## REGISTRATION OF CROSBY DURUM WHEAT[1]

(Reg. No. 559)

J. S. Quick, D. E. Walsh, K. L. Lebsock, and J. D. Miller[2]

'CROSBY' (*Triticum turgidum* L. var. *durum*), CI 17282, is a spring durum wheat developed cooperatively by the North Dakota Agric. Exp. Stn. and ARS, USDA. It was selected from the cross 'Langdon'*2/St464//'Leeds'. Langdon and Leeds were important North Dakota durum cultivars and St 464 (CI 13160) is a source of stem rust resistance from Ethiopia. The final cross was made in 1963 to combine stem rust resistance with early maturity, reduced height, and excellent spaghetti quality. Crosby was bulked in the $F_5$ generation as a single $F_4$ derived line and first entered in preliminary yield trials in 1968 as selection D6715. It has been tested in the Uniform Regional Durum Nursery (URDN) since 1970, and in North Dakota drill trips since 1971.

Crosby has midtall, strong, white culms that may show purplish coloration under some conditions. The spike is awned (dehisce at maturity), oblong, dense, and erect. The glumes are glabrous, yellow, midlong to long, and midwide; the glume shoulders are narrow and elevated; and the beaks wide, acuminate and 3 to 4 mm long. The awns are yellow and 6 to 16 cm long. The kernels are amber, hard, midlong, and elliptical; the germ midsized; the crease midwide and shallow; the cheeks angular to rounded; and the brush very short (essentially none).

In 40 URDN tests during 1970-73 in North Dakota, South Dakota, Minnesota, Montana, and Manitoba, Crosby produced 14% higher grain yield than Leeds and 3% higher than 'Ward.' Crosby was similar to Leeds in height, maturity, lodging, and disease reactions. Crosby had slightly higher kernel weight and slightly lower test weight than Leeds. Crosby appears to be better adapted than Ward to the fringe of the traditional durum area in North Dakota and adjacent states. The overall quality characteristics of Crosby were satisfactory in 3 years of drill strip tests in North Dakota. Spaghetti color was higher than that of Leeds and 'Rolette' and equal to that of Ward. Milling, processing, and cooking properties of Crosby were satisfactory.

Crosby was named and released by the North Dakota Agric. Exp. Stn. and the ARS, USDA, December 27, 1973. Breeder seed will be maintained by the Seedstocks Project, North Dakota Agric. Exp. Stn., Fargo, ND 58102. The National Small Grain Variety Review Board has approved Crosby for certification.

Crosby is described further in North Dakota Farm Research.[3]

[1] Registered by the Crop Sci. Soc. of Am. Published with approval of the director, North Dakota Agric. Exp. Stn., Fargo, N.D., as Paper No. 529A. Received 10 Nov. 1975.

[2] Associate professor, Agronomy Dep. and associate professor, Cereal Chemistry and Technology Dep., North Dakota State Univ.; assistant area director, ARS, USDA, St. Paul, Minn., and plant pathologist, ARS, USDA, Fargo, N.D.

[3] Quick, J. S., D. E. Walsh, K. L. Lebsock, and J. D. Miller. 1974. Three new durum varieties — Crosby, Botno, and Rugby. North Dakota Farm Research 31:10-15.

# *Registration of Germplasms*

## REGISTRATION OF A MULTIPLE-PEST RESISTANT ALFALFA GERMPLASM[1]

(Reg. No. GP 51)

R. N. Peaden, O. J. Hunt, L. R. Faulkner, G. D. Griffin, H. J. Jensen, and E. H. Stanford[2]

'NEVADA Synthetic XX' Alfalfa (*Medicago sativa* L.) was developed cooperatively by the ARS, USDA, and the Nevada, California, Oregon, Utah, and Washington Agric. Exp. Stns. The Syn 2 generation was released as germplasm to scientists in January 1975.

This experimental germplasm was released for source material for development of multiple pest-resistant cultivars, for materials useful in studies of effects of root-knot nematodes on alfalfa production, and for use in testing the feasibility of using a completely resistant crop in a rotation to reduce root-knot nematode populations.

