

Introduction

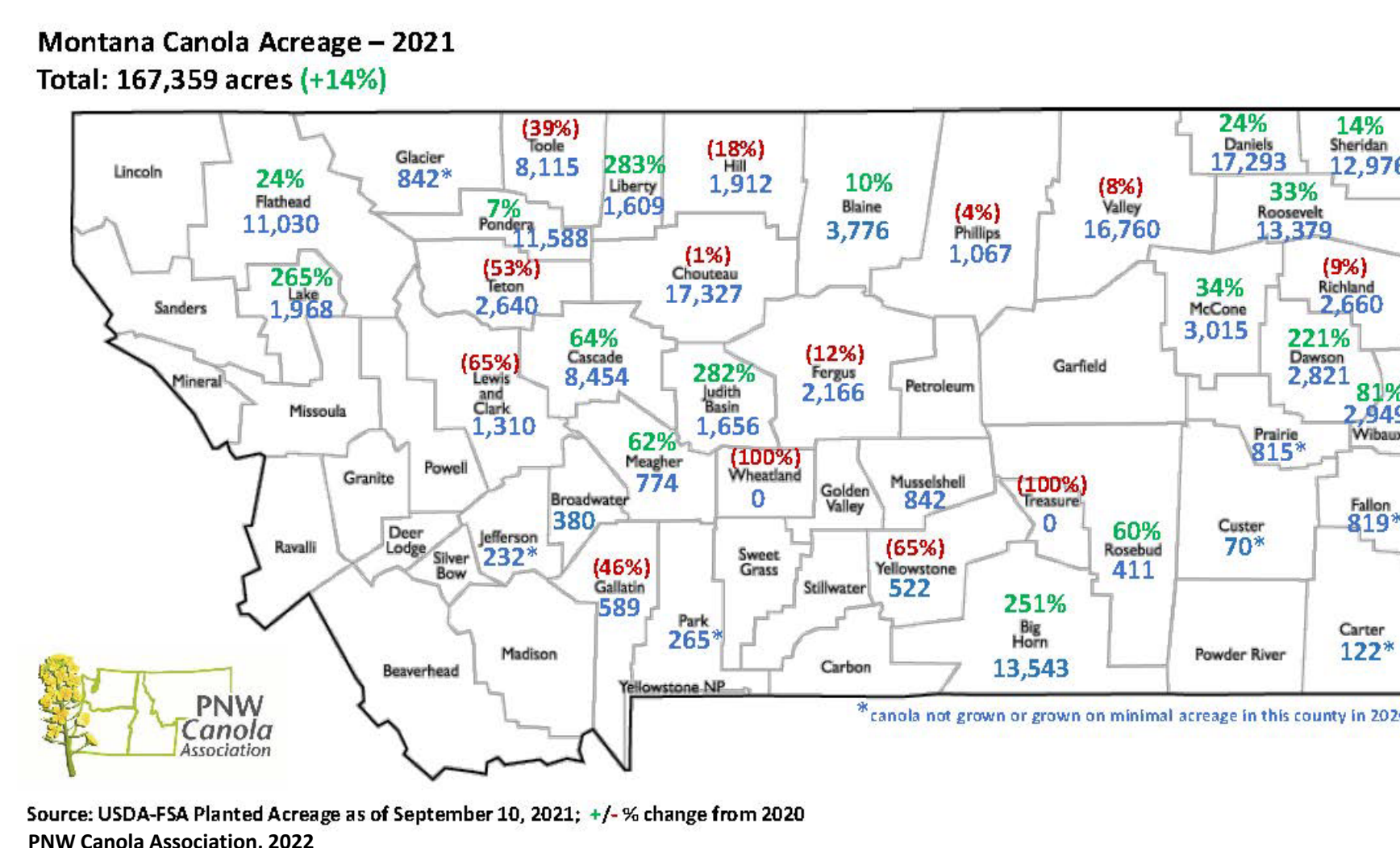
- Canola has become established as a major agronomic crop for the state of Montana. In recent years, Montana has been among the top three states in canola production in the United States.
- 2021 had a record high of acreage harvested, and in just five years time harvested canola acres in Montana have more than doubled.
- This trial has been conducted for over ten consecutive years in the state of Montana.

Objectives

- To evaluate the agronomic performance of available canola varieties and breeding lines submitted by commercial entities at research centers throughout the state.
- Provide canola growers in Montana with reliable, unbiased information regarding which canola varieties are best suited to their specific production environment.

