North Central Canola Research Program

- North Dakota
- Minnesota
- South Dakota
- Wisconsin

2010 Priorities

High priority will be given to research that identifies and addresses the major impediments to the expansion of canola acreage and production. Specific research priorities considered for funding may include, but are not limited to (not listed in order of importance):

1. **Production practices that optimize yield, quality, and profit**
2. **Disease management with emphasis on blackleg management. Note: sclerotinia research proposals should be submitted to the Sclerotinia Initiative.**
3. **Insect management, identification and control**
4. **Straight-harvest canola research, including the use of desiccants**

2010 Priorities

5. Rotation studies that determine optimal broadleaf crops to precede canola
6. Reduction of pod shattering, including identification of varieties resistant to shattering
7. Increasing oil yield per acre in canola
8. Nitrogen/sulfur fertility management, including use-efficiency studies
9. Seeding date by location studies with newer hybrids.
10. Other traditional or non-traditional research that has potential to increase canola acres and production
11. Evaluating and improving canola production on marginal lands (e.g., saline soils).

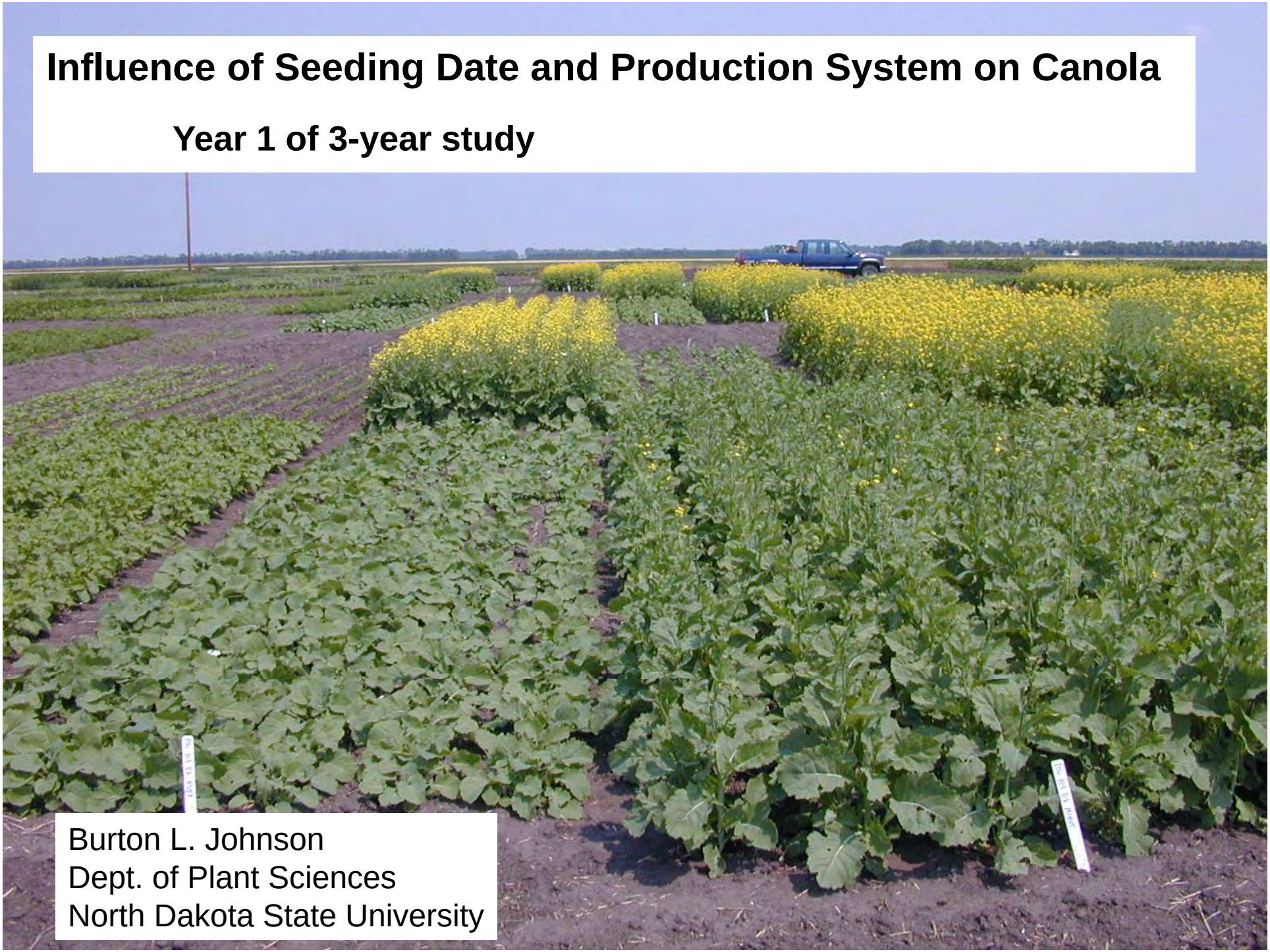
Research Areas

1. Agronomic practices to enhance yield and quality
2. Plant breeding and disease resistance
3. End-use products
4. Health benefits

Agronomic practices

Influence of Seeding Date and Production System on Canola

Year 1 of 3-year study



Burton L. Johnson
Dept. of Plant Sciences
North Dakota State University

Objective

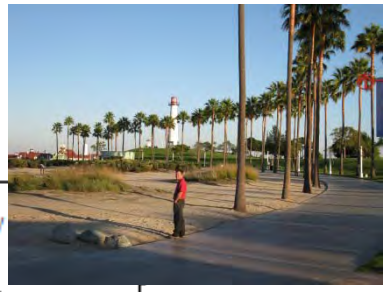
i.) Evaluate seeding date effect on
Herbicide Resistant Canola Systems

ii.) Compare net returns of the
Herbicide Resistant Canola Systems

iii.) Investigate seeding date of the
Herbicide Resistant Canola Systems
Notill
Conventional till

Angela Sebelius

Bryan Hanson



Blaine Schatz

Eric Eriksmoen

Notill - Western
Conventional till - Eastern

Experimental Design

- **RCB with split plot arrangement, 4 replicates**
  - Main plot – Seeding date
    - 5 dates space about 10 days
    - 1st date close to when producers are 1st planting

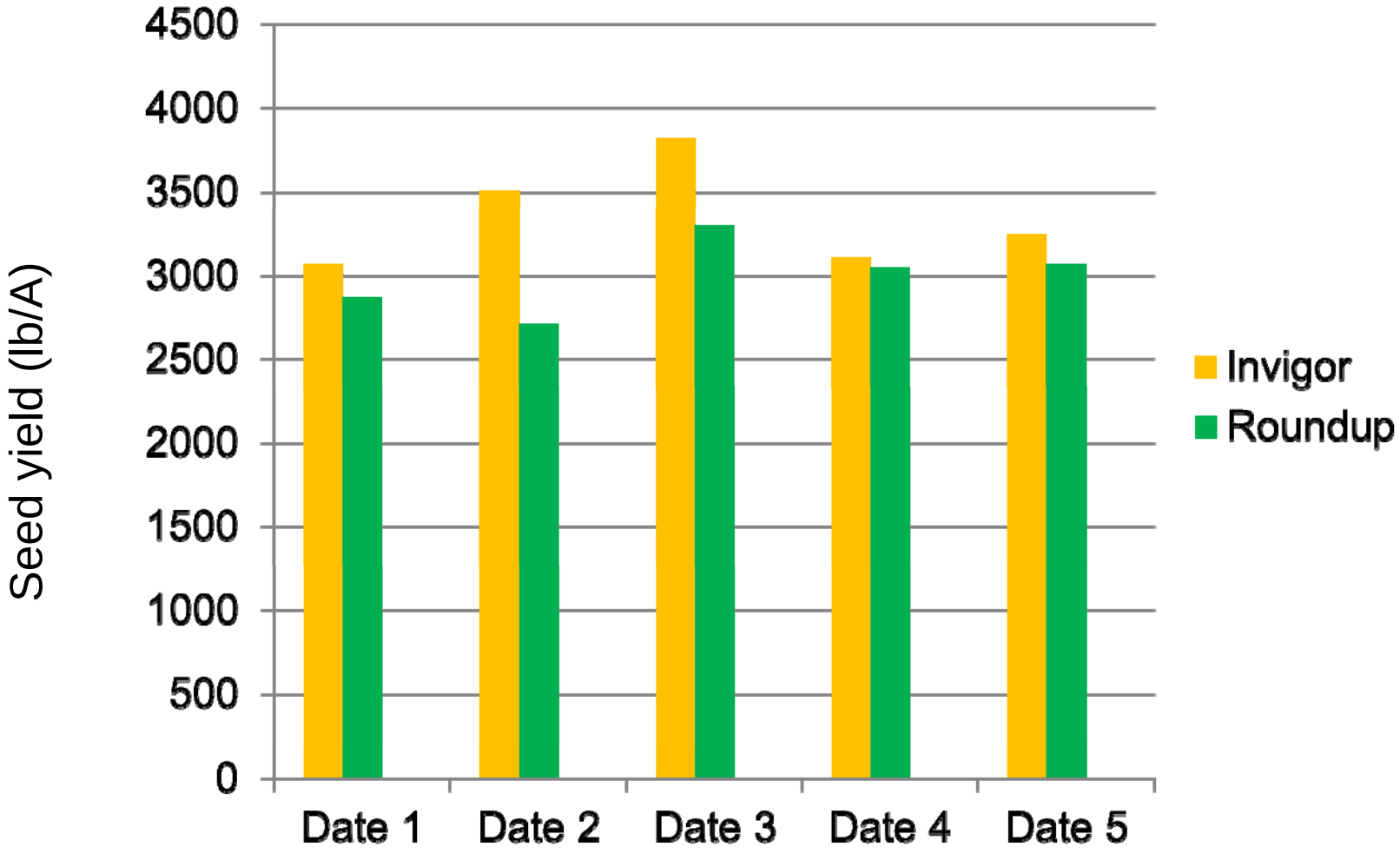
Traits Evaluated

- Stand
- Weed pressure
- Flowering ✓
- Plant height
- Plant lodging
- Test weight
- Seed yield ✓
- Seed oil content ✓
- Oil yield ✓
- Net return

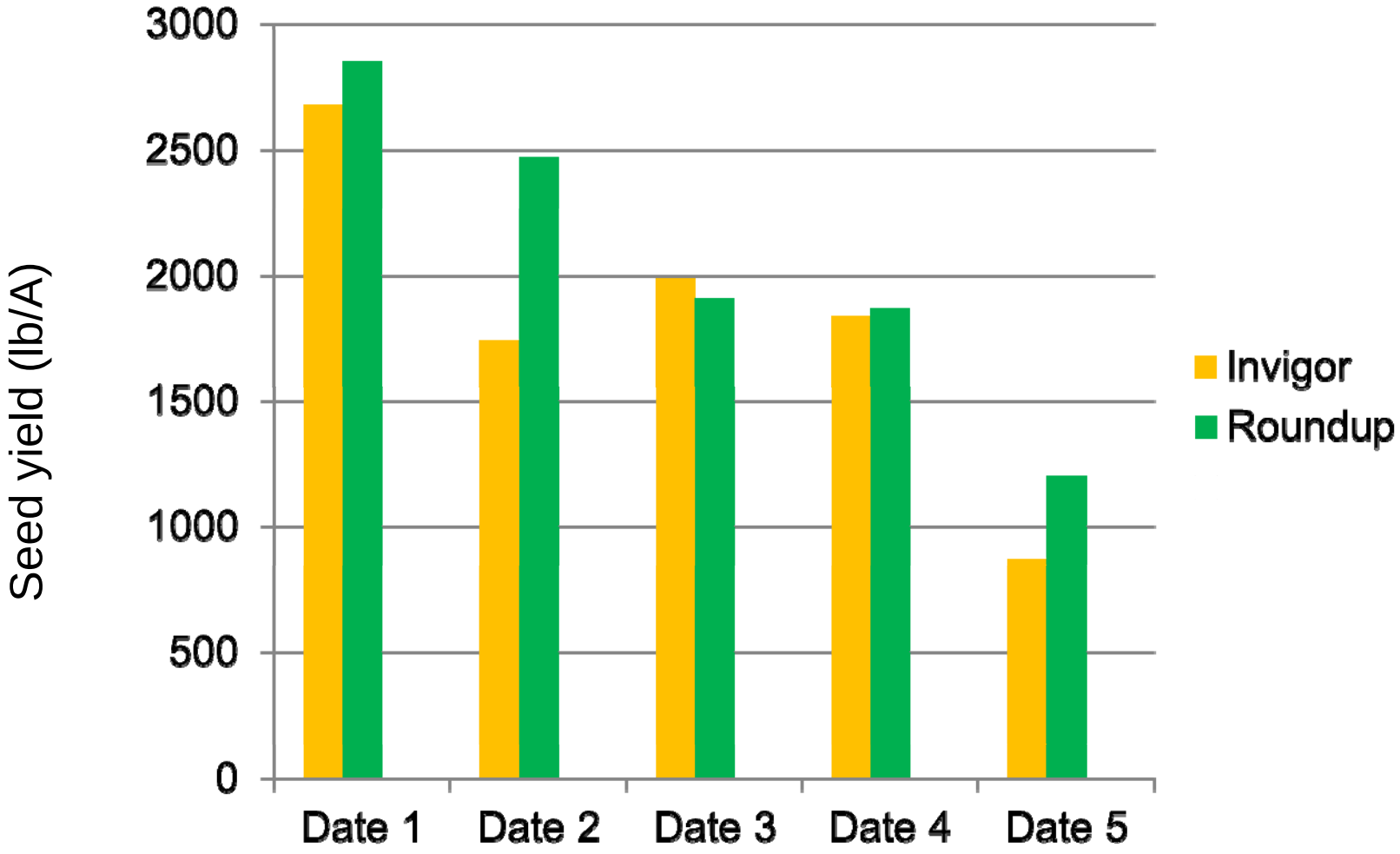
Canola seeding dates at four North Dakota locations in 2010.				
Seeding date	Carrington	Hettinger	Langdon	Minot
Date 1	28 April	21 April	29 April	na
Date 2	12 May	3 May	10 May	10 May
Date 3	21 May	17 May	21 May	20 May
Date 4	28 May	26 May	1 June	3 June
Date 5	9 June	8 June	9 June	**10** June
				23 June

Canola seed yield (lb/A) at five seeding dates at four North Dakota locations in 2010.				
Seeding date	Carrington	Hettinger	Langdon	Minot
Date 1	2540 **100%**	2770	2970	na
Date 2	2380 **94%**	2100	3110	2454
Date 3	1780 **70%**	1950	3560	1870
Date 4	1560 **61%**	1867	3080	880
Date 5	1180 **47%**	1030	3160	900
LSD(0.05)	300	180	NS	450

Canola seed oil content (%) at five seeding dates at four North Dakota locations in 2010.				
Seeding date	Carrington	Hettinger	Langdon	Minot
Date 1	44.9	47.3	45.0	na
Date 2	43.7	46.7	43.5	43.0
Date 3	41.5	45.6	43.5	42.8
Date 4	40.6	41.2	43.2	38.7
Date 5	38.9	39.0	41.0	34.5
LSD(0.05)	1.6	1.1	1.4	2.7



Canola seed yield for two hybrids at five seeding dates at Langdon, ND, in 2010.



Canola seed yield for two hybrids at five seeding dates at Hettinger, ND, in 2010.

