



APPLICATIONS UNDER EXAMINATION

BEAN

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(*Phaseolus vulgaris*)

Proposed denomination: 'ND Palomino'
Application number: 20-10190
Application date: 2020/05/05
Applicant: North Dakota State University Research Foundation, Fargo, North Dakota, United States of America
United States of America, as represented by the Secretary of Agriculture, Washington, District of Columbia, United States of America
Agent in Canada: Canterra Seeds, Winnipeg, Manitoba
Breeder: Juan M. Osorno, NDSU Research Foundation, Fargo, North Dakota, United States of America
Philip Miklas, USDA-Agricultural Research Service, Prosser, Washington, United States of America

Varieties used for comparison: 'Windbreaker' and 'CDC WM-2'

Summary: *The plants of 'ND Palomino' are taller than those of both reference varieties. At full flowering, the upper side of the leaf for 'ND Palomino' has medium rugosity whereas that of 'Windbreaker' has weak rugosity. The terminal leaflet for 'ND Palomino' is medium sized while that of 'CDC WM-2' is small. At fresh market maturity, the pod of 'ND Palomino' is shorter than that of both reference varieties. The pod of 'ND Palomino' is narrower than that of 'Windbreaker' and wider than that of 'CDC WM-2'. The degree of curvature for the pod of 'ND Palomino' is medium whereas it is weak for that of 'Windbreaker'. The pod beak for 'ND Palomino' is longer than that of 'Windbreaker' and shorter than that of 'CDC WM-2'. The secondary colour of the pod for 'ND Palomino' is closest to red while that of 'Windbreaker' is pink and that of 'CDC WM-2' is violet. The seed weight for 'ND Palomino' is medium whereas it is high for that of 'Windbreaker'. The time of flowering of 'ND Palomino' occurs very late in the season while it occurs early in the season for the reference varieties.*

Description:

PLANT: absent or very weak intensity of anthocyanin colouration of hypocotyl, dwarf growth type, indeterminate growth type

LEAF: medium green on upper side, medium rugosity

TERMINAL LEAFLET: medium sized, triangular to circular shape, medium length tip

FLOWERING: flowers very late season

FLOWER: white standard and wing

POD: cordate shape in cross-section, small thickness to width ratio, green ground colour of medium intensity, red secondary colour, stringiness of ventral suture absent, medium degree of curvature, convex curvature shape, acute distal part with beak excluded, weak curvature of beak, smooth or slightly rough surface, absent or very weak pod constrictions

SEED: pinto type, medium seed weight, rectangular shape in longitudinal section, medium elliptic shape in cross-section, medium width in cross-section, medium length

SEED COAT: two colours, white, secondary colour brown mottled pattern on entire grain

Origin and Breeding: 'ND Palomino' originated from a controlled cross conducted in the winter of 2008 in a greenhouse in Prosser, Washington, USA between 'Sante Fe' and the breeding line PSO8-103. From 2009 to 2011, plants were grown and advanced using single seed descent and plantings alternated between a greenhouse in Prosser, Washington and a field in Othello, Washington to develop a recombinant inbred line population. In the summer of 2011, one F7 line was designated SF103-8 and advanced based on plant architecture, seed quality and yield potential. From 2012 to 2015, multi-location yield testing, greenhouse disease evaluations and canning quality tests occurred across 22 environments in North Dakota, USA. From 2013 to 2014, breeder seed increases occurred in New Zealand and Washington, Wyoming and Idaho, USA.

Tests and Trials: The comparative trial for 'ND Palomino' was conducted during the 2022 growing season at Canterra Seeds in Portage la Prairie, Manitoba. The trial was conducted using a RCB design containing 3 replicates per variety. Each replicate consisted of 5 rows spaced 30 cm apart, with a row length of 5 metres. Each plot was 7.1 metres squared with a total of approximately 255 plants per variety. Measured characteristics were based on 20 measurements per variety. Mean differences were significant at the 5% probability level based on a paired Student's t-test. Results were supported by the official technical examination report 201700085, purchased from the Plant Variety Protection Office in Beltsville, Maryland, USA.

Comparison table for 'ND Palomino'

	'ND Palomino'	'Windbreaker'*	'CDC WM-2'*
<i>Plant height (cm)</i>			
mean	87.8	75.2	61.5
std. deviation	2.50	4.15	2.46
<i>Pod length (cm)</i>			
mean	13.9	14.4	15.2
std. deviation	0.62	0.58	0.79
<i>Pod width (cm)</i>			
mean	1.40	1.51	1.17
std. deviation	0.07	0.06	0.05
<i>Pod beak length (cm)</i>			
mean	12.6	11.0	14.2
std. deviation	0.49	0.77	0.68

*reference varieties



Bean: 'ND Palomino' (left) with reference variety 'Windbreaker' (right)



Bean: 'ND Palomino' (left) with reference varieties 'Windbreaker' (center) and 'CDC WM-2' (right)



Bean: 'ND Palomino' (left) with reference variety 'Windbreaker' (right)