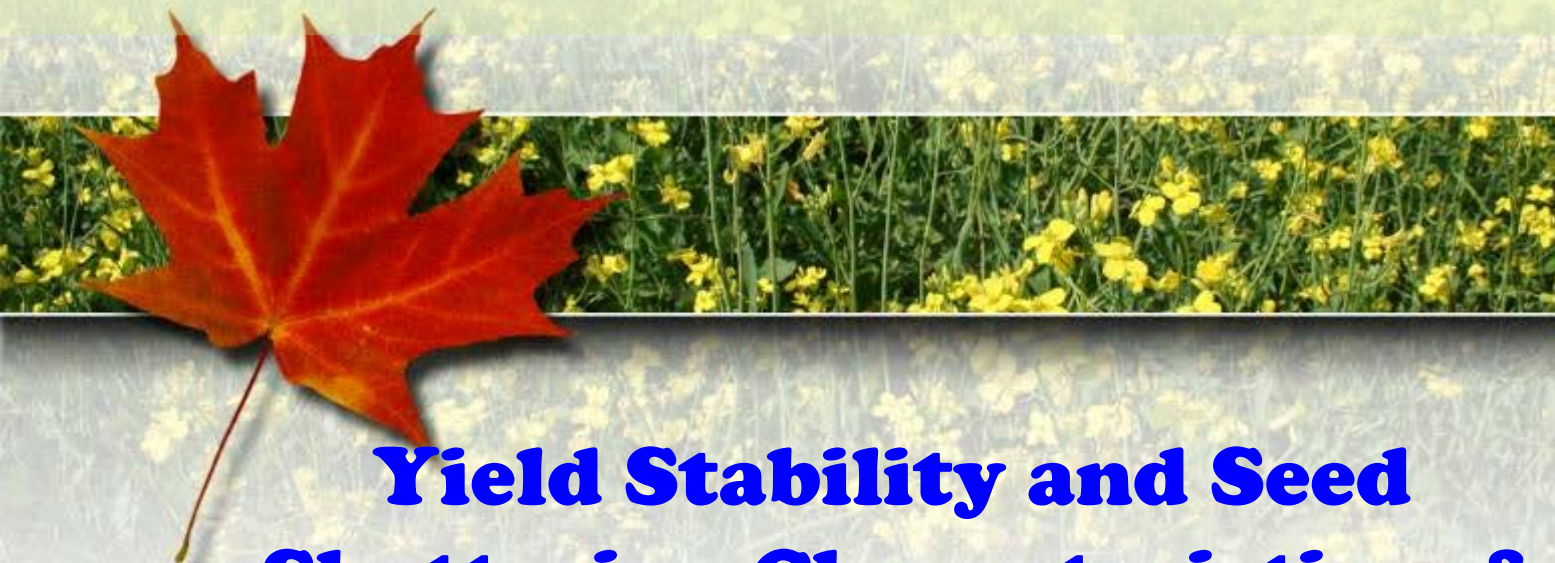




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# **Yield Stability and Seed Shattering Characteristics of *Brassica juncea***

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**Canada**

# *Brassica juncea* canola

## Genetics

- ✓ Bred from continental *B. juncea* mustard
- ✓ Erucic acid in the oil and glucosinolate in the meal, similar to *B. napus*
- ✓ Fatty acid profile modified from *B. juncea* mustard

## Agronomics

- ✓ Tolerate heat and drought stresses
- ✓ Alternative oilseed for the drier ecoregions
- ✓ Resistance to blackleg
- ✓ Plants mature uniformly due to erect growth habit

# Knowledge required

## Yield stability

- ✓ Yield performance across different growing areas
- ✓ Relative to *B. napus* canola, *B. juncea* mustard
- ✓ Hybrid *juncea* vs. hybrid *napus* cultivars

## Harvestability

- ✓ Ability for straight-combining
- ✓ Seed loss during pod maturation and harvest

