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Riley Canola, Kansas State University, February 2011.

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Riley Canola

Rleased in 2010, Riley is a new winter canola variety developed by K-State Research and Extension. Financial support was provided by the USDA Supplemental and Alternative Crops Competitive Grants Program and K-State Research and Extension. Foundation and certified seed will be available for distribution on a widespread basis for fall 2011 planting.

Origin and development. Riley is the result of a cross made in 1998 with the pedigree KS3580 / Jetton. KS3580 is the experimental line designation for Wichita, a winter canola cultivar released by K-State Research and Extension in 1999. Jetton, a variety marketed internationally by NPZ-Lembke, was a standard check in the National Winter Canola Variety Trial from 1996 to 2007.

F1 seeds of the cross were increased in the greenhouse in 1999 and F2 seeds were planted in the field in the 2000-2001 season. Pedigree selection was used yielding the F3 to F6 generations. Single-plant plots were grown in the vicinity of sister-lines each year. Selection criteria and advancement decisions were based on visual observations of agronomic characteristics, reduced levels of winter injury, breeder's score, and low glucosinolate content determined by the glucose-sensitive Tes-tape procedure. In 2004-2005, the F6 nursery plots were bulk harvested with a plot combine and the seed was used for replicated yield trials beginning in 2005-2006. Seed for subsequent yield trials was derived from bulked plot seed. Breeder seed was derived from a space-planted field increase.

Agronomic characteristics. Riley was included in variety performance trials as the experimental variety KS4158 starting in 2006. It was an entry in the National Winter Canola Variety Trial from 2008 to 2010. Riley performs similarly to hybrids and is consistently one of the highest yielding open-pollinated varieties across many environments.

Table 1 summarizes the yield (lb/a) averages for Riley, Kiowa, Sumner, and Wichita from locations of the National Winter Canola Variety Trial in the Great Plains. Riley's yield performance exceeded Wichita in six states averaged over the three years. In Kansas, Riley's yield has been 300 pounds per acre better than Wichita. Riley has produced favorable yields under irrigated and dryland conditions in the region.

The breeder seed lot of Riley was analyzed for total oil, glucosinolate content, and fatty acid profile. Riley measures 40.3 percent total oil on a dry-seed basis. This is 3.3 percent higher than the average for Wichita (37.0 percent) when it was released. Riley has a glucosinolate content of 13.3 micro-mol per gram of the oil-free meal. The fatty acid profile measures 4.2 percent (stearic), 1.9 percent (palmitic), 65.1 percent (oleic), 18.3 percent (linoleic), 7.4 percent (linolenic), 1.1 percent (eicosenoic), and 0.5 percent (erucic). Over three years of testing, Riley averaged 0.3 to 2.3 percent greater oil content than Wichita in the Great Plains (Table 2).

Winter survival of Riley is equivalent to other commercial varieties and survival at environments suffering winter stand loss has been positive. On average, Riley reaches 50 percent bloom

the same day and maturity about a day later than Wichita. Riley is approximately the same height as Wichita.

Disease resistance. Riley and 'Falcon', which is considered resistant, have equivalent infection responses to blackleg (Table 3). Riley has good tolerance to sclerotinia stem rot, another yield-reducing disease, which has been observed only minimally in variety trials in the southern Great Plains. As canola is planted on more acres in the region, both diseases may become bigger problems.

Summary. Based on its performance in the National Winter Canola Variety Trial, Riley appears to have broad adaptation and will yield favorably wherever winter canola is grown. Riley is disease tolerant, has a low glucosinolate content, and has an attractive fatty acid profile.

Riley represents a generous increase in total oil content and will produce more oil per acre than Wichita. This characteristic gives it a place in the canola oil market and makes it a desirable commodity. It is estimated that increasing oil content of all varieties by 1 percentage point would be worth an additional \$5 million per year to the canola industry.

As canola continues to be planted on more acres, there is a significant need for better genotypes. The performance record of Riley suggests an increase in productivity and consistency among the cultivars available. New open-pollinated varieties with high-quality, certified seed provide value where winter canola is gaining a foothold.

Table 1. Three-year yield averages (lb/a) from 39 site/years for Riley and selected varieties in the National Winter Canola Variety Trial on the Great Plains.

Variety	Colo.	Kan.	Neb.*	N.M.*	Okla.	Texas*	Wyo.*
Riley	1,991	1,674	2,729	3,716	1,922	2,337	2,658
Kiowa	1,749	1,344	2,719	3,616	1,815	2,138	2,491
Sumner	1,668	1,211	2,272	2,872	1,727	2,052	2,316
Wichita	1,824	1,369	2,341	3,870	1,872	1,670	2,272

*Indicates irrigated locations.

Table 2. Three-year oil content averages (%) from 39 site/years for Riley and selected varieties in the National Winter Canola Variety Trial on the Great Plains.

Variety	Colo.	Kan.	Neb.*	N.M.*	Okla.	Texas*	Wyo.*
Riley	40.9	40.2	37.8	39.3	40.3	42.7	41.9
Kiowa	39.1	38.1	35.7	38.2	39.4	40.0	40.4
Sumner	40.5	38.8	37.5	37.7	39.5	40.0	41.0
Wichita	39.4	38.2	36.4	39.0	39.8	40.4	40.6

* Indicates irrigated locations.

Table 3. Disease summary (%) for Riley and selected varieties.

Variety	Blackleg ¹			Sclerotinia stem rot ²
	2010	2009	2008	2009
Riley	0	7	20	28
Kiowa	0	7	23	23
Sumner	3	10	23	37
Wichita	7	7	30	30
Falcon ³	10	10	33	--
Westar ⁴	60	73	90	--

¹ Blackleg rated as total percentage of plants killed by blackleg or with severe basal stem canker. Ratings taken by David Spradlin, University of Georgia.

² Sclerotinia stem rot rated as percentage of plants infected. Ratings taking by Dave Starner, Virginia Tech University.

³ Included in test as a blackleg standard (Calgene Oil Division).

⁴ Included in test as a blackleg standard (Saskatoon Research Centre).