Plant Propagation Protocol for *Elaeagnus commutata*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2023*/*ELCO.pdf*

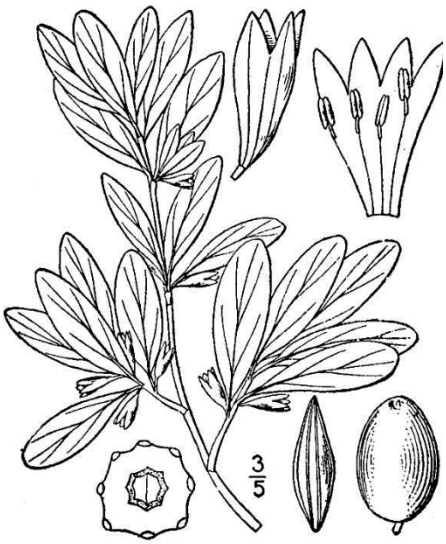


Photo gathered from USDA Plant Database.[1]

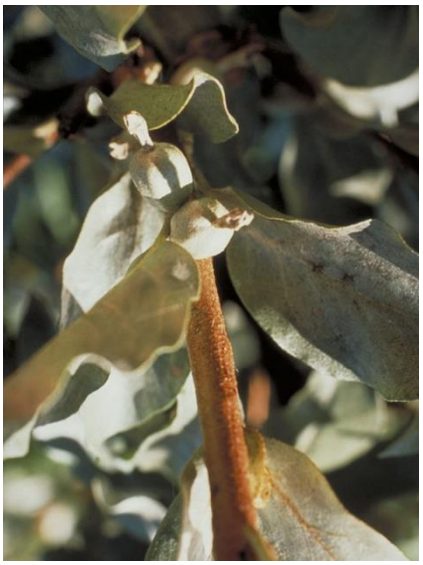
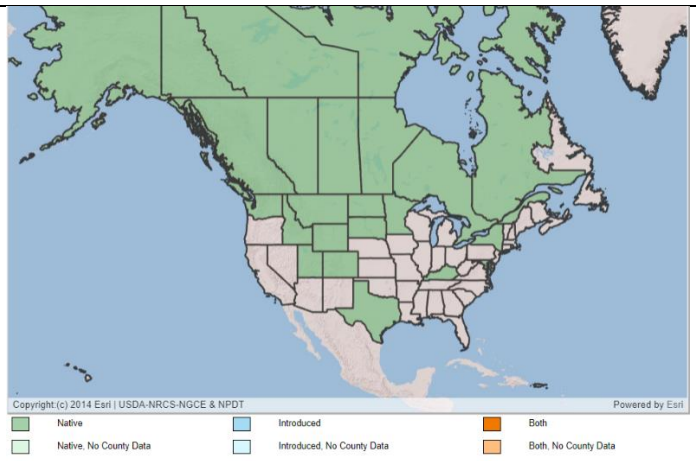


Photo accessed from Wildflower Center Slide Library.[2]

Photo taken from Burke Herbarium and taken by Wayne C. Weber (2007).[3]

TAXONOMY	
Plant Family	
Scientific Name	Elaeagnaceae Juss.
Common Name	Oleaster
Species Scientific Name	
Scientific Name	*Elaeagnus commutata* Bernh. ex Rydb.
Varieties	NA
Sub-species	NA
Cultivar	NA
Common Synonym(s)	ELAR9: *Elaeagnus argentea* Pursh, non Moench
Common Name(s)	Silverberry, wolf-willow, American silverberry, wild olive
Species Code (as per USDA Plants database)	ELCO
GENERAL INFORMATION	
Geographical range	 Photo is taken from USDA Plant Database.[4] "Silverberry occurs from Alaska and the Yukon Territory, east to the Great Slave Lake in the Northwest Territories, and south through Canada from British Columbia to Quebec to Minnesota, South Dakota, Colorado, and Utah."[5]
Ecological distribution	Ecosystems silverberry is associated with include: white pine forests, spruce-fir forests, aspen-birch forests, western hardwood forest, mountain grasslands, plains grasslands and prairie.[5] Silverberry plays an important role in many grassland communities in norther United States and Canada.[5] It can grow in open to sunny grasslands to cooler forests.[5] It grows best in loamy soils, but can handle dry or gravely soils as well.[5]
Climate and elevation range	Silverberry is found in elevations that range from 320 m to 1150 m.[6] Many sources reported that this species could handle temperatures down to -40 C, but no upper