# Field Experiments

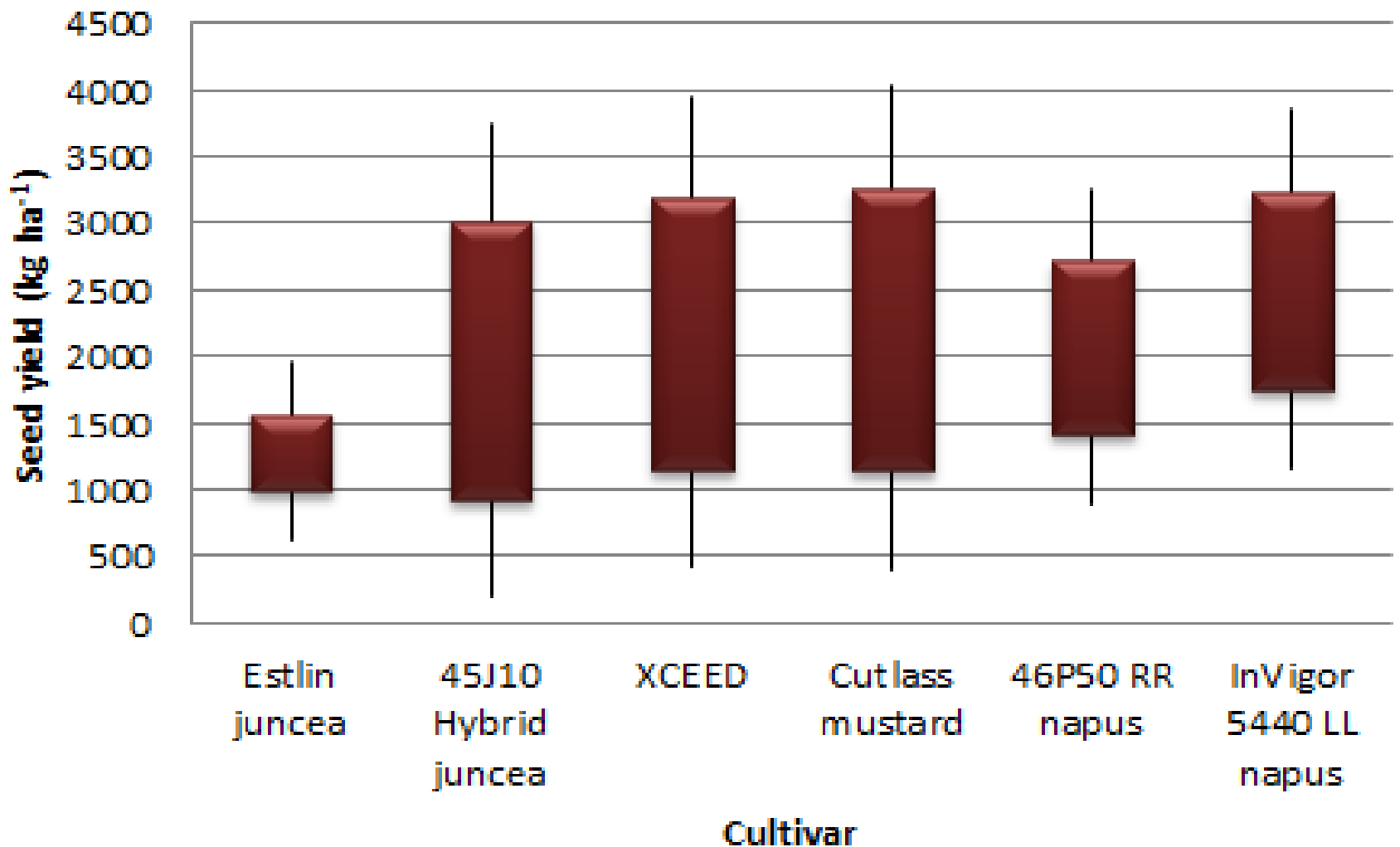
- **Site** Lethbridge, Alberta;  
Indian Head, Melfort, Scott, Swift Current, SK
- **Year** 2010, 2011
- **Split design:**
  - Factor A: Two harvest times (early vs late)
  - Factor B: Six *Brassica* species/cultivars
  - 4 replicate at each site-year

# Species and cultivars

Species	Cultivar	Feature	1000 seed weight (g)	Seeding rate (kg ha <sup>-1</sup> )
<i>B. juncea</i> canola	45J10	Conv. Hybrid	3.8	8.0
<i>B. juncea</i> canola	XCEED	Open-pollinated	2.9	5.8
<i>B. juncea</i> canola	Estlin	Open-pollinated	2.8	6.0
<i>B. napus</i> canola	46P50	RR, Hybrid	5.1	10.4
<i>B. napus</i> canola	InVigor5440	LL, Hybrid	4.8	9.8
<i>B. juncea</i> mustard	Cutlass	Open-pollinated	2.4	5.3



# Species/Cultivar Differences in Seed Yield (8 site-years)



# Effect of Harvest Timing on Seed Yield (8 site-years)

Cultivar	Seed yield (kg ha <sup>-1</sup> )		
	Early	Late	Yield loss (% of early)
45J10 Hybrid <i>juncea</i>	1680 b	1540 cd	8.9
46P50 RR <i>napus</i>	2250 a	1940 b	16.0
Cutlass mustard	1940 b	1810 cb	7.3
Estlin ( <i>juncea</i> )	1410 c	1320 d	6.7
InVigor 5440 LL <i>napus</i>	2350 a	2270 a	3.3
XCEED 8571 <i>juncea</i>	1840 b	1710 cb	7.6



