Late glyphosate applications alter yield and yield components in glyphosate-resistant canola (*Brassica napus* L.)

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Background

90% of all canola grow in Canada is GM (Beckie et al. 2011)

- 48% is glyphosate-resistant (Beckie et al. 2011)

Early/On-label glyphosate applications = optimal yields (Clayton et al. 2002)

Crop injury from late glyphosate applications in cotton and soybean (Pline et al. 2002, Krausz and Young 2001)

Increasingly wet weather during growing season in the Prairies since 2010 (Environment Canada, 2015)

Objective

Determine effects of late or sequential herbicide applications of glyphosate on glyphosate-resistant canola yield and yield components.

Materials and Methods

Canola 45H28 (RR)

Lacombe, Alberta 2010-2012

St. Albert, Alberta from 2010-2011
Lethbridge, Alberta from 2011-2012
Saskatoon, Saskatchewan in 2012

Plots were hand weeded

RCBD

4 reps/treatment

Plot size 2 x 6 m

Stubble (St. Albert, Lethbridge)

Fallow (Lacombe, Saskatoon)

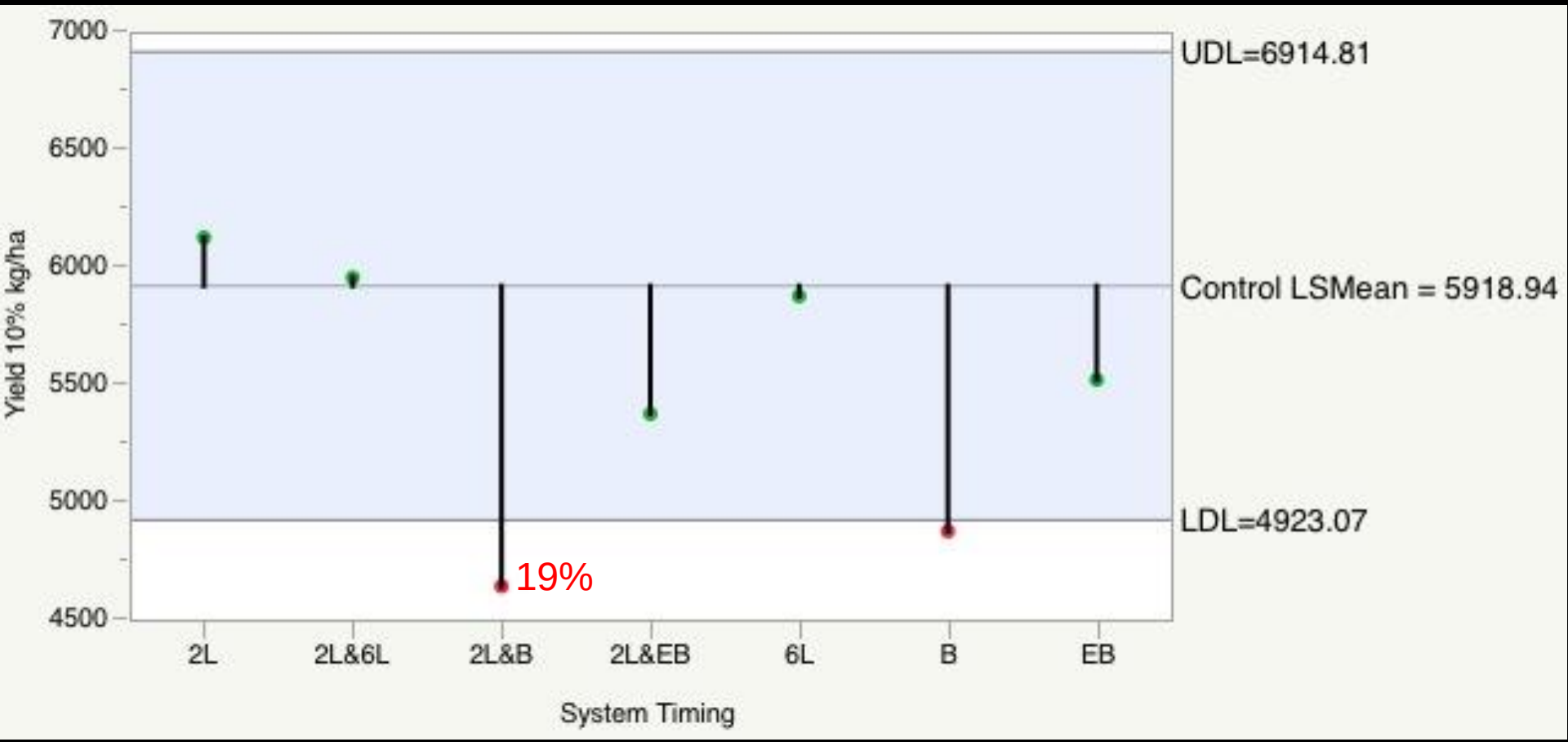
two-leaf (2L), six-leaf (6L) ,bolt (B), early bloom (EB), 2L&6L, 2L&B, 2L&EB

