

Development and Management of Canola for the Great Plains Region

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Research Objectives

The long-term goal of this multi-state, multidisciplinary project is to facilitate the adoption of winter canola as a viable rotational crop for the Great Plains and the southern High Plains. Researchers have adopted the high-priority area winter canola production systems, including, but not limited to genetic improvement, and the following supporting objectives to aid in facilitating the program.

- Continue the evaluation and development of high-yielding, locally adapted canola cultivars for the region.
- Improve canola production systems in the region by addressing agronomic management issues.
- Extend production and marketing technology for canola through appropriate, coordinated technology transfer programs.

FY10 Project Personnel

Gary M. Pierzynski	KSU	Interim Dean College of Agriculture, Interim Director K-State Research and Extension, Great Plains Regional Director of the NCRP
J. Ernest Minton	KSU	Project PI, Associate Director of Research and Technology Transfer for KSRE
Michael Stamm	KSU/OSU	Co-PI, Canola Breeder
Johnathon Holman	KSU	Asst. Prof., SWREC, Cropping Systems
Kraig Roozeboom	KSU	Asst. Prof., Cropping Systems/Crop Production
Jerry J. Johnson	CSU	Assoc. Prof., Crop Production Extension Coord.
William Wiebold	MU	Prof., Corn and Soybean Management
Dipak Santra	UNL	Asst. Prof., Alternative Crops Breeding
Sangu Angadi	NMSU	Asst. Prof., Crop Production
Chad Godsey	OSU	Asst. Prof., Cropping Systems Specialist
John Sij	TAMU-Vernon	Prof., Crop Science
Calvin Trostle	TAMU – Lubbock	Assoc. Prof., Extension Agronomist

Riley – New Cultivar Released in 2010

Table 1. Three-year yield averages (lb/a) for Riley and selected varieties in the NWCVT on the Great Plains.

	CO	KS	NE	NM	OK	TX	WY
Riley	1991	1674	2729	3716	1922	2337	2658
Kiowa	1749	1344	2719	3616	1815	2138	2491
Sumner	1668	1211	2272	2872	1727	2052	2316
Wichita	1824	1369	2341	3870	1872	1670	2272

Table 2. Two-year oil content averages (%) for Riley and selected varieties in the NWCVT on the Great Plains.

	CO	KS	NE	NM	OK	WY
Riley	40.0	39.2	37.8	39.9	39.2	42.2
Kiowa	37.8	37.0	35.7	38.3	38.6	40.6
Sumner	39.0	37.0	37.5	37.4	38.2	40.7
Wichita	38.2	36.4	36.4	39.2	38.9	40.9

- Tested in the NWCVT from 2008 to 2010

- Riley is consistently one of the highest yielding open-pollinated varieties grown in these trials

- Riley appears very well adapted to the central Great Plains and High Plains, and has performed favorably in high-yielding and stressed environments

- Riley breeder seed measures 40.3% total oil on a dry-seed basis, which is 3.3% higher than the average for Wichita (37.0%) when it was released

- New varieties with high-quality, certified seed provide value in a region where canola is gaining a foothold

