

Northern Accents® ‘Lena’, ‘Ole’, ‘Sigrid’, and ‘Sven’: Four Cold-hardy Polyantha Rose Cultivars from the University of Minnesota Woody Landscape Plant Breeding Program

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Roses are popular landscape plants valued for their beautiful and diverse floral displays that can be enjoyed throughout the majority of the growing season. Most of the landscape rose cultivars available today are not reliably winter hardy in U.S. Department of Agriculture (USDA) Plant Hardiness Zones 3 and 4 (USDA Plant Hardiness Zone Map, 2012). Susceptibility to rose black spot (*Diplocarpon rosae* F.A. Wolf) and other foliar diseases such as spot anthracnose [*Sphaceloma rosarum* (Pass.) Jenk.] is also a limiting factor. Foliar diseases defoliate plants and reduce the ornamental value, vigor, and winter survival of susceptible cultivars. A breeding program was initiated at the University of Minnesota in 1990 to develop cold-hardy, repeat blooming, black spot-resistant landscape rose cultivars available for use in northern continental landscapes (Zuzek and Hokanson, 2007). Below we describe four polyantha rose cultivars developed by the Woody Landscape Plant Breeding and Genetics Project at the University of Minnesota.

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Origin

Polyantha roses are characterized by their abundant floral displays and compact, well-branched plant habits (Delahanty, 2006). They are sometimes marketed by nurseries as shrub roses because many are low-maintenance roses. The first polyantha cultivar, Paquerette, was introduced in 1875 (Young et al., 2007) and the class grew in popularity into the early 20th century. Their popularity waned with the introduction of their larger-flowered descendants, the floribunda roses. Polyanthas produce well-branched corymbs of many flowers that are relatively small in size and occur over repeated cycles of flowering throughout the growing season. They are derived primarily from *Rosa multiflora* Thunb. and *Rosa wichurana* Crép, both section *Synstylae* species (Krüssmann, 1981). With today's need for more compact, manageable, healthy, and floriferous landscape shrubs, polyantha roses have much to offer (Zuzek and Hokanson, 2007). At the onset of the breeding program, several polyantha rose cultivars were acquired and evaluated for their performance in Minnesota. Although many had desirable ornamental features, their winter hardiness and disease resistance were not sufficient for Minnesota landscapes.

In 1992, an unlabeled rose was discovered in the Nelson Rose Garden at the Minnesota Landscape Arboretum, Chanhassen, MN. This rose performed like a polyantha and possessed shared traits with *R. multiflora*. It was suspected to be a volunteer seedling that arose in the garden, as it does not match the characteristics of any known cultivar described in the literature. The elevated and fused styles, conical corymbs, and foliage characteristics are consistent with a close genetic affinity to *R. multiflora* and its hybrids, which include roses of the polyantha and hybrid musk classes. The plant was accessioned as UMN Rosa 36 and incorporated into the rose breeding program. Among its valuable traits were continual bloom throughout the growing season, high rose black spot tolerance, reliable Zone 4 crown hardiness, and a dense upright plant habit. It produces relatively small, single white flowers. Northern Accents® ‘Lena’, ‘Ole’, ‘Sigrid’, and ‘Sven’, tested as UMN Rosa 320, 215, 362, and 251, respectively, are all descended from crosses involving UMN Rosa 36 and polyantha cultivars (Fig. 1).

Northern Accents® ‘Lena’, ‘Ole’, ‘Sigrid’, and ‘Sven’ were selected from over 1700 seedlings that represented multiple polyantha breeding lines. These seedling populations were planted and maintained without winter protection or fungicide treatments during their initial 4-year evaluation period at the University of Minnesota Horticultural Research Center in Chanhassen, MN (44°50' N latitude; Table 1). The Northern Accents® cultivars were selected due to a combination of their strong winter survival, health, attractive plant habit, floral attributes, and ease of stem cutting propagation. They were propagated from softwood and semi-hardwood cuttings and tested at four out-state locations in Rosemount, MN (44°44' N); Morris, MN (45°35' N); Grand Rapids, MN (47°12' N); and Mora, MN (45°54' N) for 3 or 4 additional years. In addition, ‘Lena’, ‘Ole’, and ‘Sven’ were planted in Kress, TX, as part of the Earth-Kind® confirmational trials (Harp et al., 2009; N. Rains, personal communication). Northern Accents® ‘Lena’, ‘Ole’, and ‘Sven’ were the first to be bred, and were tested as a cohort. They were approved by the University of Minnesota for commercial release in 2005 with public introduction in 2007. Northern Accents® ‘Sigrid’ was approved for commercial release in 2009 and was introduced in 2011.

