Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14 – Year 1

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

"Similar yields have been obtained for seeding rates of **4 to 10 pounds per acre**. A harvest population of **four to 15 plants per square foot is optimum**. Usually significant yield differences do not occur unless populations at harvest are less than one or greater than 15 plants per square foot. Hybrid canola, having larger seed size and more branching potential, may be planted at a reduced rate of **3.5 pounds per acre**."

"Canola seed of average size has approximately 115,000 seeds per pound. Hybrid canola seed is about 30 percent larger than non-hybrid seeds. "

Source:
Great Plains Canola Handbook – March 2009
KSU / OSU / NU

4 lb/ac x 115,000 sd/lb = 460,000 seeds/ac = 6.3 plants/sq ft @ 60% emergence rate

"On a twin row production system with a 15" average row width **dropping 5 to 6 seeds live seeds per linear foot** will get you in the **desired stand of 140 to 180k plants per acre**. Adjust rates according to conditions but ***we do not like excessively thick crops in high rainfall areas due to lodging and disease pressure.***"

4 lb/ac x 115,000 sd/lb = 460,000 seeds/ac = 6.3 plants/sq ft @ 60% emergence rate

3.5 lb/ac x 80,000 sd/lb = 280,000 seed/ac = 3.8 plants/sq ft @ 60% emergence rate

3.5 lb/ac x 80,000 sd/lb = 280,000 seed/ac = 5.1 plants/sq ft @ 80% emergence rate
= 224,000 plants/ac

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

- Top tier hybrid canola seed costs ~$15 per 100,000 seeds
- Emergence rates using a planter can be around 75-85% but assuming 70%:
  - 1 plant/sq ft = 43,560 plants/ac ➔ $9.33/ac (~62 ksd/ac)
  - 4 plants/sq ft = 174,240 plants/ac ➔ $37.34/ac (~250 ksd/ac)
  - 11 plants/sq ft = 479,160 plants/ac ➔ $102.68/ac (~685 ksd/ac)
- 2013 Seed:
  - Hornet – 78,491 seed/lb
  - Dimension – 70,658 seed/lb
  - Other hybrids considered were around 100,000 seed/lb

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

Plot design

- Non-replicated, large area, side-by-side
- Three seeding rates (1x, 1.5x, 2x)
- 1x rate equal to my target field rate (180 ksd/ac)
- 1.5x and 2x rate blocks each 75 ft wide and full length of field (less ends)

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

Planting – 10/02/13

- 2013 crop: Corn (harvested 9/26)
- Corn herbicides: Corvus / atrazine
- Disked to size residue
- Fertilizer broadcast
- Shallow disked to incorporate

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

43 days after planting (15NOV)

605.1 Accumulated Degree-day Heat Units

1x seeding rate – 170,430 seeds/ac
Emerged pop – 115,580 plants/ac
67.8%

1.5x seeding rate – 255,640 seeds/ac
Emerged pop – 148,680 plants/ac
58.2%

2x seeding rate – 340,860 seeds/ac
Emerged pop – 230,580 plants/ac
67.6%

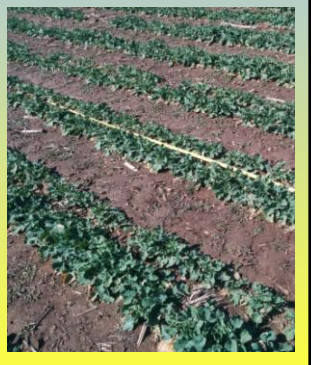
Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

167 days after planting (19MAR)