Dual purpose grain and forage crop

Figure 1. Grazing Treatment Effects on Winter Survival

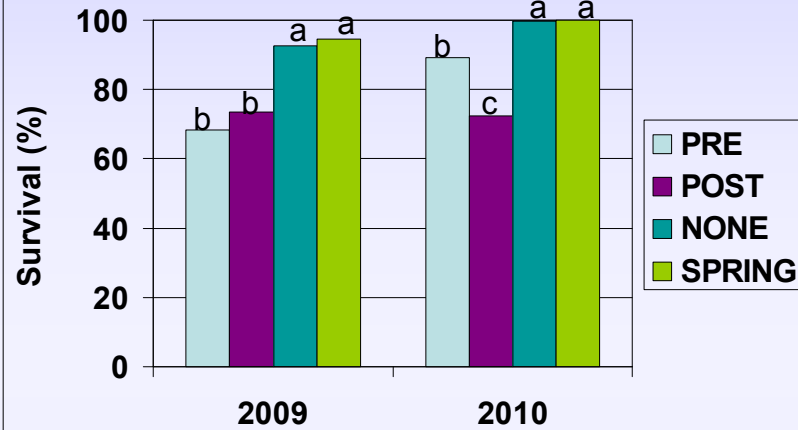


Figure 2. Grazing Treatment Effects on Grain Yield

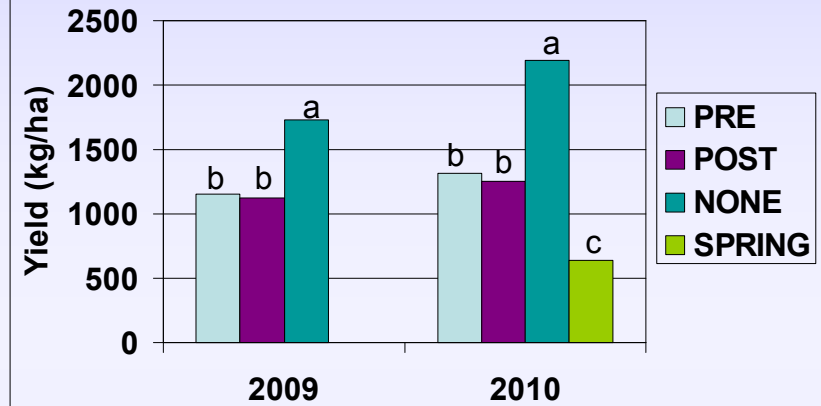
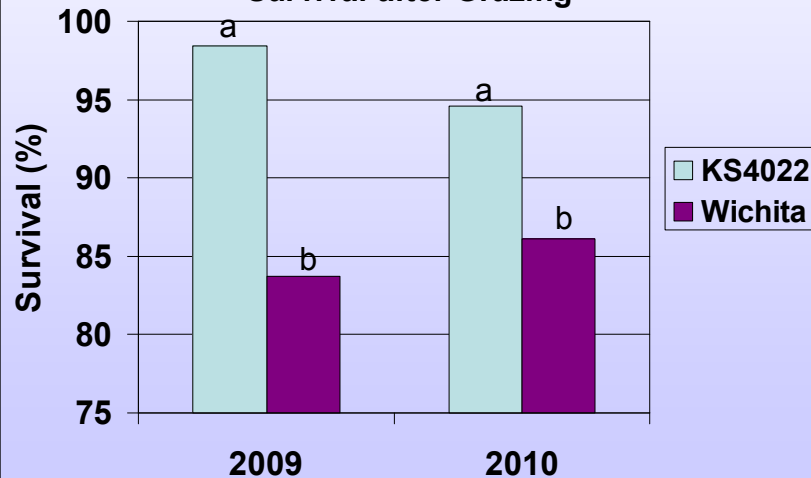


Figure 3. Genotypic Differences in Winter Survival after Grazing



Blackleg disease scores for commercial cultivars

Variety	2010	2009	2008
DKW41-10	0	0	27
DKW46-15	3	3	53
DKW47-15	0	0	40
HyClass 115W	0	0	20
HyClass 154W	0	0	13
Kadore	0	0	20
Baldur	3	3	40
Sitro	3	0	37
Visby	0	0	53
Riley	0	7	20
Sumner	3	10	23
Wichita	7	7	30
Falcon (check)	10	10	33
Westar (check)	60	73	90
LSD	5	12	19

Blackleg rated as the total percentage of plants killed by blackleg or with severe basal stem canker.

