Registration of ‘Garnet’ Spring Rapeseed

‘Garnet’ spring rapeseed [Brassica napus L. subsp. oleifera (Metzg.) Sinskaya f. annua] (Reg. no. CV-17, PI 597355) was developed for use as an industrial oil-quality cultivar by the Idaho Agricultural Experiment Station.

Garnet is a near pure-line spring rapeseed cultivar with high erucic acid content in the seed oil and canola-quality seed meal. Garnet was selected for adaptability to environmental conditions of the Pacific Northwest region (Idaho, Oregon, Washington, and Montana). The cultivar was developed from a single plant selected in 1994 from an F4 population derived from the cross ‘DNK.89.213’/‘Hero’. DNK.89.213 has low erucic acid content (40 g kg⁻¹) and <30 µmol g⁻¹ of total glucosinolate in defatted seed meal; it is a selection originating from Dansk Planterforaeldig, Denmark. Hero is a cultivar developed in 1989 at the University of Manitoba in Canada, with high erucic acid content (>500 g kg⁻¹) in the seed oil and low glucosinolate content (<30 µmol g⁻¹) in the seed meal.

F₁ seed from the original cross was produced in the spring of 1992. Progeny from the cross were evaluated in a multivariate cross prediction trial (4) in the greenhouse in 1992 (F₁ plants) and in the field in 1993 (F₂ plants). Seeds from plants in the F₃ population were evaluated for erucic acid content in the oil using a half-seed technique (2,3). The highest erucic acid selections (those with >500 g kg⁻¹) from half-seed analyses were selfed over the winter of 1993–1994 in the greenhouse. Seed from each F₄ plant was evaluated for glucosinolate content using a glucose-sensitive Test-tape procedure (5). Lines with very low Test-tape scores (<0.5 units, on a scale of 0 to 5) were selected and planted in field trials as single-plant plots in 1994. A further winter seed increase was carried out from F₅ to F₆ seed in 1994–1995. Oil and seed meal quality were re-evaluated after each increase and only plants with the highest quality were retained for re-planting.

Breeder seed of Garnet was derived from a single plant selected from the F₆ population grown in the greenhouse in 1994–1995. This seed was grown as F₇ single-plant field plots in 1995, and prior to harvest, 30 single-plant selections were identified with the desired plant uniformity, oil content, oil and seed meal quality. In 1996, F₇ seed from these 30 plants were grown in single-plant plots. During the 1996 growing season, single-plant plots were visually inspected and off-type plants removed. Before harvest, 20 single-plant selections were taken from each of the 30 single-plant plots and evaluated for fatty acid profile and seed meal glucosinolate content. Four hundred single F₈ plants were selected and their seeds combined to plant foundation seed in the spring of 1997.

Agronomic performance of Garnet was compared with the control cultivars Hero, Reston, and R.500 in replicated plot trials over 3 yr (1994, 1995, and 1996). The 1996 trials were part of the Pacific Northwest Canola Variety Trials (PNWCVT) (1). Hero and Reston are high erucic acid B. napus cultivars developed at the University of Manitoba in Canada. These cultivars account for a high proportion of the Canadian industrial-quality rapeseed acreage.

Seed from each F₄ plant was grown as F₁ single-plant field plots in 1995, and from the F₆ population grown in the greenhouse in 1994–1995. Oil and seed meal quality were re-evaluated after each increase and only plants with the highest quality were retained for re-planting.

Average seed yield of Garnet was 1557 kg ha⁻¹ over all sites and locations tested, compared with 1337, 936, and 280 kg ha⁻¹ for Hero, Reston, and R.500, respectively. Seed yield of Garnet, averaged over sites within years was 1239, 1841, and 1610 kg ha⁻¹ for Hero, Reston, and R.500, respectively. Seed yield of Garnet was significantly (P < 0.05) higher than Reston and significantly different from Hero (403 g kg⁻¹). Erucic acid content in seed oil and canola-quality seed meal. Garnet plants are medium to tall (105 cm), averaging 1 cm taller than Hero. Plants mature early, 92 d after planting, compared with 97 d for Hero. Average 1000-seed weight of Garnet was 3.1 g.

Registration of ‘Sterling’ Spring Rapeseed

‘Sterling’ spring rapeseed [Brassica napus L. subsp. oleifera (Metzg.) Sinskaya f. annua] (Reg. no. CV-17, PI 597355) was developed for use as an industrial oil-quality cultivar by the Idaho Agricultural Experiment Station.

Sterling is a near pure-line spring rapeseed cultivar with high erucic acid content in seed oil and canola-quality seed meal. Sterling was selected for adaptability to environmental conditions of the Pacific Northwest region (Idaho, Oregon, Washington, and Montana). Sterling was developed in 1989 at the University of Manitoba in Canada. Sterling is a spring rapeseed cultivar (423 g kg⁻¹). Total seed glucosinolate (0.05) than Garnet (490 g kg⁻¹). Erucic acid content in seed oil and canola-quality seed meal. Sterling plants are medium to tall (105 cm), averaging 1 cm taller than Hero. Plants mature early, 92 d after planting, compared with 97 d for Hero. Average 1000-seed weight of Garnet was 3.1 g.

References and Notes


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