Description

All four Northern Accents® cultivars share similar growth habits, inflorescence architecture, foliage, remontancy, ornamental hip production, prickles, and ploidy. Growth habits are dense and upright and plant silhouettes are rounded. As with other polyantha cultivars, small blooms are borne in great abundance on well-branched corymbs against small but ample foliage. Flowers are produced in three to four prominent cycles per season and some blooms are

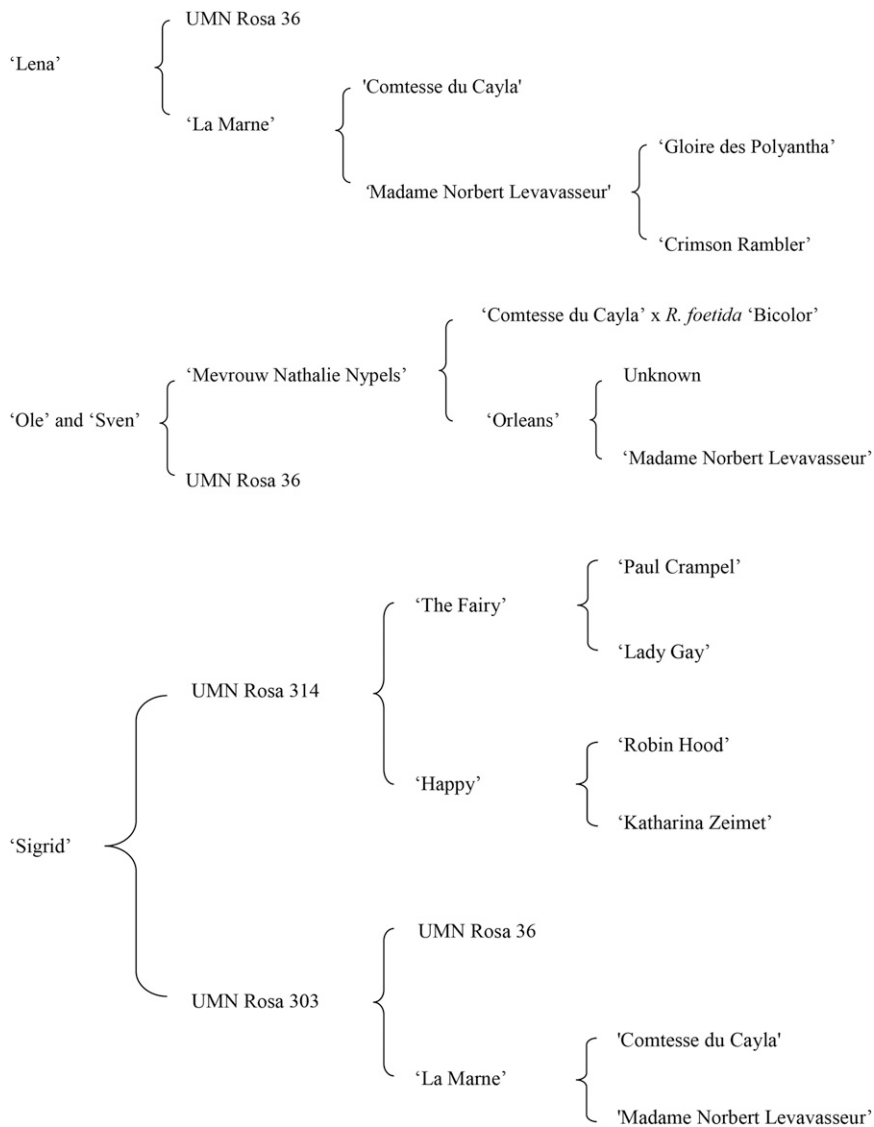


Fig. 1. Pedigrees of Northern Accents® ‘Ole’, ‘Sven’, ‘Lena’, and ‘Sigrid’ roses.

Table 1. Year of pollination, evaluation periods, and year of introduction for the four Northern Accents® rose cultivars.