1st Year Summary

- Seeding date
  - Yield decreased as seeding delayed (Langdon)
  - Oil content decreased as seeding delayed
- Hybrid
  - DLK30-42 > yield at Carrington and Hettinger
  - INV8440 greater yield at Langdon
  - Hybrids equal yield at Minot
  - DLK 30-42 greater oil content
- Seeding date by Hybrid interaction yield

Acknowledgements

Appreciation for funding support is extended to
USDA North Central Canola
Northern Canola Growers Association

Effect of Sharpen and Valor applied pre-harvest on canola yield and seed quality

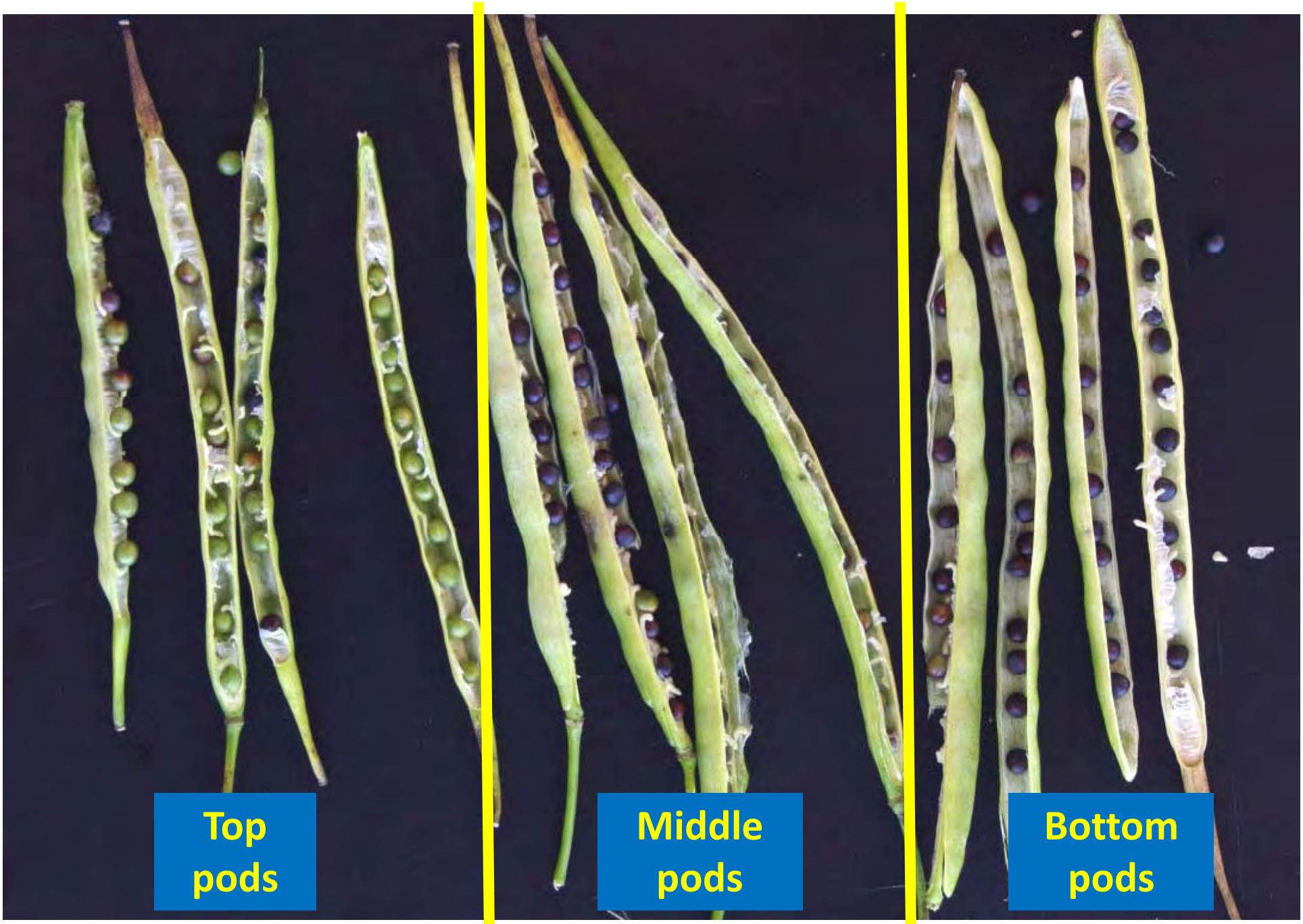
- **Brian Jenks, Jordan Hoefing, and Gary Willoughby**
  North Dakota State University
- **Ed Davis**
  Montana State University

Objectives

- Determine the effect of Sharpen and Valor applied pre-harvest on canola yield, seed moisture, and seed quality compared to diquat and swathing.

Evaluations

		Days After Treatment			
Treatment	Rate	4 DAT	8 DAT	11 DAT	14 DAT
		---------- % desiccation ----------			
Straight-cut	------				
Sharpen	1 fl oz				
Sharpen	2 fl oz				
Glyphosate	0.75 lb ae				
Sharpen + Gly	1 oz + 0.75 lb				
Reglone	**1.5 pt**				
Valor	2 oz				
Swath	------				


Top pods
Middle pods
Bottom pods

Sticky card

Pod desiccation

		Days After Treatment			
Treatment	Rate	4 DAT	8 DAT	11 DAT	14 DAT
		---------- % desiccation ----------			
Straight-cut		21	34	55	66
Sharpen	1 fl oz	34	55	70	84
Sharpen	2 fl oz	38	60	75	84
Glyphosate	0.75 lb ae	21	38	61	73
Sharpen + Gly	1 oz + 0.75 lb	28	51	76	87
Reglone	**1.5 pt**	**86**	**97**	**99**	**99**
Valor	2 oz	31	63	84	91
Swath		91	98	99	99
LSD (0.05)		8.8	9.2	9.0	7.5

Stem desiccation

		Days After Treatment			
Treatment	Rate	4 DAT	8 DAT	11 DAT	14 DAT
		---------- % desiccation ----------			
Straight-cut		5	5	11	12
Sharpen	1 fl oz	8	15	20	23
Sharpen	2 fl oz	10	15	20	24
Glyphosate	0.75 lb ae	6	8	16	21
Sharpen + Gly	1 oz + 0.75 lb	6	11	23	29
Reglone	**1.5 pt**	**26**	**34**	**44**	**51**
Valor	2 oz	9	19	29	45
Swath		60	88	95	98
LSD (0.05)		4.0	4.7	4.7	5.0

Seed loss, yield, and quality

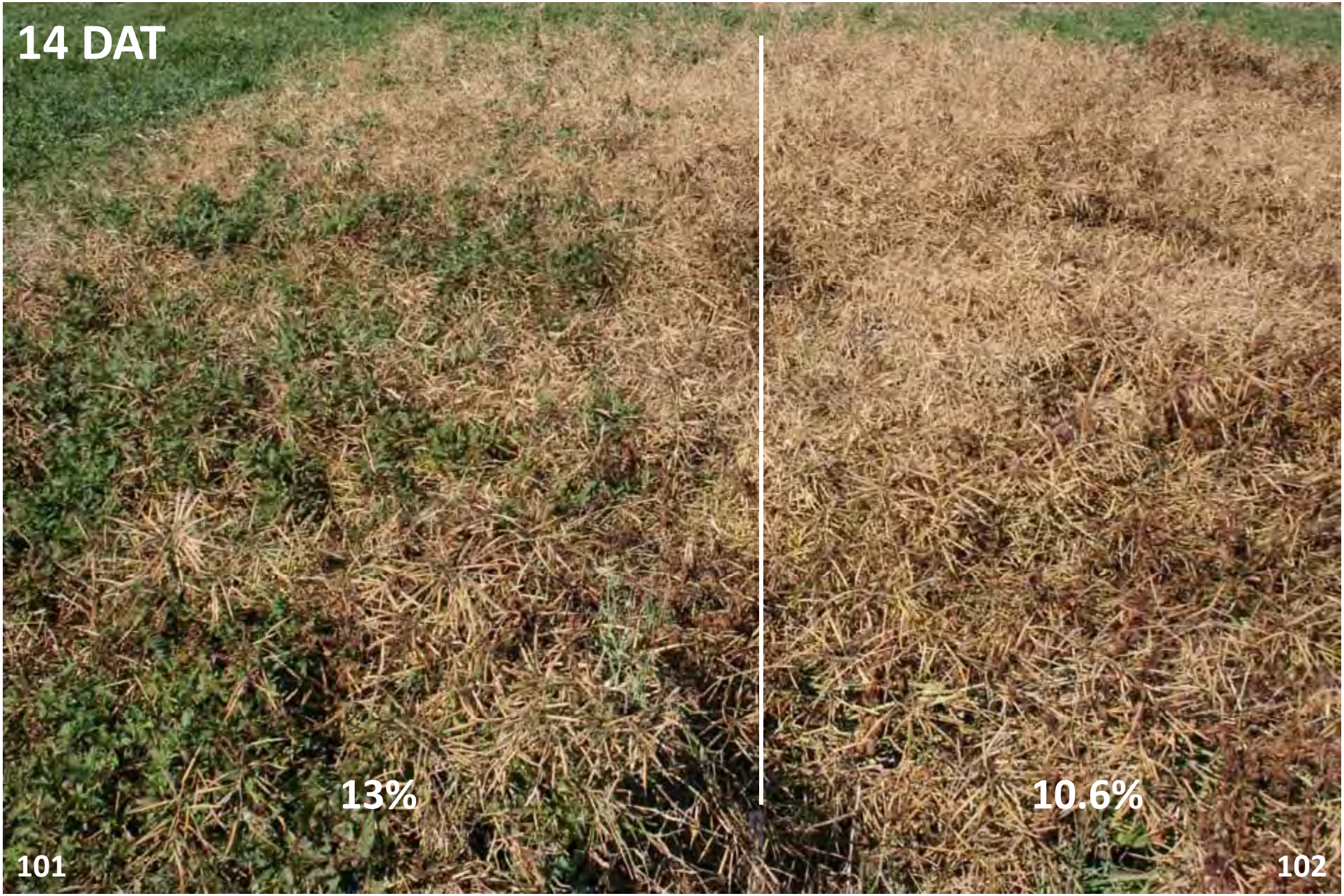
Treatment	Rate	Seed loss	Harvest moisture	Yield	Test wt.
		lb/A	%	lb/A	lb/bu
Straight-cut		40	14.6	2057	49.0
Sharpen	1 fl oz	34	9.2	2008	50.9
Sharpen	2 fl oz	44	10.5	2133	51.1
Glyphosate	0.75 lb ae	33	9.7	1910	51.0
Sharpen + Gly	1 oz + 0.75 lb	37	7.7	1882	51.8
Reglone	**1.5 pt**	**43**	**6.6**	**2025**	**52.5**
Valor	2 oz	31	7.5	2115	50.9
Swath		96	6.3	2358	51.7
LSD (0.05)		26	2.5	268	1.0

