

ANNOUNCING THE RELEASE OF THE CULTIVAR

'McKenzie' Black Chokeberry

by the
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

and the
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

and the
CENTRAL LAKES AGRICULTURAL CENTER

and the
MINNESOTA
AGRICULTURAL EXPERIMENT STATION

and the
NORTH DAKOTA
AGRICULTURAL EXPERIMENT STATION

and the
SOUTH DAKOTA
AGRICULTURAL EXPERIMENT STATION

The United States Department of Agriculture, Natural Resources Conservation Service; United States Department of Agriculture, Agricultural Research Service; Central Lakes Agricultural Center; Minnesota Agricultural Experiment Station; North Dakota Agricultural Experiment Station; and South Dakota Agricultural Experiment Station announce the naming and release of a seed-propagated cultivar of black chokeberry, *Aronia melanocarpa* (Michx.) Ell., also known as aroniaberry.

As a formal cultivar release, this plant will be named **'McKenzie' black chokeberry**. Plant Introduction (PI) number 323957 was assigned prior to testing. This species is a North American native shrub suitable for many conservation and agroforestry uses, including wildlife plantings, farmstead and field windbreaks, single-row wind barrier plantings (especially under overhead irrigation systems), fruit production, and ornamental/recreational plantings. The dark purple fruit is high in vitamins and antioxidants. 'McKenzie' black chokeberry establishes readily and is adapted to a diverse array of sites. The glossy leaves, showy flowers, abundant fruit, and red fall color add to its visual appeal and desirability in the landscape. The name 'McKenzie' was chosen to acknowledge the initial evaluation planting site in North Dakota where the original plants were established in 1976 and continue to perform well today.

Collection Site Information: In 1976, five potted seedlings of PI 323957 black chokeberry were received from USDA-ARS North Central Regional Plant Introduction Station (NCRPIS) at Ames, Iowa. Howard J. Brooks, ARS Horticulturist, obtained seeds of this native North American shrub from the Stavropol Botanic Garden in Stavropol, Russia, in 1967. The seedlings were propagated from plants growing at the NCRPIS. The parent plants were described as “handsome shrubs with abundant large edible black fruit and clean dark-green leaves turning brilliant red in early fall” by Albert F. Dodge, ARS Horticulturist, in his statement from the NCRPIS accompanying the distribution of these plants for evaluation in the NC-7 Regional Ornamental Plant Trials. On May 15, 1976, the five seedlings were planted at the McKenzie Off-center Evaluation Planting (OCEP) site located about 20 miles east of Bismarck, North Dakota, in Major Land Resource Area (MLRA) 53B, Central Dark Brown Glaciated Plains. The soils were derived from calcareous glacial till and are a composite of silty clays and silty clay loams. The USDA plant hardiness zone is 3b, and the average freeze-free period is 110 to 130 days. Average annual precipitation is 16–18 inches. The plants performed very well at the McKenzie site and were last measured in 2000, 24 years after planting. The five plants averaged 8.9 feet tall and had a canopy cover (width) averaging 10.0 feet. The abundant fruit produced in most years was occasionally harvested as a seed source for Lincoln-Oakes Nurseries, Bismarck, North Dakota, which then produced seedlings that were evaluated in various plantings throughout Minnesota, North Dakota, and South Dakota (Tables 1 and 2).