Cultivar	Yr of pollination	HRC ^z evaluation period	Regional trial ^y evaluation period	Yr of introduction
Sven	1997	1998–2002	2003–05	2007
Ole	1997	1998–2002	2003–05	2007
Lena	1997	1998–2002	2003–05	2007
Sigrid	2004	2005–08	2010–13	2011

^zThe original seedlings germinated the winter after pollination and were planted in outdoor ground beds at the Horticultural Research Center (HRC) in Chanhassen, MN.

^yThe original genotypes of these cultivars were clonally propagated and planted at Grand Rapids, Mora, Morris, and Rosemount in MN.

typically present on the plant between major flowering cycles. Orange to red round rose hips (1.0 to 1.5 cm in diameter) ripen in autumn and continue to provide ornamental value into the winter. Prickles are slightly hooked and face downward. Northern Accents® ‘Lena’, ‘Ole’, ‘Sigrid’, and ‘Sven’ were found to be diploid ($2n = 2x = 14$) when characterized for ploidy using root tip squashes and observing cells in metaphase (Zlesak, 2009).

Northern Accents® ‘Lena’

‘Lena’ (Fig. 2) has single (five-petaled) pink/white blend flowers [Royal Horticultural Society (RHS) 61D corolla face; 155A petal base; 57D corolla back; RHS, 1995] with a light fragrance and a diameter of 2.5–3.8 cm. Plants produce an average of 34 flowers per inflorescence. In USDA Zones 3 and 4 in Minnesota, average mature plant size (plants ≥ 3 years of age) at the end of the growing season was 76 × 91 cm (height ×

width). In contrast, mature plants trialed in Kress, TX (Zone 7a), with its longer warmer growing season and lack of winter dieback attained a larger size of 140 × 157 cm. The foliage color is medium green (RHS 146A adaxial; 146C abaxial).

Northern Accents® ‘Ole’

Northern Accents® ‘Ole’ (Fig. 2) has double-blush pink flowers (RHS 73D upper petal; 155D, 158B petal base) with a moderately sweet fragrance and a diameter of 3.8 to 5.1 cm. Flowers have an average of 21 petals. About 30 flowers are produced per inflorescence. In USDA Zones 3 and 4, average mature plant size (plants ≥ 3 years of age) at the end of the growing season is 76 × 107 cm (height × width); plants trialed in Kress, TX, attained a size of 122 × 198 cm (height × width). The foliage color is medium green (RHS 147A, 146A adaxial; 147B, 146B abaxial).

Northern Accents® ‘Sigrid’

Northern Accents® ‘Sigrid’ (Fig. 2) has double, red flowers (RHS 60A to 61B corolla face; 155D petal base; 60B corolla back) with a light fragrance and a diameter of 2.0 to 2.5 cm. Under high temperatures, the flowers develop a lighter shade of red (RHS 63B). Flowers average 30 petals and ≈ 30 flowers are produced per inflorescence. In USDA Zones 3 and 4, average mature plant size (plants ≥ 3 years of age) at the end of the growing season is 107 × 91 cm (height × width). The foliage is a rich, glossy green (RHS 147A, adaxial; 147B abaxial).

Northern Accents® ‘Sven’

Northern Accents® ‘Sven’ (Fig. 2) has double, mauve colored flowers (RHS 78A) that are strongly and sweetly scented and 3.8 to 5.1 cm in diameter. The flowers have an average of 37 petals and ≈ 20 flowers are produced per inflorescence. In Zones 3 and 4, average mature plant size (plants ≥ 3 years of age) at the end of the growing season is $\approx 61 \times 91$ cm (height × width); plants trialed in Kress, TX, attained a size of 152 × 213 cm (height × width). The foliage is a medium green (RHS 147A; 147B adaxial and abaxial leaf surfaces, respectively).

Performance

After initial selection, Northern Accents® ‘Sven’, ‘Ole’, and ‘Lena’ were rooted from softwood and semihardwood cuttings and established in replicated field plots during May 2003 at UMore Park in Rosemount, MN (44°44’ N, USDA Zone 4b, silt loam soil with 6.3 pH), at the West Central Research and Outreach Center in Morris, MN (45°35’ N, USDA Zone 4a, silt loam soil with 7.4 pH), and at the North Central Research and Outreach Center in Grand Rapids, MN (47°12’ N, USDA Zone 3b, sandy loam soil with 5.1 pH) (Table 1). At each site, three plants of each genotype were planted adjacent to each other in full sun. Three plants of Carefree Beauty™ (‘Bucbi’) were also