Straight cut – no desiccant

Sharpen + MSO + AMS
1 fl oz + 1% + 2%

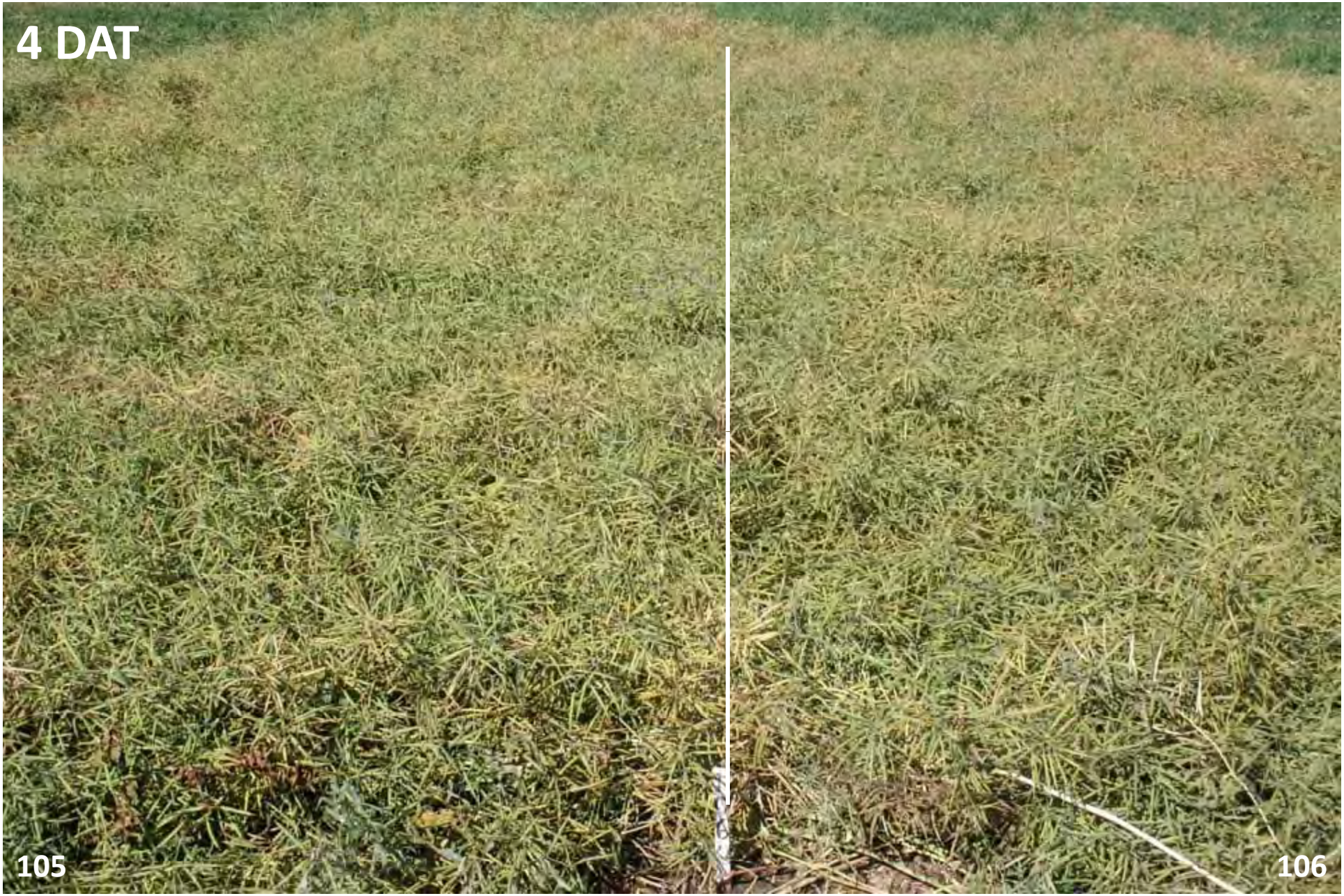
Straight cut – no desiccant

Sharpen + MSO + AMS
1 fl oz + 1% + 2%



Straight cut – no desiccant

Sharpen + MSO + AMS
1 fl oz + 1% + 2%

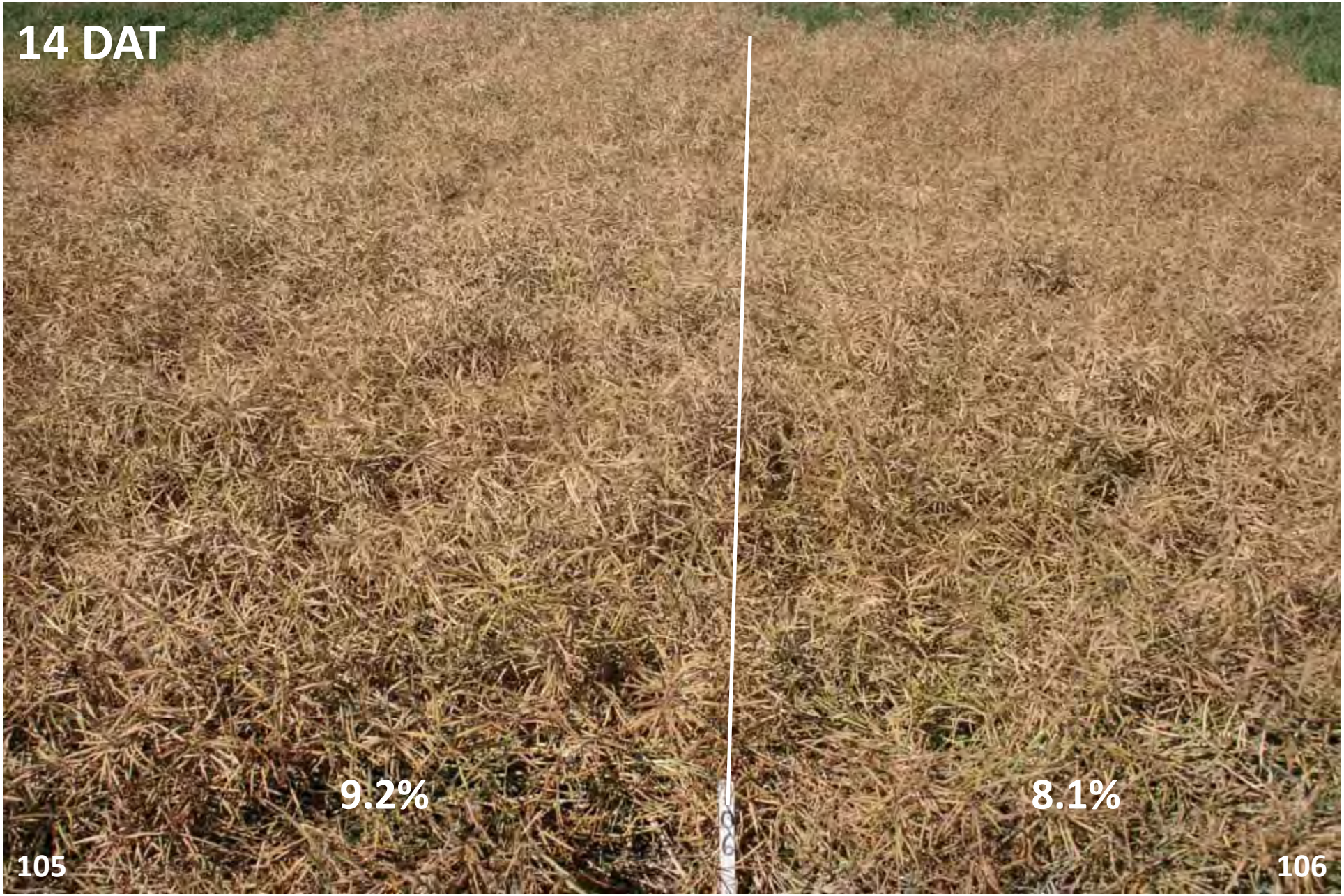


Rup + MSO + AMS
1 qt + 1% + 2%

Sharpen + Rup + MSO + AMS
1 fl oz + 1 qt + 1% + 2%

Rup + MSO + AMS
1 qt + 1% + 2%

Sharpen + Rup + MSO + AMS
1 fl oz + 1 qt + 1% + 2%



Rup + MSO + AMS
1 qt + 1% + 2%

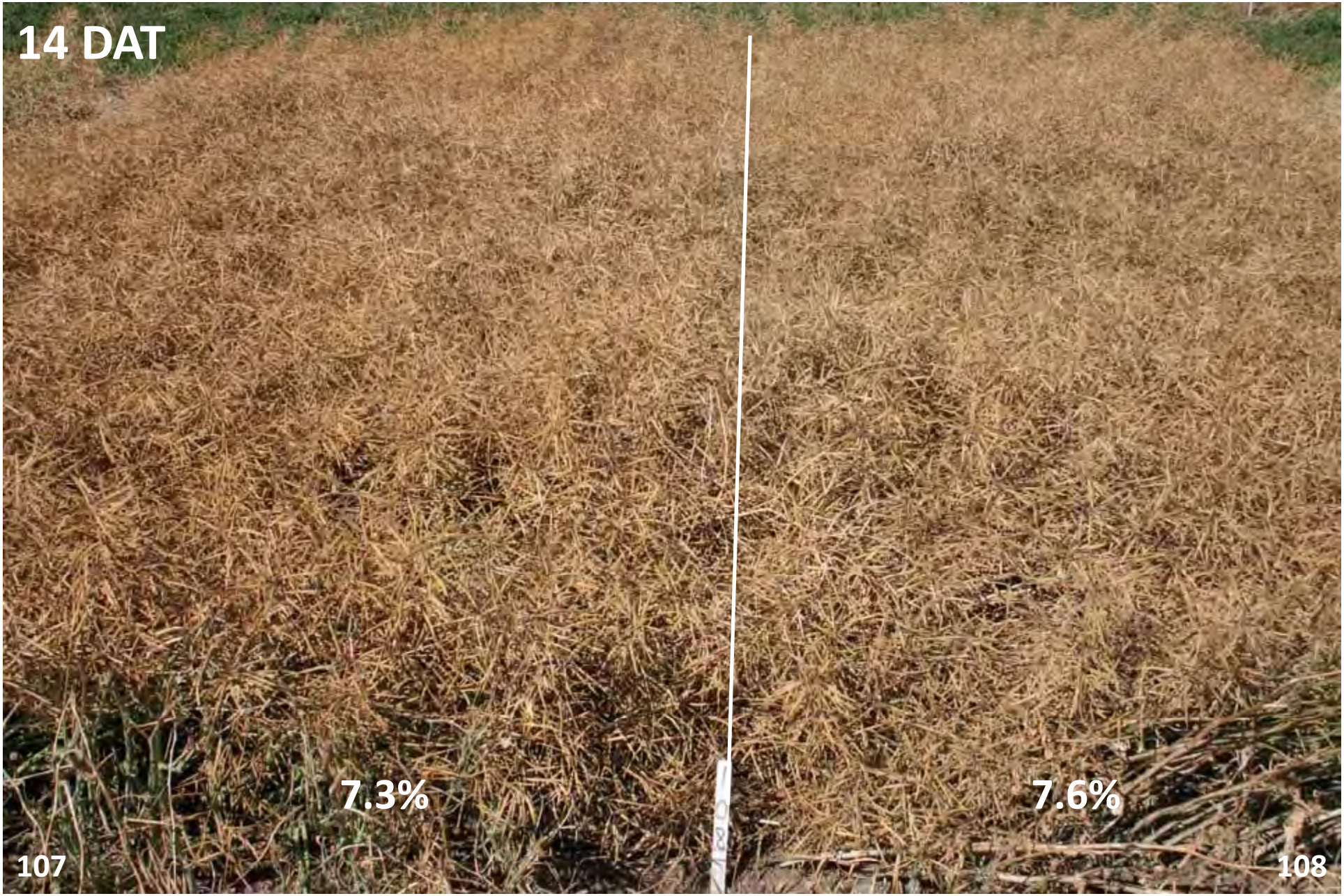
Sharpen + Rup + MSO + AMS
1 fl oz + 1 qt + 1% + 2%

Reglone + NIS
1.5 pt + 0.25%

Valor + MSO
2 oz + 2.5%

Reglone + NIS
1.5 pt + 0.25%

Valor + MSO
2 oz + 2.5%



Reglone + NIS
1.5 pt + 0.25%

Valor + MSO
2 oz + 2.5%

Bozeman, MT

Effect of Sharpen and Valor applied preharvest on canola yield and seed quality

Seed loss and moisture

Treatment	Rate	Seed Loss	Moisture
		lb/A	----%----
Straight cut		27	23.3
Sharpen	1 oz	18	22.9
Glyphosate	22 oz	27	13.9
Sharpen + Glyphosate	1 oz + 22 oz	17	15.8
Reglone	1.5 pt	41	9.6
Valor	2 oz	21	22.7
Swathed		48	12.9
LSD (0.05)		NS	10

•Sharpen applied with MSO(1%) and AMS(2.04%);Valor applied with MSO(2.25%);Glyphosate applied with MSO(1%) and AMS(2.04%);Reglone applied with R-11 (0.25%);All treatments applied on August 23

Green count and grade

Treatment	Rate	Green cnt.	Grade
		----%----	
Straight cut		3.1	1.5
Sharpen	1 oz	3.0	2.0
Glyphosate	22 oz	3.7	2.0
Sharpen + Glyphosate	1 oz + 22 oz	4.6	2.0
Reglone	1.5 pt	1.9	1.5
Valor	2 oz	3.2	1.8
Swathed		6.5	2.8
LSD (0.05)		2.1	0.72

•Sharpen applied with MSO(1%) and AMS(2.04%);Valor applied with MSO(2.25%);Glyphosate applied with MSO(1%) and AMS(2.04%);Reglone applied with R-11 (0.25%);All treatments applied on August 23.

Long-Term Canola Rotation Study

North Central Research Extension Center

Brian Jenks
Jordan Hoefing
Gary Willoughby

OBJECTIVES

- **Document the influence of crop rotation on the incidence and severity of Sclerotinia stem rot and Blackleg in canola.**

Materials and Methods

- Established in 2000
- 5 Rotations
  - 4 crops
- RCBD
  - 4 replications
- Fungicide
  - Ronilan (Vinclozolin)
- 30’ x 180’ plots
- 3 Disease Evaluations
- Yield

Disease Evaluation 1

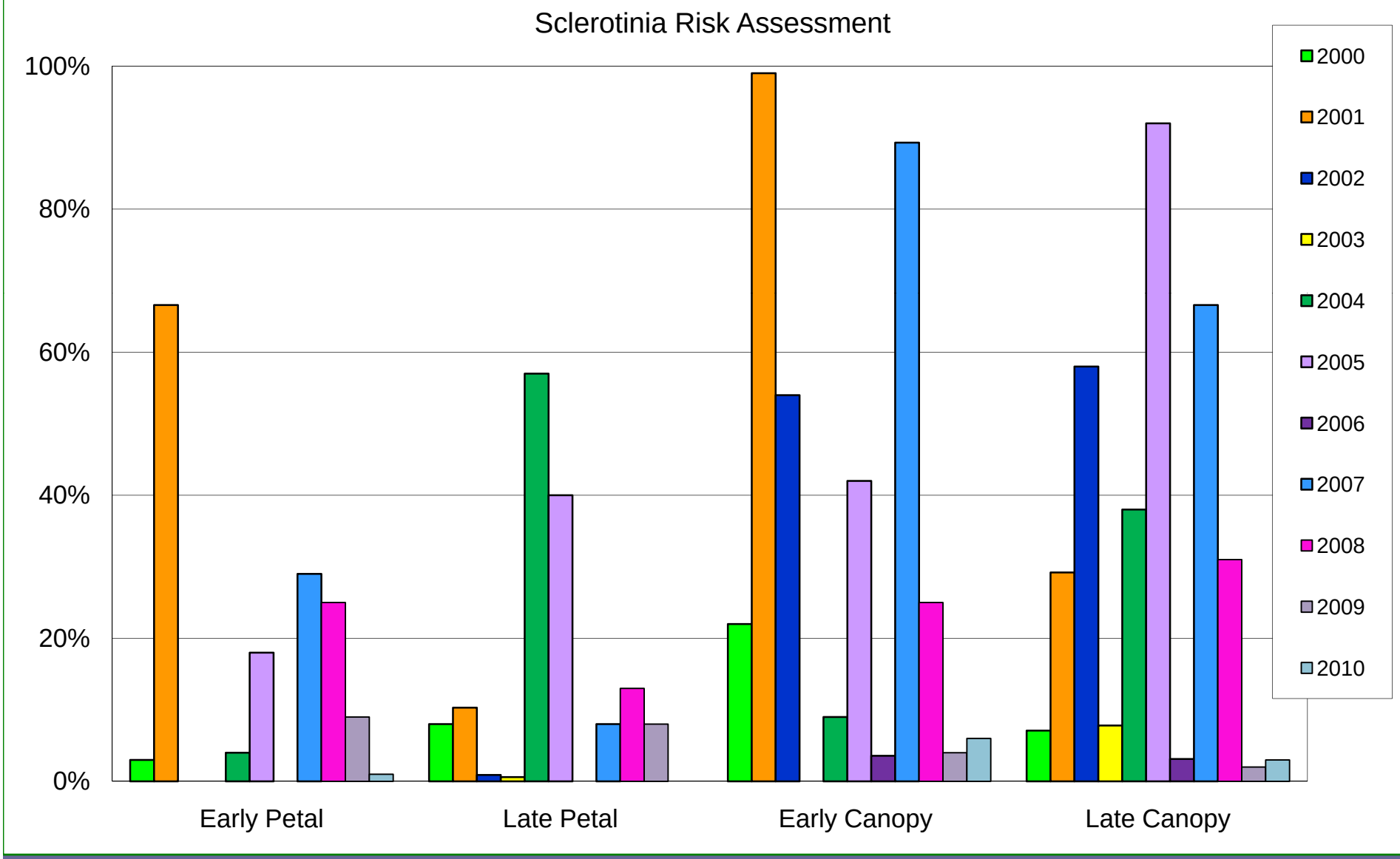
- **Risk Assessment**
  - 20 and 50% bloom
  - *Sclerotinia Only*
  - Lower and Upper Canopy Tests
  - Steadman's Semi-Selective Medium* for selection of airborne ascospores

    *Can. J. Plant Path 16: 68-70

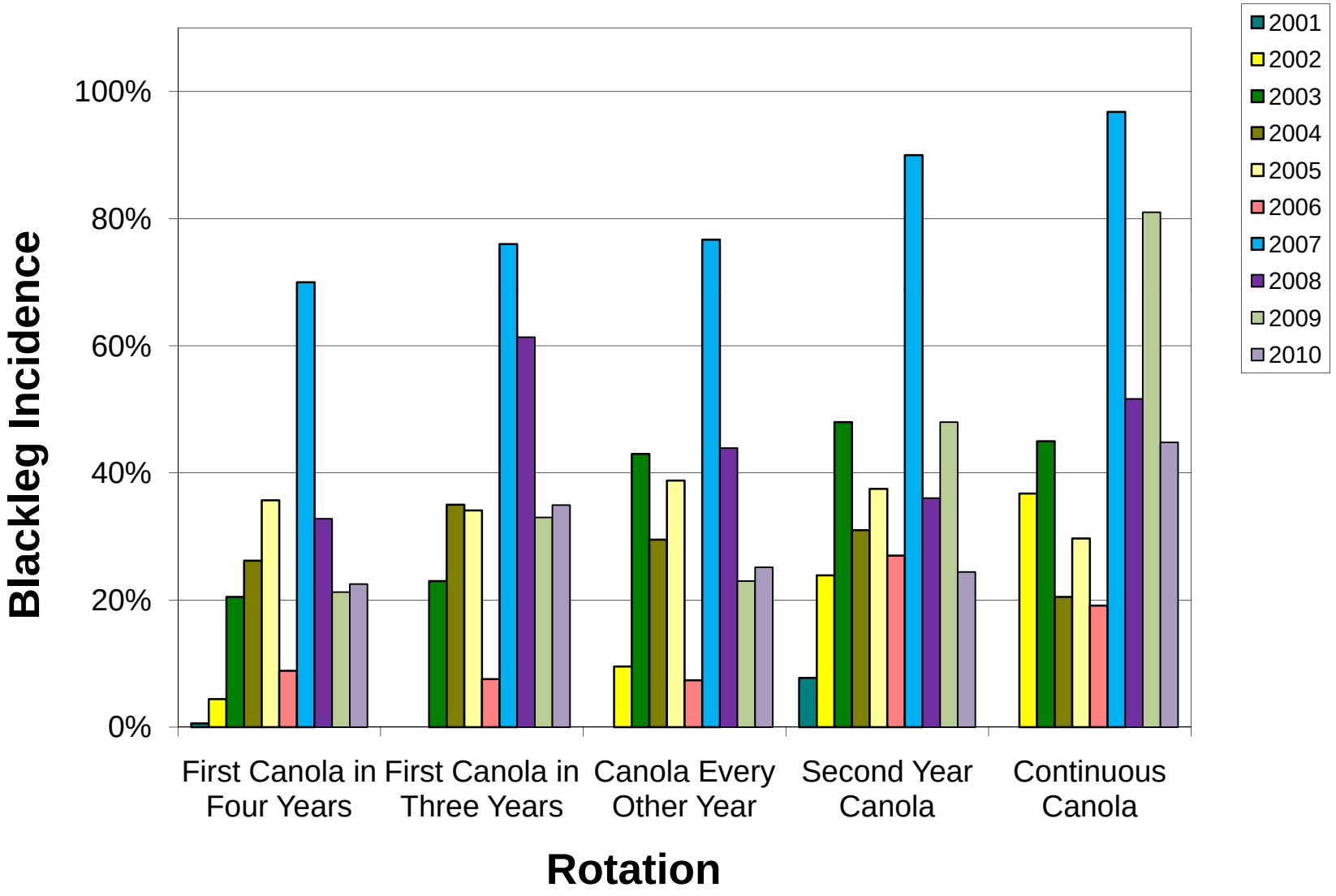
Disease Evaluation 2

- **Late Season Evaluation**
  - Canola is in the swath
  - *Blackleg and Sclerotinia* stem cankers/lesions
  - 100 plants per subplot, adjacent to the swath
- **Evaluation scale**
  - Rating of 0 to 5