Data Collection

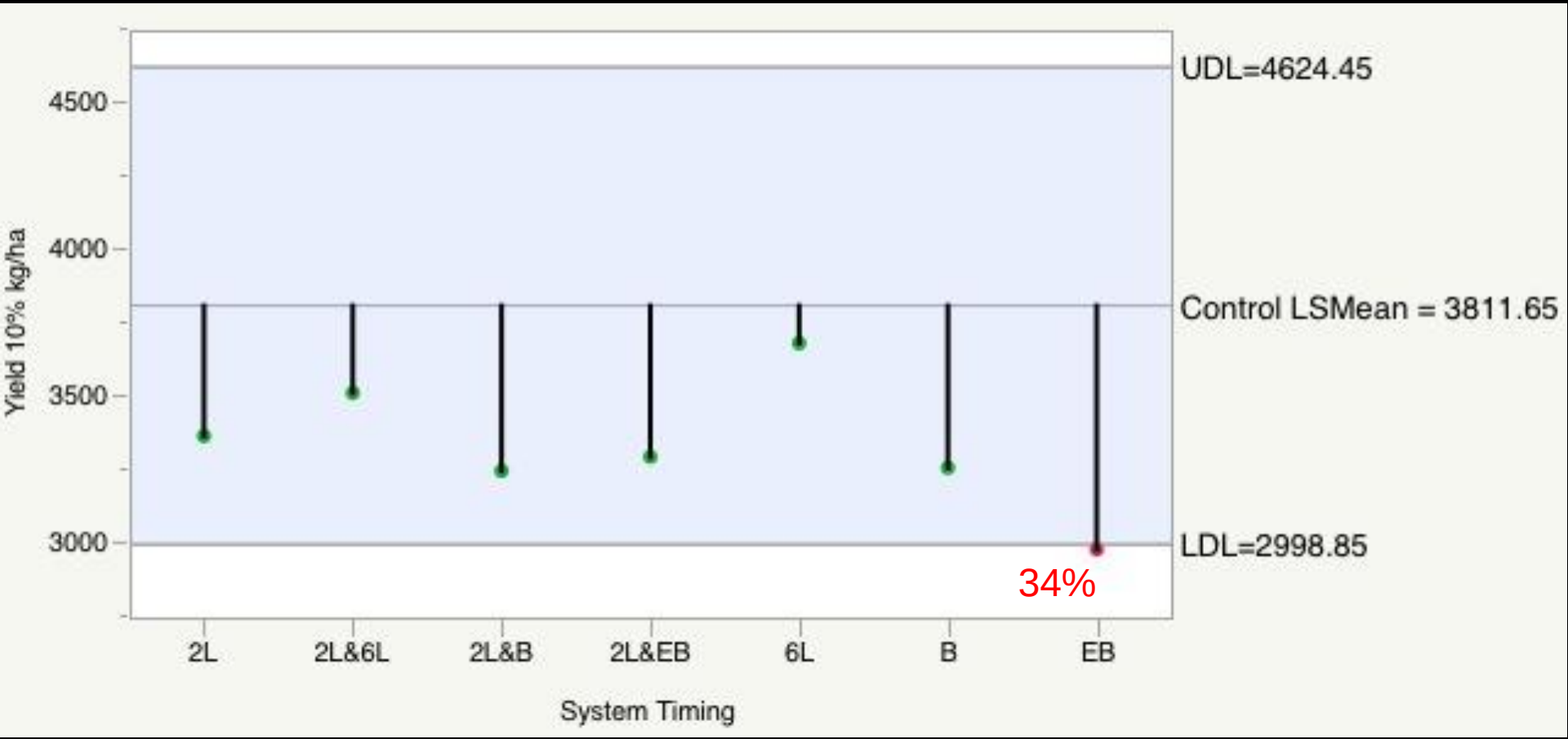
- Yield
- Seeds/Pod
- Aborted Pods
- Thousand-Seed Weight (TSW)

Site-Year	Burnoff (trifluralin)	Seeding	Glyphosate	Insecticide
	g ai ha^{-1}	seeds m^{-2}	g ae	g ai ha^{-1}
Lacombe-2010	1705	150	450	-
Lacombe-2011	1705	150	450	-
Lacome-2012	1705	150	450	Deltamethrin (6.2)
St. Albert-2010	1705	150	450	-
St. Albert-2011	1705	150	450	-
Saskatoon-2012	1705	150	450	-
Lethbridge-2010	1705	150	450	-
Lethbridge-2011	1100	150	450	Lambda-Cyhalothrin (10.1)
Lethbridge-2012	1100	150	450	Lambda-Cyhalothrin (10.1)