Catch trays

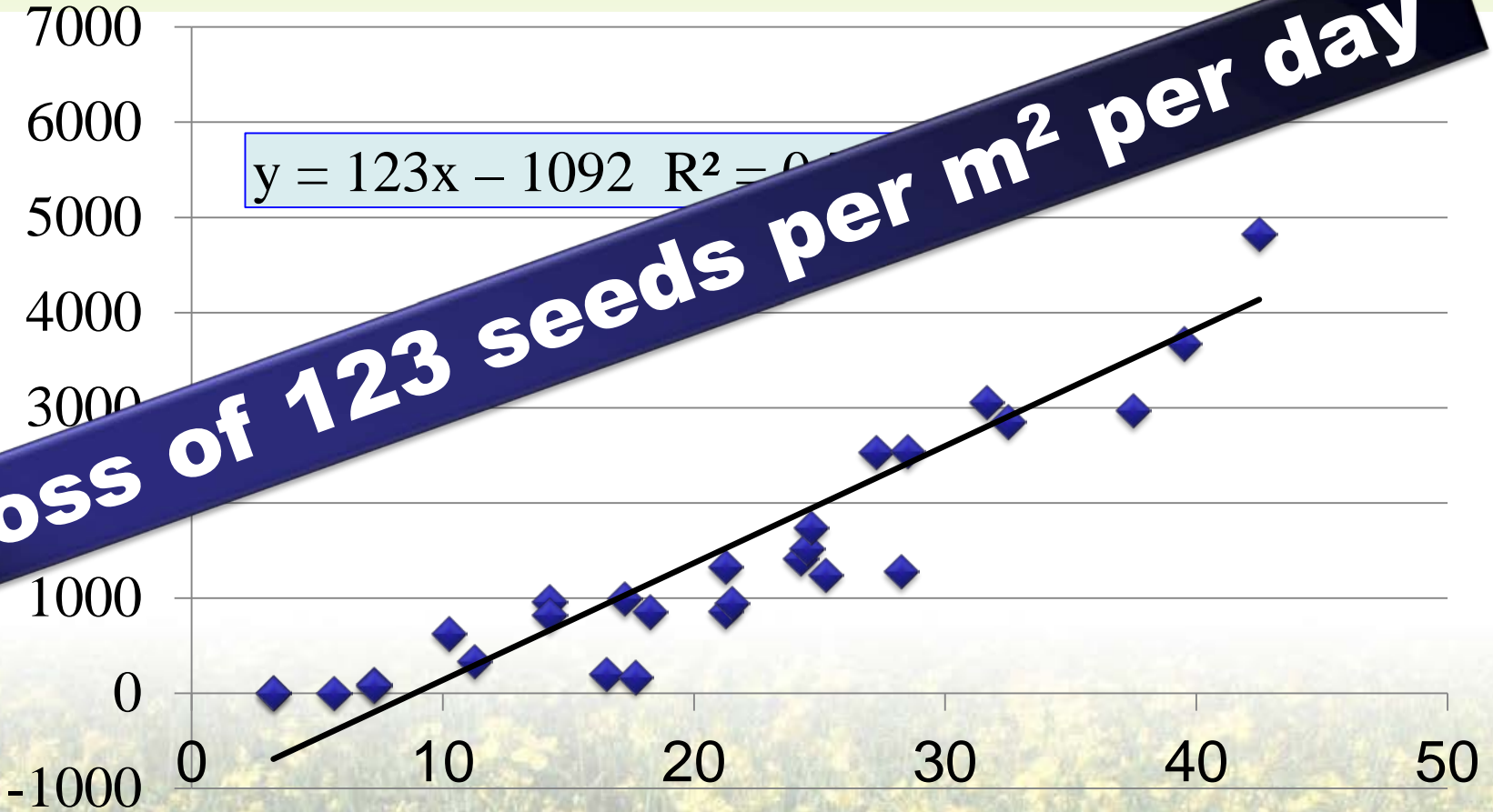


Photo provided by Chris Holzapfel



# Seed Loss Progress (6-site-yrs)

# seeds m<sup>-2</sup>



Days after physiological maturity (d)

# Lost Seed at the low-losing sites

(Ind2010, Scott2010, Swift2010, Swift2011)

Species	Lost seeds (# m <sup>-2</sup> )	Lost yield (kg ha <sup>-1</sup> )	% yield lost
45J10 Hybrid juncea	1944	73.9	6.7
46P50 RR napus	3095	154.0	9.3
Cutlass mustard	3365	80.8	6.3
Estlin (juncea)	1006	29.1	2.2
InVigor 5440 LL napus	1789	85.9	4.4
XCEED 8571 CF	2431	70.7	5.0
Mean	2259	82.4	5.6



# Lost Seed at the high-losing sites (Leth2011, Melt2011)

Species	Lost seeds (# m <sup>-2</sup> )	Lost yield (kg ha <sup>-1</sup> )	% yield lost
45J10 Hybrid juncea	7269	276.2	19.7
46P50 RR napus	11364	579.6	24.9
Cutlass mustard	13859	332.6	12.8
Estlin (juncea)	13984	391.6	41.0
InVigor 5440 LL napus	8048	386.3	14.4
XCEED 8571 CF	8390	243.3	18.3
<b>Mean</b>	<b>10168</b>	<b>366.1</b>	<b>20.1</b>



# Conclusion

- *B. juncea* canola offers an alternative for oilseed industry in western Canada
- *Juncea* canola can be adapted across the southern SK and Alberta ecoregions
  - Hybrid *juncea* canola performed superior than conventional *juncea* in yield and yield stability
  - *Juncea* averaged 27% lower yield than *napus* canola; this may limit its adaptation
- Seed loss is severe for all canola species, and loss can be minimized with timely harvest

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