- Commercial entries from the National Winter Canola Variety Trial planted at Plains, GA
- New blackleg nursery planted at Lake Carl Blackwell, OK in fall 2010
- Searching domestic and international germplasm sources for resistance

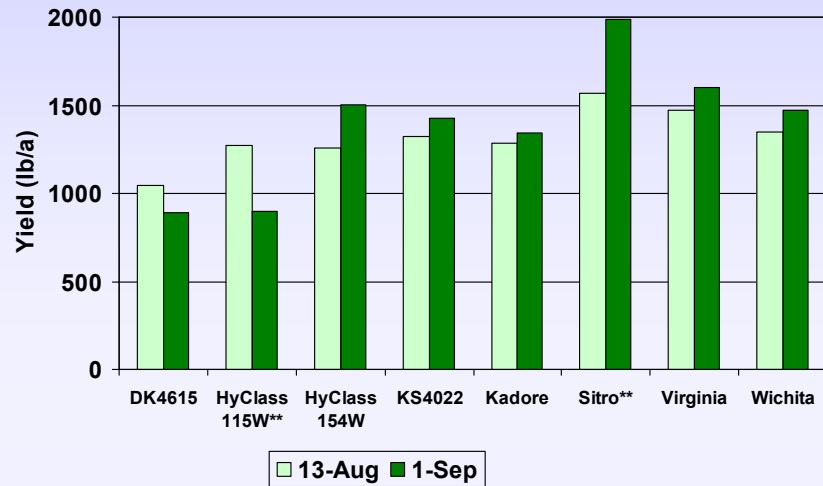
Blackleg pycnidia spores
11/11/10; Kiowa, KS



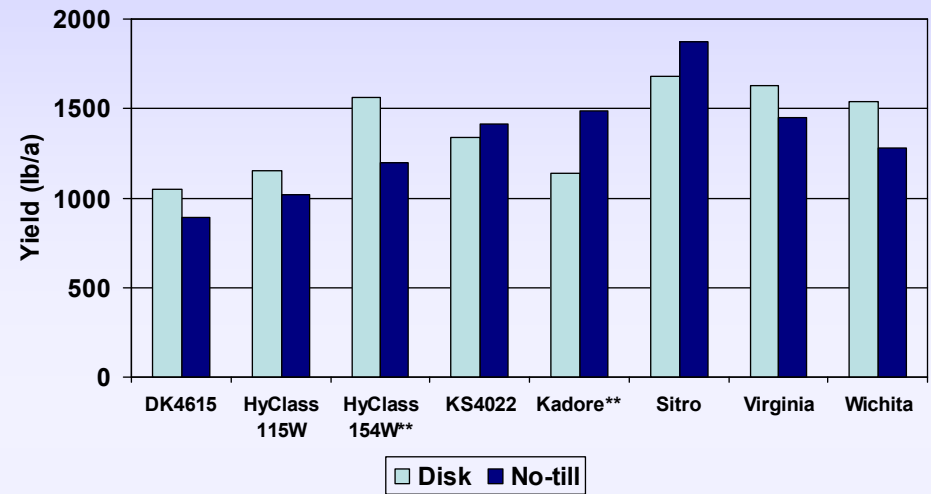
Planting Date x Tillage x Genotype

Manhattan, KS – 2010 – (**P<0.05)