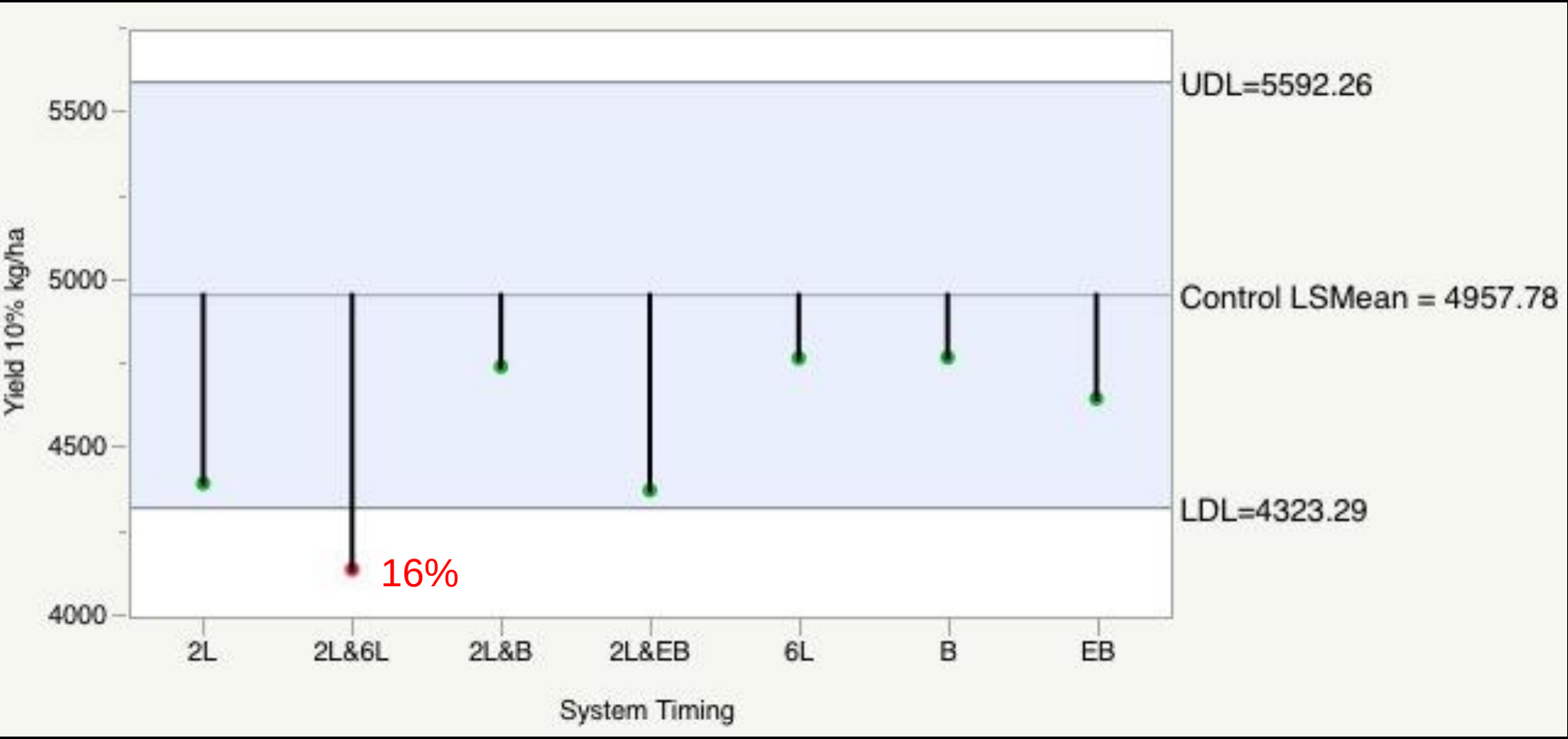
St. Albert 2010 - Yield



Lethbridge 2011 - Yield



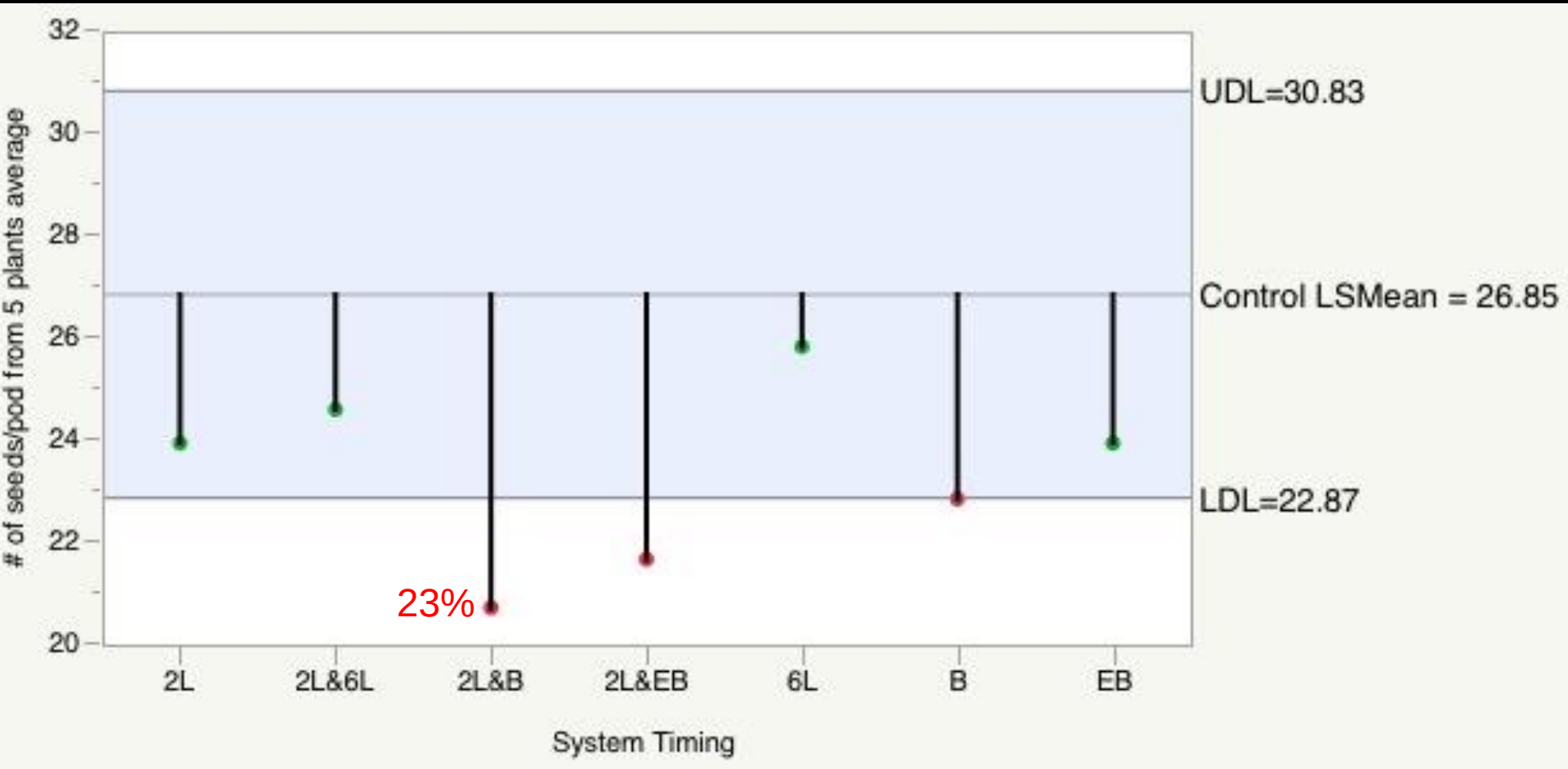
Lethbridge 2012 - Yield



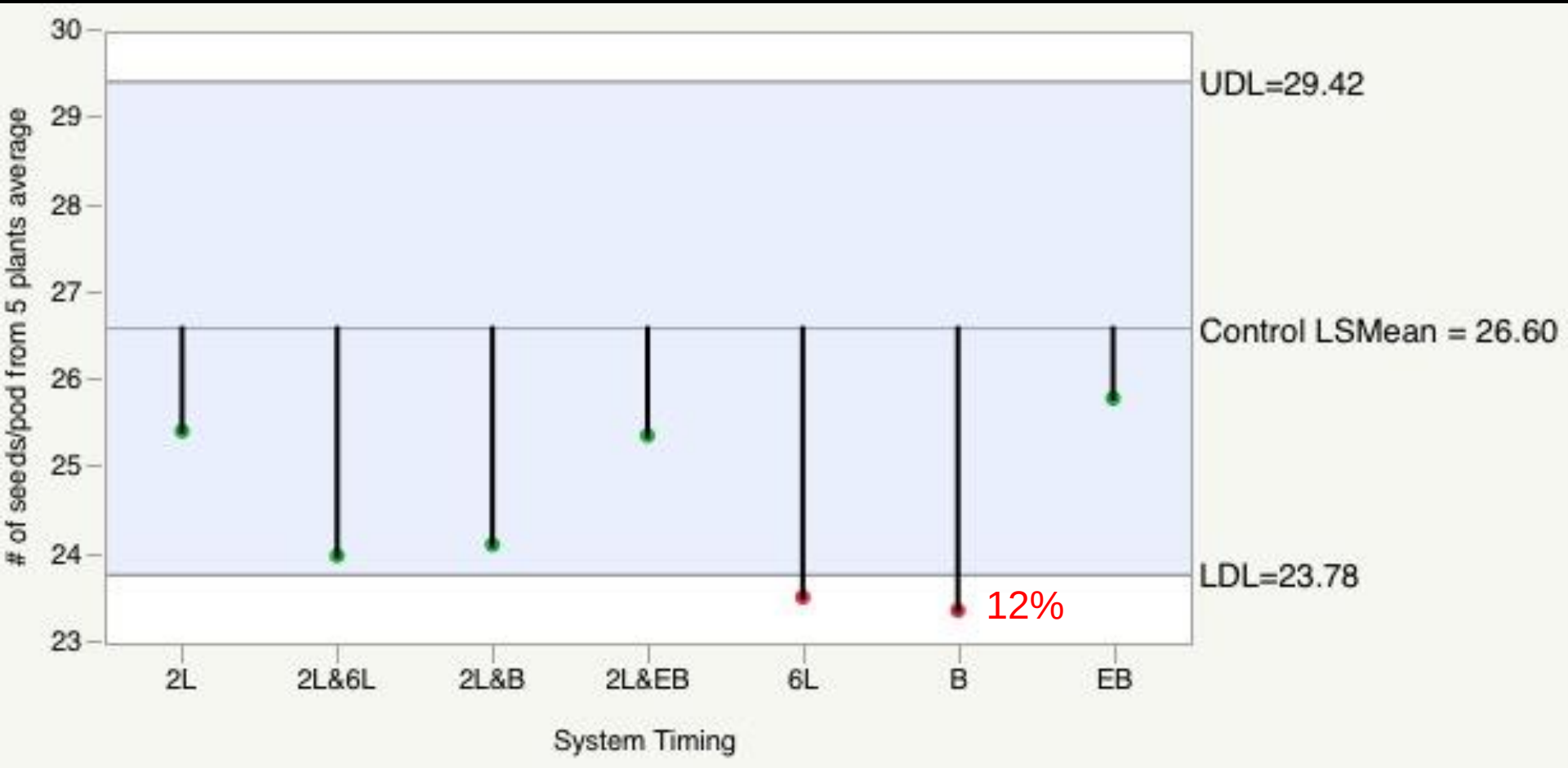
Contrasts - Yield

	St. Albert 2010	Lethbridge 2011	St. Albert 2011	Lethbridge 2012
	kg ha^{-1}			
On Label vs. Control	65.9	-289.4	-276.1	-522*
Off Label vs. Control	-816 *	-614.7 *	-886.1 *	-322.1
Single vs. Double	275.0	-30.1	305.1	226.5
Single-early vs. Control	81.1	-285.6 *	-131.8	-374.4
Single-late vs. Control	-721.4 *	-690.9	-856.1 *	-247
Double-early vs. Control	35.6	-297	-564.9	-817.3*
Double-late vs. control	-910.6 *	-538.6 *	-916.1 *	-397.2