	temperature ranges were found.[7] Multiple sources identified this plant as hardy, able to withstand "cold, wind, heat, poor soil and drought," as well as herbivory from deer and rabbits.[8]
Local habitat and abundance	Silverberry can be found growing with quaking aspen (*Populus tremuloides*), willow (*Salix spp*.), cottonwood (*Populus spp*.), mixed grass prairie systems, tallgrass prairie systems, shrubland systems and riparian systems.[5] It is considered a faculative hydrophyte species that occurs in both wetlands and non-wetlands systems in some areas (e.g. Alaska, Arid West), and an obligate upland species in other areas, never occurring in wetlands (e.g. Midwest, Great Plains).[4] The presence of silverberry is an indicator for the "quaking aspen parkland community type in the Canadian prairie provinces."[5]
Plant strategy type / successional stage	Silverberry is an early seral species that can handle disturbed soils, gravel banks and sunny areas.[3,5] It grows well post-fire due to the ability to resprout from rhizomes and colonize disturbed via seed.[5] It is a facultative wetland species in some regions (e.g. Alaska).[5]
Plant characteristics	Silverberry is a deciduous, long-lived perennial shrub with height generally between 3 to 13 feet.[5] Silverberry is named after its silvery leaves, which are alternate with blades lanceolate.[3] This species flower from June-July, with flowers clustered at the base of twigs in 1-3 leaf axils.[3] Fruits are drupe obovoid and are 9-12 mm. long.[3] Its main reproduction strategy is rhizomes, spreading via underground stems.[5] The species can also spread by seed, with birds often aiding seed dispersal.[5]
PROPAGATION DETAILS **Note: the following two protocols were written by the same author, Joe Scianna. The level of detail was so high for both of these experiments, full excerpts were added to this protocol so that no information was lost.**	
Ecotype	Pondera Floodplain Germplasm, Pondera County, Montana; Dupuyer Streambank Germplasm, Pondera County, Montana; and a Bridger PMC source, Wheatland County, Montana.[9]
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Plug
Stock Type	Containerized material in 40-cubic-inch to 2-gal containers.

Time to Grow	2 years
Target Specifications	NA
Propagule Collection Instructions	"Seeds are hand collected at Bridger, MT from early September through October and stored in woven synthetic sacks in a cooler at 34 to 37 F until processing."[9]
Propagule Processing/Propagule Characteristics	"Seeds are readily cleaned in a Dybvig macerator. After maceration, rinse repeatedly in a bucket to float off debris. Further cleaning generally not necessary. Spread wet seed on kraft paper in a warm, dry place for 24 to 48 hours before packaging and storing. Seed stores well for several years in paper envelopes or woven cloth sacks in a cool environment such as a basement."[9]
Pre-Planting Propagule Treatments	"Fresh seed requires little or no cold, moist chilling to germinate. A cold, moist chilling of 30 to 60 days may increase the rate and total germination of fresh seed slightly. Imbibed seed may be chilled in a ventilated ziploc bag in a perlite, vermiculite, or sand media and then sowed into containers or the seeds can be sowed directly into containers and then chilled in a cooler or unheated coldframe. Sow seeds in at least 10-cubic-inch pots for 1-year-old production and in 40-cubic-inch to 2-gal pots for 2-year-old stock."[9]
Growing Area Preparation / Annual Practices for Perennial Crops	"For container production, sow seeds in a well drained commercial peat lite mix in 10- to 40-cubic-inch cones."[9]
Establishment Phase Details	"After chilling, place containers in a greenhouse maintained at 75 to 80 F days for 16-hour photoperiods and 60 to 65 F nights. Germination is variable often ranges from 60 to 80 percent under greenhouse conditions."[9]
Length of Establishment Phase	NA
Active Growth Phase	NA
Length of Active Growth Phase	NA
Hardening Phase	"Move containerized material (at least 2 months since germination or rooting) started in the greenhouse that winter to an outdoor hoophouse in late spring/early summer (i.e. "finish" the plants in the hoophouse). The hoophouse is ventilated but not cooled, and the containers are usually exposed to full sunlight for 2 to 4 weeks early in the season. The hoophouse is then covered with a 50% shade cloth until temperatures cool in the fall. Another option is to finish container plants and rooted cuttings in the greenhouse and then move them to the shadehouse in late summer, allowing 30 to

