

## Winter barley survivability in Northern Ontario

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In 2021, a trial to test winter barley survivability in Northern Ontario was undertaken at the two northern Ontario research stations, the Ontario Crop Research Centre - New Liskeard and Ontario Crop Research Centre-Emo. Support was also provided by Secan for the trial.

Acreage for winter barley in Ontario is small. The usual target market for winter barley seed is in southwestern Ontario, around the London area. The reason for its limitation in Northern Ontario is unpredictable winter survivability and market opportunities. Elevators largely don't accept this product, therefore it deters growers. The market in Northern Ontario is in the process of being established. However, growers need to be aware that it can be a risky crop. If a grower has had problems growing winter wheat in the past, winter barley will also be a challenge.

There is interest from local growers in winter barley as a potential crop, especially from those tilling land, as it could be an early crop option to allow for harvesting before working the land.

Finding a variety with more consistent winter survivability could provide more cover crop and cropping options for northern growers. Whether it is from the harshness of winter or the freeze-thaw cycle of the spring, barley can be very susceptible to winterkill.

For this trial, observational plots were planted in 2021 to collect data on winter barley survivability in Northern Ontario. Survivability can be an indicator for its success as a potential cover crop in Northern Ontario. Survivability data from the winter barley trials are detailed below, gathered from Kim-Jo Bliss at Emo and Nathan Mountain at New Liskeard.

### Results – Ontario Crops Research Centre - New Liskeard

Test plots were planted following winter wheat. Plots were seeded on August 24, August 31, September 7 and September 13. Fall conditions were ideal, resulting in a good amount of vegetative growth before entering dormancy for winter. One relationship noticed by research teams was that a lighter planting performed better.

The data showed only 12.5% survival of winter barley plots in the spring of 2022. This is compared to an ideal adequate survival rate of 65-75% coverage in the spring.

In the spring of 2022, the New Liskeard plots did have some new growth coming, but not enough for a good result. Test plots differed in maturity. Research did not use winter wheat as a comparison, which would have been a good side-by-side comparison. Survivability of the winter barley trial showed only 65-75% coverage at four plots of the thirty-two planted. The other plots showed varying lower survivability.

Only one eighth, or 12.5%, of the 32 plots survived enough to create a crop or adequate coverage in the spring. All surviving plots were planted in the latest week of the trial, Sept 13<sup>th</sup>.

While vegetative growth prior to the winter dormancy period was adequate, a couple of suggestions as to why poor survivability was observed are either not enough snow cover to insulate the crop, and perhaps mould damage.

While this trial focussed primarily on winter survivability, yield data was also collected. A potential for 7500-7600 kg /ha or over 110 bushels/acre was observed on the surviving plots, which is about average for winter barley.

Overall, only four of thirty-two plots were considered to have survived adequately with 65-75% coverage in spring (see figure 1). These plots were all Ruzena variety, with the latest planting date in week 4 in New Liskeard.

All plots with adequate survivability were planted in the final week – September 14<sup>th</sup>, 2021. Half of those plots planted that week survived (with greater than 50% coverage observed).

New Liskeard Winter Barley Sowing Date 2021-2022												
Ontario Crops Research Centre – New Liskeard												
(NLWBSD21)												
TIER 1			TIER 2			TIER 3			TIER 4			
X1	Guard-Ruzena	% surv	X2	Guard-Ruzena	% surv	X3	Guard-Ruzena	% surv	X4	Guard-Ruzena	% surv	
101	SU Ruzena - W1	10	102	SU Ruzena - W1	10	103	LCS Calypso -W1	10	104	LCS Calypso -W1	20	Aug 24
105	LCS Calypso -W1	10	106	LCS Calypso -W1	15	107	SU Ruzena - W1	5	108	SU Ruzena - W1	10	
201	LCS Calypso -W2	5	202	LCS Calypso -W2	10	203	SU Ruzena - W2	5	204	SU Ruzena - W2	5	Aug 31
205	SU Ruzena - W2	10	206	SU Ruzena - W2	10	207	LCS Calypso -W2	5	208	LCS Calypso -W2	5	
301	SU Ruzena - W3	20	302	LCS Calypso -W3	5	303	SU Ruzena - W3	10	304	LCS Calypso -W3	5	Sep 7
305	LCS Calypso -W3	15	306	SU Ruzena - W3	20	307	SU Ruzena - W3	15	308	LCS Calypso -W3	5	
401	LCS Calypso -W4	35	402	SU Ruzena - W4	75	403	LCS Calypso -W4	20	404	SU Ruzena - W4	65	Sep 13
405	SU Ruzena - W4	75	406	LCS Calypso -W4	40	407	LCS Calypso -W4	35	408	SU Ruzena - W4	70	
Y1	Guard-Ruzena		Y2	Guard-Ruzena		Y3	Guard-Ruzena		Y4	Guard-Ruzena		