937.4 Accumulated Degree-day Heat Units (100.9 since 1MAR)

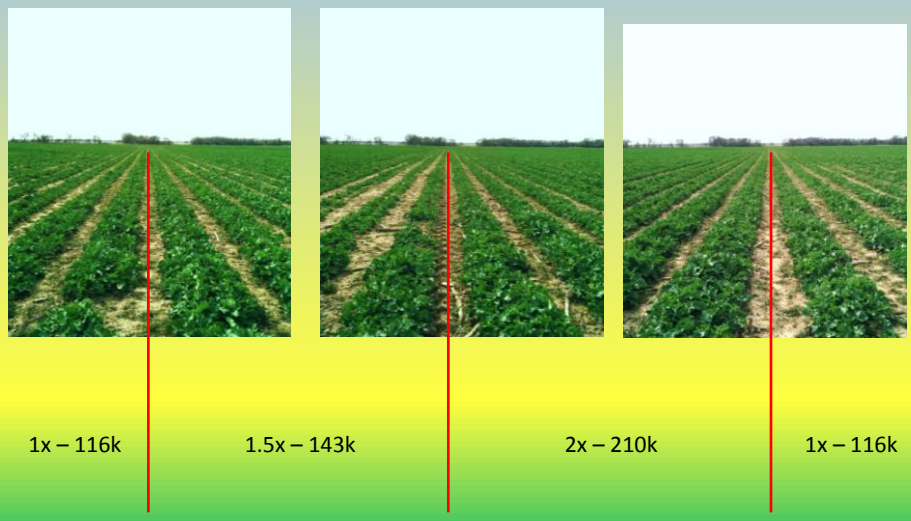
Emerged pop – 115,580 plants/ac
Spring pop – 118,500 plants/ac
102%

Emerged pop – 148,680 plants/ac
Spring pop – 141,100 plants/ac
95%

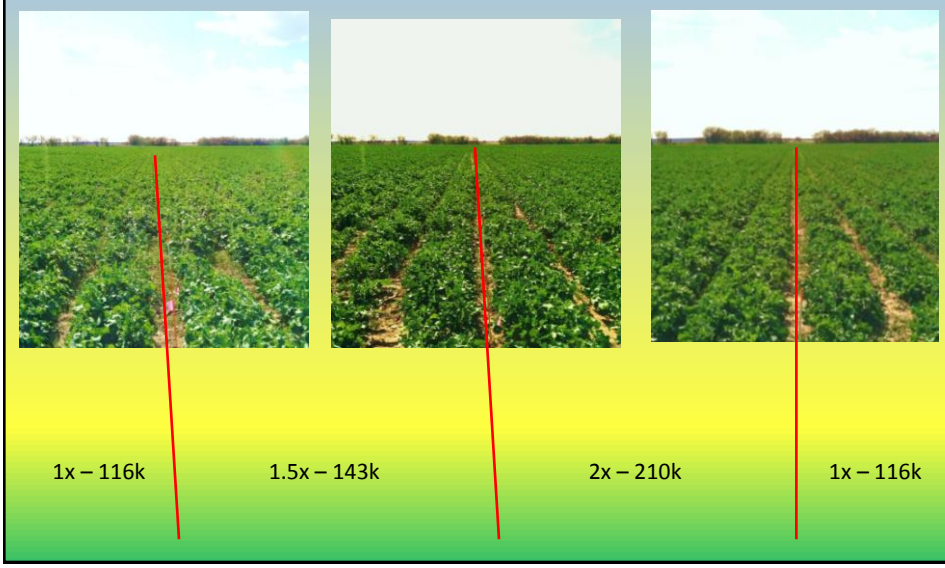


Emerged pop – 230,580 plants/ac
Spring pop – 209,100 plants/ac
91%

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14
178 days after planting (30MAR)
1015.3 Accumulated Degree-day Heat Units (178.8 since 1MAR)