	60 days of hardening prior to winter. The shade is usually removed in late summer/early fall and replaced with clear plastic. The plants harden-off gradually in the hoophouse prior to winter. [9]
Length of Hardening Phase	"As a standard practice, we allow a minimum of 30 days of hardening off prior to killing frost, 60 days is preferred."[9]
Harvesting, Storage and Shipping	Overwinter containers in a hoophouse. "Containers can be placed on 2 inches of pea gravel and arranged in a side-by-side pattern. The stock is watered over the fall and winter as needed. If temperatures in the spring are too warm to assure dormancy, plant material that is designated for dormant spring planting is moved to a walk-in cooler. Plants may be shipped with or without containers in heavy waxed boxes by priority ground mail (avoid weekend holdover at post offices)."[9]
Length of Storage	"Fully dormant container store well for several weeks at 34 to 37 F and 80+% relative humidity."[9]
Guidelines for Outplanting / Performance on Typical Sites	NA
Other Comments	
PROPAGATION DETAILS	
Ecotype	Pondera Floodplain Germplasm, Pondera County, Montana; Dupuyer Streambank Germplasm, Pondera County, Montana; and a Bridger PMC source, Wheatland County, Montana.
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	Container (plug)
Stock Type	Containerized material in 40-cubic-inch to 2-gal containers
Time to Grow	NA
Target Specifications	NA
Propagule Collection Instructions	"Collect dormant hardwood cuttings in December through February, 8 to 10 inches long, basal end of pencil diameter (~0.25 inches). Store in plastic bags with light moisture in a cooler or refrigerator until processing."[10]
Propagule Processing/Propagule Characteristics	NA
Pre-Planting Propagule Treatments	"Trim all cuttings to a 6- to 8-inch length. Remove all buds, leaves, and branches from the basal 2 to 3 in. of each cutting. Remove all flowers and fruit,when present, as well. Store the cuttings in moistened paper towels during processing. Recut the base of each stem cutting at an angle with a sharp knife and wound the