Nevada Synthetic XX was developed by backcrossing Northern root-knot nematode (*Meloidogyne hapla* Chitwood) -resistant clones M-7 and 1-167 (selected from Vernal) to clones C952, C949, C951, C954, C953 (all parents of 'Washoe'), C89 (a parent of 'Lahontan'), Nevada 759, and a pea aphid [*Acyrthosiphom pisum* (Harris)]-resistant clone (PAR). Both donor parents were simplex for the *M. hapla* resistance gene. Test crosses to root-knot nematode-susceptible tester clones were utilized during backcrossing to identify the genotypes of the resistant progeny[3]. Screening for resistance to *M. hapla* was done with three regional collections of nematodes from Oregon, Washington, and Utah. Nevada Synthetic XX Syn 1, was an intercross of 25 $S_1$ clones that were either triplex or quadruplex for the single tetrasomic gene that confers *M. hapla resistance*[4]. The Syn 2 generation was grown under strict isolation at Reno, Nevada.

Nevada Synthetic XX, Syn 2, was highly resistant to three regional collections of the Northern root-knot nematode in greenhouse tests at Reno, Nevada, and Prosser, Washington. Nevada Syn XX plants showed no galling with any of the regional nematode collections, whereas plants in the susceptible cultivar Lahontan were all heavily galled. At Manteca, California, where *M. hapla* and other nematode species were prevalent, Nevada Syn XX had the highest stand density of 34 cultivars after 2 years of production. Stands of many entries were virtually eliminated.

A test for plant survival under severe spotted alfalfa aphid (*Therioaphis maculata* (Buckton)) infestation at Tucson, Arizona, showed 76% and 68% of Nevada Syn XX plants surviving Ent A and Ent F biotypes, respectively, compared to 85% and 84% of Washoe plants. Survival of Nevada Syn XX under pea aphid infestation was 87% compared to 65% in the resistant variety Washoe. Resistance to stem nematode (*Ditylenchus dipsaci* (Kühn) Filipjev) at Reno, Nevada was 71% in Nevada Syn XX, compared to 74% in the resistant variety Lahontan. Tests for resistance to bacterial wilt (*Corynebacterium insidiosum* (McCull) H. L. Jens) and Phytophthora root-rot (*Phytophthora megasperma* Drechs.) were conducted at the Univ. of Minnesota. Although Nevada Syn XX originated from Vernal and Washoe parentage, it had an average bacterial wilt severity index of 3.57 (0 = no symptoms; 5 = plant dead), compared to 4.30, 2.71, and 2.14, respectively, for 'Narragansett', 'Ranger', and Vernal. Phytophthora root-rot resistance was high in Nevada Syn XX, with an average severity index of 2.70 (1 = no symptoms; 5 = plant dead), compared to 4.07, 3.83, and 2.61, respectively, for 'Saranac', Vernal, and 'Agate'.

Forage yield of Nevada Syn XX at Reno, Nevada, the year after establishment was similar to that of the recurrent parent Washoe and higher than that of Vernal. Forage yield of related populations has also been very high, especially in nematode-infested soils.

Seed stocks of Nevada Synthetic XX, Syn 2, are maintained by the ARS, P.O. Box 8858, Univ. Station, Reno, NV 89507. Up to 6 g seed will be sent to alfalfa scientists on request.

[1] Registered by Crop Sci. Soc. of Am. Received 28 Oct. 1975.

[2] Research agronomist, ARS, USDA, Prosser, WA 99350 (formerly Reno); Research agronomist, ARS, USDA, Reno, NV 89507; head, Dep. of Plant Pathology, Kansas State Univ., Manhattan, KA 66504 (formerly plant pathologist, Washington State Univ., Prosser,); research plant nematologist, ARS, USDA, Logan, UT 84322; professor of nematology, Oregon State Univ., Corvallis, OR 97331; and professor of agronomy, Univ. of California, Davis, CA 95616, respectively.

## REFERENCES

1. B. P. Goplen, and E. H. Stanford. 1960. Autotetraploidy and linkage in alfalfa—A study of resistance to two species of root-knot nematodes. Agron. J. 52:337-342.
2. O. J. Hunt, R. N. Peaden, L. R. Faulkner, G. D. Griffin, and H. J. Jensen. 1969. Development of resistance to root-knot nematode (*Meloidogyne hapla* Chitwood) in alfalfa (*Medicago sativa* L.). Crop Sci. 9:624-627.


## REGISTRATION OF 74SN3, 74SN4, AND 74SN5 PEA GERMPLASM[1]

**(Reg. No. GP 15 to GP 17)**

**J. M. Kraft and R. A. Giles[2]**

THREE small-sieved canner breeding lines of peas (*Pisum sativum* L.) were released by ARS and the College of Agric., Washington State Univ., Pullman, in 1975. Each line combines resistance to races 1, 2, and 5 of *Fusarium oxysporum* Schlecht f. sp. *pisi* (van Hall) Snyd. & Hans.; and all three lines are resistant to a new strain of wilt capable of destroying pea varieties resistant to race 5.

