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and
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HELENA, MONTANA
and
MONTANA AGRICULTURAL EXPERIMENT STATION
BOZEMAN, MONTANA
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WYOMING AGRICULTURAL EXPERIMENT STATION
LARAMIE, WYOMING

NOTICE OF RELEASE OF PONDERA FLOODPLAIN GERmplasm
SILVERBERRY
SOURCE-IDENTIFIED CLASS OF NATURAL GERmplasm

The United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) and the Montana Department of Natural Resources and Conservation (DNRC) announce the naming and release of Source-Identified germplasm of Pondera Floodplain Germplasm silverberry, *Elaeagnus commutata* Bernh. ex. Rydb. This germplasm was identified by the USDA/NRCS Montana Riparian and Wetlands Team, Bozeman, Montana and the USDA/NRCS Plant Materials Center at Bridger, Montana.

Pondera Floodplain Germplasm silverberry has been assigned the NRCS accession number 9081340. It was selected primarily for its vigorous sprouting, ease of propagation, and hardiness in the northern Plains for use in upper streambank stabilization applications, wildlife habitat projects, and potentially, windbreak and shelterbelt systems.

COLLECTION SITE INFORMATION: Pondera Floodplain Germplasm silverberry was identified and collected by the NRCS Montana Riparian and Wetlands Team in Pondera County along Dupuyer Creek. The site is located in Section 28, Township 29N, Range 6W at a North Latitude of 48°14'21.31" and a West Longitude of 112°23'14.06". The area is classified as Major Land Resource Area 46, Northern Rocky Mountain Foothills. The elevation of the original collection site was 1,195 m (3,919 ft.), on a slope of 2 percent or less with a northwesterly exposure. The soils are mapped as Ryell/Havre coarse loams. The original collection site is located in USDA Hardiness Zone 3b (-30° to -35°F) or 4a (-25° to -30°F) in an annual precipitation zone of 305 to 356 mm (12 to 14 in.). Plants growing in association include cottonwood *Populus* species, smooth brome *Bromus inermis* and miscellaneous wheatgrasses. Seed collections were originally made on November 6, 1997 by Joe Carleton of the Intermountain Riparian and Wetlands Resource Technical Team, Bozeman, Montana.

SELECTION STATEMENT: Pondera Floodplain Germplasm silverberry was identified for its ability to stabilize mesic streambanks and floodplains by vegetative spread of underground shoots. It was identified for its hardiness in Montana and its ease of propagation by seed and

stem cuttings. Limited commercial availability of local germplasms and an urgent need for species diversity in riparian restoration and stabilization work in the northern Plains warrants the use of the prevarietal release procedure. Field testing of this germplasm, as well as two additional germplasms, has been initiated in plantings at Huntley, Montana; Pinedale, Wyoming; and Cutbank, Montana.

Pondera Floodplain Germplasm silverberry is one of two Source-Identified germplasms currently being released by Montana NRCS for riparian stabilization. Pondera Floodplain Germplasm silverberry is recommended for upper streambank and floodplain terraces characterized by fairly well drained sites and adequate, but not excessive, available soil moisture. In contrast, Dupuyer Streambank Germplasm silverberry is recommended for lower riparian, bottomland sites characterized by high levels of soil moisture and periods of temporary inundation. These recommendations are based on the sites conditions observed at each respective germplasm source, under naturally occurring field conditions.

GERMPLASM DESCRIPTION

Botanical Characteristics: Pondera Floodplain Germplasm silverberry has the same general botanical, foliage, fruit, seed, and phenological attributes noted below for the species as a whole. Slight variations in stem form, leaf shape and color, and rates of growth have been noted between Pondera Floodplain Germplasm silverberry and other seed sources, but are not considered significant. Pondera Floodplain Germplasm silverberry is a native shrub with potential use in upper streambank stabilization, wildlife habitat, windbreaks, and naturalistic landscaping projects. It is a multi-stemmed, suckering, deciduous shrub ranging from 1.5 to 3.6 m (5 to 12 ft.) tall. It has an erect, upright habit with slender and sometimes twisted branches. The new stems are initially a light to medium brown color, the bark becoming dark gray, but remaining smooth, with age. The leaves are deciduous, alternate, 38 to 89 mm (1.5 to 3.5 in.) long and 19 to 38 mm (0.75 to 1.5 in.) wide. The leaf shape is described as oval to narrowly ovate with an entire leaf margin. Both the upper and lower leaf surfaces are covered with silvery white scales, the bottom sometimes with brown spots. The highly fragrant, yellow flowers are trumpet-shaped (tubular), approximately 13 mm (0.5 in.) in length, and borne in the leaf axils in large numbers in May or June. The fruit is a silvery-colored, 7.6 mm (0.3 in.) long, egg-shaped drupe that ripens in September to October. Some fruit may persist on the plant until well into December. It can spread vegetatively by underground stems, forming thicket-like colonies. The species has several characteristics that distinguish it from its exotic relative, Russian olive. Silverberry is a multi-stemmed shrub averaging about 1.8 m (6 ft.) in height, whereas Russian olive is a multi-stemmed tree reaching heights of 6 m (20 ft.) or more on favorable sites. Russian olive has pronounced thorns, silverberry does not. The leaves of Russian olive are about the same length as silverberry but are much narrower, usually only about 12.7 mm (0.5 in.) wide and, therefore, linear in shape. Silverberry is also confused with silver buffaloberry *Shepherdia argentea* because of similarity in common name and silvery-green foliage. Silverberry is distinguishable from this species because silver buffaloberry has thorns, opposite leaves and buds, and a red or yellow-orange, berry-like fruit. Silverberry is native from eastern Canada to the Northwest Territories, south to Minnesota, South Dakota, and Utah. It is the only *Elaeagnus* native to North America.