Entries

Company	Variety	Herbicide Resistance
WinField - CROPLAN	CP9978TF	TruFlexx
WinField - CROPLAN	CP7130LL	Liberty
WinField - CROPLAN	CP7144LL	Liberty
WinField - CROPLAN	CP930RR	Roundup
WinField - CROPLAN	CP9919RR	Roundup
Bayer - Dekalb	DKTF91SC	RR-TruFlex
Bayer - Dekalb	DKTF99SC	RR-TruFlex
Bayer - Dekalb	DKTFLL21SC	RR-TruFlex + Liberty Link
BrettYoung	BY 6211TF	TF
BrettYoung	BY 6217TF	TF
BrettYoung	BY 5125CL	Clearfield
Photosyntech	NCC101S	N/A
Photosyntech	NCC1825/8-S	N/A
BASF	InVigor L233P	LL
BASF	InVigor L340PC	LL
BASF	InVigor LR344PC	LL/RR TruFlex
BASF	InVigor L343PC	LL
BASF	InVigor L345PC	LL
BASF	InVigor L356PC	LL
Meridian Seeds	CS4000 LL	LibertyLink
Meridian Seeds	CS2600 CR-T	TruFlex
Meridian Seeds	CS3000 TF	TruFlex
Nutrien	DG280CLC	Clearfield
Nutrien	DG660LCM	Liberty Link
Nutrien	DG760TM	TruFlex
Nutrien	DG781TCM	TruFlex
Nuseed	NC155 TF	TruFlex
Nuseed	NC471 TF	TruFlex
Nuseed	NC527CR TF	TruFlex



