

# DEVELOPMENT OF HT CAMELINA VARIETIES

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# Project Outcome Oriented Objectives

1. Select the best performing HT line from (SM4 x Calena) for PVP and variety release.
2. Objective 2: Select best HT low erucic acid line for PVP. Advance trait to make better variety.
3. Evaluate 66 advanced lines for second generation HT cultivar release with higher yield?
4. Evaluate 113 large seeded lines for yield, oil content, seed size.
5. Start genetic analysis of oil content vs seed size with graduate student.



# Project Methods

- Genetic background of HT mutation improved first by crossing to Calena and selecting advanced lines.
- Low erucic acid mutation identified by Chaofu Lu, Montana State.
- Large seeded lines advanced by cycles of selection and intermating.
- New breeding populations made by crossing advanced lines HT lines to other germplasm.



Crossing



F<sub>1</sub>s



Early generation plots

# HT cultivar performance averages

	<u>2014 Wilke</u>		<u>2015 Pullman</u>	
	Yield	Oil	Yield	Oil
HT136	303	32.7%	329	34.7%
HT427	304	33.1%	349	34.1%
HT494	280	33.6%	335	35.1%
HT554	318	33.7%	364	34.8%
HT556	293	33.0%	384	33.6%
Blaine Ck.	191	31.2%	289	34.6%
Calina	362	34.5%	311	35.2%
Suneson	255	32.3%	320	36.0%
Midas	-	-	299	33.7%
Acc-19	347	34.1%	378	35.3%
Acc-31	380	33.7%	308	34.8%

# Low Erucic Camelina Lines

<b>Fatty Acid</b>		50-26-1	50-26-18	50-26-26	Calina	Blaine C.	Midas	Suneson
Palmitic Acid	16:0	6.0	5.9	6.1	5.5	5.4	5.5	5.4
Stearic Acid	18:0	3.6	3.4	3.7	2.6	2.5	2.3	2.7
Oleic Acid	18:1	27.5	23.3	25.1	19.9	19.9	18.8	20.0
Linoleic Acid	18:2	23.9	23.4	23.5	20.6	20.3	20.4	22.6
Linolenic Acid	18:3	28.1	33.6	30.8	26.0	28.4	29.7	25.0
Eicosenoic Acid	20:1	7.2	6.7	6.9	14.8	14.4	13.5	14.6
Erucic Acid	22:1	0.40	0.45	0.40	3.40	2.90	2.90	2.70

# Genetic mapping populations completed & grown in one environment

Populations for genetic analysis: Seed size inversely related to oil content?

- SO-1 x SO-2 (High x Low oil) 254 advanced lines
- SO-3 x SO-4 (Big x Small seed) 334 advanced lines



# Outcomes

- Better PNW camelina varieties with lower risk to growers
- New market expansion with low erucic lines
- Better understanding of traits & crop development limitations

