

# Searching unique qualities from old and alien cereals for use in conventional and organic breeding

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# Nutrition Facts in 100 g

100 gr in whole grain wheat flour

Nutrition Facts	
<b>Serving Size</b>	<b>100 g</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>339</b>
<b>% Daily Values*</b>	
<b>Total Fat</b> 1.87g	<b>2%</b>
Saturated Fat 0.322g	<b>2%</b>
<i>Trans</i> Fat -	
Polyunsaturated Fat 0.779g	
Monounsaturated Fat 0.232g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 5mg	<b>0%</b>
<b>Total Carbohydrate</b> 72.57g	<b>26%</b>
Dietary Fiber 12.2g	<b>44%</b>
Sugars 0.41g	
<b>Protein</b> 13.7g	
Vitamin D -	
Calcium 34mg	3%
Iron 3.88mg	22%
Potassium 405mg	9%
Vitamin A 0mcg	0%
Vitamin C 0mg	0%

\* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

100 gr in rice

Nutrition Facts	
<b>Serving Size</b>	<b>100 g</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>129</b>
<b>% Daily Values*</b>	
<b>Total Fat</b> 0.28g	<b>0%</b>
Saturated Fat 0.076g	<b>0%</b>
<i>Trans</i> Fat -	
Polyunsaturated Fat 0.075g	
Monounsaturated Fat 0.087g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 365mg	<b>16%</b>
<b>Total Carbohydrate</b> 27.9g	<b>10%</b>
Dietary Fiber 0.4g	<b>1%</b>
Sugars 0.05g	
<b>Protein</b> 2.66g	
Vitamin D -	
Calcium 10mg	1%
Iron 1.19mg	7%
Potassium 35mg	1%
Vitamin A 0mcg	0%
Vitamin C 0mg	0%

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100 gr in maize

Nutrition Facts	
<b>Serving Size</b>	<b>100 g</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>86</b>
<b>% Daily Values*</b>	
<b>Total Fat</b> 1.18g	<b>2%</b>
Saturated Fat 0.182g	<b>1%</b>
<i>Trans</i> Fat -	
Polyunsaturated Fat 0.559g	
Monounsaturated Fat 0.347g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 15mg	<b>1%</b>
<b>Total Carbohydrate</b> 19.02g	<b>7%</b>
Dietary Fiber 2.7g	<b>10%</b>
Sugars 3.22g	
<b>Protein</b> 3.22g	
Vitamin D -	
Calcium 2mg	0%
Iron 0.52mg	3%
Potassium 270mg	6%
Vitamin A 10mcg	1%
Vitamin C 6.8mg	8%

\* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

100 gr in potato

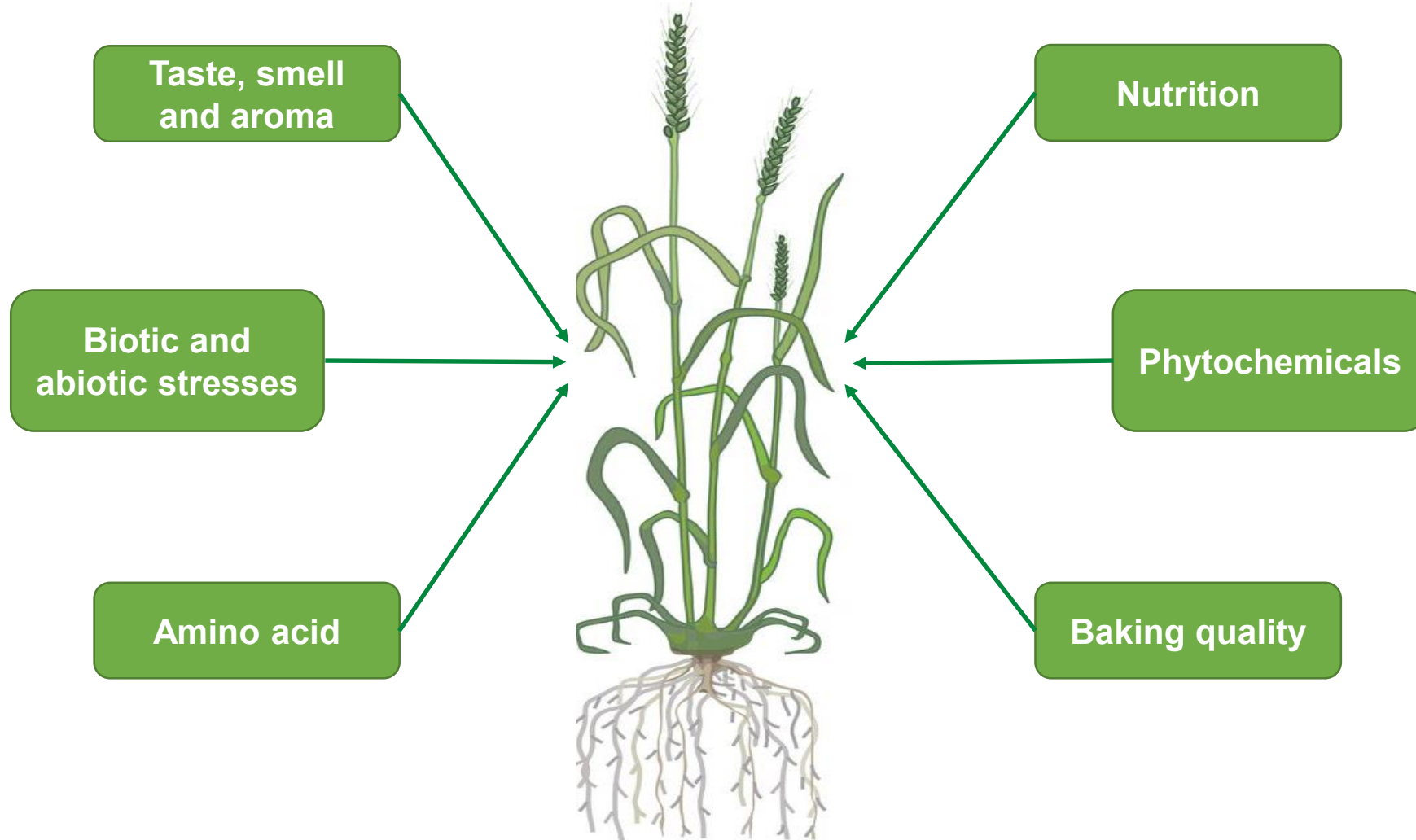
Nutrition Facts	
<b>Serving Size</b>	<b>100 g</b>
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>77</b>
<b>% Daily Values*</b>	
<b>Total Fat</b> 0.09g	<b>0%</b>
Saturated Fat 0.026g	<b>0%</b>
<i>Trans</i> Fat -	
Polyunsaturated Fat 0.043g	
Monounsaturated Fat 0.002g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 6mg	<b>0%</b>
<b>Total Carbohydrate</b> 17.47g	<b>6%</b>
Dietary Fiber 2.2g	<b>8%</b>
Sugars 0.78g	
<b>Protein</b> 2.02g	
Vitamin D -	
Calcium 12mg	1%
Iron 0.78mg	4%
Potassium 421mg	9%
Vitamin A 0mcg	0%
Vitamin C 19.7mg	22%

\* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



# Our long-term goal

Bring novel traits from wild relatives, landraces, ancient and old cultivars into improved bread wheat germplasm for organic and conventional farming



# Plant materials

## Wheat-alien introgression lines

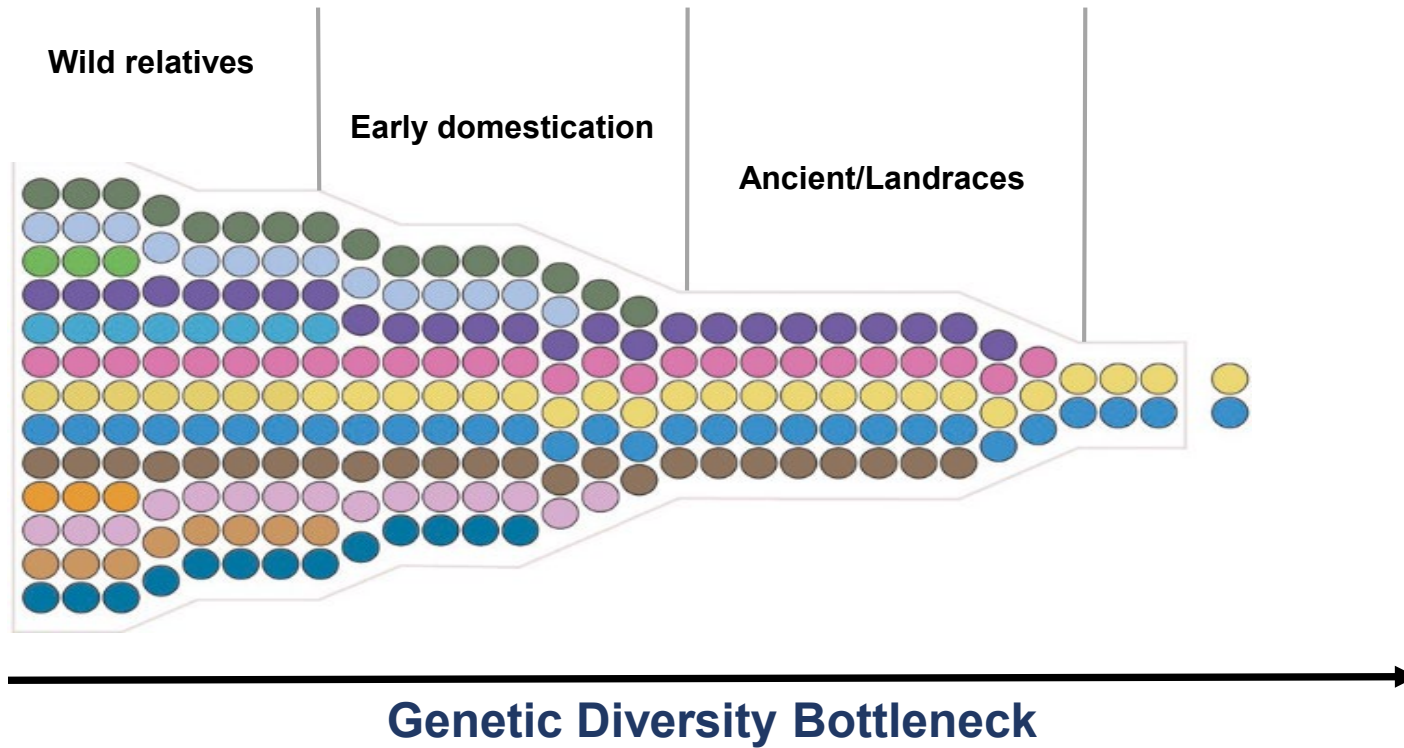
- ✓ Wheat-rye introgression lines
- ✓ Wheat-*Leymus spp.* introgression lines
- ✓ Wheat-*Thinopyrum spp.* introgression lines
- ✓ Wheat-*Aegilops spp.* introgression lines
- ✓ Wheat-Kernza introgression lines