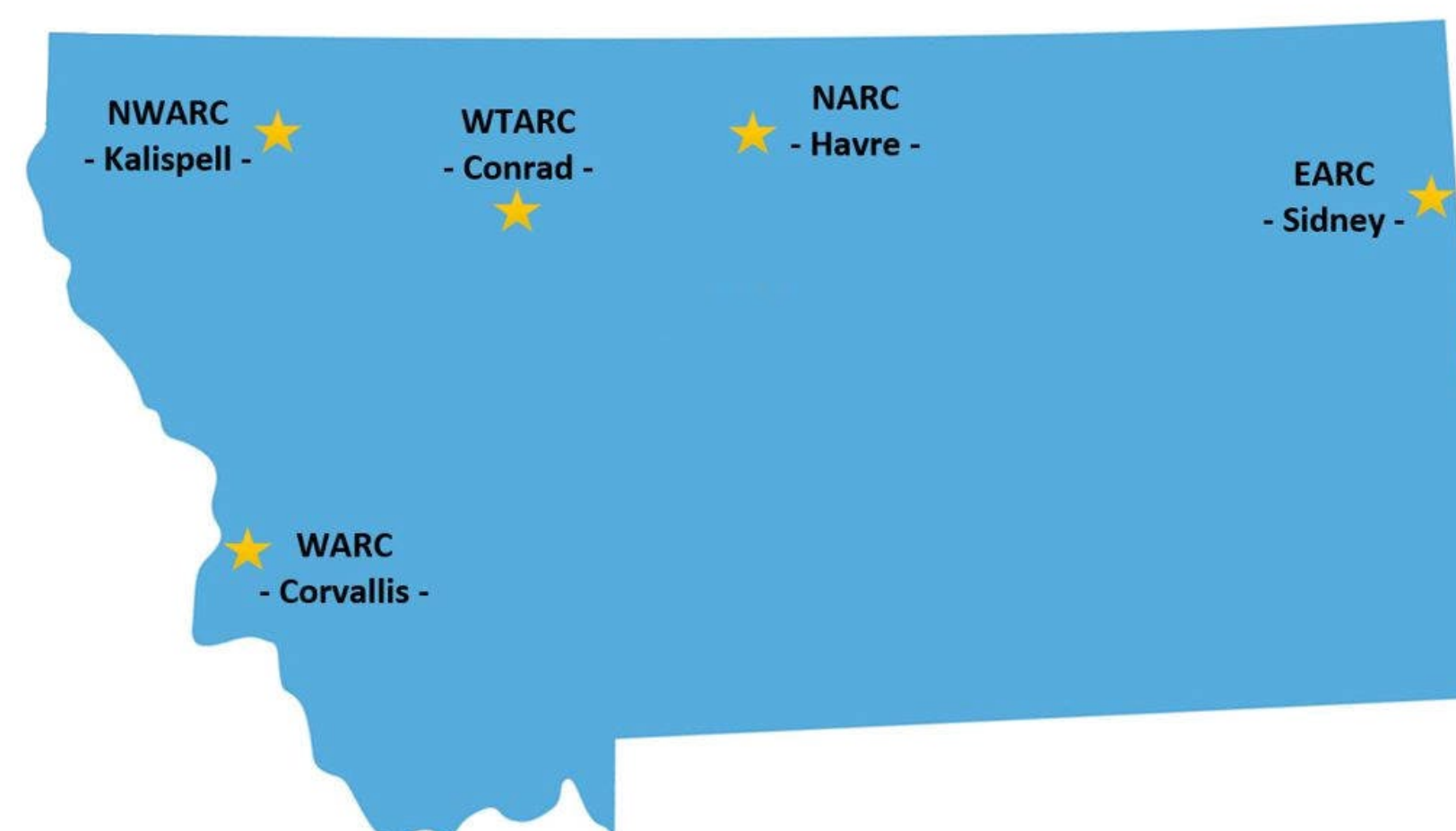
Management

Management	NWARC (Ka)	NARC (Ha)	EARC (Si)
Irrigation (in)	None	None	1.14
Tillage	Conventional	No-till	Conventional
Row Spacing (in)	6	12	9
Seeding Date	4/29/2022	4/22/2022	5/3/2022
Harvest Date	9/8/2022	8/4/2022	8/1/2022
Harvest Type	Direct Cut	Direct Cut	Direct Cut
Previous Crop	Spring Wheat	Spring Wheat	Cereal
Fertilizer	50-25-40 @ 1b/A	50-15-0-20s @ 173 lb/A	80-30-0 @ 136 lb/A
Pesticide	Lambda-CY @ 3.84 oz/A on 6/2/22 & 6/28/22	RT3 @ 28 oz/A on 4/8/22, Mustang Maxx @ 4 oz/A on 6/11/22, Baythroid @ 2.4 oz/A on 6/27/22	Mustang Maxx @ 4 oz/A on 6/10/22
Pests	Flea beetle and seedpod weevil	Weeds, flea beetle, and grasshoppers	Flea beetle

Meteorological & Soils	NWARC (Kalispell)	NARC (Havre)	EARC (Sidney)
2022 15th Apr through 15th Sep Precip (inches)	8.1	5.2	11.5
Long-Term Average Precip & Period of Record (inches)	9.61 (1989-2022)	7.95 (1916-2021)	9.53 (1949 - 2020)
Last Killing Frost in Spring (< 32°F)	5/22/2022	5/21/2022	5/2/2022
First Killing Frost in Fall (< 32°F)	9/10/2022	10/7/2022	10/6/2022
Frost-free Period (days)	110	139	156
2-wk Avg. Air Temp Beginning at First Flowering (°F)	62.3	63.27	65.4
Max Summer Temperature (°F)	96.9	100.0	99.9
Date of Max Summer Temperature	7/31/2022	7/17/2022	8/4/2022
Soil Type	Creston Silt Loam	Telstad-Joplin loams	Savage silty clay loam
Elevation (ft)	2956	2668	1931

Discussion

- Highest average yielding variety by location (Table 1):
Kalispell: InVigor L345PC
Havre: DG760TM
Sidney: NCC1825/8-S
- CP930RR had the highest average oil content across all locations.
- NCC101S was consistently one of the earliest flowering varieties across three locations.



Results

Table 1. Statewide Yield Summary (bu/A)				
¹ Herb Resistance	Variety	EARC (Sidney) ²	NARC (Havre)	NWARC (Kalispell)
CL	BY 5125CL	40.0	31.2	70.0
	DG280CLC	-	28.8	64.7
LL	CP7130LL	36.5	29.5	64.4
	CP7144LL	36.8	28.9	65.2
	CS4000 LL	-	29.8	60.7
	DG660LCM	-	23.5	59.8
	InVigor L233P	35.6	28.2	72.6
	InVigor L340PC	40.9	31.7	72.7
	InVigor L343PC	-	31.7	73.5
	InVigor L345PC	-	30.2	74.2
	InVigor L356PC	-	-	67.9
None	NCC101S	34.7	30.7	64.3
	NCC1825/8-S	48.1	29.9	68.5
RR	CP930RR	41.9	26.9	58.8
	CP9919RR	29.7	24.7	53.6
RR/TF	DKTF91SC	39.0	-	-
	DKTF99SC	46.6	-	-
RR/TF/LL	DKTFLL21SC	38.5	-	-
	InVigor LR344PC	35.0	31.7	67.6
TF	BY 6211TF	34.2	28.4	68.0
	BY 6217TF	25.7	20.7	66.3
	CP9978TF	36.8	28.2	64.6
	CS2600 CR-T	-	32.1	62.9
	CS3000 TF	-	28.9	62.2
	DG760TM	-	34.3	62.4
	DG781TCM	-	32.5	63.1
	NC155 TF	-	31.2	60.9
	NC471 TF	-	27.7	66.2
	NC527CR TF	-	31.9	68.6
Mean		37.7	29.3	65.5
CV		15.1	7.5	7.7
Pr>F		<0.001	<0.001	<0.001