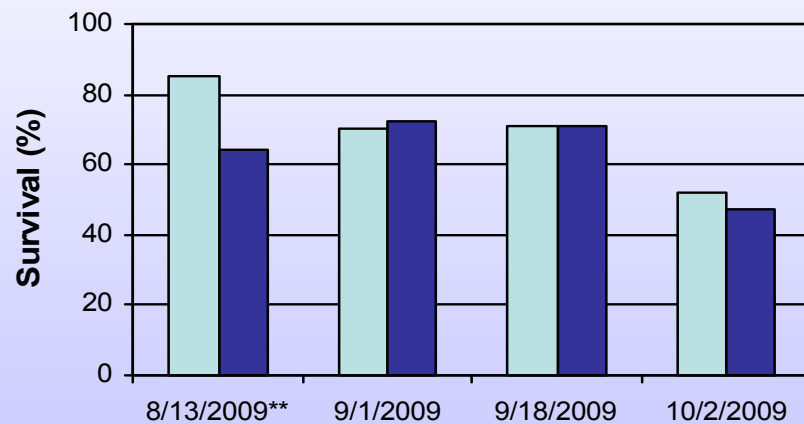
Yield Means - Date x Genotype



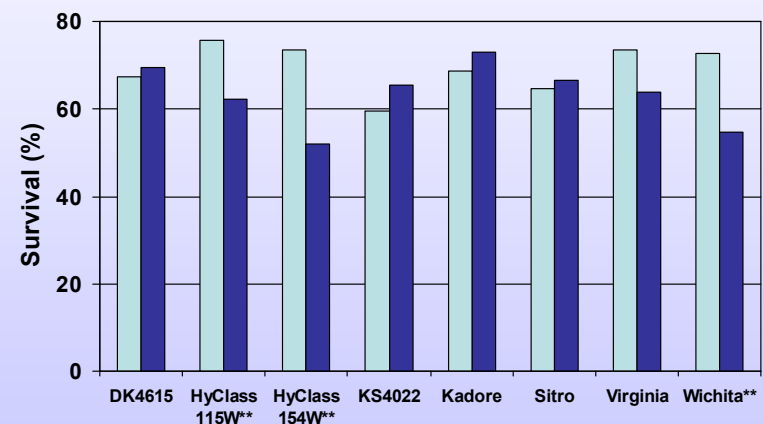
Yield Means - Tillage x Genotype



Winter Survival Means - Tillage x Planting Date



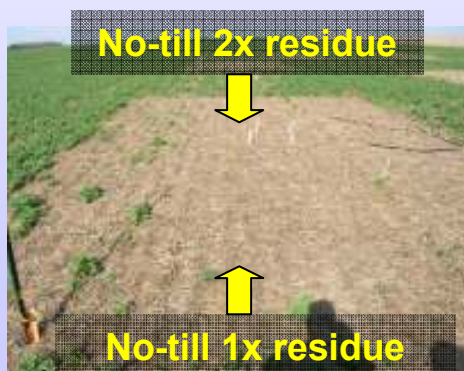
Winter Survival Means - Tillage x Genotype



Developing varieties for no-till seeding

Problem

- Producers have struggled maintaining a canola stand under minimum disturbance no-till
- Varieties do not possess the winter hardiness necessary
- Varieties with enhanced winter survival and ideal plant morphology are needed



Selected varieties from 150 planted in a no-till variety trial.

Name	Stand (0-10)	Bloom (d)	Shatter (%)	Test Wt (lb/bu)	Yield (lb/a)
KSNT08	5.0	106	20	49.3	1512
KSNT114	4.5	103	20	48.6	1445
KSNT09	7.0	104	30	46.0	1420
KSNT88	5.0	109	35	48.4	1395
KSNT127	3.0	106	25	47.5	1390
KSNT22	7.5	104	20	50.1	1343
Safran	7.5	106	10	48.5	1287
Wichita	6.0	104	25	48.2	1190
Mean	4.8	106	27	46.6	899
LSD (0.05)	3.0	2	18	NS	556

National Winter Canola Variety Trial

- Regional testing started in 1994-1995 in the Advanced Canola Nursery (ACN)
- 1997-1998 was the first season the NWCVT was coordinated by K-State
- Objectives
 1. Evaluate the performance of released and experimental varieties
 2. Determine where the varieties entered are best adapted
 3. Increase the visibility of winter canola across the nation
 4. Provide a decision making tool for breeders, marketers, and producers
- 2010-2011 trial contained 46 entries planted at 65 locations in 25 states
- 16 Reports of Progress published by K-State since 1994
- Maintains a continuous flow of yield data across years and locations
- Illustrates advances in canola variety development as yield and winter hardiness levels have increased