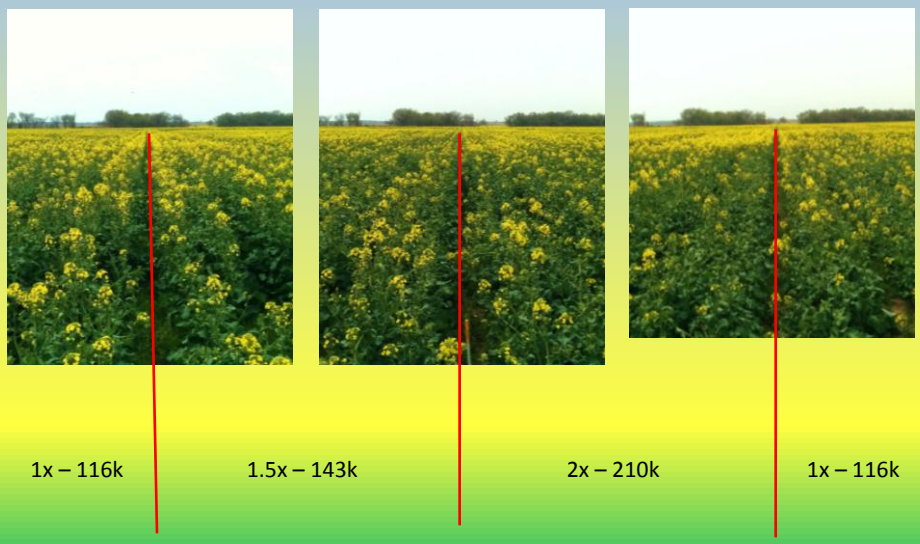
Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14
187 days after planting (8APR)
1127.4 Accumulated Degree-day Heat Units (290.9 since 1MAR)



Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

196 days after planting (17APR)