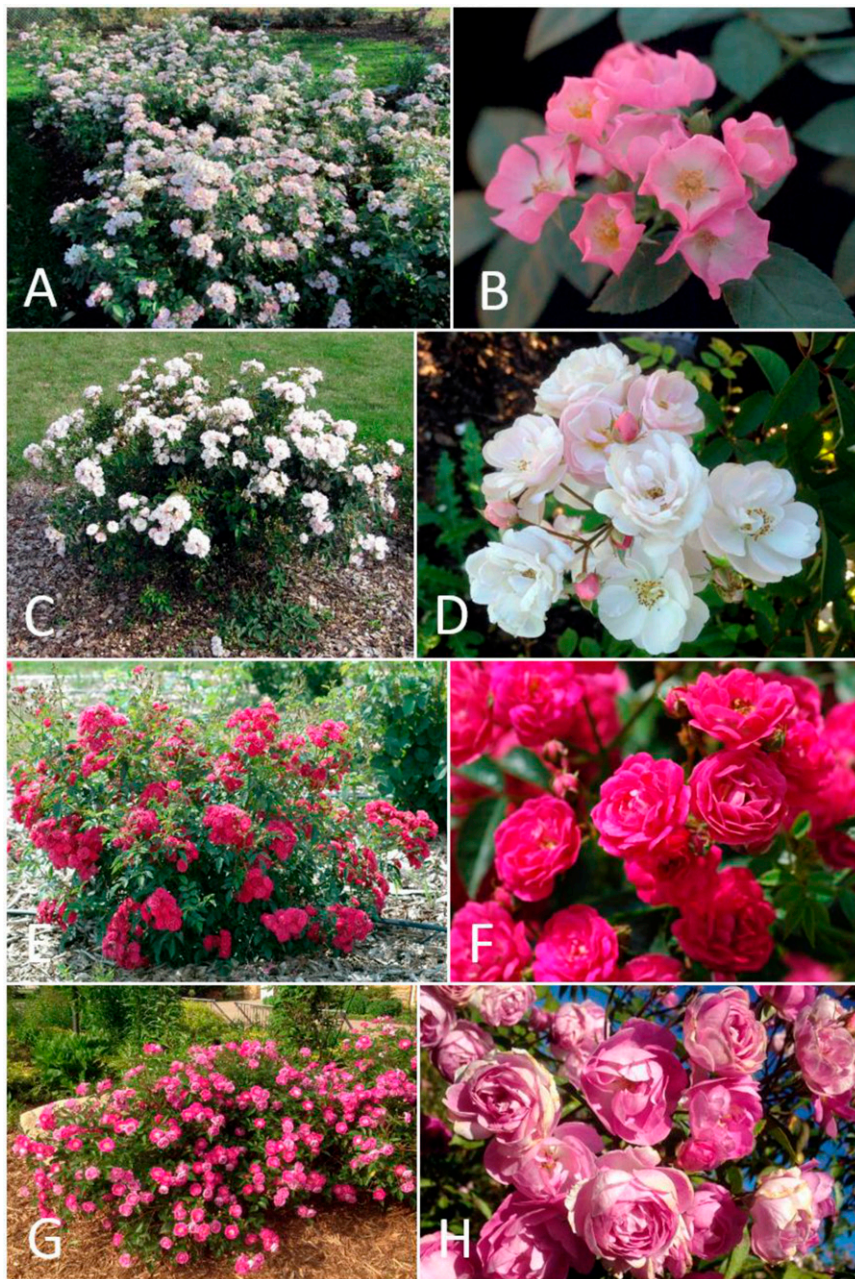


Fig. 2. Plant and flower cluster of Northern Accents® (A, B) 'Lena', (C, D) 'Ole', (E, F) 'Sigrid', and (G, H) 'Sven'.

Table 2. Black spot lesion diameter (mm) after controlled inoculations with three races of *Diplocarpon rosae* for the four Northern Accents® rose cultivars and Chorale.