Propagation by Seed: The seed can be hand-collected in October through December, depending on location. The seed is readily cleaned by processing in a macerator, using water to float off the pulp, and then air drying the cleaned seed. Cleaned seed can be stored in sealed containers at 6 to 14 percent moisture content for up to 2 years with good viability. Greenhouse propagation by seed is easy, the fresh seed germinates readily with little or no cold chilling. Although the literature recommends 30 to 90 days of cold chilling prior to sowing, tests at the Bridger Plant Materials Center (PMC) indicate that, at least for certain seed sources, fresh seed germinates well without cold chilling (see Table 1). Pondera Floodplain Germplasm silverberry germinated at 83 percent in this trial. It should be noted that old or improperly processed/stored seed may benefit from a cold chilling period. Sow fresh seed onto a commercial peat-lite mix with

moderate nutrition. The growth of this species is rapid, so fairly large (20 cubic inch or greater) containers are needed for a 5 to 6 month growing season. If the plants are seeded in the greenhouse in the fall, and kept actively growing until the following fall, they need to be planted or potted up in 2 gallon pots. Few problems are reported, but include aphids, scale, and branch canker. Late-fall sown seed germinates the next spring. Seed sown too early in the fall, however, may germinate prematurely if warm temperatures and adequate moisture prevail. Fresh seed sown in the field in the spring often germinates within 2 to 4 weeks. Use a 60-day artificial chilling pretreatment prior to sowing to ensure good germination. Put the seed in a lightly moistened, sand:peat mix in a ziploc bag and place in cold storage at 0.55° to 2.8°C (33° to 37°F). Bareroot production in a nursery bed is similar to that of other easy-to-grow species. Cultivate a fairly well-drained soil to eradicate weeds and allow good seed:soil contact. Rototilling followed by light packing works well. Sow the seed by hand, with a push-type, one-row belt seeder, or other mechanical planter. Because germination is normally high, sow 15 to 20 seeds per linear foot of row. If hand planting, cover the seed with approximately 6.3 mm (0.25 in.) of soil. The use of an agronomy cloth covering over the seeded rows may increase germination by reducing erosion and animal predation, and by maintaining optimum soil moisture. Root prune production beds early in year two if a 2-0 or older plant is to be produced. Harvest 1- or 2-year old stock in the early spring or late fall as dormant material. Follow established guidelines for the handling, storage, transport, and planting of bareroot material.

Table 1. Germination results of three germplasms of silverberry, Bridger PMC 1998.

Seed-Source	Accession Number	Origin	Seed Age	Number Seeded	Number Germinated	Percent Germination
PMC Source	9005352	Wheatland County, MT	1998	98	56	57
Streambank	9081339	Pondera County, MT	1998	98	71	72
Floodplain	9081340	Pondera County, MT	1998	98	81	83
Grand Mean:						(70)

Vegetative Propagation: Greenhouse asexual propagation of this germplasm is by dormant, hardwood cuttings taken in January through February. Tests conducted at the PMC indicate that Pondera Floodplain Germplasm silverberry has a mean rooting percentage of 93 percent from stem cuttings taken from wildlings (see Table 2). Percentages should increase when the cuttings are taken from cultivated plants. Twenty to 30 cm (8 to 12 in.) long stem cuttings, 6.3 to 12.7 mm (0.25 to 0.50 in.) in diameter were taken, making sure that at least two internodes (and hence, buds) were included. The cuttings were placed in a ziploc bag, lightly moistened with a spray bottle, then placed in cold storage at 1° to 2.8° C (34° to 37°F). Although the cuttings should have stored well for several days, they were prepared and placed in the greenhouse propagation bench as soon as possible. All cuttings were trimmed to a uniform size. The base of each cutting was recut at a 45° or greater angle with a sharp grafting knife to increase water uptake. The bottom of each stem was wounded with a shallow, 2.5 to 3.8 cm (1 to 1.5 in.) vertical slice to barely expose the bark cambium. The base of the cutting was lightly misted prior to treatment with 3,000 to 5,000 ppm indole-3-butyric acid (IBA) powder. The cuttings were placed in a well-drained, sterile mix of sand, perlite, and vermiculite. Overhead, intermittent mist and 21° to 24°C (70° to 75°F) bottom heat was used. As an alternative, cuttings may be placed directly into 4 to 6 inch pots under mist until rooting. In such cases, amend the propagation mix with a 50 percent peat-lite mix. Cuttings root in about 8 weeks. Pot into a 1- to 2-gallon pot in a well-drained, peat-lite mix with baseline nutrition. Harden-off for 2 months outdoors prior to field planting. Anticipate losses of 10 to 15 percent as a result of lifting and transplanting. No information is currently available on softwood propagation or root cuttings, but both are assumed to work well. Information on the field propagation of this species by dormant, unrooted hardwood cuttings is not available, but may prove successful on favorable sites.

