Island	Apr 30	Oct 1	154	**May 4**	**Oct 2**	**151**	**100%**
Brooks	May 5	Sept 28	146	**May 2**	**Sept 27**	**148**	**107%**

Note: Average frost free days 1971 - 2000

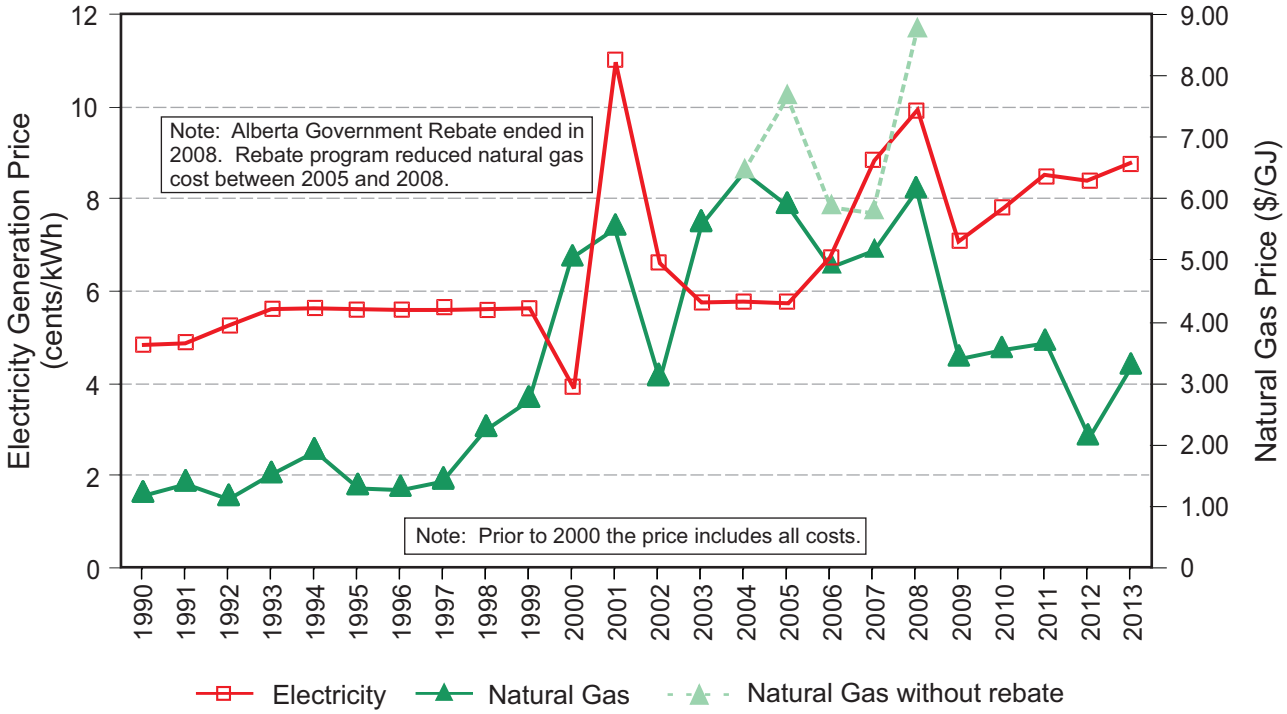
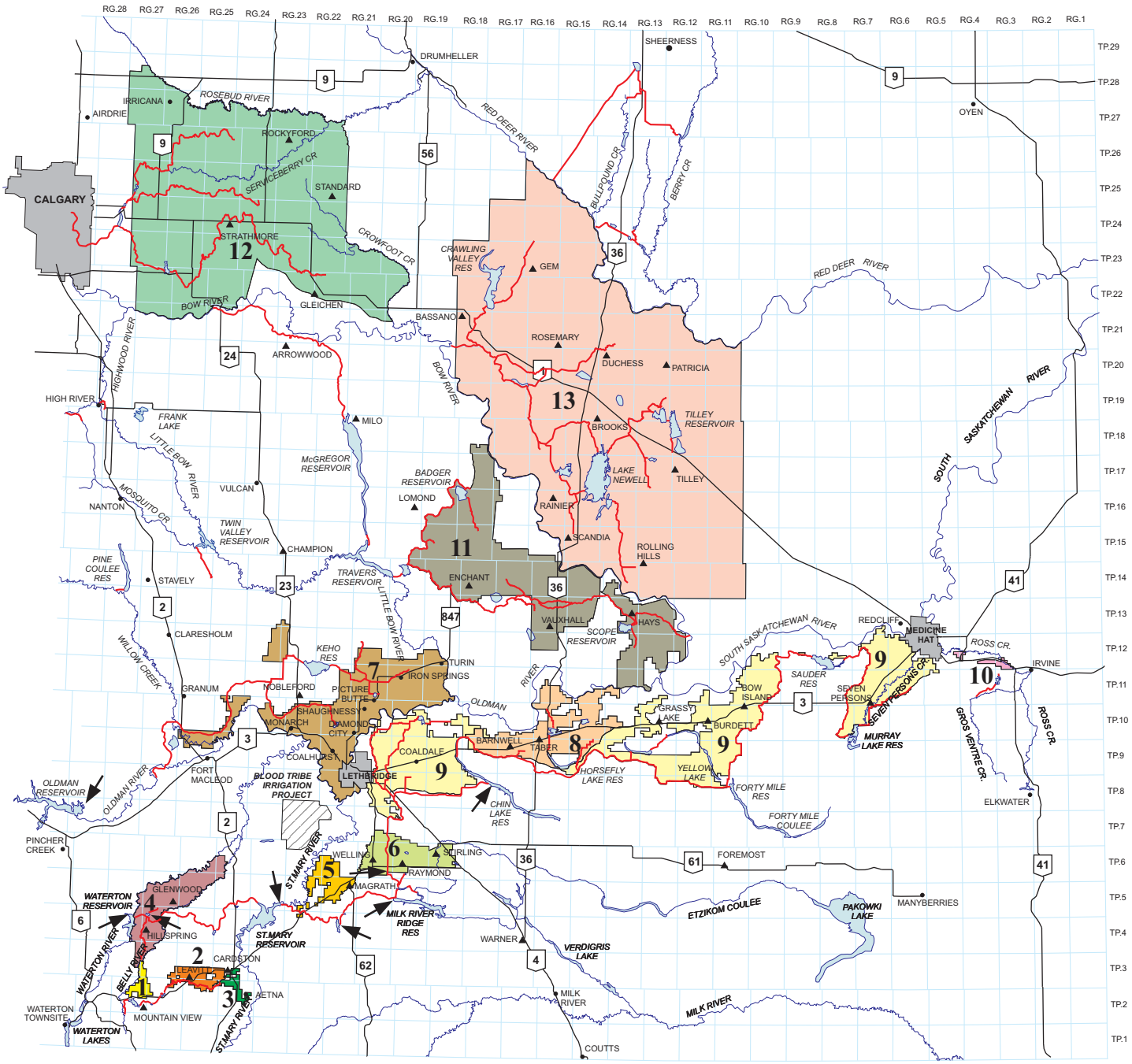