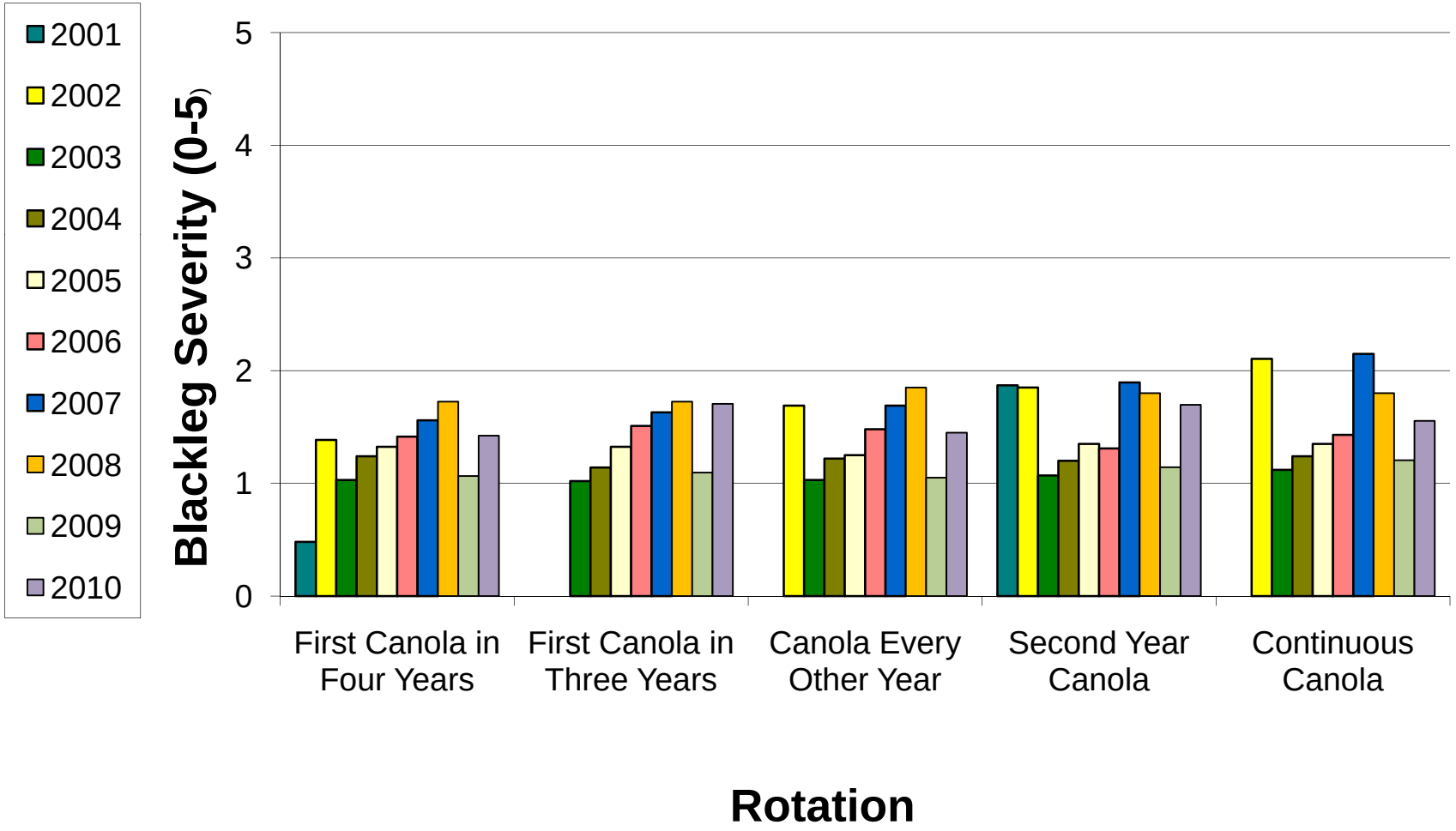
Sclerotinia Risk at 20-50% Flower



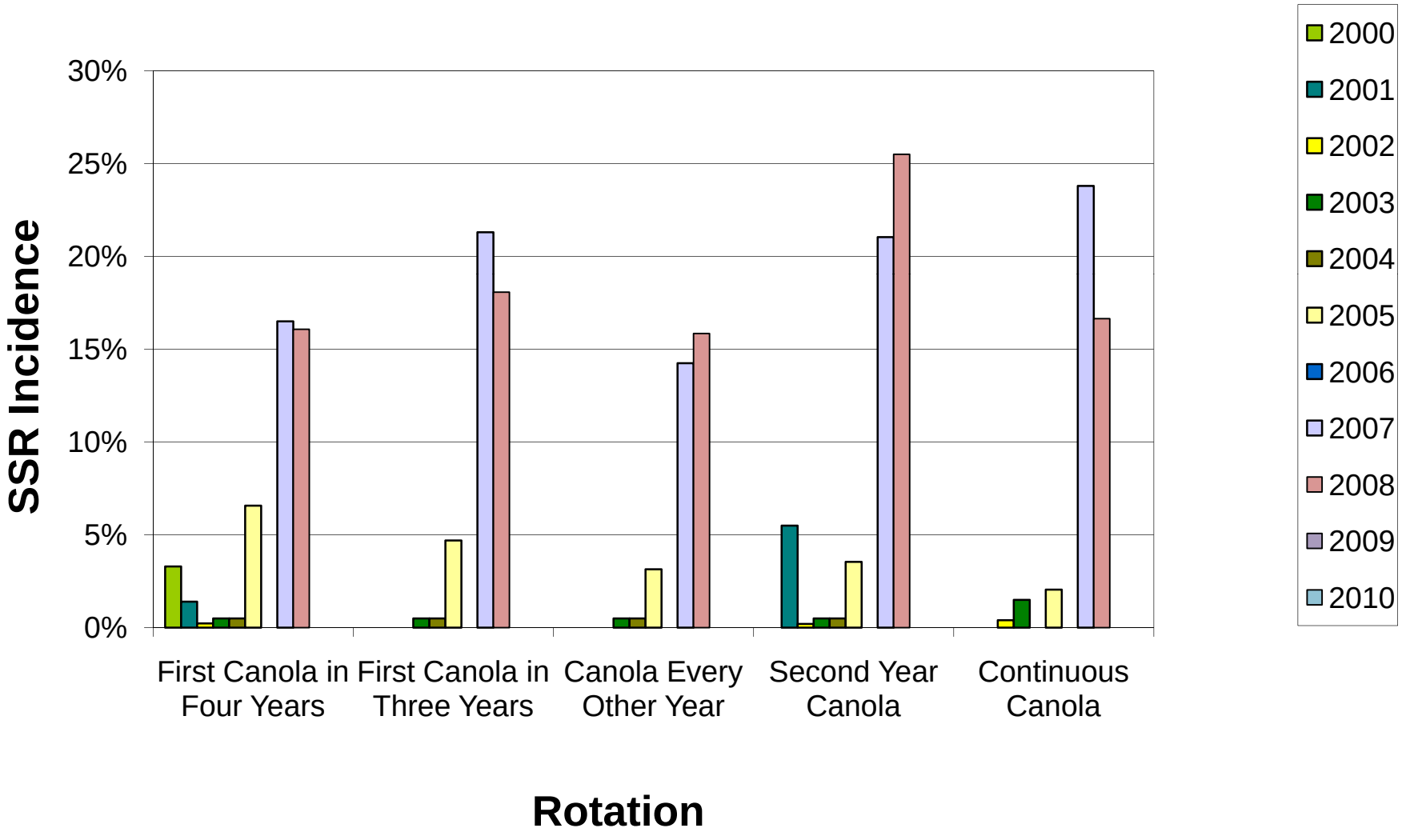
Blackleg Incidence at Swathing



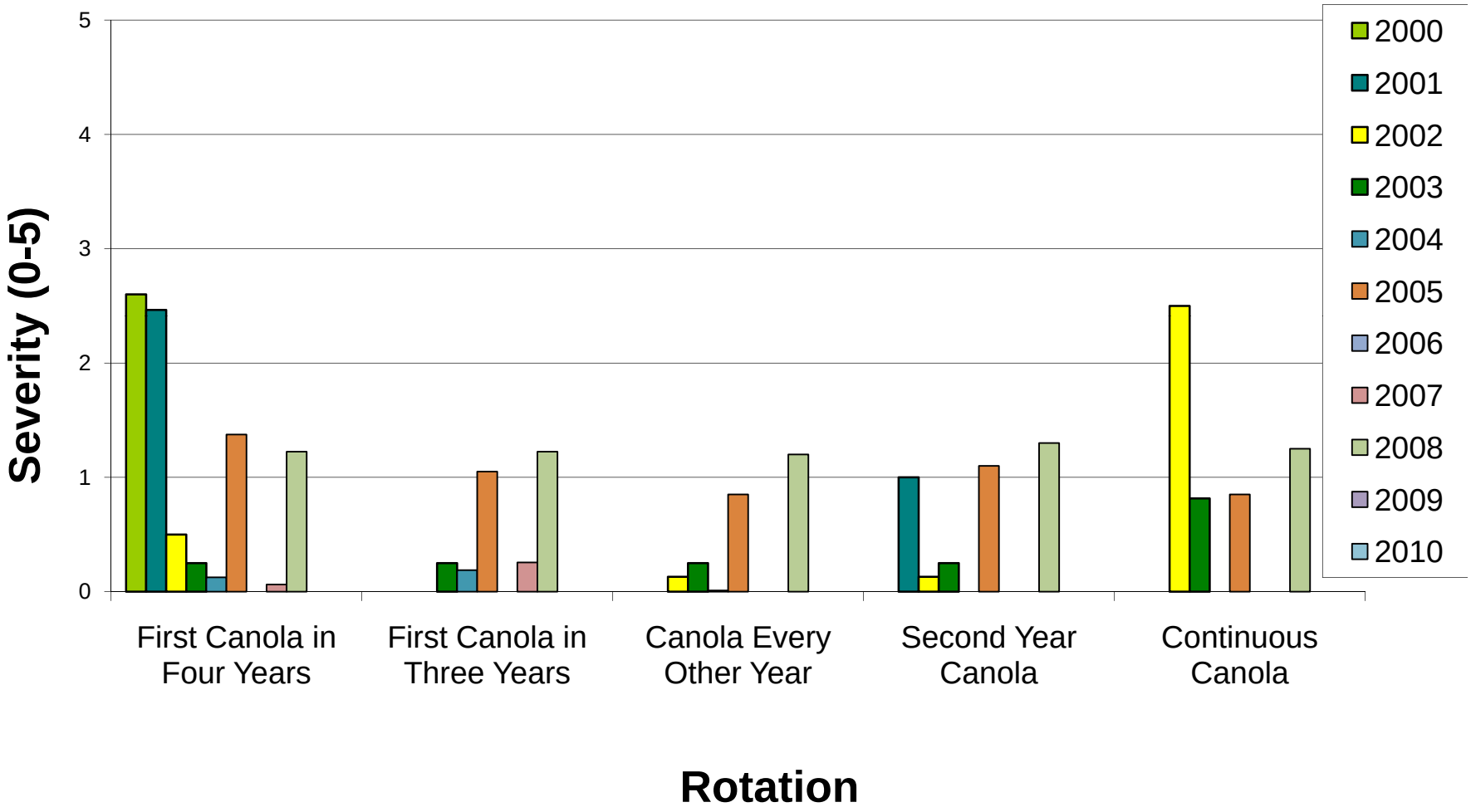
Blackleg Severity at Swathing



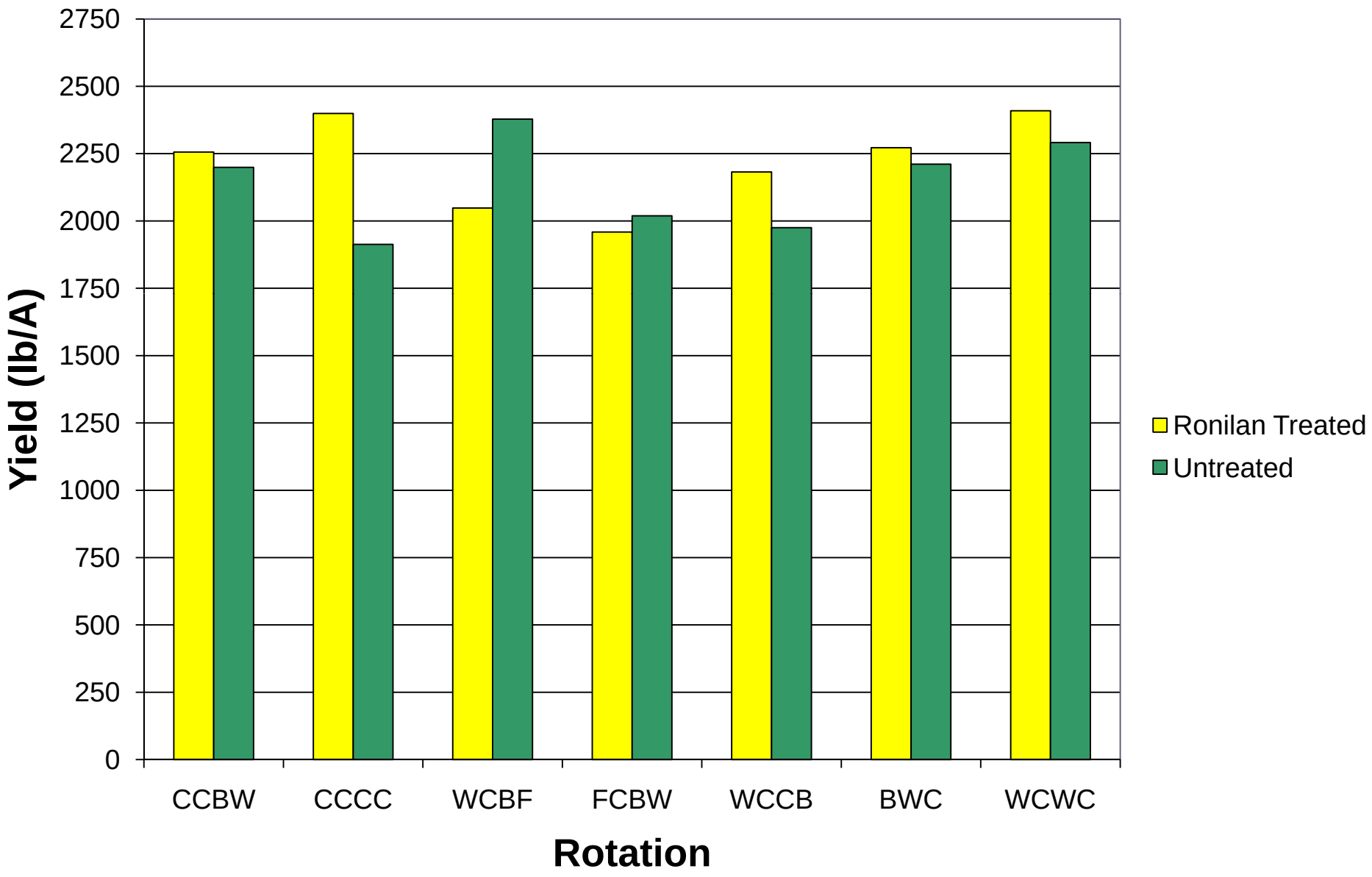
Sclerotinia Incidence at Swathing



Sclerotinia Severity at Swathing



Yield: 2010


2750
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Yield (lb/A)
CCBW
CCCC
WCBF
FCBW
WCCB
BWC
WCWC
Rotation
Ronilan Treated
Untreated

Results and Discussion

- **Blackleg**
  - Low disease levels between 2000-2006, 2008-2010
  - High disease levels in 2007
    - Rotation influenced amount of disease
  - Severity remains low
    - Rotation influences severity

2010 Canola Production Centre Highlights

Rob Proulx

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Research Overview

- Variety Trials
  - Large-plot public variety trial
  - Small-plot public variety trial
  - Monsanto Performance Ready Trial (small-plot)
  - Mycogen MEGA Trial (small-plot)
- Nitrogen Topdressing Trial
- Straight Harvesting Trial
- Wilbur-Ellis Micronutrient Trial
- NDSU Planting Date Trial (abandoned)