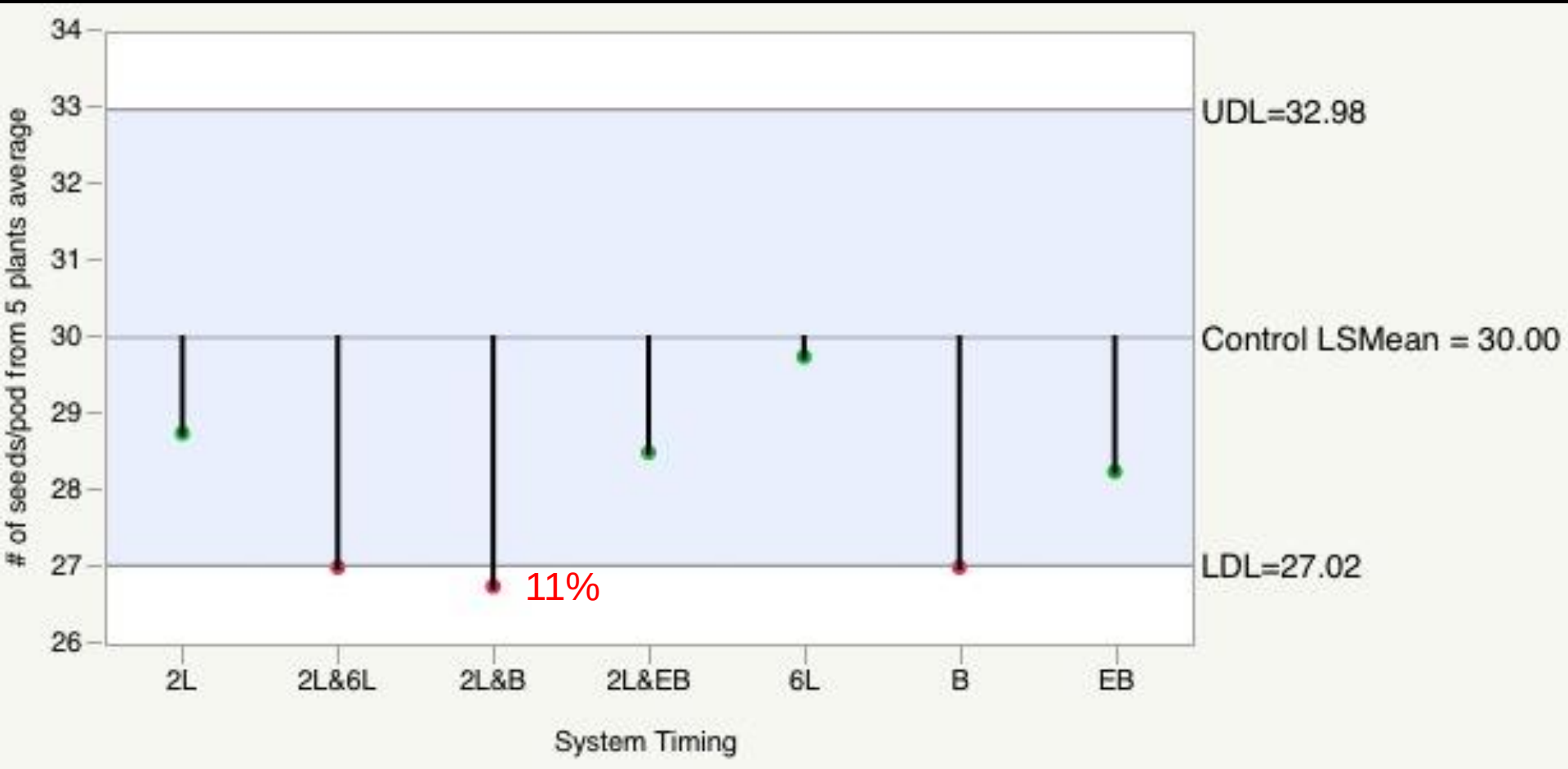
St. Albert 2010 – Seeds/pod



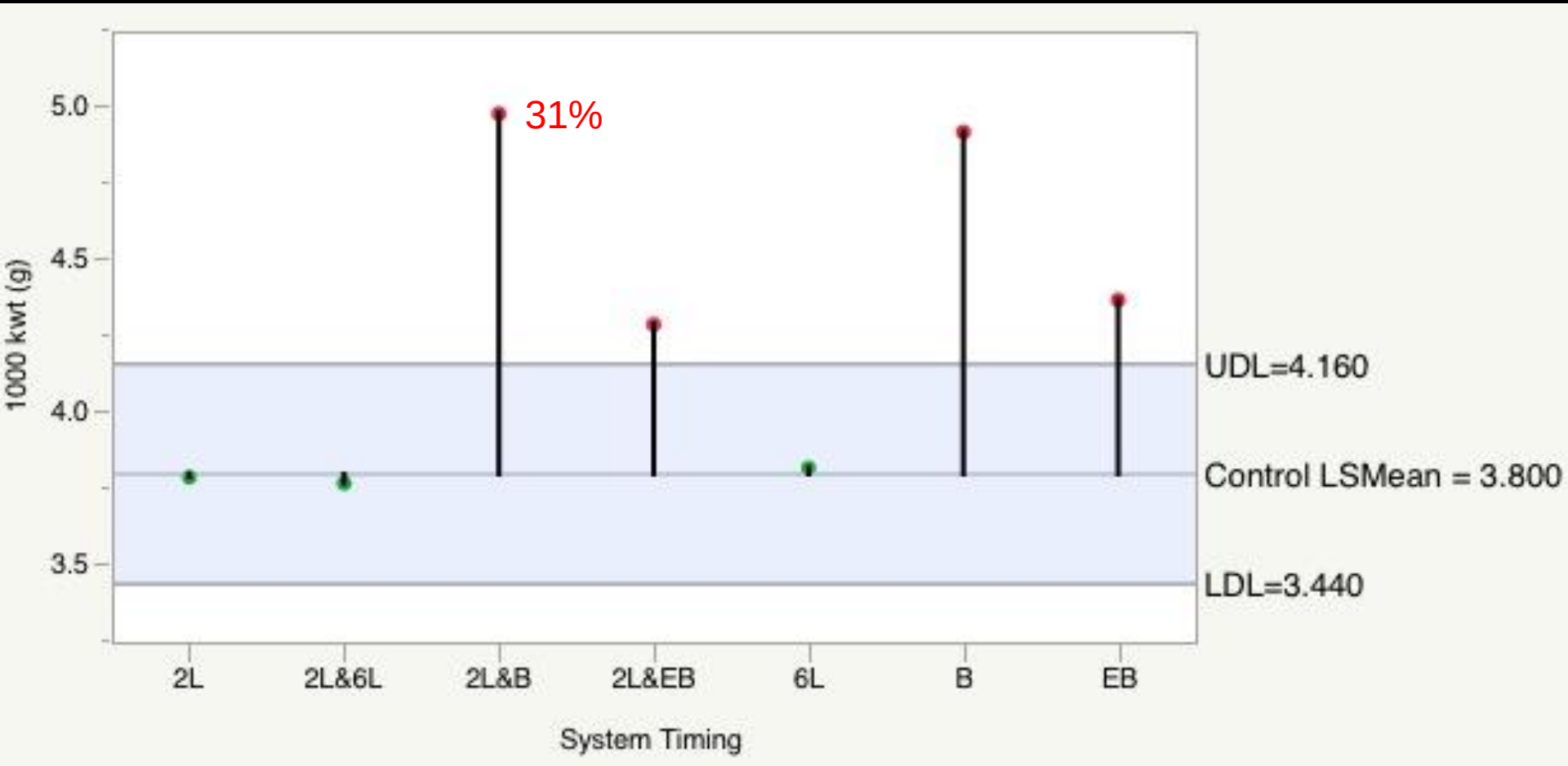
St. Albert 2011 – Seeds/pod



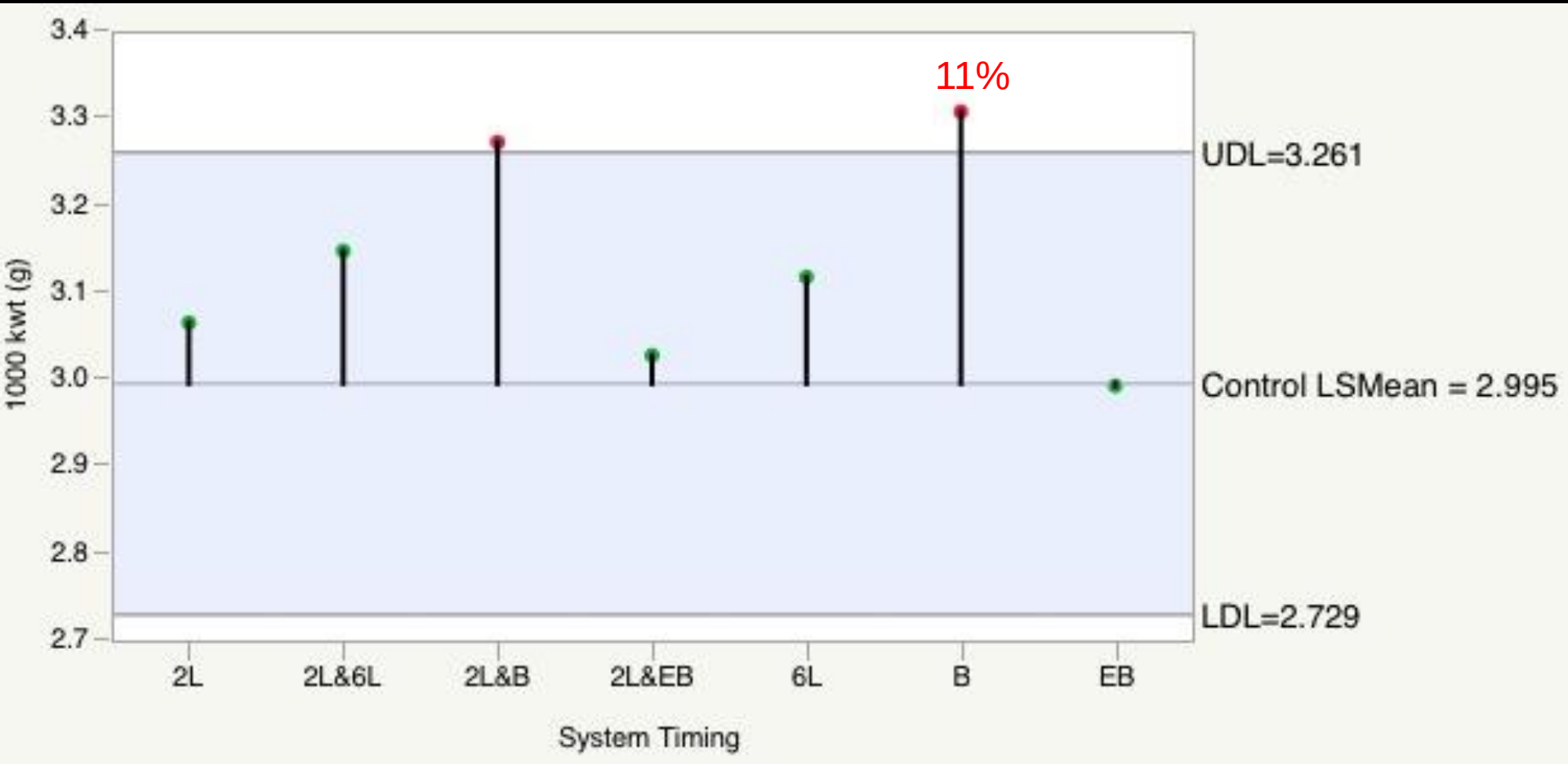
Lethbridge 2011 – Seeds/pod