Cultivar	Race 3	Race 8	Race 9	Overall avg
	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)
Chorale ^z	3.82 (0.36)	3.05 (0.68)	3.30 (0.88)	3.73 (0.60)
Lena	1.57 (0.34)	1.44 (0.26)	1.02 (0.16)	1.34 (0.34)
Ole	2.15 (0.58)	2.35 (0.17)	2.05 (0.37)	2.10 (0.31)
Sven	2.43 (0.26)	2.67 (0.46)	1.43 (0.41)	2.05 (0.66)
Chorale ^y	3.05 (0.41)	3.65 (0.05)	3.40 (0.02)	3.37 (0.33)
Sigrid	2.00 (0.55)	1.70 (0.43)	1.45 (0.38)	1.54 (0.41)

^zData for top group of four cultivars is from Zlesak et al. (2010).

^yData for lower group of two cultivars are from a later inoculation following the protocols in Zlesak et al. (2010).

planted as a reference cultivar at each site. Northern Accents® 'Sigrid' was rooted from softwood and semihardwood cuttings and in May 2010, three plants were established in

a replicated randomized field plot along with 14 other advanced rose selections from the Woody Landscape Plant Breeding and Genetics Project at the Mora Community Garden

managed by the University of Minnesota Extension Kanabec County Master Gardeners in Mora, MN (45°54' N, USDA Zone 3b, sandy loam soil with 5.2 pH). Three plants of Northern Accents® 'Ole' were also planted as a reference cultivar.

Two or three years of monthly evaluation data were collected between 2003 and 2006 for Northern Accents® 'Sven', 'Ole', and 'Lena' at the Grand Rapids (2 years), Morris (3 years), and Rosemount (3 years) locations. Monthly evaluation data were collected during the growing season (2011 to 2013) at Mora for Northern Accents® 'Sigrid'. Winter injury to plant canopies, measured as the point (height) on living cane tissue above which the cane tissue was killed by cold, was recorded in early spring. Plant height and width were collected annually in October. Level of rose black spot infection and defoliation from rose black spot and other leaf spot diseases were evaluated monthly. In addition, flower size, form, color, and fragrance were recorded.

At the Grand Rapids site, Northern Accents® 'Sven', 'Ole', and 'Lena' have proven to be reliably crown hardy in USDA Zone 3b (−37.2 to −34.4 °C) with snow cover. In Jan. 2005, the three selections also survived a −40 °C cold event typical of USDA Zone 3a (−40 to −37.2 °C) at Grand Rapids. These three cultivars were also reliably crown hardy at USDA Zone 4 test sites (−34.4 to −28.9 °C), where low temperatures of −35 °C and −31 °C occurred in Morris and Rosemount, respectively, in Jan. 2004. Northern Accents® 'Sigrid' was crown hardy at the Mora site where the low minimum temperature during the evaluation period was −34 °C in Jan. 2011. During recent warm winters, more typical of USDA Zone 5, some exposed canes survived above the ground on all four cultivars. Although winter cane injury is extensive in USDA Zones 3 and 4, vigorous regrowth of all four cultivars produces heavily blooming plant canopies by late spring, followed by two to three more cycles of canopy growth and rebloom, typical of repeat blooming roses, throughout the growing season.

Northern Accents® 'Sven', 'Ole', and 'Lena' have been characterized for resistance to rose black spot disease, incited by the fungal pathogen *D. rosae*. In the field, small numbers of rose black spot lesions develop slowly at the base of plants through mid and late summer and only a slight-to-moderate amount of defoliation due to the disease is evident by mid-September (typical first frost). Controlled inoculation experiments using races 3, 8, and 9 of *D. rosae* were conducted using detached leaves for all four Northern Accents® roses with the cultivar Chorale serving as the susceptible control (Whitaker et al., 2010; Zlesak et al., 2010). Lesion diameter was measured after the incubation interval and is presented in Table 2. In the field plantings, rose black spot disease and other less prevalent foliar diseases can lead to defoliation. Percent defoliation (calculated by nodes of current