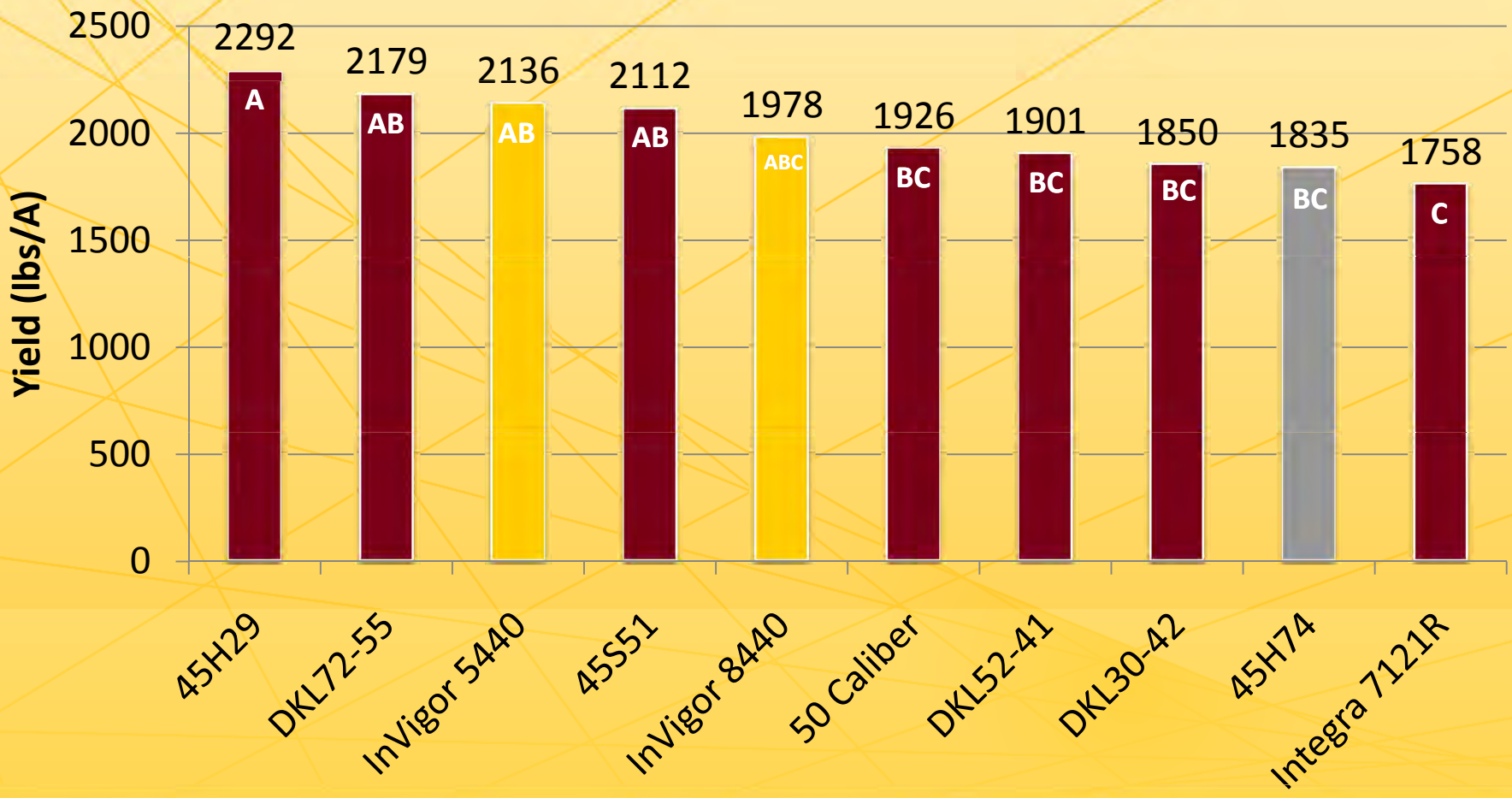
Results

- Variety Trials
  - Large-plot public variety trial
  - Small-plot public variety trial
- Nitrogen Topdressing Trial
- Straight Harvesting Trial

Large-Plot Variety Trial

- 10 entries
  - 7 Roundup Ready®
  - 2 Liberty Link®
  - 1 Clearfield®
- 5 companies
  - Bayer CropScience
  - Monsanto
  - Pioneer
  - Proseed
  - Wilbur-Ellis

Large-Plot Variety Trial



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Small-Plot Variety Trial

- 35 entries
  - 27 Roundup Ready®
  - 5 Liberty Link®
  - 3 Clearfield®
- 6 companies
  - Bayer CropScience
  - BrettYoung
  - CROPLAN Genetics
  - Dekalb/Monsanto
  - Pioneer
  - Wilbur-Ellis

Small-Plot VT Top Yielders

Company	Entry	HS	Yield (lbs/A) @ 8.5% moisture	Large-Plot VT Yield
Bayer CropScience	InVigor 5440	LL	3813	2136 (AB)
BrettYoung	30423-D8	CL	3709	–
BrettYoung	5525CL	CL	3660	–
Pioneer	45H74	CL	3484	1835 (BC)
Bayer CropScience	InVigor L130	LL	3412	–
Pioneer	45H29	RR	3370	2292 (A)
Bayer CropScience	InVigor L150	LL	3324	–

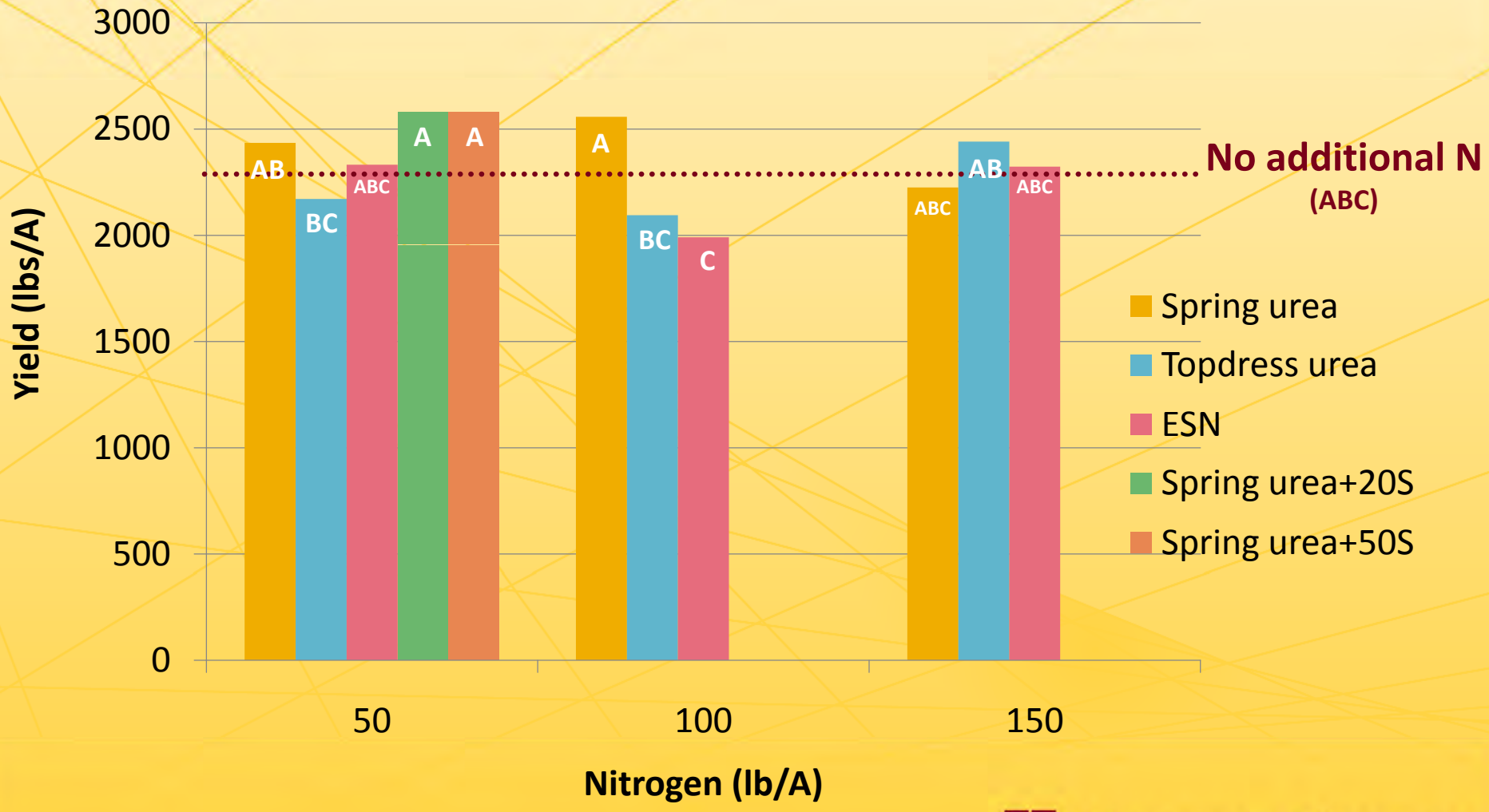
Nitrogen & Sulfur Fertility Trial

- Baseline fertility
  - 100 lbs/A nitrogen, fall-applied as urea
  - 62 lbs/A P_2O_5, spring-applied
  - 40 lbs/A K_2O, spring-applied
  - 10 lbs/A sulfur, spring-applied
- All fertilizers broadcast applied

Treatments

Trt.	Application Timing	N rate (lbs/A)	N source
1	No additional fertilizer	–	–
2	Spring Broadcast & Inc.	50	Urea
3	Spring Broadcast & Inc.	100	Urea
4	Spring Broadcast & Inc.	150	Urea
5	Topdress	50	Urea
6	Topdress	100	Urea
7	Topdress	150	Urea
8	Spring Broadcast & Inc.	50	ESN
9	Spring Broadcast & Inc.	100	ESN
10	Spring Broadcast & Inc.	150	ESN
11	Spring Broadcast & Inc.	50 + 20S	Urea + AMS
12	Spring Broadcast & Inc.	50 + 50S	Urea + AMS

No evidence that additional N fertilizer resulted in a higher yield (baseline N was enough)



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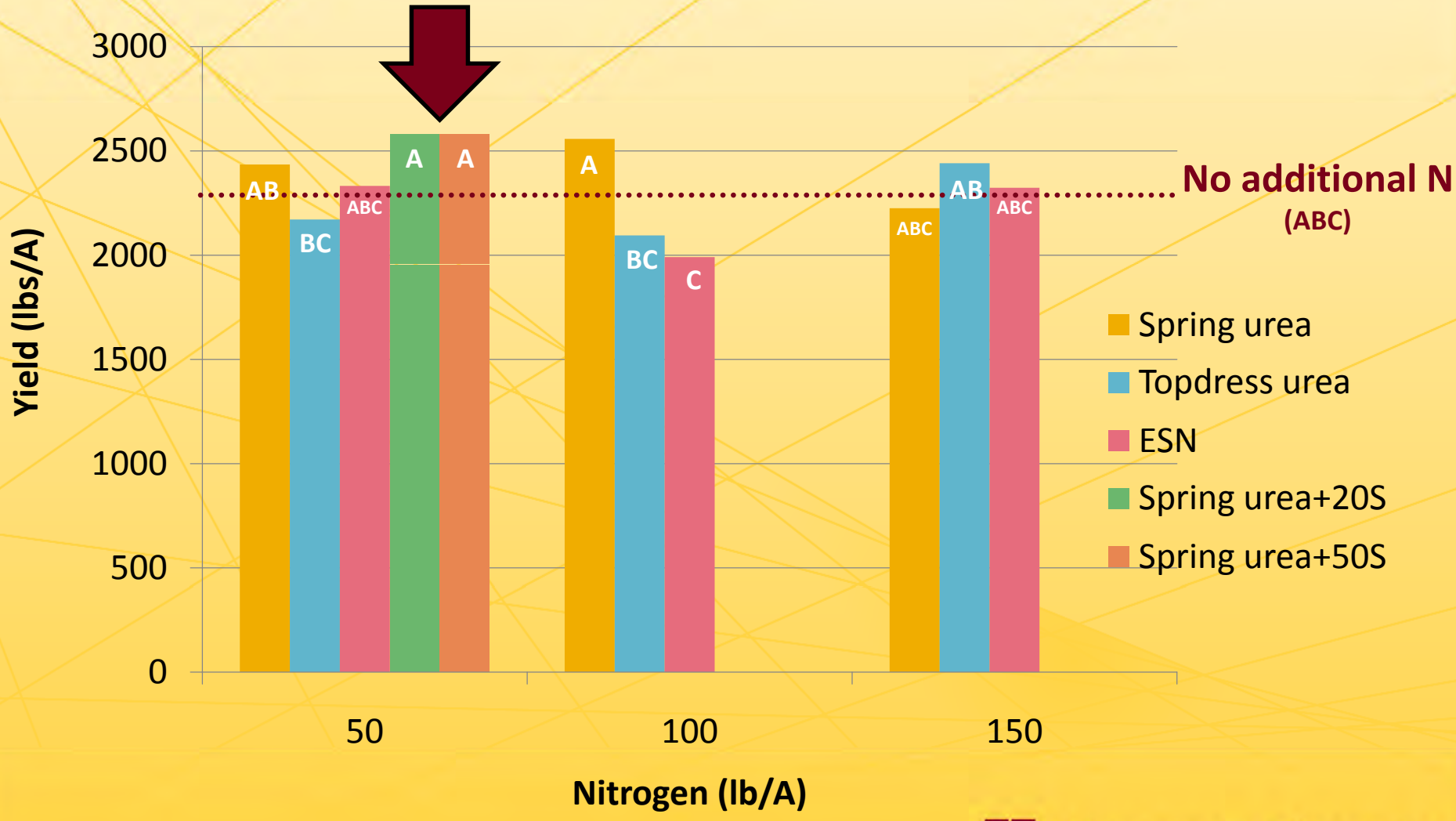
*Treatments with the same letter are not significantly different (P=0.05)

Possible future research: Sulfur fertility



*Treatments with the same letter are not significantly different (P=0.05)

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STRAIGHT HARVESTING TRIAL

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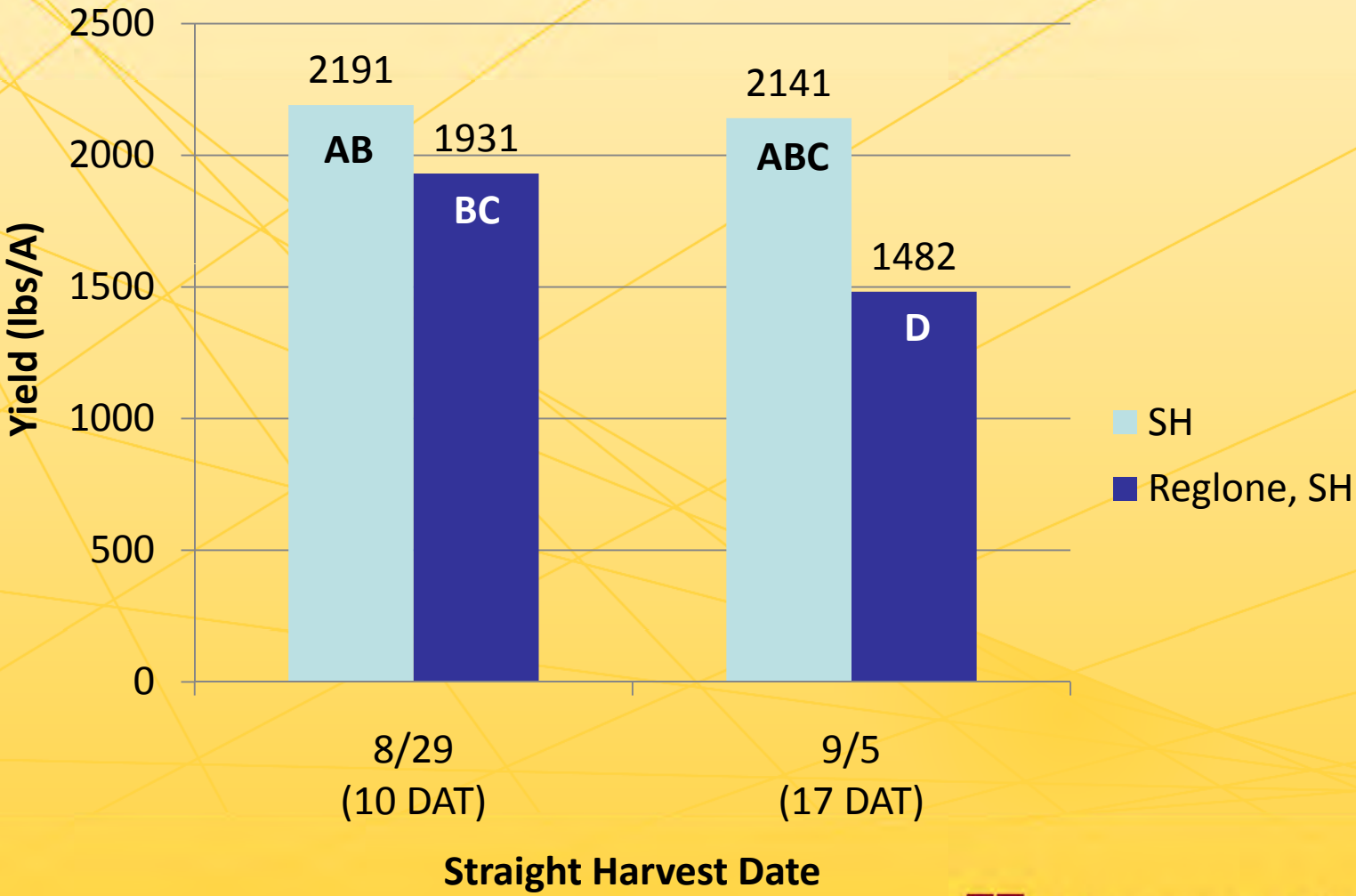
Stand-alone Reglone treatments did not maximize yield when straight harvesting.