1259.4 Accumulated Degree-day Heat Units (670.1 since 1MAR)



Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

MESONET CLIMATOLOGICAL DATA SUMMARY (MIAM) Miami
Latitude: 36-53-17

April 2014
Nearest City: 2.0 NE Miami
Longitude: 94-50-39

Time Zone: Midnight-Midnight CST
County: Ottawa
Elevation: 810 feet

DAY	TEMPERATURE (°F) MAX	MIN	AVG	DEWPT	DEG DAYS HDD	CDD	HUMIDITY (%) MAX	MIN	AVG	RAIN (in)	PRESSURE (in) STN	MSL	WIND SPEED (mph) DIR	AVG	MAX	SOLAR (MJ/m^2)	4" SOIL TEMPERATURES SOD	BARE	MAX	MIN
1	57	38	47.2	33.7	18	0	81	46	60	0.00	29.13	30.00	NNE	8.9	19.4	7.26	49.0	48.3	52	44
2	78	50	66.7	58.9	1	0	90	63	76	0.00	28.89	29.75	S	11.1	24.5	7.23	51.4	55.9	63	48
3	82	45	67.7	59.2	2	0	84	52	75	0.03	28.79	29.65	S	13.4	33.2	9.68	56.8	62.3	69	55
4	54	34	44.6	31.5	21	0	88	38	61	0.00	29.21	30.08	NW	10.3	34.4	22.29	52.9	52.0	60	47
5	63	29	47.6	29.9	19	0	96	25	56	0.00	29.24	30.11	ENE	5.4	19.2	25.06	50.5	50.9	62	41
6	60	39	51.4	39.1	16	0	96	39	65	0.13	29.06	29.92	S	5.8	18.1	12.56	51.1	51.7	56	46
7	66	45	53.4	43.3	9	0	97	36	72	0.01	28.94	29.81	WNW	6.7	21.3	16.62	52.1	53.7	61	49
8	63	38	51.7	33.9	15	0	84	23	54	0.04	29.13	30.00	NNW	10.3	36.6	19.82	51.6	51.4	57	47
9	74	31	55.8	34.1	13	0	97	23	51	0.00	29.18	30.05	S	9.8	27.7	22.76	50.5	51.2	61	41
10	81	55	68.9	46.7	0	3	63	35	46	0.00	28.98	29.84	S	13.3	35.3	22.52	54.5	58.0	66	51
11	80	47	64.1	50.4	2	0	82	42	63	0.00	29.09	29.96	SSE	6.1	18.4	21.85	56.3	60.8	72	51
12	81	63	71.7	57.6	0	7	80	46	62	0.00	28.91	29.77	S	15.9	32.9	23.84	59.2	64.3	71	59
13	75	52	63.9	56.9	7	0	95	53	79	0.42	28.75	29.61	S	16.6	43.4	10.10	59.8	62.5	67	55
14	46	30	38.5	30.1	27	0	95	38	74	0.01	29.18	30.05	NNW	13.3	32.4	12.16	53.5	48.8	55	42
15	58	25*	43.2*	27.1*	23*	0*	97*	26*	58*	0.00*	29.29*	30.17*	SE *	4.1*	22.4*	26.57*	50.8*	49.3*	62*	38*
16	64	27	53.5	31.1	11	0	57	27	44	0.00	29.15	30.02	S	14.0	35.5	25.69	52.1	51.0	59	44
17	62	41	51.4	39.6	14	0	92	45	65	0.00	29.33	30.20	N	6.0	15.1	18.80	52.8	53.0	62	45
18	73	38	55.7	41.8	10	0	98	30	65	0.00	29.34	30.21	N	4.0	12.2	26.77	54.4	57.2	70	46
19	76	49	63.5	45.9	3	0	80	31	56	0.00	29.27	30.14	SSE	7.2	21.2	25.03	55.7	59.4	69	50
20	75	56	66.2	53.8	0	0	88	48	65	0.00	29.22	30.09	SSE	6.7	21.4	16.54	57.3	61.4	67	55
21	69	54	62.5	60.0	4	0	100	73	92	0.07	29.13	30.00	SSW	4.2	13.7	7.52	58.2	62.2	67	59
22	72	47	59.4	41.4	6	0	100	26	57	0.00	29.17	30.04	NNE	7.1	20.2	28.13	58.2	61.2	70	53
23	81	46	66.7	45.9	2	0	84	31	50	0.00	29.00	29.87	SSE	10.3	25.9	26.43	58.1	61.1	71	51
24	69	45	62.9	53.4	8	0	96	53	72	0.29	28.87	29.73	SSE	12.1	34.9	5.57	59.0	60.3	64	54
25	77	40	60.0	42.2	7	0	99	24	59	0.00	29.06	29.93	SSW	6.7	22.1	27.75	57.6	58.5	69	48
26	81	52	69.9	52.6	0	2	70	41	55	0.03	28.87	29.73	SSE	13.5	35.0	22.37	59.0	61.6	71	54
27	79	63	71.7	60.2	0	6	96	27	69	0.68	28.59	29.44	S	12.6	34.1	10.80	61.7	65.3	70	62
28	71	52	61.6	43.7	4	0	79	30	54	0.00	28.63	29.49	WSW	12.8	43.0	23.86	61.2	61.1	67	55
29	53*	46*	48.9*	39.6*	15*	0*	90*	56*	70*	0.00*	28.86*	29.72*	WSW*	10.8*	28.0*	NA	56.3*	51.9*	55*	50*
30	58	41	49.2	36.1	16	0	83	36	62	0.00	29.13	30.00	NW	7.9	24.5	15.06	54.5	52.0	57	47
	69*	44*	58.0*	44.0*	<- Monthly Averages ->						29.05*	29.91*	S *	9.6*	43.4*	18.64*	55.2*	56.6*	64*	50*

Temperature - Highest: 82*
Lowest: 25*

Degree Days - Total HDD: 269*
Total CDD: 18*

Number of Days With:
Tmax ≥ 90: 0* Rainfall ≥ 0.01 inch: 10*
Tmax ≤ 32: 0* Rainfall ≥ 0.10 inch: 4*
Tmin ≤ 32: 4* Avg Wind Speed ≥ 10 mph: 15*
Tmin ≤ 0: 0* Max Wind Speed ≥ 30 mph: 12*

Rainfall: Monthly Total: 1.71* in.
Greatest 24 Hr: 0.68* in.