Figure 17. Historical Irrigation Energy Prices (average prices from May to September)

Table 21. Energy Type Used in the Irrigation Districts (acres irrigated by energy type)

Energy Type	BRID	EID	LNID	MID	RCID	RID	SMRID	TID	UID	WID	Average Energy Type
Electricity	74.0% 166,654	45.6% 134,975	39.9% 71,265	8.2% 1,499		39.7% 17,762	61.6% 225,928	61.8% 48,785	52.4% 10,954	34.1% 27,445	53.8%
Natural Gas	11.8% 26,682	23.9% 70,736	34.4% 61,366	58.4% 10,686		45.9% 20,539	32.9% 120,612	33.7% 26,556	5.3% 1,116	32.0% 25,713	27.8%
Diesel	2.8% 6,220	4.0% 11,811	0.5% 869	0.0% 0		0.4% 186	0.7% 2,609	0.8% 635	0.6% 132	10.3% 8,262	2.3%
Gravity	5.9% 13,365	20.3% 60,105	2.0% 3,635	16.9% 3,094		7.5% 3,333	1.7% 6,258	3.0% 2,340	21.9% 4,571	7.4% 5,914	7.8%
Gravity Pressure Pipeline	4.0% 9,062	2.2% 6,644	13.3% 23,662	16.3% 2,991	100.0% 1,075	0.5% 228	2.8% 10,112	0.5% 415	17.6% 3,675	8.6% 6,925	4.9%
Pump Pressure Pipeline	0.5% 1,081	2.3% 6,805	7.6% 13,638	0.0% 0		0.0% 0	0.0% 0	0.0% 0	2.2% 451	0.2% 125	1.7%
Other*	0.4% 929	0.9% 2,648	0.6 1,093	0.2% 30		1.9% 839	0.3% 1,008	0.2% 170	0.1% 19	7.5% 6,050	1.0%
Unknown	0.6% 1,293	0.9% 2,577	1.7% 3,028	0.0% 0		4.1% 1,839	0.1% 370	0.0% 15	0.0% 0	0.0% 0	0.7%
Total Acres	225,286	296,301	178,556	18,300	1,075	44,726	366,897	78,916	20,918	80,434	1,311,409

Notes: – * other includes gasoline, propane or butane
– AID, LID, and MVID did not report any data



- 1 Mountain View Irrigation District
- 2 Leavitt Irrigation District
- 3 Aetna Irrigation District
- 4 United Irrigation District
- 5 Magrath Irrigation District
- 6 Raymond Irrigation District
- 7 Lethbridge Northern Irrigation District
- 8 Taber Irrigation District
- 9 St.Mary River Irrigation District
- 10 Ross Creek Irrigation District
- 11 Bow River Irrigation District
- 12 Western Irrigation District
- 13 Eastern Irrigation District

- ▲ Communities receiving irrigation water
- ● Communities not receiving irrigation water
- Hydroelectric plants associated with water distribution works
- — Main canals

There are 13 irrigation districts in southern Alberta providing water to 1,389,427 assessed acres of farmland. The infrastructure within these irrigation districts is comprised of approximately 7,926 kilometres of conveyance system, of which 339 kilometres are owned and operated by Alberta Environment and Sustainable Resource Development.

Figure 18. Alberta's Irrigation Districts

Data Dictionary

Actually irrigated: A parcel of assessed land that includes an irrigation system and received water during the current year.

Assessed and covered by an irrigation system: A parcel of land recorded on the irrigation district assessment roll as having irrigation acres and has some type of irrigation system.

> Irrigated this year: A parcel of land that received irrigation water in the current year.
>
> Not irrigated this year: A parcel of land that did not receive irrigation water in the current year.

Assessed with no irrigation system: A parcel of land recorded on the irrigation district assessment roll as having irrigation acres without any type of system.

Assessment roll acres: These include irrigation, terminable, and annual acres. To learn more about assessments, link to the Alberta Irrigation Districts Act.

> **Irrigation acres:** Acres in a parcel recorded on the assessment roll as irrigation acres. Subject to an irrigation charge.
>
> **Terminable acres:** Acres in a parcel recorded on the assessment roll as terminable acres. The agreement is terminable at the option of either party by giving notice before March 1. Subject to a terminable agreement charge.
>
> **Annual acres:** Acres in a parcel recorded on the assessment roll as annual acres. The agreement expires at the end of the calendar year. Subject to an annual agreement charge.

Canal Evaporation: Water lost through the delivery system by vaporizing from the water surface of an open channel.

Canal Seepage: Water lost through the delivery system through the sides and bottom of an open channel.

Constructed Drain: A man-made open channel or pipeline that provides a means to move unused water away from irrigation works.