The parentage of '74SN3' (Reg. No. GP 15) is {691005 × [('Small Sieve Freezer' × C-165) $F_3$ × ('Early Perfection 3040' × C-165) $F_3$] $F_6$}$F_7$. The parent, 691005,[4] is a selection of PI 210568' and is resistant to race 5. Small Sieve Freezer is a variety of Rogers Brothers Seed Company, C-165 is a Univ. of Wisconsin breeding line, and Early Perfection 3040 is a variety of Canners Sed Corporation. 74SN3 has a mixture of dimpled and smooth green seed. It will bloom at the 12th to 14th nodes and sets single and double pods. This line is segregating for resistance to race 2. In addition, in repeated greenhouse and field trials, this line has shown more resistance to the pea root rot complex of eastern Washington[3] than has 'Dark Skin Perfection'.

The parentage of '74SN4' (Reg. No. GP 16) is {691004 × [(Small Sieve Freezer × C-165) $F_3$ × (Early Perfection 3040 × C-165) $F_3$]$F_6$}$F_7$. The parent, 691004,[4] is a selection of PI 203066 and is resistant to race 5. 74SN4 has smooth green seeds. It blooms at the 12th to 14th nodes and sets single and double pods. This line is less resistant to the root rot complex than 74SN3 or '74SN5.'

The parentage of 74SN5 (Reg. No. GP 17) is [(Small Sieve Freezer × C-165) $F_3$ × (Early Perfection 3040 × C-165) $F_3$] $F_6$ × 691004] $F_7$. 74SN5 has smooth green seeds, blooms at the 12th to 14th nodes and sets single and double pods. In addition, this line is more resistant to the root rot complex of eastern Washington than is Dark Skin Perfection.

Small amounts of seed of these selections can be obtained from J. M. Kraft, USDA Vegetable Crops Production Investigations, Irrigated Agric. Res. and Ext. Center, Prosser, WA 99350.

[1] Registered by the Crop Sci. Soc. of Am. Information Paper, College of Agric. Res. Center, Washington State Univ., Pullman. Cooperative investigations of ARS, USDA, Prosser, Wash., and the Washington State Univ., Pullman. Received 28 Oct. 1975.

[2] Plant pathologist and research technician, respectively, ARS, USDA, Irrigated Agric. Res. and Ext. Center, Prosser, Wash.

[3] Kraft, J. M. and D. D. Roberts. 1969. Influence of soil water and temperature on the pea root rot complex caused by *Pythium ultimum* and *Fusarium solani* f. sp. *pisi*. Phytopathology 59:149-152.

[4] Selections made by W. A. Haglund, plant pathologist, N.W.W.R.E.C., Mt. Vernon, Wash.

## REGISTRATION OF VIRGINIA SYNTHETIC NUMBER 10 BIRDSFOOT TREFOIL GERMPLASM[1]

**(Reg. No. GP 4)**

**John D. Miller[2]**

'VIRGINIA Synthetic Number 10' germplasm pool of birdsfoot trefoil (*Lotus corniculatus* L.) was constituted when five clones were intercrossed, four of which were selected in Virginia. One clones each was selected for vigor and persistence from 'PI 157531' (Italy), 'PI 188556' (Yugoslavia), and 'PI 230190' (Denmark). One clone was obtained from 'Viking' and one was provided by P. R. Henson, ARS, Beltsville, Maryland. Clones were intercrossed and seed were composited to produce the synthetic.

Virginia Synthetic Number 10 is early and semi-erect, with disease tolerance equal or superior to that of Viking and 'Dawn'. Organisms associated with this disease complex were *Rhizoctonia solani*, *Fusarium* spp., *Leptodiscus terrestris*, and *Mycoleptodiscus* spp. This synthetic has yielded and persisted well under hay and pasture management when grown with several grasses in Virginia, but has not been extensively tested in other states.

The parental clones and seed production nurseries will be maintained by ARS at Blacksburg, Virginia. Up to 10 g of seed will be provided to forage-crop breeders on written request to the author at the Agronomy Department, Virginia Polytechnic Institute and State Univ., Blacksburg, VA 24061.

[1] Registered by the Crop Sci. Soc. of Am. Cooperative investigations of the Research Div., Virginia Polytechnic Institute and State Univ., and ARS, USDA, Blacksburg, VA 24061. Received 24 Oct. 1975.

[2] Research Agronomist, ARS, USDA, Blacksburg, VA 24061.