*Treatments with the same letter are not significantly different (P=0.05)

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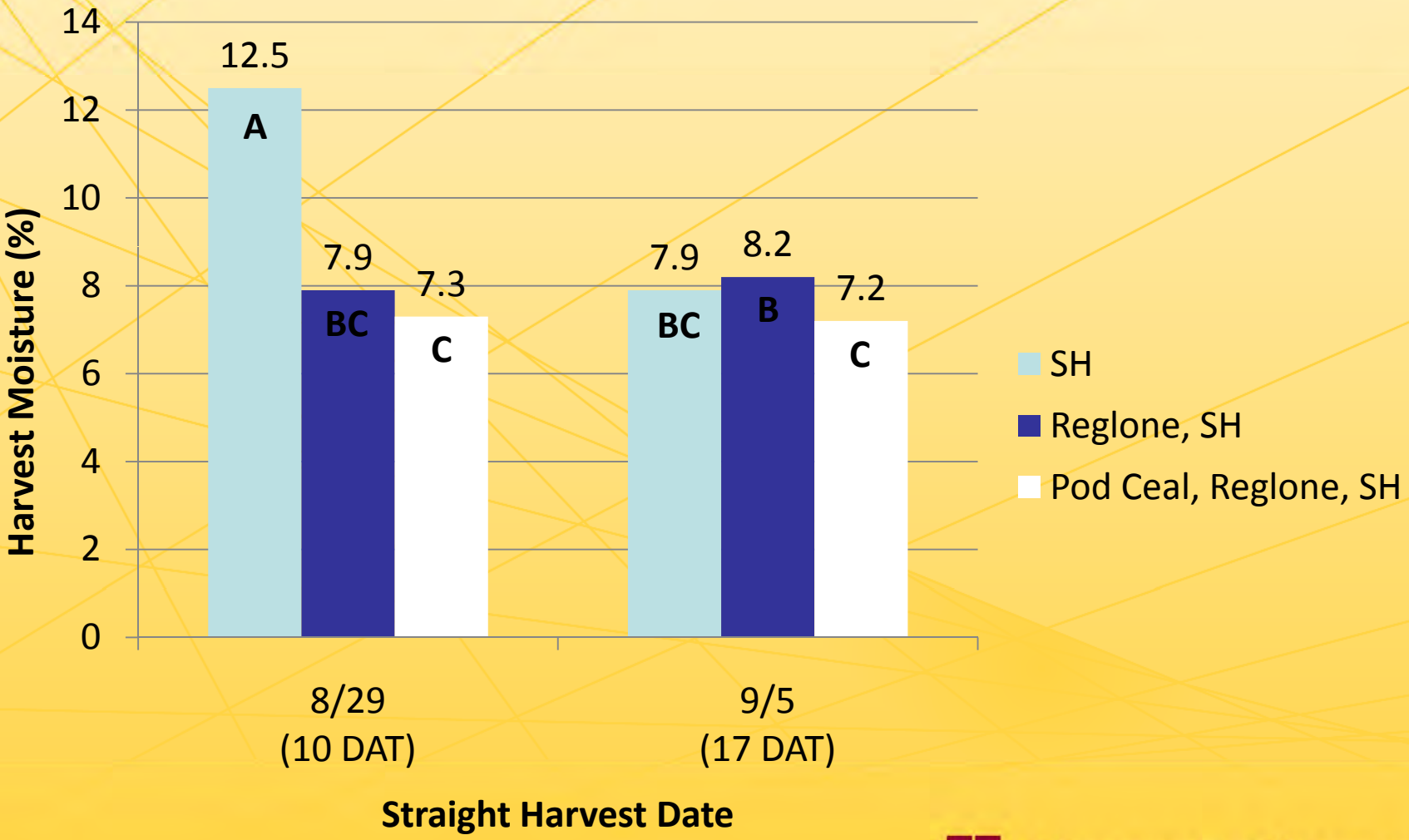
Without the use of a desiccant (such as Reglone), straight harvesting would need to be delayed so the seed could dry down.



*Treatments with the same letter are not significantly different (P=0.05)

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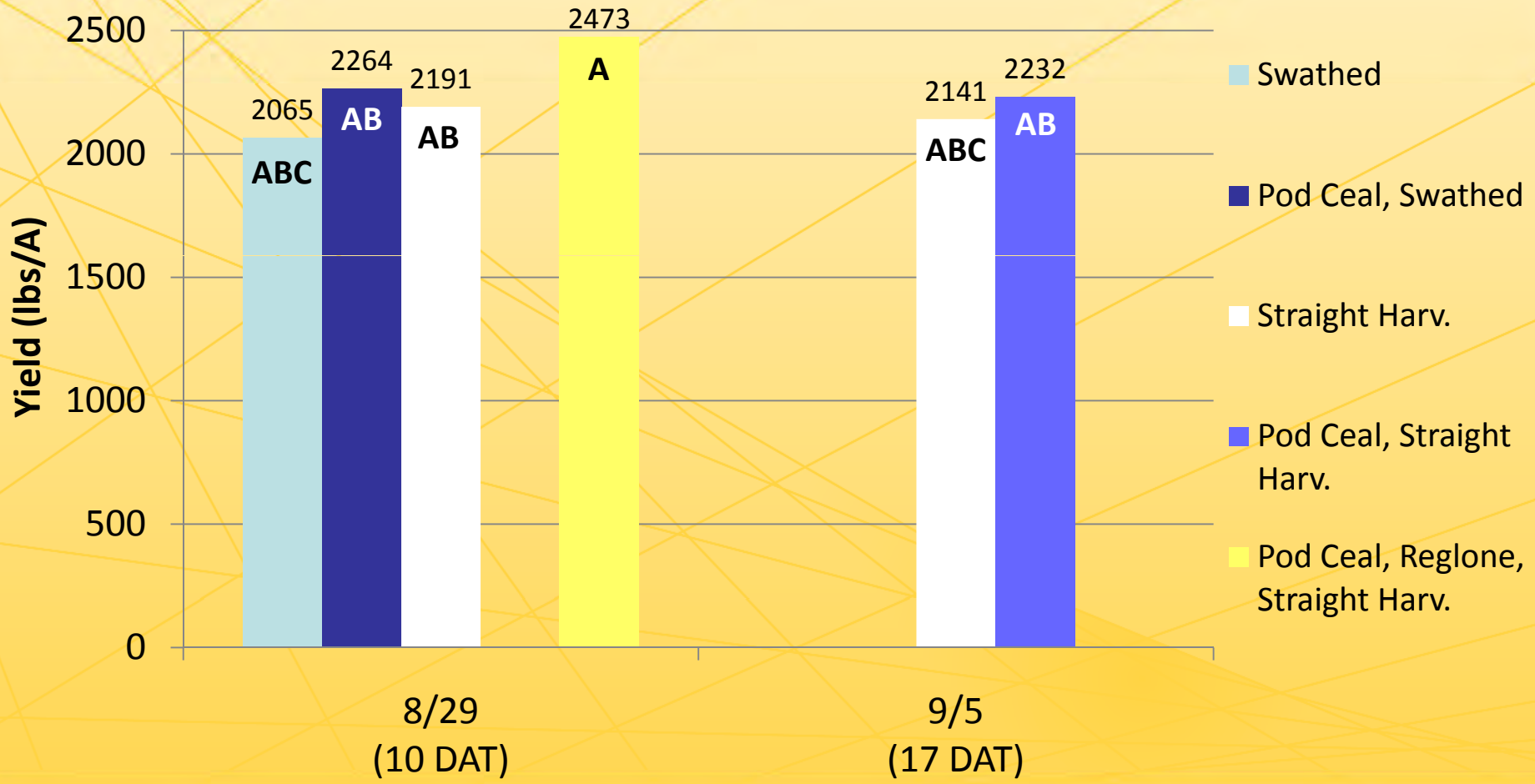
Many treatments had yields that were not significantly different from each other.



*Treatments with the same letter are not significantly different (P=0.05)

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Plant breeding and disease resistance

NDSU-COE Canola Breeding program

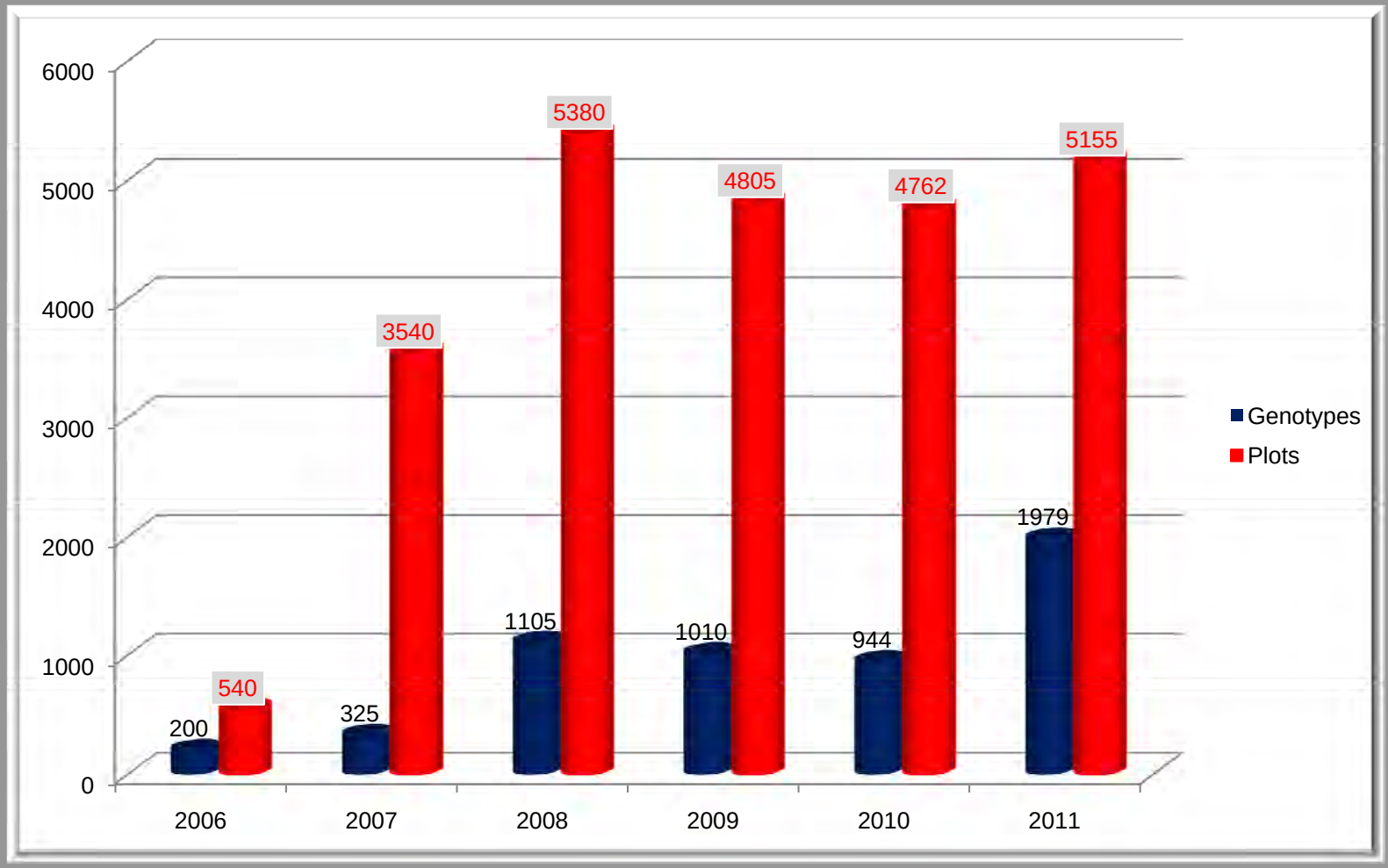
Objectives:

1- High seed yield
2- High oil content

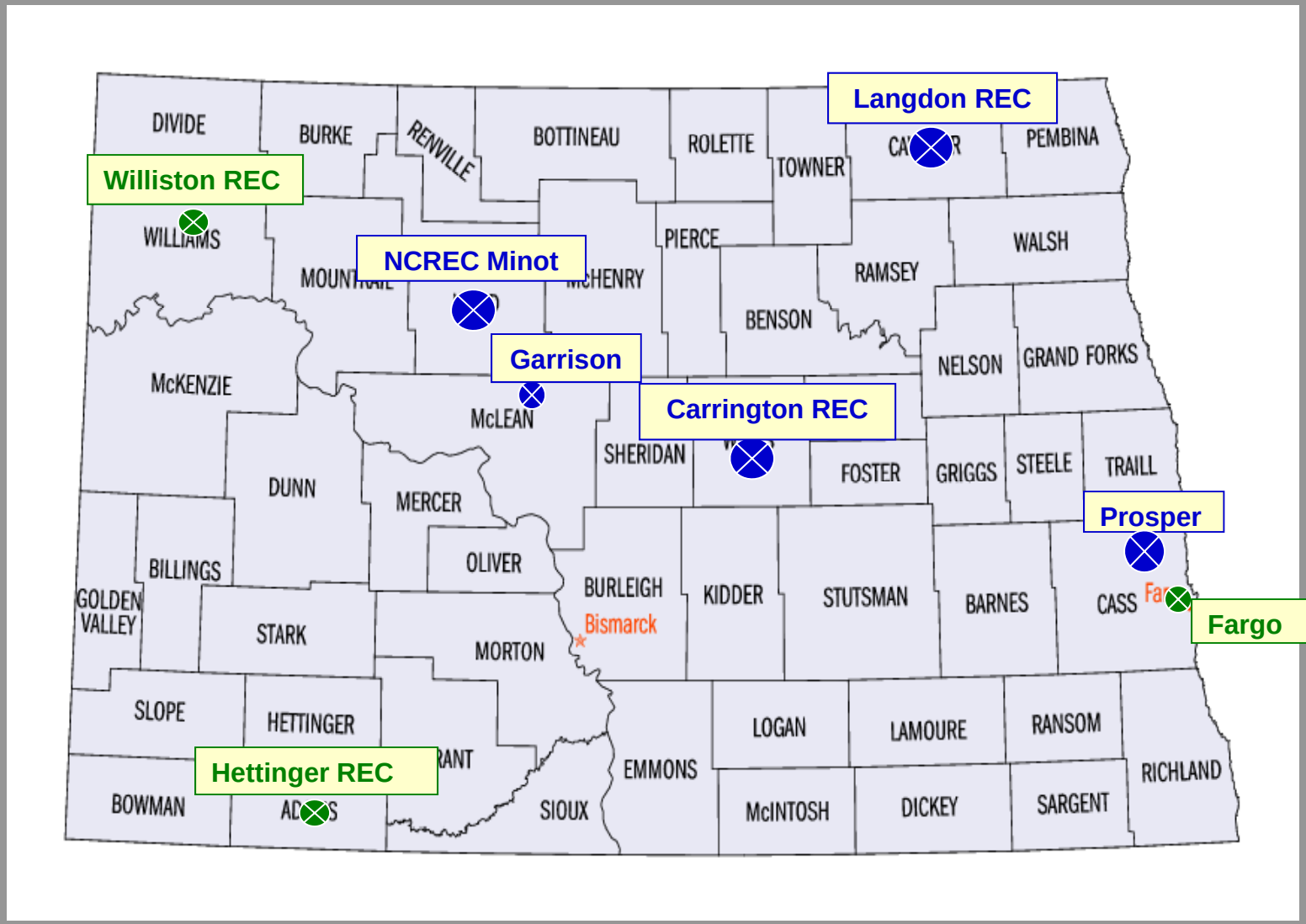
} High oil/acre

3- Canola oil standards (00)
4- Resistance to WM and blackleg
5- Resistance to lodging
6- Resistance to shattering

