

Growing Trees and Shrubs from Seed

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Tips on how to collect and handle seeds of Montana species for the greatest success in plant production.



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STARTING YOUR OWN PLANTS CAN BE FUN AND

can save you money on plant material – if you're willing to wait the several years it may take to produce a seedling of field-planting size. Here are some tips on how to collect and handle seeds of Montana species for the greatest success in plant production.

Collection

Where. Gather seeds from parent plants that have good form and are the dominant trees in stands of the same species, where cross pollination was probable. Don't collect from lone trees that would be self pollinated. Some species, like willow and poplar, are dioecious, having male and female trees. Only the female trees bear seeds.

When. Collect fleshy fruit as soon as they're fully ripe but before they fall or have been damaged by squirrels and birds (Table 1).

Harvest the cones of most pines when they have become dry enough to shed their seeds or when their specific gravity has fallen to 0.88 to 0.86. To test this, drop a few cones into a can of S.A.E. 20 motor oil. If they float, cones from a similar location on the tree are ready for harvest. Harvest legume seeds when the cord connecting the seed to the pod has shriveled.

How. By hand. Do not leave fleshy fruit in piles for more than an hour to reduce the chance of fermentation.

Extraction

The method of seed extraction depends upon the species.

Air drying. Place fruit on a screen in a single layer, making sure they don't touch each other. This works well for arborvitae, elm, mountain ash, pine, poplar, Russian olive, spruce, viburnum and willow.

Oven-drying. Use a simple convection oven or a screen placed above a stove burner. Spread the fruit in a thin layer and be sure the temperature doesn't get too high. Seeds of Ponderosa pine (120°F for three hours) and Scotch pine (130°F for five to 24 hours) are extracted this way.

Threshing. Spread fruit on a concrete floor and walk on them, but don't stomp your feet. You may have to remove walnut hulls by hand with a sharp knife. Use this method for catalpa, honeylocust, common lilac, locust, caragana and walnut.

Depulping. Remove the pulp promptly after harvest by running them over a screen by hand or by placing them into a food chopper. Wash out the pulp with running water. For chokecherry, crush and soak the fruit in water before trying to separate the seeds from the pulp. Most fleshy fruit, including those of apple, barberry, blackberry, buffaloberry, honeysuckle, juniper, mountain ash, pear, raspberry, serviceberry and viburnum are extracted by this method.

Cleaning

Dewinging. Rub winged seeds like those of pine, spruce, ash, birch and elm between your hands to remove the wings.

Winnowing. Pass any of the above seeds from container to container on a windy day or in front of a fan, allowing the chaff to blow away.

Flotation. After depulping, place seeds of fleshy fruit in a jar of water. Sound seeds sink, poor seeds and chaff float.

Storing

How do you store the seeds for extended periods once you've collected them? Room temperature is recommended for common lilac, pear and caragana. Store buckeye, silver maple, oak and walnut in damp cold (33 to 50° F). Be sure there is plenty of air circulation. All other species are best stored in dry cold in sealed containers. A paper envelope will work well and reduces the possibility of condensation destroying the seeds.

Treatments before sowing

Overcoming seed dormancy. As fruit ripen, physical and chemical changes occur in seeds. Some seeds can germinate as soon as they mature; most, especially in Montana and other cool regions, enter a dormancy, which

must be overcome before germination (Table 2). This is a preservation mechanism to prevent sprouting in autumn and subsequent winter damage to the seedling. The dormancy can be mechanical and caused by seed-coat impermeability, as in locust and honeylocust; by physiological conditions in the seed, as in maple and birch; or by both factors (double dormancy), as in serviceberry. To germinate, the seeds must have overcome their dormancy and have the proper amounts of moisture, heat and oxygen.

Seed coat dormancy. Seeds that have seed coat dormancy need only have their coats scarified or injured in order to germinate. Some commercial treatments require the use of concentrated sulfuric acid, but the safer methods include rubbing the seeds between two pieces of sandpaper, nicking the coats of larger seeds with a triangle file, and soaking seeds in hot water. The best method depends upon the species and is outlined in Table 2.

Internal dormancy. Give these seeds a cold treatment (stratification) to mimic the winter conditions they would normally be subject to. Generally this treatment includes holding seeds under moist conditions at 32 to 41°F for one to four months. Some species need a warm treatment followed by a cold treatment. Precise conditions depend upon the species. To satisfy stratification requirements, mix seeds with about three times their volume of moist sand or moist peat moss, place them in a polyethylene sandwich bag and store them in the refrigerator for the required amount of time. Or, sow them outdoors in the fall and mulch them with a few inches of straw or leaves. Refer to Table 2 for details.

Double dormancy. About a sixth of the woody species have both seed coat and internal dormancy and must be subjected to different treatments before germination. Amur maple is one of these.

Sowing

You can use a plastic or wooden flat to start seeds in the house, or sow them outdoors in spring or fall. Plant the seeds at a depth equal to their largest diameter and cover them with a light peat/sand mix or sand alone. Keep sprouting media damp, never waterlogged or dry. A porous media such as peat moss or sand that is not waterlogged will have the right amount of oxygen to promote germination.

The right temperature for germination varies for different species. For example, American plum seeds germinate best at 50°F, while Norway maple do best between 41 and 50°F. Seeds of American bittersweet germinate best between 50 and 77°F. Some species require fluctuating temperatures. For example, boxelder needs 50°F night temperature and 77°F day temperature for best germination.