Description: The original plants were identified as black chokeberry (*Aronia melanocarpa*) at the time of initial distribution in 1976 and were confirmed as such by Dr. Mark P. Widrechner, USDA-ARS Horticulturist at the NCRPIS. Dr. Widrechner curates *Aronia* germplasm for the US National Plant Germplasm System. Black chokeberry is also known as *Photinia melanocarpa*, and is sometimes called Aroniaberry in the nursery trade. The genus consists of two species and an interspecific hybrid, all closely related to *Sorbus*, mountain ash (Rosendahl 1955; USDA-ARS 2008). It is native to eastern North America and extensively planted in Europe and Asia. ‘McKenzie’ is a winter-hardy, medium-sized deciduous shrub which may reach heights greater than 10 feet on favorable sites. Dr. Widrechner reported this source to be the largest that has been grown in their collection at Ames, measuring 12 feet tall and 12 feet wide. Average height for the species is stated as 3-5 feet (Symonds 1963). It has an open, upright, and often leggy growth habit. The species is noted to be moderately tolerant of shade. Canopy width increases from basal root sprouts or short suckers and may exceed the plant height at maturity (10 years). The fine-toothed leaves are medium-light green and hairless, with raised glands along the top of the midrib. In spring, the white 5-petaled perfect flowers form clusters that are 2 to 2 ½ inches wide. The primary pollinators are small bees. The leaves turn a deep, glossy green as the season progresses. In mid to late summer the fruit begins to form. The large pea-sized fruit darkens to a purplish-black color as it ripens. Small amounts of fruit are often produced the second year after planting from bareroot seedlings. The juicy fruits are pomes and usually persist into winter. They begin to raisin in late fall, and are inconsistently consumed by birds because of their astringent flavor. The juice and seed are deep purple in color. There are one to five small seeds per pome. Approximately 100 pounds of fruit yield a pound of seed. Four-year old shrubs planted at the Wadena, Minnesota site (Table 2) each yielded over 20 pounds of fruit. The fruit is held in heavy clusters at the end of the branches which makes for easy hand picking. Although technically edible, the fruits are too bitter to be recommended for fresh eating, but may be used for making tasty juice, jams, and jellies. The juice contains high levels of vitamins, antioxidants, and anthocyanins (Knudson 2005). Plant longevity depends on the site location, but plants may persist for 25 years or more. Some regeneration will occur from short plant suckers or basal sprouts depending on site conditions, especially on well-drained or organic soils. No spreading from seed has been observed.

Evaluation and Plant Performance: The original five shrubs planted at the McKenzie site were established from potted seedlings. Seed was harvested from these shrubs and used to grow bareroot seedlings for evaluation. Eight landowner field planting evaluations were established in Minnesota,

North Dakota, and South Dakota (Table 1). Field plantings were evaluated for three to seven years and had moderate to heavy weed competition. Survival averaged 83 percent and overall performance averaged 2.3, with 1 being the highest rating and 9 the lowest rating. Weed competition was a critical factor in plant size and overall performance rating. The longer term Off-center Evaluation Plantings (Table 2) were established at nine locations beginning in 1976. Data collection at each evaluation site varied from a 4 to 25-year period. Performance was better than in the field plantings. Improved weed control was probably a key factor. Survival averaged 94.5 percent and the average vigor rating was 3.4. The site at Rochester, Minnesota had the lowest vigor ratings and the smallest plants primarily because of smooth brome grass (*Bromus inermis*) competition. The plants at McKenzie, North Dakota were the largest at 8.9 feet tall with a canopy width of 10 feet, and the oldest at 25 years of age. Growth rates and canopy spread varied depending on site conditions, but generally averaged less than 0.5 foot per year. The highest growth rates occurred in the first five years. The performance of 'McKenzie' black chokeberry was documented at 11 different sites through the NC-7 Regional Ornamental Plant Trials (Table 3). Twenty-seven sites originally received this material. Ten sites returned the 10-year reports. One unofficial site at Ames (NCRPIS farm site) is also included in the summary. It is interesting to note that no favorable reports were received from east of Urbana, Illinois. Height varied from 4 to 10 feet tall, with an average of 7.3 feet after 10 years. Canopy width varied from 5 to 10 feet, with an average of 7.1 feet after 10 years. Performance at one site was rated poor overall, two sites were rated medium, and eight sites were rated excellent. Fruit production varied from none to abundant. Three sites reported unsightly foliage (leaf spot) and eight reported clean foliage.

Ecological Considerations: 'McKenzie' black chokeberry produces abundant fruit on adapted sites. Use of the berries by wildlife is debatable, but most agree the fruit is usually not a first choice and often persists into the winter months. The seeds are very small and generally unnoticeable when the juicy berries are eaten fresh from the plant. No off-site movement of the plant was observed at any of the evaluation locations. The plant produces basal sprouts that increase in width with age of the plant. Increase in canopy width is considered desirable for wildlife habitat. The species is native to eastern North America, typically on acid soils. The glossy leaves, showy flowers, abundant fruit, and red fall color make it a desirable shrub in most landscapes. Invasiveness has not been a concern in the United States, but *Aronia* is known to be invasive in northwestern Europe. 'McKenzie' black chokeberry was documented as "OK to Release" when rated through the worksheet for "Environmental Evaluation of Plant Material Releases."