Corn Heat Unit: A numerical measure of the growth response of a corn plant to daily minimum and maximum temperatures. Zero corn heat units are calculated when daily minimum temperatures are below 4.4°C and daily maximum temperatures are below 10°C. They are calculated on a daily basis and accumulated annually starting on May 15 and continuing until the first killing frost of -2°C.

Crop Requirement: The amount of water a crop needs to transpire in response to meteorological conditions.

Crop Type: Plants that are grown in the irrigation districts are grouped into four categories: cereals, forages, oil seeds, specialty crops, and other.

> **Cereals:** Annual grasses grown for their grain. Crops reported include barley, CPS wheat, durum wheat, grain corn, hard red spring wheat, malt barley, oats, rye, soft wheat, triticale, and winter wheat.
>
> **Forages:** Plants that are consumed by livestock. Crops reported include alfalfa (two & three cut, hay, and silage), barley silage, brome hay, corn silage, grass hay, green feed, milk vetch, millet, native pasture, oats silage, sorghum/sudan grass, tame pasture, timothy hay, and triticale silage.
>
> **Oil Seeds:** Plants that are grown for the oil contained in the seeds. Crops reported include canola, flax, and mustard.

Specialty Crops: Include fruits and vegetables, horticulture, seed production, pulse crops, and nursery crops. Crops reported include alfalfa seed, canola seed, carrots, catnip, chick peas, dill, dry beans, dry peas, faba beans, fresh sweet corn, fresh peas, grass seed, hemp, lawn turf, lentils, market gardens, mint, nursery, onions, potatoes, pumpkins, safflower, seed potatoes, small fruit, soy beans, sugar beets, and sunflower.

Other: Other reported include miscellaneous, non-crop, summer fallow, and unknown.

Delivered for Irrigation: All water delivered by an irrigation district through its infrastructure for the purpose of irrigation.

Expansion Limit: The total number of irrigation acres plus acres subject to a terminable agreement in an irrigation district; the total irrigated area of an irrigation district cannot exceed this limit as per the Irrigation Districts Act.

Frost Free Period (0°C): Continuous period of time where the minimum daily temperature does not drop below 0°C.

Frost Free Period (-2°C): Continuous period of time where the minimum daily temperature does not drop below -2°C.

Gross Annual Diversion: All water diverted into the works of an irrigation district from a water source. It includes water used directly for irrigation purposes, reservoir filling, and the water supplied or licenced to municipal, domestic, other agricultural, industrial, and environmental uses.

Irrigation District: A corporation that operates under the authority of the Alberta Irrigation Districts Act whose primary purpose is to convey and deliver water through irrigation works, divert and use quantities of water within the terms of its licence, and to construct, operate and maintain irrigation works. An irrigation district is the geographical area consisting of the parcels of land included in the district.

Irrigation District Annual Water Rate: The annual amount charged by an irrigation district per assessed acre of land for irrigation water. Some districts levy additional surcharges for services including pipeline and/or pressurized delivery, using more water than allocated, and automated screen cleaning.

Irrigation District Works: Any structure, device, contrivance or thing or any artificial body of water or watercourse used or to be used by a district.

Rehabilitated: Includes membrane-lined canals, concrete-lined canals, earth canals, closed pipelines, and open pipelines.

Membrane-lined canal: An open channel that has been coated with a membrane material to prevent water seepage.

Concrete-lined canal: An open channel that has been coated with concrete to prevent water seepage.

Earth canal: An open channel that has been coated with a natural low porosity material that reduces water seepage.

Closed pipeline: A buried conduit that is closed at the outlet.

Open pipeline: A buried conduit that is open at the outlet.

Un-rehabilitated: Consists of un-rehabilitated canals.

Un-rehabilitated canal: An open channel that was constructed through the native material.

Irrigation method: Irrigation systems are grouped into five categories: high pressure pivot sprinkler, low pressure pivot sprinkler, wheel move sprinkler, gravity, and other.