Bold = top-performer within a column; **Bold** = statistically equivalent to top-performer by Tukey pairwise comparisons (p > 0.05)
¹CL = Clearfield; LL = Liberty Link; RR = Roundup Ready; TF = TruFlex; ²Irrigated

Table 2. NWARC (Kalispell) Summary									
¹ Herb Resistance	Variety	Flowering Date	Plant Height (in)	Stand Count (plnt/ft ²)	Lodging (%)	Shatter (%)	TWT (lb/bu)	Oil Content (%)	Yield (bu/A)
CL	BY 5125CL	179	48.8	-	22.5	-	50.5	48.8	70.0
	DG280CLC	179	54.2	-	10.0	-	50.0	47.9	64.7
LL	CP7130LL	179	44.8	-	15.0	-	50.0	47.3	64.4
	CP7144LL	180	49.2	-	17.5	-	50.0	48.0	65.2
	CS4000 LL	177	40.1	-	37.5	-	50.5	48.9	60.7
	DG660LCM	179	47.8	-	22.5	-	49.8	48.4	59.8
	InVigor L233P	180	49.5	-	22.5	-	49.8	48.0	72.6
	InVigor L340PC	178	51.0	-	17.5	-	50.0	46.4	72.7
	InVigor L343PC	179	43.0	-	25.0	-	49.1	47.1	73.5
	InVigor L345PC	179	44.0	-	20.0	-	50.2	48.2	74.2
	InVigor L356PC	179	46.6	-	17.5	-	50.0	48.2	67.9
None	NCC101S	175	45.5	-	22.5	-	49.9	44.4	64.3
	NCC1825/8-S	176	44.5	-	27.5	-	50.4	48.1	68.5
RR	CP930RR	176	41.5	-	60.0	-	49.8	50.4	58.8
	CP9919RR	175	31.7	-	85.0	-	49.4	47.2	53.6
RR/TF/LL	InVigor LR344PC	180	46.1	-	27.5	-	49.8	47.6	67.6
TF	BY 6211TF	179	42.3	-	30.0	-	51.0	48.2	68.0
	BY 6217TF	181	58.7	-	10.0	-	50.2	49.0	66.3
	CP9978TF	178	42.5	-	57.5	-	49.8	48.4	64.6
	CS2600 CR-T	178	41.1	-	22.5	-	50.4	49.4	62.9
	CS3000 TF	178	45.3	-	25.0	-	50.3	49.0	62.2
	DG760TM	178	51.0	-	10.0	-	50.4	48.2	62.4
	DG781TCM	178	51.6	-	15.0	-	49.6	48.5	63.1
	NC155 TF	177	50.8	-	10.0	-	50.6	48.1	60.9
	NC471 TF	177	56.4	-	12.5	-	50.6	48.1	66.2
	NC527CR TF	178	54.4	-	15.0	-	49.7	49.4	68.6
Mean		178.1	47.0	-	25.3	-	50.1	48.1	65.5
CV		0.8	8.0	-	44.4	-	0.9	1.5	7.7
Pr>F		<0.001	<0.001	-	<0.001	-	<0.001	<0.001	<0.001

Bold = top-performer within a column; **Bold** = statistically equivalent to top-performer by Tukey pairwise comparisons (p > 0.05)
¹CL = Clearfield; LL = Liberty Link; RR = Roundup Ready; TF = TruFlex