### Results - Ontario Crop Research Centre - Emo

20% survival ability of plots into spring

Going into the winter of 2021, it was observed that the plots were well-established. In the spring, however, the plots were not looking well, and weeds were coming up. The plant material looked fine, but the plots were scarce.

Of the 40 plots planted in September of 2021 in Emo, 8 survived enough to harvest in August of 2022. The remaining 32 did not have adequate winter survivability.

All surviving plots Ruzena variety, planted in weeks 2, 3 or 4. All week 1 plantings failed, and all of the Calypso variety plots failed.

Harvest data was taken on the plots that did survive, and the yields were substantially lower in Emo compared to New Liskeard. The winter barley yielded an average of 44.5 bushels/ acre or 2364 kg/ha.

Emo Winter Barley Trail - 2021

Ontario Crops Research Centre - Emo 2021/2022

EWBT21/22

Seeded: Week 1 - September 1, 2021  
 Week 2 - September 12, 2021  
 Week 3 - September 15, 2021  
 Week 4 - September 28, 2021  
 2 Varieties - Ruzena & Calypso

Fertilization: 11-52-0 @ 30kg/ha - August 24, 2021  
 46-0-0 @ 70kg/ha - September 1, 2021  
 20-0-0-24 @ 10 kg/ha - September 1, 2021  
 46-0-0 @ 70 kg/ha - May 17, 2022  
 Buctril M @ 1.0 l/ha

Herbicide:

Rep	Code	Variety	Grain kg/ha	1000 Seed weight (g)	Test Wt. kg/hl	Height (cm)	Days to Head	Days to Mature
1	1	Ruzena Week 2	1647	52.2	48.0	72	169	217
1	5	Ruzena Week 3	2380	55.2	50.6	68	169	217
2	1	Ruzena Week 2	1856	48.1	44.8	60	169	217
2	5	Ruzena Week 3	2815	56.4	53.6	67	169	217
2	7	Ruzena Week 4	4310	48.5	40.6	76	169	217
3	5	Ruzena Week 3	1344	45.2	41.3	68	169	217
3	7	Ruzena Week 4	1874	44.6	45.6	74	169	217
4	7	Ruzena Week 4	1799	48.0	44.2	78	169	217
		Average	2253.1	49.8	46.1	70	169	217

Rep	Code	Variety	Index Grain	Harv Adjusted Grain	Yield bu/acre
1	1	Ruzena Week 2	73	73	31
1	5	Ruzena Week 3	106	106	42
2	1	Ruzena Week 2	82	82	37
2	5	Ruzena Week 3	125	125	47
2	7	Ruzena Week 4	191	191	96
3	5	Ruzena Week 3	60	60	29
3	7	Ruzena Week 4	83	83	37
4	7	Ruzena Week 4	80	80	37

Notes - These are the only plots that we cut. The others were poor and full of grass weeds.

None of the Calypso plots were worth cutting.

They should have been sprayed for grass weeds.

I would have liked to get them in earlier, but interesting to see that none of the Week 1 plots were worth cutting!

Conclusion:

Winter barley as a cover crop would be an unreliable option for a producer as winterkill remains an ongoing concern for northern production. Only 12.5-20% of the plots planted at the two research stations showed survivability into the spring. It is an option for growers, but not likely to be consistently successful each year.

The 2022 data from New Liskeard and Emo would support a recommendation for a later planting date in mid-September with a preference for the Ruzena variety over Calypso for the northern climate.