	basal end of the stem with a shallow 1- to 1.5-inch wound just below the cambium layer. Dip the entire cutting in a broad spectrum fungicide and allow to dry. Lightly spray the wound with water from a mist bottle, shake off excess water, and then insert the base into rooting compound containing 3,000 to 5,000 ppm of IBA. Remove excess hormone by lightly tapping the end of the cutting on the side of a hard surface."[10]
Growing Area Preparation / Annual Practices for Perennial Crops	"Prepare a well drained sterile media of 100% sand, 50:50 sand:perlite, 50:50 sand:vermiculite, or 50:50 perlite:vermiculite. Use bottom heat (70 to 80 F) for the root initiation stage (first 4 to 6 weeks), overhead intermittent mist controlled by a Mist-o-maticT, 16-hour photoperiods, in a greenhouse maintained at 75 to 80 F days and 60 to 65 F nights."[10]
Establishment Phase Details	"Cuttings are well rooted in 12 to 16 weeks. Pot up into 40-cubic-inch to 2-gal pots into a well drained peat-lite mix with baseline nutrition. Cuttings taken from wildland plants typically root 80 percent or better."[10]
Length of Establishment Phase	NA
Active Growth Phase	NA
Length of Active Growth Phase	NA
Hardening Phase	"Move containerized material (at least 2 months since germination or rooting) started in the greenhouse that winter to an outdoor hoophouse in late spring/early summer (i.e. "finish" the plants in the hoophouse). The hoophouse is ventilated but not cooled, and the containers are usually exposed to full sunlight for 2 to 4 weeks early in the season. The hoophouse is then covered with a 50% shade cloth until temperatures cool in the fall. Another option is to finish container plants and rooted cuttings in the greenhouse and then move them to the shadehouse in late summer, allowing 30 to 60 days of hardening prior to winter. The shade is usually removed in late summer/early fall and replaced with clear plastic. The plants harden-off gradually in the hoophouse prior to winter. Bridger is characterized by a high number of solar days that keeps the environment inside the hoophouse relatively mild until winter. In the case of premature and severely cold weather, a small propane heater is used at keep temperatures above freezing."[10]
Length of Hardening Phase	"As a standard practice, we allow a minimum of 30 days of hardening off prior to killing frost, 60 days is preferred."[10]

Harvesting, Storage and Shipping	"Fully dormant containerized plants store well for several weeks at 34 to 37 F and 80+% relative humidity."[10]
Length of Storage	NA
Guidelines for Outplanting / Performance on Typical Sites	NA
Other Comments	NA
INFORMATION SOURCES	
References	1. Britton, N., & Brown, A. (n.d.). An illustrated flora of the norther United States, Canda and the Birtish Possesions. 3 vols. 2. Weyand, P. (1992). Elaeagnus commutata (Silverberry) | NPIN. Wildflower Center Slide Library. https://www.wildflower.org/gallery/result.php?id_image=3808 3. Elaeagnus commutata—Burke Herbarium Image Collection. (n.d.). Retrieved May 23, 2023, from https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Elaeagnus%20commutata 4. USDA Plants Database: Elaegnus commutata. (n.d.). Retrieved May 23, 2023, from https://plants.usda.gov/home/plantProfile?symbol=ELCO 5. Elaeagnus commutata. (n.d.). Fire Effects Information System (FEIS). Retrieved May 21, 2023, from https://www.fs.usda.gov/database/feis/plants/shrub/elacom/all.html 6. E-Flora BC Distribution Map: Elaegnus commutata. (n.d.). Retrieved May 23, 2023, from https://linnet.geog.ubc.ca/eflora_SMaps/indexStatic.html?sciname=Elaeagnus%20commutata&synonyms=%27Elaeagnus%20argentea%27&mapservice=Vascular 7. Elaeagnus commutata Silverberry PFAF Plant Database. (n.d.). Retrieved May 23, 2023, from https://pfaf.org/user/Plant.aspx?LatinName=Elaeagnus+commutata 8. Elaeagnus commutata (Silverberry). (n.d.). Truckee Meadows Water Authority. Retrieved May 23, 2023,

	from https://tmwa.com/elaeagnus-commutata-silverberry/ 9. Scianna, J. (n.d.-a). Elaeagnaceae (Elaeagnus)—Reforestation, Nurseries and Genetics Resources. Retrieved May 23, 2023, from https://npn.rngr.net/npn/propagation/protocols/elaeagnaceae-elaeagnus-2773/?searchterm=Elaeagnaceae%20commutata 10. Scianna, J. (n.d.-b). Elaeagnaceae (Elaeagnus)—Reforestation, Nurseries and Genetics Resources (Vegetative). Retrieved May 23, 2023, from https://npn.rngr.net/npn/propagation/protocols/elaeagnaceae-elaeagnus-2775/?searchterm=Elaeagnaceae%20commutata
Other Sources Consulted	Many sources had great information for this species; no major sources lacked guidance.
Protocol Author	Stacey Dixon
Date Protocol Created or Updated	5/23/2023