

North Dakota State University - Dry Bean Breeding Program
ND Whitetail (ND122386) White Kidney

Attributes:

- Superior seed yield compared to other commercial cultivars
- Excellent seed quality
- Resistance to BCMV (*I* gene)
- Uniform drydown
- Intermediate resistance (tolerance) to Halo Blight (5 in a 1-9 scale)
- Good canning quality (3 in a 1-7 scale)

Limitations:

- Later maturity compared with one commercial cultivar.

ND Whitetail is a white kidney bean cultivar selected from the cross of Beluga/ND061209. Beluga is a white kidney bean cultivar released by Michigan State University (Kelly et al., 1999), and one of the most commonly grown white kidney cultivars in the country. ND061209 is a dark red kidney breeding line from NDSU with superior agronomic performance. It was obtained from a complex cross series (Figure 1) involving other well-known kidney cultivars such as Foxfire, Montcalm, Redhawk, and Red Kloud, among others. It also includes some older breeding lines from NDSU that showed overall superior agronomic performance.

ND Whitetail has a determinate Type I growth habit typical of most kidney cultivars. ND Whitetail has white flowers. Under North Dakota and Minnesota conditions (Tables 1 and 2), ND Whitetail shows higher seed yield across all the trials in which this cultivar has been tested with other white kidney cultivars commonly used in the region. Average days to maturity is 101, plant height is 52 cm, and average 100-seed weight is 49.1 g. ND Whitetail shows intermediate resistance for Halo Blight (Table 2) and white Mold (Table 3). Canning quality is superior to other white kidney cultivars. It also has resistance to BCMV and intermediate resistance to Halo Blight and the root rot complex. Agronomic traits of economic importance such as seed shape/size, maturity, and plant height are within commercial acceptable ranges.

Kelly, J.D., Hosfield, G.L., Varner, G.V., Uebersax, M.A. and Taylor, J., 1999. Registration of 'Beluga' alubia bean. *Crop science*, 39:294-294.

Table 1. Seed Yield (cwt/Acre) of ND Whitetail white kidney bean compared to commercial checks across 14 environments in Minnesota between 2012 and 2018.

Year	Trial†	Location	ND Whitetail	Beluga	Silvercloud	Snowdon	Yeti
Seed Yield (cwt/acre)							
2012	KPYT 3	Park Rapids	20.0	-	-	-	-
2013	KPYT	Park Rapids	15.0	10.1	-	-	-
2014	KAYT-WK	Park Rapids	21.3	7.3	9.2	7.6	-
2014	KAYT-WK	Perham	19.6	8.2	9.1	12.6	-
2015	KAYT-WK	Park Rapids	30.5	23.4	23.3	23.6	-
2015	KAYT-WK	Perham	17.1	14.7	11.6	19.8	-
2015	KVT	Park Rapids	28.5	-	20.3	30.3	28.9
2015	KVT	Perham	17.7	-	9.0	-	-
2016	KVT	Park Rapids	18.9	12.7	-	14.9	14.0
2016	KVT	Perham	14.9	8.8	-	15.3	11.5
2017	KVT	Staples	10.9	10.1	-	13.1	-
2017	KVT	Perham	24.3	16.8	-	19.8	-
2017	KAYT	Michigan	43.2	39.6	-	31.0	-
2018	KVT	Park Rapids	9.0	7.7	-	-	11.0
2018	KVT	Perham	20.4	15.3	-	-	-
Overall Means							
		Mean 11 Common Env.	20.4a	14.6b			
		Mean 6 Common Env.	22.5a		13.8b		
		Mean 9 Common Env.	22.9a			18.8b	
		Mean 4 Common Env.	17.8a				16.4a

Different letters indicate significant differences ($P \leq 0.05$) based on paired t-test.

† KPYP, Kidney Preliminary Yield Trial; KAYT-WK, Kidney Advanced Yield Trial – White Kidney; KVT, Kidney Variety Trial.

Table 2. Other agronomic traits of ND Whitetail white kidney bean compared to commercial checks across 6 environments in Minnesota between 2015 and 2018.

Genotypes	100-seed Weight	Days to Maturity	Plant Height	Canning Score	Halo Blight
	g ± SD	d ± SD	cm ± SD	†1-7 ± SD	‡1-9 ± SD
ND Whitetail	49.1 ± 4.2	101 ± 6	52 ± 7	5.1 ± 1.1	5 ± 1.4
Beluga	47.1 ± 3.9	103 ± 7	53 ± 8	4.1 ± 1.1	9 ± 1.6
Yeti	48.4 ± 1.8	98 ± 4	49 ± 4	-	-
Snowdon	53.0 ± 3.0	90 ± 3	44 ± 4	4.4 ± 1.9	8 ± 1.5

†. Canning quality is a visual score where 1=unacceptable, 2=poor, 3-4=average, 5-6=above average, and 7=Excellent. Data obtained from 4 locations only.

‡. Halo blight (*Pseudomonas syringae* pv. *phaseolicola*) CIAT scale: 1-3=Resistant, 4-6=Intermediate, and 7-9=Susceptible. Data obtained from 2 locations only.

Table 3. White mold (*Sclerotinia sclerotiorum* Lib. De Bary) screening. Greenhouse results from 2017 White Mold National Nursery (WMMN) testing* at five states.

Line	NE	OR	WA	WI	CO	Mean	Grouping
P14814	7.5	8.3	7.9	6.5	7.5	7.6	A
N14229	7.3	7.9	6.3	5.5	7.8	7	A B
B15430	7.6	7	7.8	6.1	6.2	6.9	A B
PT9-5-6	7.5	6.9	6.1	6.3	7.5	6.9	A B C
Beryl	7.2	5.6	7.9	4.3	7.7	6.5	A B C D
SR16-5	7.1	7.6	5.8	4.7	7.2	6.5	A B C D
NDZ14083	7.2	6.6	6.1	4.8	6.4	6.2	B C D E
Cayenne	4.7	5.2	5.9	5.5	6.9	5.7	C D E
Bunsi	6.6	5.1	6.3	4.2	5.8	5.6	D E
ND121630	5.8	3.2	6.1	4	6.8	5.2	E F
ND Whitetail	4.4	5.3	3.8	3.5	4	4.2	F G
G122	5.2	2.8	3.8	4	4.6	4.1	F G
NE5-16-101	3.5	2.7	2.4	3.3	5.1	3.4	G
NE5-16-98	4	3.1	2.8	3.3	3	3.2	G

*Petzoldt & Dickson scale: 1-3 = resistant, 4-6 = intermediate, 7-9 = susceptible. Source: Higgins, R., Z. N. Kamvar, S.E. Everhart and J.R. Steadman. 2018. New sources of white mold resistance derived from wide crosses in common bean and evaluated in the greenhouse and field using multi-site screening nurseries comparing 2016 and 2017 data. Annu. Rept. Bean Improv. Coop. 61:157.158.