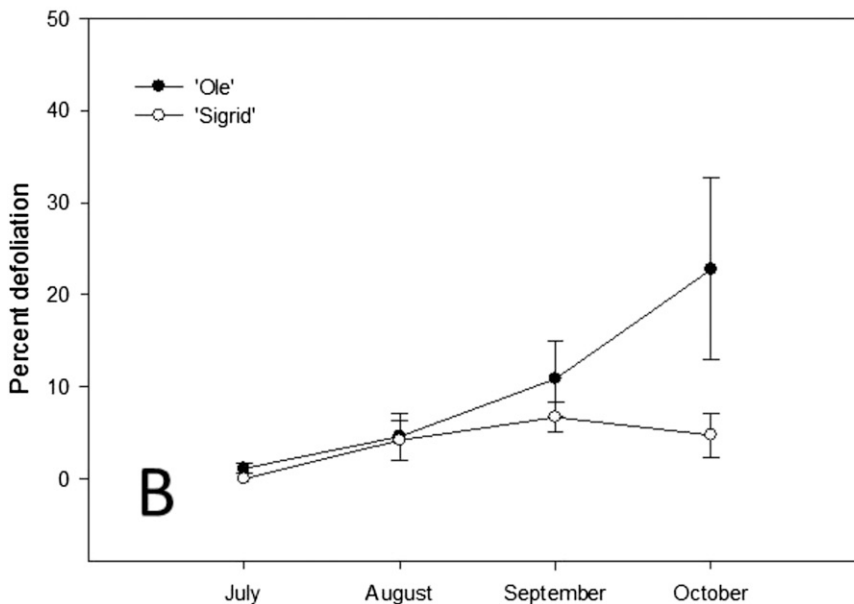
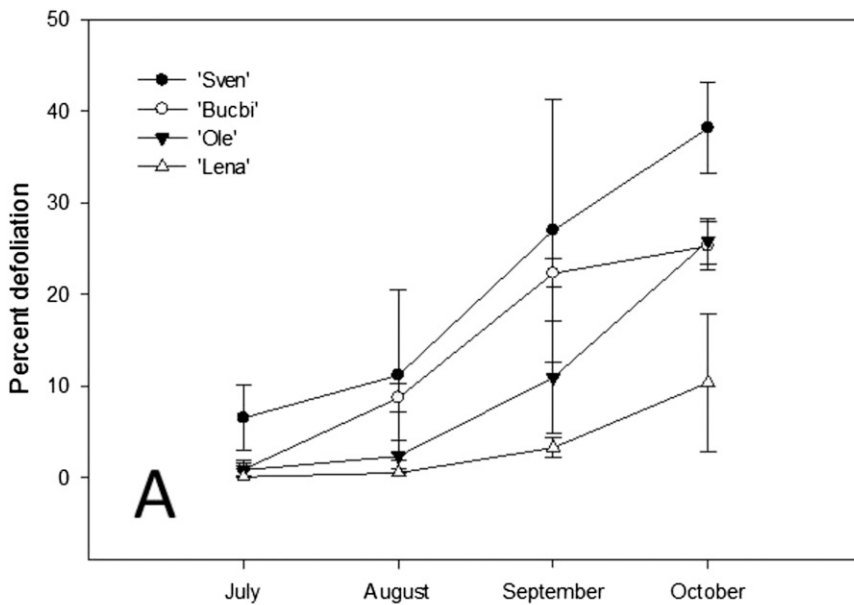


Fig. 3. (A) Plant defoliation over the growing season for Northern Accents® 'Lena', 'Ole', and 'Sven' along with Carefree Beauty™ ('Bucbi') as a reference cultivar averaged across locations (Grand Rapids, Morris, and Rosemount in MN) and years with standard errors and (B) Northern Accents® 'Ole' and 'Sigrid' averaged across years at Mora, MN.

season's growth without leaves divided by total nodes) averaged by month across the years is presented over the growing season (Fig. 3). Rose black spot lesion diameters from the detached leaf assays were generally consistent with field defoliation. 'Lena' and

'Sigrid' were able to limit disease development better than 'Ole' and 'Sven' in all experiments and all four Northern Accents® roses had 40% or less defoliation by the end of the growing season at the Minnesota regional trial sites.

Uses

With mounded, compact, and floriferous growth habits, the Northern Accents® roses can serve as colorful shrub additions suitable for multiple landscape applications. They are useful for mass plantings, borders, groupings, or mixed plantings with other shrubs and herbaceous plants. Because of their compact size and strong repeat blooming habit, they can also be used as floriferous containerized plants placed on patios and balconies. With similar plant sizes and complementary floral displays, the different cultivars can be mixed and used together for more diverse color effects and additional ornamental appeal.

Availability

Nonexclusive marketing/distribution licenses for all four of the Northern Accent® rose cultivars can be obtained by contacting the University of Minnesota Office of Technology Commercialization (<http://www.license.umn.edu>). Please contact Dr. Stan Hokanson with any questions (hokan017@umn.edu).

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