Table 3. NARC (Havre) Summary									
¹ Herb Resistance	Variety	Flowering Date	Plant Height (in)	Stand Count	Lodging (%)	Shatter (%)	TWT (lb/bu)	Oil Content (%)	Yield (bu/A)
CL	BY 5125CL	167.5	35.4	4.7	0	0	52.7	41.9	31.2
	DG280CLC	168.8	39.2	5.2	0	0	52.9	39.7	28.8
LL	CP7130LL	167.8	38.5	4.5	0	0	53.3	38.7	29.5
	CP7144LL	167.8	36.9	5.7	0	0	52.9	39.7	28.9
	CS4000 LL	168.0	38.4	4.9	0	0	53.3	41.1	29.8
	DG660LCM	168.8	37.2	4.2	0	0	52.5	40.4	23.5
	InVigor L233P	168.8	37.7	5.2	0	0	52.5	41.1	28.2
	InVigor L340PC	168.0	39.9	6.6	0	0	53.6	38.5	31.7
	InVigor L343PC	168.0	37.5	5.3	0	0	53.1	41.4	31.7
	InVigor L345PC	168.2	38.7	6.9	0	0	53.3	40.8	30.2
None	NCC101S	165.5	34.8	5.5	0	0	53	37.3	30.7
	NCC1825/8-S	165.5	32.1	4.8	0	0	54.3	37.3	29.9
RR	CP930RR	166.0	34.6	4.6	0	0	51.1	44.6	26.9
	CP9919RR	167.2	32	4.3	0	0	52	41	24.7
RR/TF/LL	InVigor LR344PC	168.2	38.1	5.3	0	0	52.6	40.8	31.7
TF	BY 6211TF	167.5	37.9	6.4	0	0	53.2	38.7	28.4
	BY 6217TF	168.5	41.8	5.6	0	0	51.9	41.8	20.7
	CP9978TF	167.2	33.7	5.1	0	0	52.4	40.6	28.2
	CS2600 CR-T	166.5	36.9	5.4	0	0	53.1	41.4	32.1
	CS3000 TF	166.8	32.9	3.7	0	0	52.5	40.6	28.9
	DG760TM	168.2	36	5.0	0	0	52.3	40.5	34.3
	DG781TCM	167.2	35.3	4.8	0	0	52.1	42.9	32.5
	NC155 TF	166.5	36.5	5.8	0	0	54.2	36.2	31.2
	NC471 TF	167.8	37.9	6.0	0	0	52.5	40.7	27.7
	NC527CR TF	167.0	37.6	5.0	0	0	51.6	42.4	31.9
Mean		167.5	36.8	-	-	-	52.7	40.4	29.3
CV		0.4	4.5	-	-	-	0.8	3.6	7.5
Pr>F		<.001	<.001	0.25	-	-	<.001	<.001	<.001

Bold = top-performer within a column; **Bold** = statistically equivalent to top-performer by Tukey pairwise comparisons (p > 0.05)
¹CL = Clearfield; LL = Liberty Link; RR = Roundup Ready; TF = TruFlex

Table 4. EARC ² (Sidney) Summary									
¹ Herb Resistance	Variety	Flowering Date	Plant Height (in)	Stand Count	Lodging (%)	Shatter (%)	TWT (lb/bu)	Oil Content (%)	Yield (bu/A)
CL	BY 5125CL	173.0	41.5	-	-	-	54.2	44.9	40
LL	CP7130LL	173.0	39.5	-	-	-	54.0	43.6	36.5
	CP7144LL	172.5	44.5	-	-	-	50.6	44.4	36.8
	InVigor L233P	173.0	39.1	-	-	-	52.7	45.9	35.6
	InVigor L340PC	173.0	38.2	-	-	-	53.4	43.5	40.9
None	NCC101S	171.5	33.2	-	-	-	54.7	40.4	34.7
	NCC1825/8-S	171.0	39.2	-	-	-	55.6	42.3	48.1
RR	CP930RR	171.0	39.7	-	-	-	53.5	47.5	41.9
	CP9919RR	171.0	35.8	-	-	-	53.5	43.6	29.7
RR/TF	DKTF91SC	171.5	36.6	-	-	-	53.6	45.9	39
	DKTF99SC	173.0	44.2	-	-	-	53.4	44.6	46.6
RR/TF/LL	DKTFLL21SC	171.5	36.0	-	-	-	54.1	45.3	38.5
	InVigor LR344PC	173.0	39.3	-	-	-	51.2	47.5	35
TF	BY 6211TF	173.0	38.6	-	-	-	53.1	45.1	34.2
	BY 6217TF	174.0	43.6	-	-	-	51.3	45.7	25.7
	CP9978TF	172.5	40.3	-	-	-	53.5	44.8	36.8
Mean		172.0	39.3	-	-	-	53.3	44.7	37.7
CV		0.3	8.4	-	-	-	1.9	2.5	15.1
Pr>F		<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001

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¹CL = Clearfield; LL = Liberty Link; RR = Roundup Ready; TF = TruFlex; ²Irrigated