Table 2. Adventitious rooting of three germplasms of silverberry, Bridger PMC 1998.

Seed-Source	Accession Number	Origin	Treatment (hormone)	Number Stuck	Number Rooted	Percent Rooting
PMC Source	9005352	Wheatland Co., MT (at Bridger PMC)	Rootone®	18	17	94
			16,000 ppm	18	18	100
			45,000 ppm	14	14	100
			Dip-N-Gro®	18	17	94
			Mean:			(97)
Streambank	9081339	Pondera Co., MT	Rootone®	18	17	94
			16,000 ppm	18	17	94
			45,000 ppm	18	16	89
			Dip-N-Gro®	18	17	94
			Mean:			(93)
Floodplain	9081340	Pondera Co., MT	Rootone®	18	18	100
			16,000 ppm	18	16	89
			45,000 ppm	18	15	83
			Dip-N-Gro®	18	18	100
			Mean:			(93)
				Grand	Mean:	(94)

ENVIRONMENTAL IMPACT ASSESSMENT: Pondera Floodplain Germplasm silverberry demonstrates growth, reproductive habits, and ecological niche functions comparable to the species as a whole, as observed in its original collection site and as compared to silverberry performance overall in Montana. It is a native species that spreads readily via underground shoots and is capable of forming dense colonies of thicket-like growth. In naturally occurring populations in Montana, silverberry is not invasive. It can be considered comparable to colonizing members of the Genus willow *Salix*, quaking aspen *Populus tremuloides*, and other sprouting native species such as American plum *Prunus americana* and snowberry *Symphoricarpos albus*. It tends to spread vegetatively more readily on moist, high fertility sites where competition from other species is moderate. It may spread between and within rows of windbreak and shelterbelt systems but is usually controlled by frequent mechanical cultivation as part of standard windbreak maintenance operations.

ANTICIPATED CONSERVATION USE: Pondera Floodplain Germplasm silverberry has several valuable conservation uses. It readily sprouts by suckers, especially on moist, fertile sites, making it useful in upper streambank stabilization work (NRCS Montana is currently testing three germplasms for this purpose). It is adaptable to high pH (8.0) and saline soils. It is quite drought tolerant and will grow well in 279 to 305 mm (11 to 12 in.) annual precipitation zones in eastern Montana, once established. It is a potential shrub component in windbreak and shelterbelt systems, although it may, however, prove unacceptably vigorous on moist, high fertility sites. Mechanical cultivation between rows has effectively controlled the spread of suckers into adjacent rows in a long-term planting at the PMC. It is recommended for Windbreak Suitability Groups 1, 3, 4, 5, 6, 9 (see Subgroups for more specific information). This germplasm provides dense, thicket-like cover for numerous wildlife species. The buds and fruit are food for song and game birds. Although silverberry provides emergency food for deer during critical winter periods, it has a lower palatability for deer and cattle than many other sources of browse. Moose are also thought to utilize silverberry for browse. It is also susceptible to girdling by rabbits and rodents.

POTENTIAL AREA OF ADAPTATION: Pondera Floodplain Germplasm silverberry should grow well in all areas where the species is found occurring in Montana and Wyoming east of the Continental Divide. It may also perform well in western Montana and Wyoming but has not been field tested in those areas to date. It is considered USDA Hardiness Zone 2 hardy, capable of tolerating average minimum winter temperatures of -40° to -46°C (-40° to -50°F). Although it

prefers moist, well-drained sites associated with riparian and streambank environments, it will tolerate relatively low annual precipitation zones 305 mm (12 in.) and heavy soils given proper establishment care and regular weed maintenance.

AVAILABILITY OF PLANT MATERIALS: Seed and cuttings of *Pondera Floodplain Germplasm* silverberry are available from the original collection site with permission of the private landowner. Contact the USDA/NRCS Plant Materials Specialist, Federal Building, Room 443, 10 East Babcock Street, Bozeman, Montana 59715 or the Bridger Plant Materials Center, Route 2, Box 1189, Bridger, Montana 59014 for more information. Propagules may also be available from the Nursery Supervisor, Montana Conservation Seedling Nursery, 2705 Spurgin Road, Missoula, Montana 59804. Propagules may also be available from commercial nurseries as advertised.

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