Anticipated Conservation Use: The primary conservation use of 'McKenzie' black chokeberry is for farmstead and field windbreaks, and in wildlife habitat and recreational plantings. The showy flowers and sweet fragrance in early spring make this an excellent species for attracting pollinators. A secondary benefit is the edible fruit for home use or an alternative income crop. The health food industry has been promoting chokeberry fruit products for the high content of antioxidants and anthocyanins. Fruit production, processing, and associated marketing strategies represent potential business opportunities for the landowner.

Potential Area of Adaptation: This selection has performed well in extensive test plantings on diverse sites in North Dakota, South Dakota, Minnesota, Iowa, Illinois, Kansas, and Nebraska. Adaptation is anticipated to be on soils/sites recommended for the species, as referenced in each States' NRCS Field Office Technical Guide, across the regions of the Upper Midwest and Northern Great Plains. The best plant performance has generally been on Conservation Tree and Shrub Groups 1 and 3. The best growth and fruit production occurs on low, moist, but well-drained sites in full sun. Good weed control improves overall plant performance. Increased rates of foliar diseases such as leaf spot were noted in areas of higher rainfall and summer humidity.

Availability of Plant Materials: Small quantities of breeder seed and seedling plants will be made available from the USDA Plant Materials Center at Bismarck, North Dakota, for nursery operators to establish seed orchards of 'McKenzie' black chokeberry. The North Central Regional Plant Introduction Station at Ames, Iowa, will continue to conserve 'McKenzie' under the number PI 323957 making it available for research and educational purposes. Various conservation nurseries in the region sell seed and bareroot seedlings.

References:

Knudson, M. 2005. Plant Guide – Black Chokeberry. USDA-NRCS, National Plant Data Center, Baton Rouge, LA. Available at: <http://plants.usda.gov>. Accessed 11 March 2008.

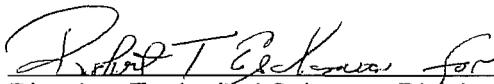
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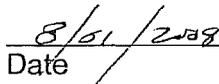
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Prepared by: Dwight A. Tober, Plant Materials Specialist, USDA-NRCS, P. O. Box 1458, Bismarck, North Dakota 58502; and Michael J. Knudson, Forester, USDA-NRCS Plant Materials Center, 3308 University Drive, Bismarck, North Dakota 58504.

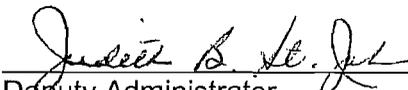
Approvals for the release of 'McKenzie' black chokeberry, *Aronia melanocarpa* (Michx). Ell.:



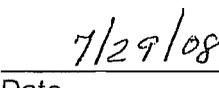
Director, Ecological Sciences Division
United States Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.



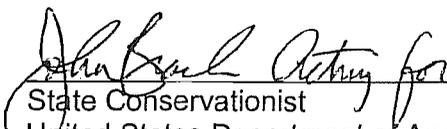
Date



Deputy Administrator
United States Department of Agriculture
Agricultural Research Service
Washington, D.C.



Date



State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Saint Paul, Minnesota



Date



State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Bismarck, North Dakota

5-22-08

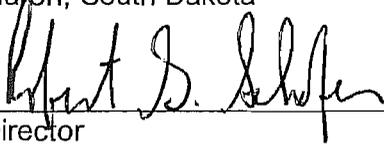
Date



State Conservationist *acting for*
United States Department of Agriculture
Natural Resources Conservation Service
Huron, South Dakota

6/3/08

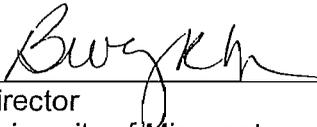
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Director
Central Lakes Agricultural Center
Staples, Minnesota

6/30/08

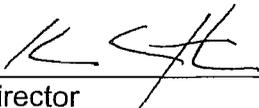
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University of Minnesota
Agricultural Experiment Station
St. Paul, Minnesota

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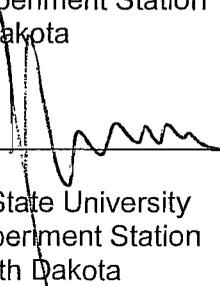
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Director
North Dakota State University
Agricultural Experiment Station
Fargo, North Dakota

5/27/08

Date



Director
South Dakota State University
Agricultural Experiment Station
Brookings, South Dakota

9/6/08

Date