High pressure pivot sprinkler includes:

Pivot high pressure: Centre pivot irrigation system with high pressure (greater than 50 pounds per square inch (psi)) impact sprinklers.

Pivot high pressure – corner arm: Centre pivot irrigation system with high pressure (greater than 50 psi) impact sprinklers with the addition of a secondary pivotal arm connected to the end of the centre pivot boom.

Linear – high pressure: Linear move irrigation pivot system with high pressure (greater than 50 psi) impact sprinklers that irrigate a rectangular field.

Low pressure pivot sprinkler includes:

Pivot medium pressure: Centre pivot irrigation system with medium pressure (between 30 and 50 psi) impact sprinklers.

Pivot medium pressure – corner arm: Centre pivot irrigation system with medium pressure (between 30 and 50 psi) impact sprinkler nozzles with the addition of a secondary pivotal arm connected to the end of the centre pivot boom.

Pivot low pressure: Centre pivot irrigation system with low pressure (less than 30 psi) spray nozzles.

Pivot low pressure – corner arm: Centre pivot irrigation system with low pressure (less than 30 psi) spray nozzles with the addition of a secondary pivotal arm connected to the end of the centre pivot boom.

Linear – low pressure: Linear move pivot irrigation system with low pressure (less than 30 psi) spray nozzles that irrigates a rectangular field.

Wheel move includes:

Wheel move – two laterals: Two wheel mounted pipelines with sprinklers along their length per parcel of land.

Wheel move – four laterals: Four wheel mounted pipelines with sprinklers along their length per parcel of land.

Gravity includes:

Gravity – developed – no control: surface irrigation system with some land modification (leveling plus construction of border strips, furrows, basin), where the soil surface is used to distribute and infiltrate the applied water.

Gravity undeveloped flood: surface irrigation system without any land modification (leveling) or application control (furrows, border strips, dykes).

Other includes:

Volume gun – stationary: Large volume sprinkler stationed at a single point.

Volume gun – traveller: Large volume sprinkler mounted on wheels.

Solid set: Sprinklers mounted on risers connected to a buried pipe.

Hand move: Sprinklers mounted on risers connected to a surface pipe that can be moved.

Micro – spray – sprinkler: Spray emitter connected to a drip irrigation system.

Micro – drip – trickle: Drip emitter connected to a drip irrigation system.

Other application use: Water used for purposes other than irrigation.

Natural Drain: An open channel that exists as a natural watercourse that provides a means to move unused water away from irrigation works.

Net Requirement: The amount of water supplied by irrigation to meet the crop requirement.

Other Use: Any water delivered by an irrigation district for a use other than irrigation; this includes municipal, domestic, other agricultural, industrial, and environmental uses.

Percent of Licence: The percentage of the irrigation district's licence that was diverted in a year.

Replacement Cost: The cost in today's dollars to restore a piece of irrigation district infrastructure.

Reservoir Evaporation: Water lost from the surface of a reservoir by vaporization.

Reservoir Storage: Net change in irrigation district reservoir storage volume. Irrigation districts own and operate reservoirs to store irrigation water for release when there is insufficient diversion capacity to meet the demand for water. They are also used for normal district operations to stabilize flows and capture unused water for further use.

Return: Water returned by an irrigation district to the river system.

Total District Operations: Total volume of water used for irrigation district operations comprised of water delivered for irrigation, other uses, water lost to seepage and evaporation, and water returned.

Water Licence (Irrigation): Includes irrigation district and private licences.

> **Irrigation District Water Licence:** An authorization which permits the irrigation district to divert a certain volume of water, at a specific rate, from a watercourse into district owned conveyance and storage systems.
>
> **Private Irrigation Water Licence:** An authorization which permits a private irrigator to divert a certain volume of water, at a specific rate, from a watercourse to a private irrigation development project.

Water Licence Allocation (Irrigation District): The total volume of water that an irrigation district is licenced to divert annually.

Water Source: The origin of the watercourse that is diverted by an irrigation district.