NDSU-COE Testing Program 2006 - 2011



COE - Testing locations



Breeding Program

Germplasm development

1. Open pollinated (OP) breeding (e.g.: pedigree with EGT)
2. Hybrid breeding

Breeding materials

1. Roundup ready lines
2. Conventional lines

Variety release

NDSU-662c

Seed yield (lb/a)

Var	2006 (2 loc)	2007 (4 loc)	2008 (6 loc)	2009 (6 loc)	2010 (4 loc)	5 yr ave (lb/a)	Over Ave (%)
NDSU-662c	2287	1903	1873	2796	2511	2309	2.3
DKL 38-25	2146	1880	1742	2708	2435	2216	
IS 71-45	2132	2022	1799	2748	2431	2262	
DKL 52-41	.	1832	1802	2773	2398	2246	
					Ave	2258	

Seed Oil (%)

Var	2006 (2 loc)	2007 (4 loc)	2008 (6 loc)	2009 (6 loc)	2010 (4 loc)	5 yr ave (%)	Over Ave (%)
NDSU-662c	43.6	44.1	43.1	44.7	43.7	43.9	1.6
DKL 38-25	42.4	42.0	42.6	43.4	43.5	42.9	
IS 71-45	42.2	43.5	42.5	43.9	43.1	43.2	
DKL 52-41	.	40.8	41.8	44.3	43.7	42.9	
					Ave	43.2	

NDSU-662c

Oil/acre (lb)

Var	2006 (2 loc)	2007 (4 loc)	2008 (6 loc)	2009 (6 loc)	2010 (4 loc)	5 yr ave (lb/a)	Over Ave (%)
NDSU-662c	997	839	807	1250	1097	998	5.2
DKL 38-25	910	790	742	1175	1059	935	
IS 71-45	900	879	765	1206	1048	960	
DKL 52-41	.	747	753	1228	1080	952	
					Ave	949	

	Blackleg				Sclerotinia stem rot			
Entry	**Incidence (%)**		**Severity**		**Incidence (%)**		**Severity**	
Environment	**4**	**Over ave. Hybrid**	**4**	**Over ave. Hybrid**	**2**	**Over ave. hybrid**	**1**	**Over ave. hybrid**
NDSU-662c	**23.6**	**(-) 38**	**1.2**	**(-) 43**	**18.0**	**(-) 33**	**1.9**	**(-) 21**
IS 71-45	**40.0**		**1.5**		**16.7**		**2.1**	
DKL 52-41	**40.0**		**1.6**		**15.3**		**2.1**	
DKL 30-42	**42.5**		**1.2**		**21.3**		**3.1**	
Invigor 5550	**37.5**		**3.2**		**45.0**		**.**	
Ave. Hybrid	**38.0**		**2.1**		**26.7**		**2.4**	

NDSU-662c

Agronomic data

Entry	Days to flowering	Days to maturity	Plant height (inch)	Seed protein (%)	Early vigor	Standability
Sta. Years	16	14	18	14	12	12
NDSU-662c	46.1	92.7	35.4	23.5	4.5	4.3
DKL 38-25	47.1	94.2	38.0	25.0	4.2	4.2
IS 71-45	48.7	94.6	37.7	24.6	4.8	4.0
DKL 52-41	47.8	92.9	38.7	24.9	4.8	4.5
Average hybrids	46.9	93.7	38.3	24.8	4.6	4.2

2010 – Advance Yield Trial performance

Lines	Yield (lb/a)	Yield over ave check (%)
NDSU-1041	2626	15.0
NDSU-1018	2592	13.5
NDSU-1030	2564	12.3
NDSU-1046	2553	11.8
NDSU-1045	2542	11.3
NDSU-1007	2501	9.6
NDSU-1033	2488	9.0
DKL 72-55	2514	10.2
DKL 52-41	2198	-3.6
DKL 38-25	2256	-1.1
IS 71-45	2140	-6.2
45H26	2300	0.7
Ave hybrid	2282	
LSD (5%)	225.5	

EGT Hybrid - 2010 - performance (4 locs)

2010 Entry	Ave-Yield (lb/a)	Ave-Check (DKL 72-55)	Yield over ave. Check	Oil (%)
10-182	3563	2453	31	43.5
10-271	3215	2474	23	42.8
10-007	3273	2623	20	44.4
10-015	3263	2623	20	44.4
10-094	2852	2323	19	44.5
10-184	2932	2453	16	43.5
10-228	2825	2367	16	43.8
10-266	3090	2590	16	42.9
10-188	2882	2453	15	43.6
10-098	2724	2323	15	43.0
10-297	3003	2563	15	44.1
10-257	3035	2590	15	44.4
10-227	2749	2367	14	44.3
10-120	2773	2395	14	44.1
10-129	2932	2543	13	45.0
10-135	2916	2543	13	44.0
10-186	2808	2453	13	43.4
10-038	3114	2721	13	43.4

Breeding facilities

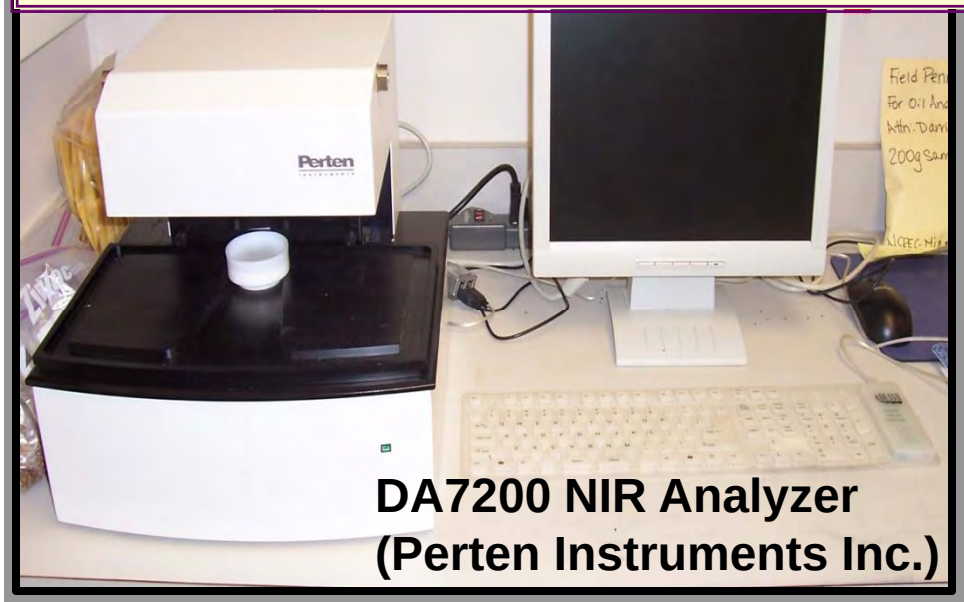
Combine with harvest master

Swather

6-row planter

Truck + Tractor + Trailer + Cultivator

Breeding facilities



DA7200 NIR Analyzer
(Perten Instruments Inc.)

Canola Bio-diesel

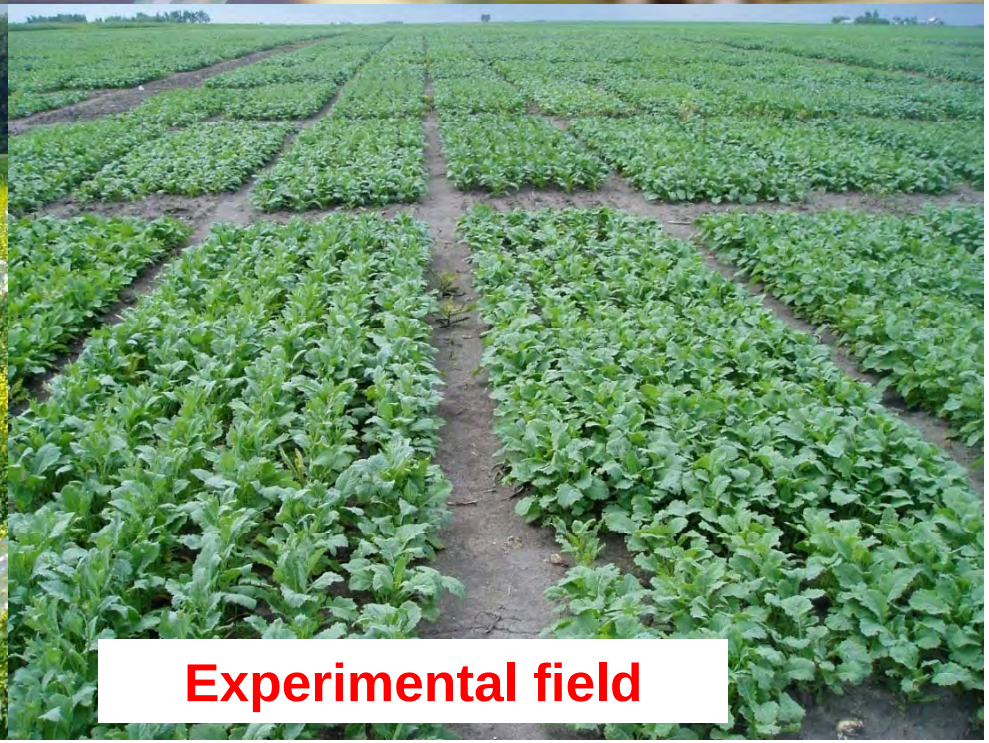
Seed quality lab

Breeding facilities

Greenhouse

Disease screening

Breeding nursery, Prosper



Experimental field

Breeding facilities

Winter nursery - Chile

Acknowledgements

Funding:

- **North Dakota State Government**
- **NIFA (National Institute of Food & Agriculture, former CSREES)**
- **SBARE (State Board of Agricultural Research & Education's)**
- **NCGA (Northern Canola Growers' Association)**

Partnership: Monsanto

Collaborator:

- **Pilot Plants, NDSU (Dennis Wiesenborn)**
- **NDSU Regional Research/Extension Centers**
- **Northern Canola Growers' Association**

Canola Pathology Program

Research update 2010

Luis del Río
North Dakota State University

NDSU Plant Pathology

Identification of sources of disease resistance to Sclerotinia stem rot and blackleg

- Population 1: PI458939 x Ames 26628
- Population 2: PI169080 x Westar
- Screening of USDA collection of *Brassica rapa,* and *B. juncea*
- Field and greenhouse screening of NDSU canola breeding lines

Release of canola cultivar NDSU 662c

NDSU Plant Pathology

Identifying sources of resistance – Blackleg

Reaction of *Brassica* spp. PI to inoculation with PG3 and PG4 isolates of *L. maculans* in greenhouse

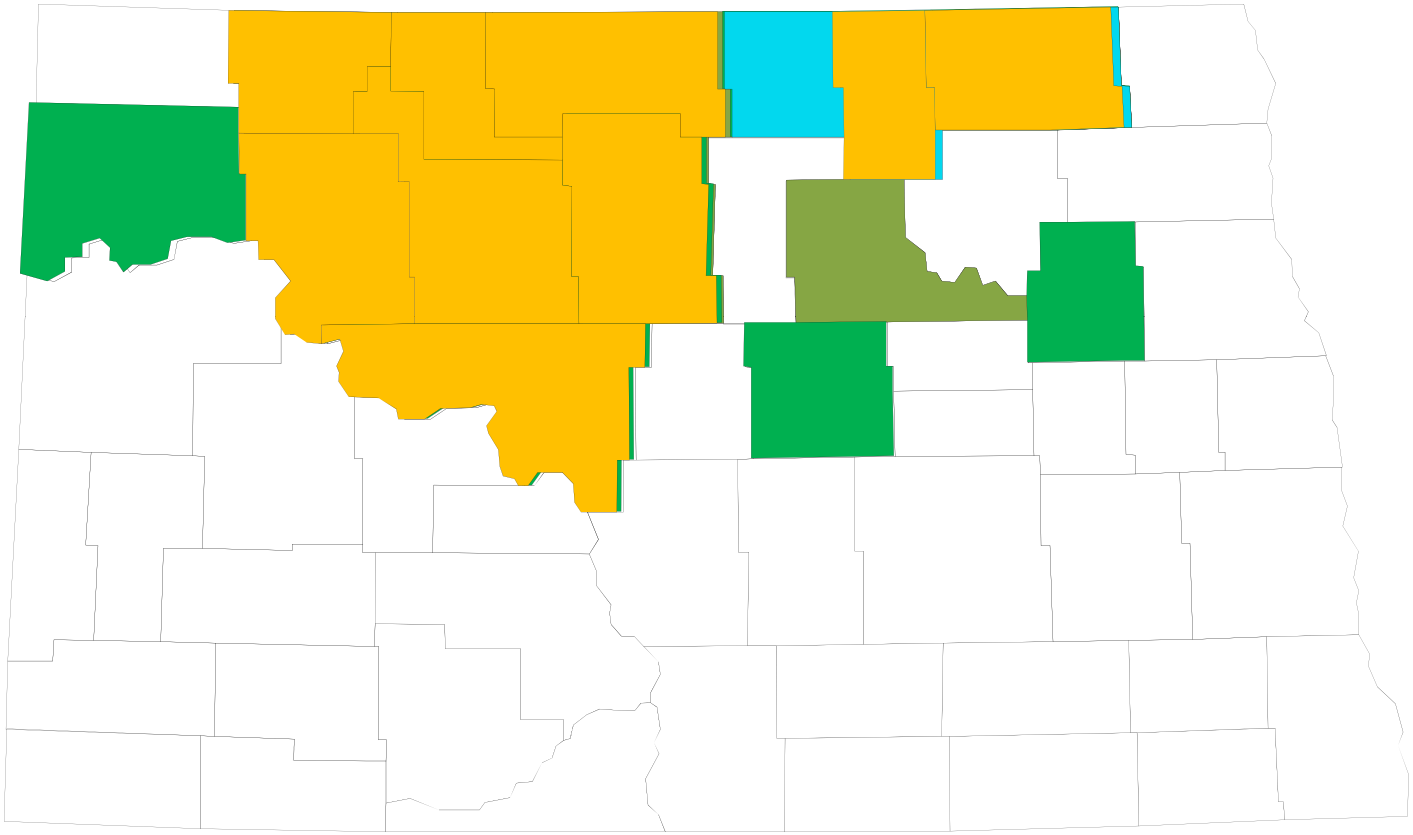
Severity scale	Number of accessions			Commercial genotypes
	B. rapa	*B. napus*	*B. juncea*	
0-3	0	0	0	0
4-6	11	0	58	2
7-9	377	27	348	75
Total	388	27	406	77

NDSU Plant Pathology

Disease management

- SSR
  - Risk map available on internet had >1,700 hits during canola flowering period
  - Fungicide trials indicate fungicide tank mixtures could reduce cost of protection by up to 25%
  - Research has helped register two new fungicides for control of SSR in last two years
- Blackleg
  - Characterized geographic distribution of newly discovered pathogenicity groups