Humidity - Highest: 100*
Lowest: 23*

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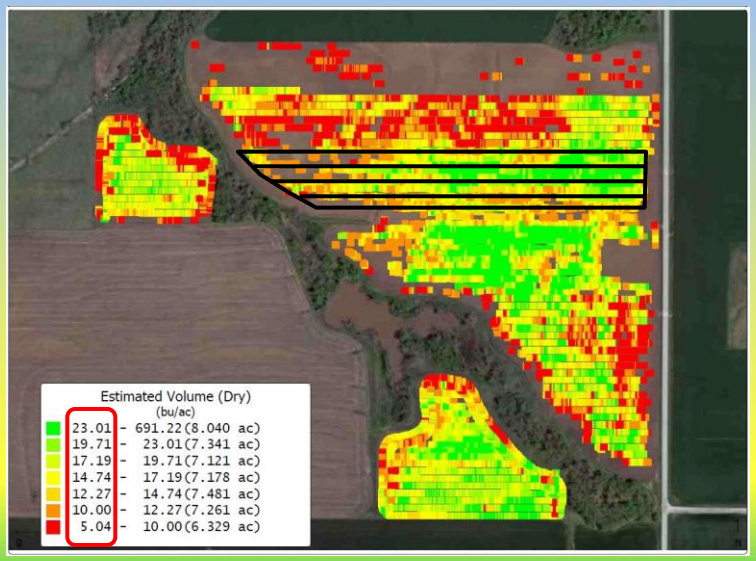
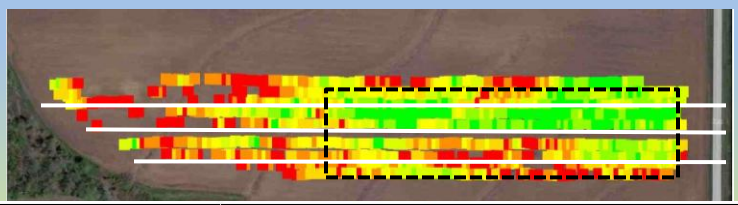


Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14



Query 1

Layer 1 - L6:S 1X rate | Canola - CANOLA

Main Layer

Total area	1.183 ac
Length	1,717.6 ft
Count	142

1X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	14.68 bu/ac	17.36 bu	10.13 bu/ac	22.71 bu/ac
Moisture	7.930 %		7.850 %	8.030 %
Elevation	835.40 ft		827.89 ft	843.97 ft

Query 2

Layer 1 - L6:S 1X rate | Canola - CANOLA

Main Layer

Total area	1.256 ac
Length	1,823.9 ft
Count	146

1.5X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	16.61 bu/ac	20.87 bu	10.15 bu/ac	26.94 bu/ac
Moisture	7.855 %		7.750 %	7.940 %
Elevation	835.10 ft		827.23 ft	842.00 ft

Query 3

Layer 1 - L6:S 1X rate | Canola - CANOLA

Main Layer

Total area	1.334 ac
Length	1,937.2 ft
Count	155

2X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	24.13 bu/ac	32.20 bu	11.68 bu/ac	34.99 bu/ac
Moisture	7.770 %		7.700 %	7.890 %
Elevation	836.29 ft		829.53 ft	843.64 ft

Query 4

Layer 1 - L6:S 1X rate | Canola - CANOLA

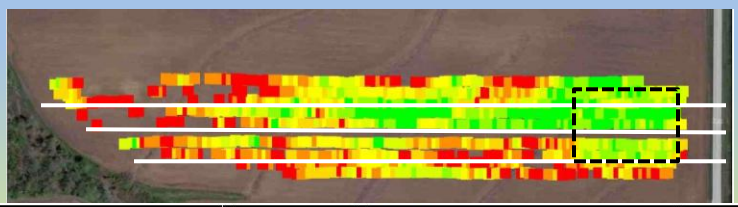
Main Layer

Total area	1.306 ac
Length	1,895.8 ft
Count	150

1X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	19.97 bu/ac	26.08 bu	10.68 bu/ac	27.66 bu/ac
Moisture	7.773 %		7.660 %	7.900 %
Elevation	837.73 ft		830.84 ft	845.28 ft