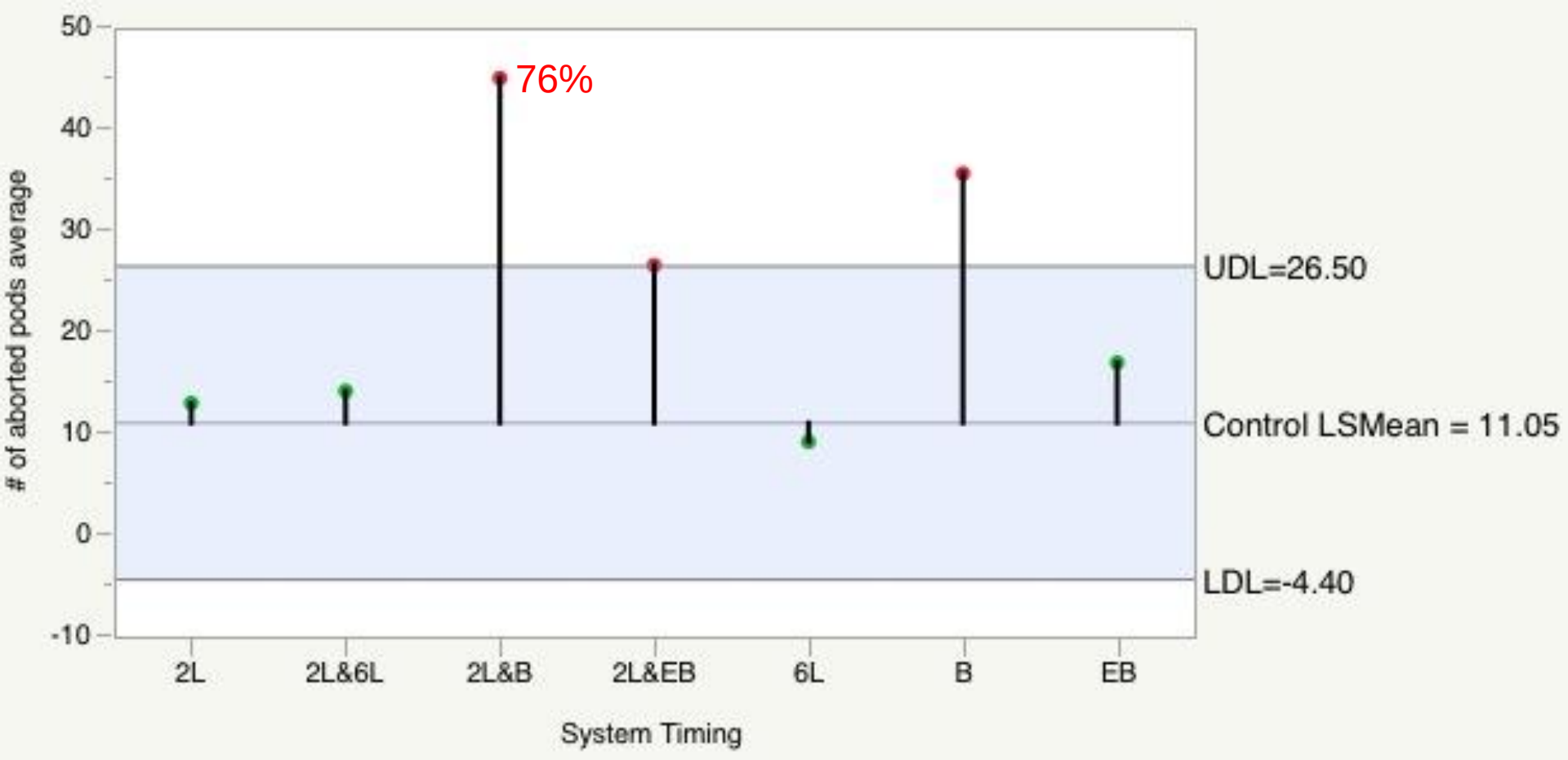
St. Albert 2010 – TSW



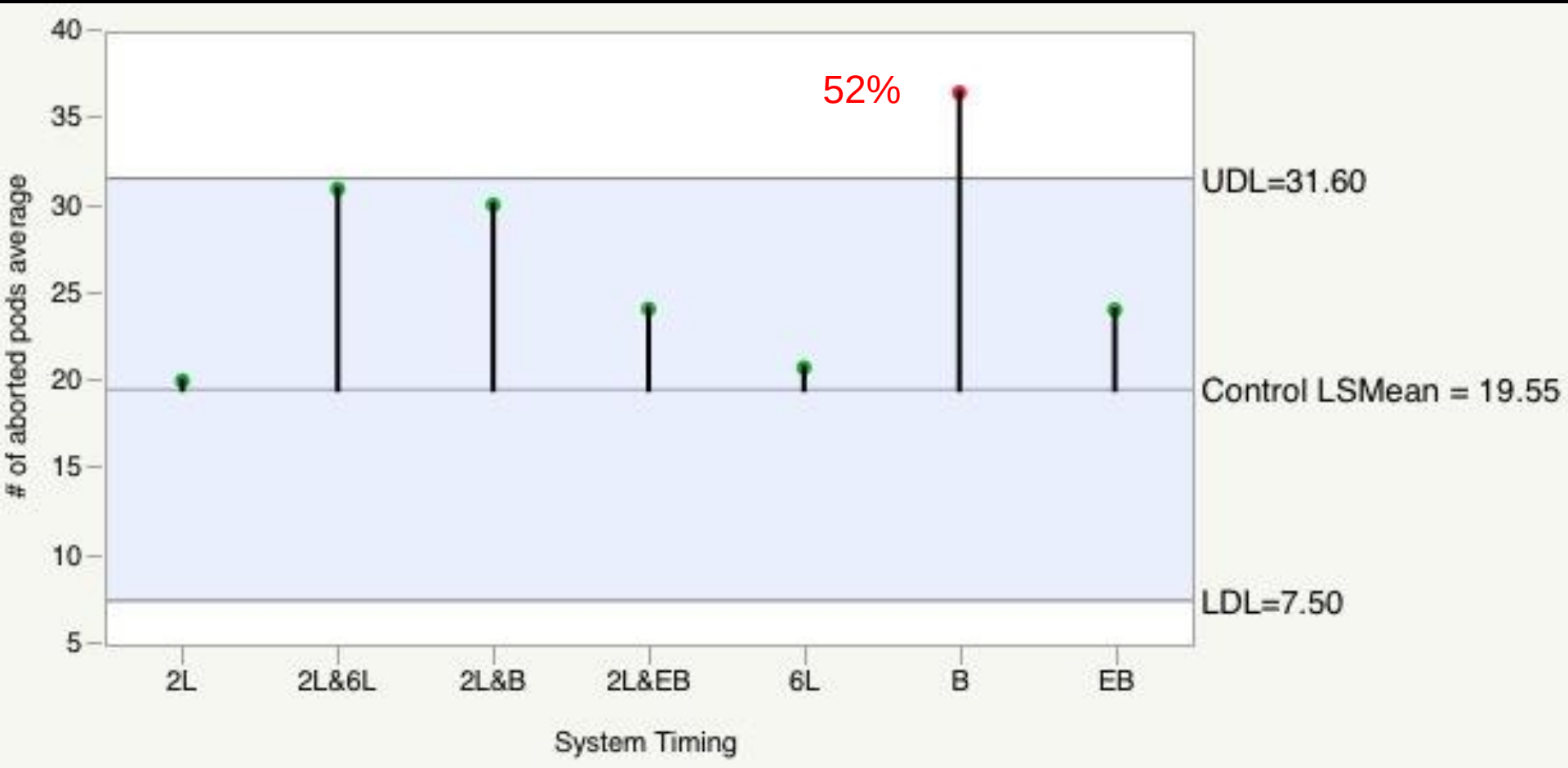
Lethbridge 2011 - TSW



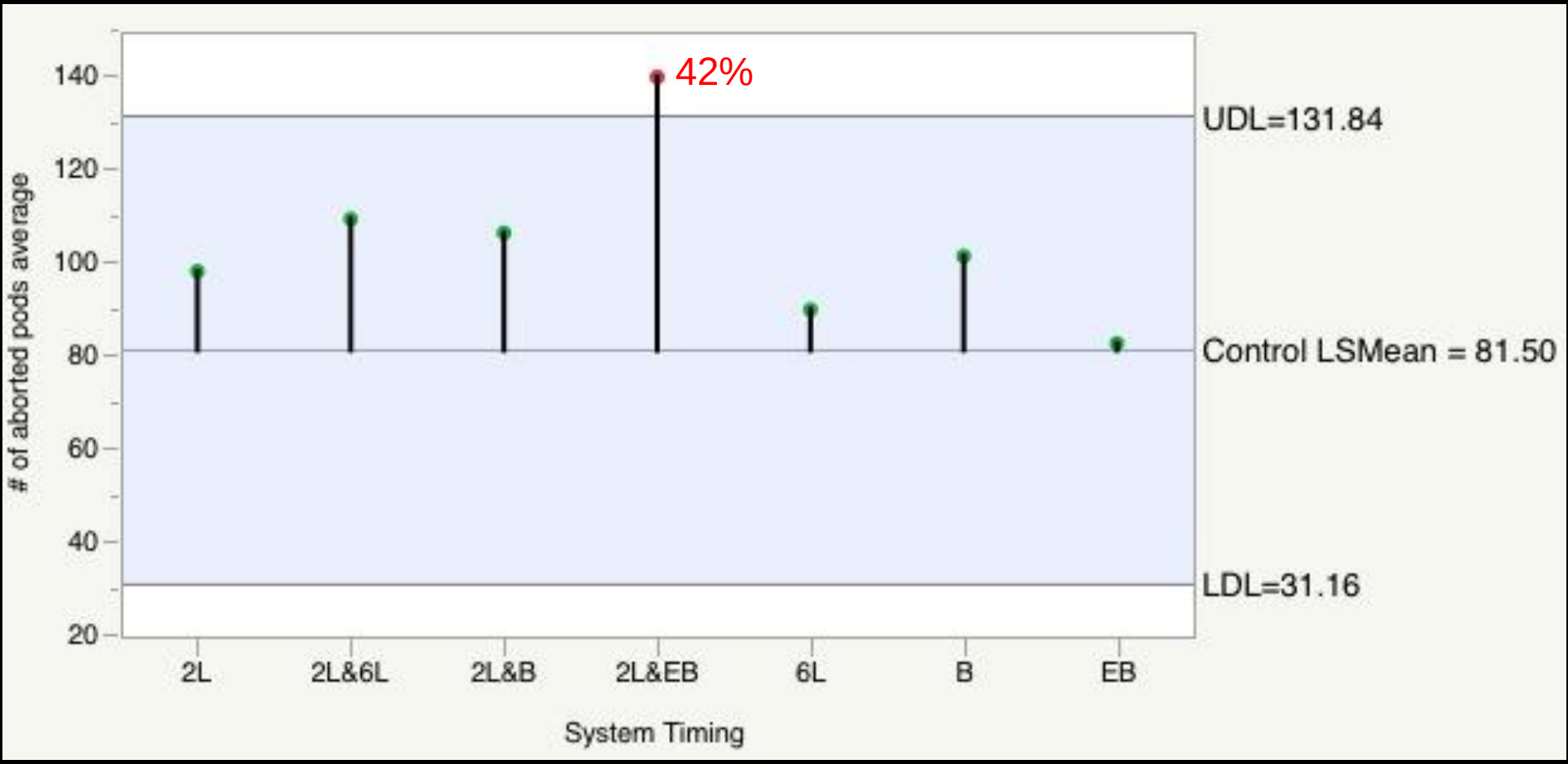
St. Albert 2010 – Aborted Pods



St. Albert 2011 – Aborted Pods



Lethbridge 2012 – Aborted Pods



Discussion

- Stubble (St. Albert, Lethbridge) vs. Fallow (Lacombe, Saskatoon)
- Local Seasonal Weather – site/year differences
- Taco Bell?

Conclusion

- Potential for reduced tolerance in GR canola to late and sequential applications
- Possible significant economic impact (~20bu/ac)
- Important to stay on-label
- Yield effects if late or sequential applications are needed


Thank you!
Captain Canola!