Prevalence of PG4 strains of blackleg in North Dakota



27 2002

75 2003

66 2004

168 2007

144 2008

89 2009

End-Use Products

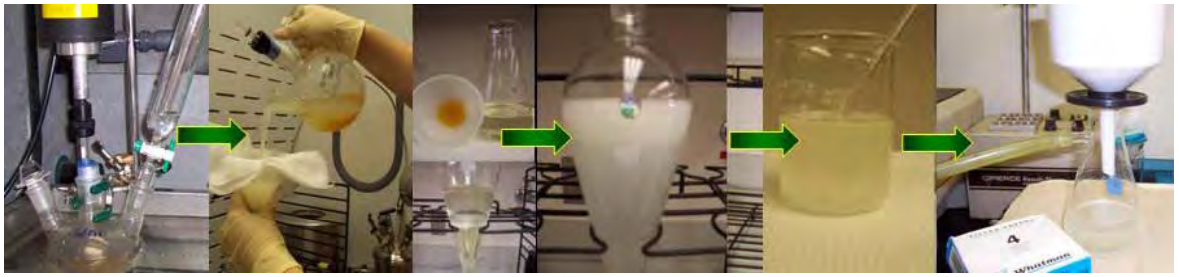
Canola-based Resins for Composites

Drs. Dennis Wiesenborn and Judith Espinoza-Perez, Ag & Biosystems Engineering, NDSU

Dr. Chad Ulven, Mechanical Engineering, NDSU

Dr. Zhigang Chen, Center for Nanoscale Science & Engineering, NDSU

Process for making reinforced composites with canola oil



Canola oil + H_2O_2 + CH_3COOH + Catalyst → ECO

ECO + Synthetic epoxy + E-Glas + Curing agent → Composite
(hardener)

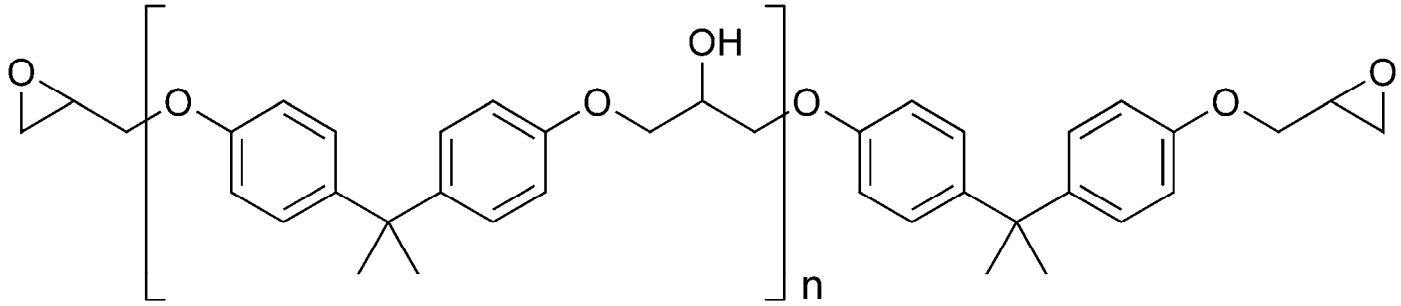
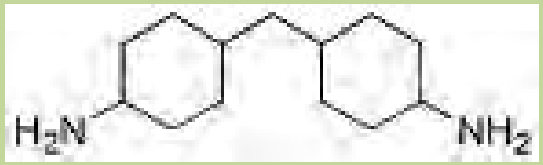
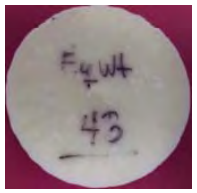
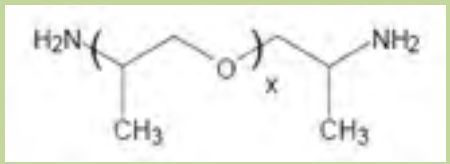


Table 1. Properties of composite samples prepared using 0, 30, 35 and 40% canola oil-based epoxy resin (ECO) blended with Resinfusion™ 8603 cured with ECA 100KA.

Samples	Flexure Properties		Toughness (J)	Glass transition
	Strength (MPa)	Modulus (GPa)		T_g (°C)
CONTROL	372 ± 2	16.9 ± 0.6	2.7 ± 0.2	105.8 ± 0.2
ECO 30	266 ± 9	14.6 ± 1.1	2.3 ± 0.1	75.9 ± 0.5
ECO 35	181 ± 6	12.5 ± 0.6	2.8 ± 0.2	64.5 ± 0.6
ECO 40	120 ± 4	9.6 ± 0.7	2.8 ± 0.4	69.2 ± 0.3

Alternative Hardeners

Amine	Chemical Structure	Neat Resins
PACM-20		
EFB	Mixture	
FB-31	Mixture	
APR	Mixture	
J230		

Objectives (past 4 years)

- ✓ Develop bench-scale process
- ✓ Produce & characterize composite samples
- ✓ Cost analysis
- ✓ **Evaluate alternative hardeners** (2010-11)
- ❑ **Process scale-up** (2011)

Outcomes

- Improved performance of cured (hardened) resin, especially at elevated temperatures
- Proposal to ND Renewable Energy Program; Renewable resins for pultruded building products, in partnership with Tecton Products, Fargo

Canola Oil and Breast Cancer Studies

Progress Report (FY2010)

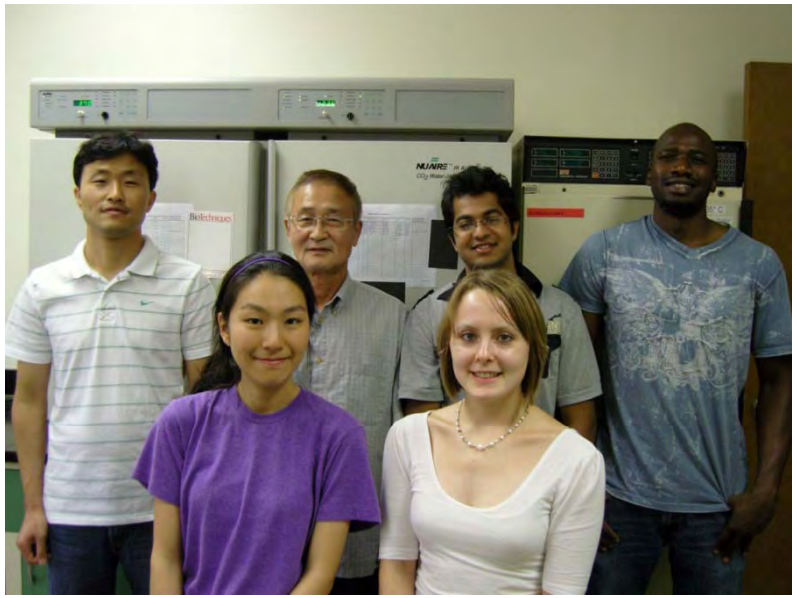
North Dakota State University

Supported by

USDA National Canola
Research Program-North Central
Region Canola Research
Program

Background

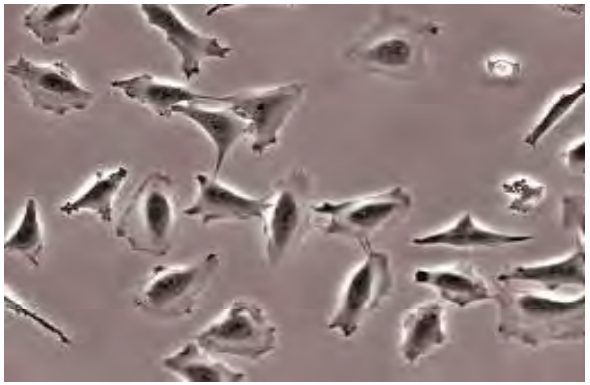
- Over the past 3 years, Dr. Park in Laboratory of Lactation at NDSU has been investigating the role of canola oil on breast cancer risk.



NDSU

Completed Projects

- They (Dr.Park's group) have shown that canola oil may reduce growth of human breast cancer cells in culture.



- Also, canola oil may reduce susceptibility of rats to breast cancer carcinogenesis.

Dissemination

- Published in '**Lipids**' journal on September 2010.

Lipids (2010) 45:777–784
DOI 10.1007/s11745-010-3462-8

ORIGINAL ARTICLE

Canola Oil Inhibits Breast Cancer Cell Growth in Cultures and In Vivo and Acts Synergistically with Chemotherapeutic Drugs

Kyongshin Cho · Lawrence Mabasa · Andrea W. Fowler · Dana M. Walsh · Chung S. Park

Dissemination

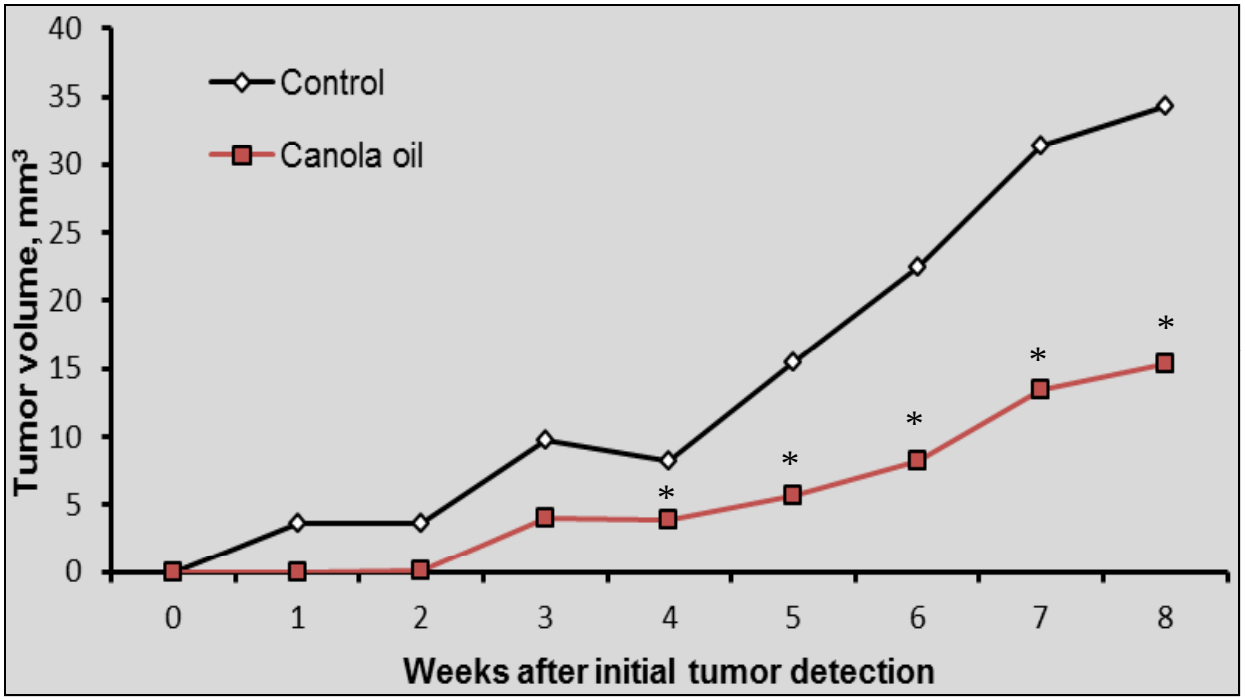
- Data has been presented at:
  - American Society for Cell Biology (San Francisco)
  - Federation of American Societies for Experimental Biology (San Diego)
  - Keystone symposia (Kyoto, Japan)
  - American Institute for Cancer Research (DC)
  - US Canola Conference (Long Beach)

Ongoing Study (FY 2010)

- Multi-drug resistance of human breast cancer has been a major concern in cancer treatment.

- In 2009, they began a 2-year project aimed at investigating the role of canola oil on growth of drug resistant human breast cancer in nude mice.

Ongoing Study (FY2010)



- Data shows that canola oil may inhibit growth of drug-resistant breast cancer.
- Currently, samples and additional data are being analyzed to complete the project.

Upcoming Study (FY2011)

- Over the last decades, Dr. Park's lab has also been investigating the effect of lipotropes (methyl nutrients: methionine, choline, folic acid, and vitamin B_{12}) on breast cancer.
- To date, these studies have shown that lipotropes may reduce incidence and growth of cancer cells in culture and in rats.

Upcoming Study (FY 2011)

- Given the encouraging findings, they will study the effect of a combination of canola oil and lipotropes (Lipocan) on inhibition of growth of breast cancer.

- Data to be collected will be used to apply for a US patent (invention).

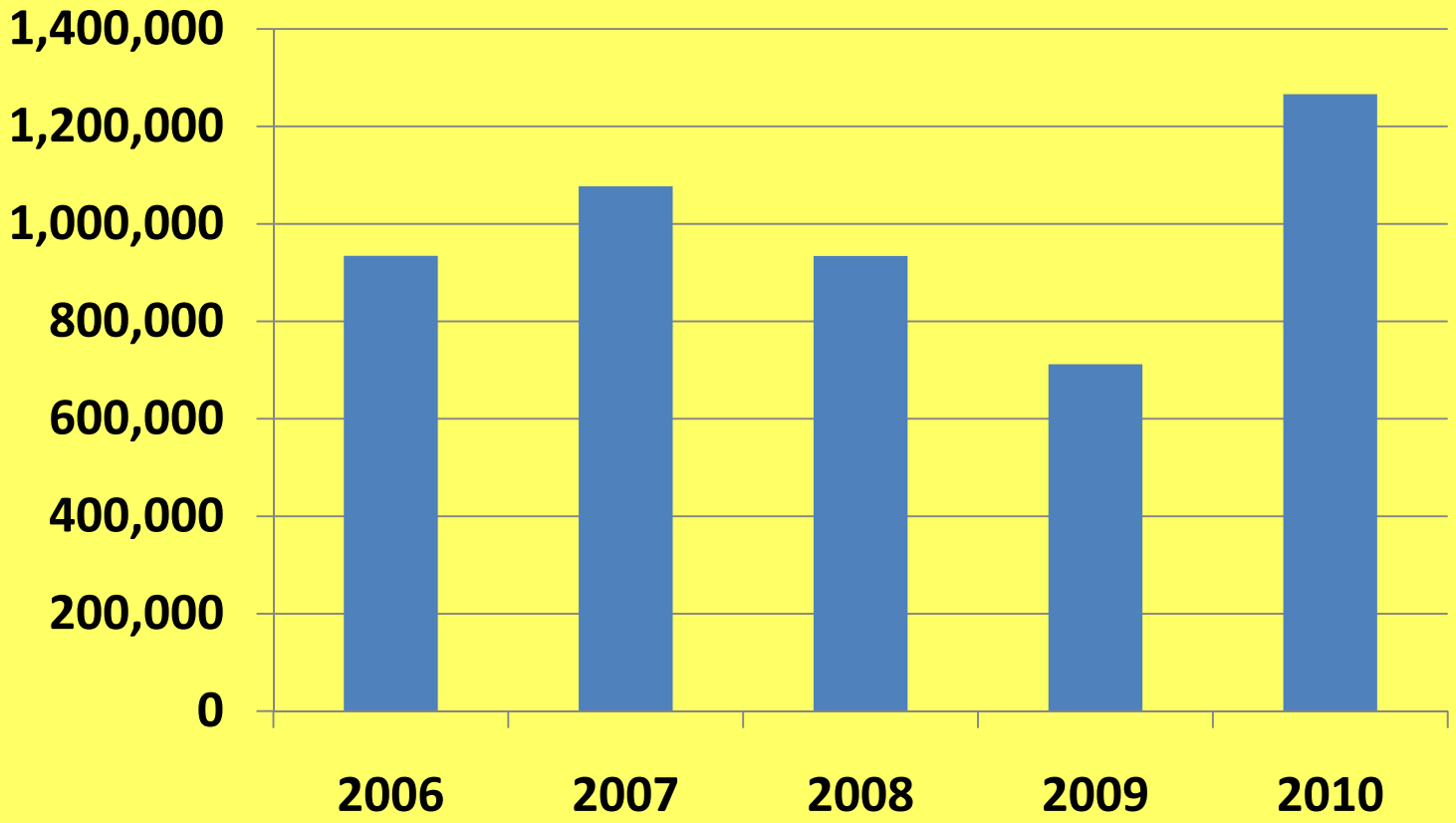
Collaborations

- They are developing a collaborative relationship with a Nutrition/Food Research Group at Cargill Corporation.
- In addition, researchers at Pharmaceutical Sciences at NDSU and other universities have shown interest in exploring collaborative possibilities on canola and breast cancer projects.

Implications

- Positive findings may …
  - Increase awareness of health benefits of canola oil, contributing to the expansion of potential market avenues for canola growers.
  - Aid in the development of canola-based anti-cancer nutraceutical products.

Canola Acreage (2006-2010)



Canola Acreage (2006-2013)