## Ancient wheat, landraces and old cultivars





# Why wild relatives?



**Biotic stress**

**Environmental changes**

**Nutrition**

**Abiotic stress**

**Agronomic**

**End-use qualities**



OrginNo	Chromosome	Protein analyses			Mineral analyses		
		TOTE	TOTU	UPP	Cd mg/kg	Fe mg/kg	Zn mg/kg
Kr 08-10	1R+6R	174061964	52144275	0.43	0.050	46.81	37.35
Kr 08-54	1R/1D	170022962	23578257	0.28	0.075	55.64	39.64
Kr 08-16	1R+6R	163737627	49225634	0.46	0.042	54.16	51.75
Kr 08-57	1R/1D	162573785	29751326	0.33	0.060	60.34	54.67
Kr 08-15	1R+6R	159766273	54828979	0.47	0.053	45.35	38.53
Kr 08-8	1R+6R	159758076	48089833	0.41	0.030	59.71	67.45
Kr 08-55	1R/1D	159303291	30412326	0.34	0.079	95.94	62.33
Kr 08-9	1R+6R	157986720	71583015	0.54	0.068	79.68	134.21
Kr 08-53	1R/1D	153679388	32944504	0.36	0.056	48.21	44.88
Kr 08-30	1R+6R	152794541	33952327	0.27	0.076	141.85	174.10
Kr 08-143	5RS.5AL	152578833	39038461	0.39	0.011	43.44	37.68
Kr 08-63	1R+6R	151622918	43769120	0.45	0.042	39.82	36.26
Kr 08-75	1RS.1BL&2BS.2RL	150490669	52166213	0.50	0.070	46.73	54.39
Kr 08-76	1RS.1BL&2BS.2RL	149897063	48229425	0.52	0.067	50.08	55.06
Kr 08-82	2Rreplaced2B	147266610	50684902	0.58	0.100	44.44	41.26
Kr 08-60	1R+6R	146733965	43702462	0.47	0.057	119.37	170.97
Kr 08-84	2Rreplaced2B	145372132	49522284	0.60	0.061	56.21	86.38
Kr 08-156	1R/1A	144740340	27972061	0.33	0.033	40.75	42.00
Kr 08-52	1R/1D	144725275	36450282	0.40	0.046	112.30	135.09
Kr 08-20	1R+6R	144188696	35867662	0.35	0.067	69.88	75.90
Kr 08-51	1RInversion	143230657	30424168	0.37	0.059	129.19	158.99
Kr 08-155	1BS.1RL	142277887	42289655	0.47	0.033	32.38	29.87
Kr 08-157	2RL	141641109	40998583	0.54	0.038	47.97	46.92
Kr 08-92	1R+2R	141171718	50101049	0.63	0.056	29.52	40.79

# Conclusion

- ✓ 25 best lines selected for field planting in conventional and organic fields = winter lines
- ✓ GBS data obtained, and GWAS in progress



# Acknowledgement



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