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14



Query 1

Layer 1 - L6:S 1X rate | Canola - CANOLA

Main Layer

Total area	0.338 ac
Length	491.37 ft
Count	40

1.5X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	21.29 bu/ac	7.206 bu	18.09 bu/ac	26.02 bu/ac
Moisture	7.967 %		7.750 %	7.940 %
Elevation	834.29 ft		827.56 ft	840.03 ft

Query 2

Layer 1 - L6:S 1X rate | Canola - CANOLA

Main Layer

Total area	0.338 ac
Length	491.31 ft
Count	40

2X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	24.88 bu/ac	8.417 bu	19.12 bu/ac	29.56 bu/ac
Moisture	7.780 %		7.700 %	7.890 %
Elevation	838.34 ft		829.53 ft	842.98 ft

Query 3

Layer 1 - L6:S 1X rate | Canola - CANOLA

Main Layer

Total area	0.340 ac
Length	494.06 ft
Count	39

1X

Description	Average	Total	Minimum	Maximum
Estimated Volume (Dry)	21.69 bu/ac	7.381 bu	17.00 bu/ac	26.74 bu/ac
Moisture	7.775 %		7.710 %	7.830 %
Elevation	841.65 ft		839.05 ft	845.28 ft

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

Test Results Summary:

- Higher emerged populations had more observed winter kill
- Low, variable production reduced quality of yield data
- 2x seeding rate (210k plants/ac) produced highest overall yield with ~3.5 bu/ac more than 1X @ $10.10/bu ➔ **$35.35/ac**
- 2X rate used 170ksd/ac more than 1X (equal emergence rate ~68%) @ $15.50/100ksd ➔ **$26.35/ac**
- No significant yield difference between 1X (116k plants/ac) and 1.5x (143k plants/ac)

Ottawa Co, OK Hybrid Winter Canola Population Test 2013/14

Lessons Learned:

- Need much broader span of low and high seeding rates to better determine “ideal” populations (will require planter drive modification)
- Low emergence issues must be addressed (seedbed prep / residue sizing)
- Consider using summer fallow following wheat to allow planting into stale seedbed and avoid potential chemical carryover issues (changes current crop rotation)

Ottawa Co, OK Hybrid Winter Canola Population Test 2014/15

Variety
Mercedes 101705 sds/lb $ 14.80 per 100k seeds

	Target Pop	lbs/ac	Planter Chart settings Driver	Driven	
Low	105000	1.03	12	28	
Medium Low	150000	1.47	17	28	
Medium	225000	2.21	24	26	
Medium High	300000	2.95	23	19	
High	375000	3.69	26	17	
Ultra High	450000	4.42	23	24	HI DRIVE*

30 ft

Border

Low	Medium Low	Ultra High	Medium
Medium Low	Medium High	High	Low
Medium	Low	Medium Low	High
Medium High	Ultra High	Medium	Medium High
High	Medium	Low	Ultra high
Ultra High	High	Medium High	Medium Low

Border

North

* Note 1: HI DRIVE is 1.875 faster than Normal drive

Ottawa Co, OK Hybrid Winter Canola Population Test 2014/15
32 days after planting (28 OCT)
733.3 Accumulated Degree-day Heat Units

Low – 61k plant/ac

Medium Low – 96k Plant/ac

Medium – 142k plant/ac

Medium High – 191k plant/ac

High – 260k plant/ac

Ultra High – 315k plant/ac

Questions?

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@OkiefarmerBrent (Twitter)