Most home gardeners don't have the means to control temperature this precisely in the home, and there is no way to control outdoor temperatures. Start your seeds indoors in a warm area out of direct sunlight or plant them outdoors at about the time of the last spring frost.

Transplant the seedlings from flats to an area where they will receive frequent and proper attention. Keep them weed free and well watered through the first season and transplant them to their permanent location in the spring after sowing.

TABLE 1. The general season to collect seeds of woody plants. Some plants may be listed in more than one season depending upon when the seeds of different species ripen. In general, collect seeds from fleshy fruit when the fruit are fully ripe.

Spring	Summer	Fall		Winter	Anytime
Cottonwood	Cherry	Ash	Pine (most)	Ash	Lodgepole pine
Elm (except Chinese)	Caragana	Birch	Plum	Boxelder	
Maple, silver	Plum	Boxelder	Spruce	Catalpa	
Poplar	Serviceberry	Catalpa	Walnut	Spruce, Norway	
Willow	Honeysuckle	Cherry	Buffaloberry	Walnut	
	Cotoneaster	Elm, Chinese	Viburnum	Euonymus	
		Fir	Cotoneaster		
		Juniper	Euonymus		
		Maple, Norway			

TABLE 2. Cold treatments (stratification) needed for seeds to germinate. You can supply this artificially or sow seeds of most species outdoors in the autumn.

Common Name	Scientific Name	Medium	Degrees F	Duration (days)	Other Methods
Apple, common	<i>Malus x domestica</i>	Peat	35-45°	60-90	Sow outdoors in fall.
Apple, prairie crab	<i>Malus ioensis</i>	Sand or peat	41°	60	
Apple, Siberian crab	<i>Malus baccata</i>	Sand or peat	41°	30	
Apple, sweet crab	<i>Malus coronaria</i>	Sand or peat	41°	120	
Arborvitae, northern white cedar	<i>Thuja occidentalis</i>	Sand or peat	32-50°	30-60	
Arborvitae, western red cedar	<i>Thuja plicata</i>	Sand or peat			Generally, no strat. necessary.
Ash, green	<i>Fraxinus pennsylvanica</i>	Sand or peat	41°	90	
Barberry, Japanese	<i>Berberis thunbergii</i>	Sand or peat	41°	15-40	Sow fruit outdoors in moist soil in autumn.
Birch	<i>Betula</i> spp.	Sand or peat	41°	30-90	
Bittersweet, American	<i>Celastrus scandens</i>	Sand or peat	41°	90	Remove seeds from berries. Sow in fall or stratify for spring planting.
Buckthorn, European	<i>Rhamnus cathartica</i>	No dormancy; plant immediately.			Some species need scarification 20 minutes.
Buffaloberry	<i>Shepherdia argentea</i>	Sand	41°	60-90	
Caragana, common	<i>Caragana arborescens</i>	No dormancy.			Sow outdoors in late summer.
Catalpa, northern	<i>Catalpa speciosa</i>	No treatment necessary.			Store dry at room temperature and sow in spring.
Cherry, black	<i>Prunus serotina</i>	Sand or peat	41°	90-120	
Cherry, chokecherry	<i>Prunus virginiana</i>	Sand or peat	35-45°	45-90	
Cherry, sour	<i>Prunus cerasus</i>	Peat	32-50°	90-120	
Cherry, sweet	<i>Prunus avium</i>	Sand or peat	32-41°	90-120	
Cherry, western sand	<i>Prunus besseyi</i>	Sand	41°	90+	
Currants, red & white	<i>Ribes sativum</i>	Sand	68-86° followed by 41°	60 60-90	
Currants, golden	<i>Ribes aureum</i>	Sand	41°	90	
Elm, American	<i>Ulmus americana</i>	Sand	41°	60	
Elm, Lacebark	<i>Ulmus parvifolia</i>	No treatment required.			
Elm, Siberian	<i>Ulmus pumila</i>	No treatment required.			
Hackberry	<i>Celtis occidentalis</i>	Sand	41°	60-90	Sow in fall with no treatment or stratify. Macerate pulp before treatment.
Hawthorn	<i>Crataegus</i> spp.	Peat	41°	150	Some species require scarification.
Honeylocust	<i>Gleditsia triacanthos</i>				Soak in water at 190° until water cools.
Honeysuckle, Tartarian	<i>Lonicera tatarica</i>	Sand or peat	41°	60-90	
Horsechestnut, common	<i>Aesculus hippocastanum</i>	Sand	41°	120	Prompt stratification in fall.
Horsechestnut, Ohio buckeye	<i>Aesculus glabra</i>	Sand	41°	120	
Juniper, common	<i>Juniperus communis</i>	Sand	68-86° followed by 41°	60-90 90	Alternate temps in first period: 68° at night, 86° during the day
Juniper, Rocky mountain	<i>Juniperus scopulorum</i>	Sand	68-86° followed by 41°	120 120	
Lilac, common	<i>Syringa vulgaris</i>	Sand	41°	40-60	Will not reproduce true from seed. Fall planting out of doors or stratification
Locust, black	<i>Robinia pseudoacacia</i>				Soak in boiling water for 10 sec. to 5 min., then in water at room temperature for 8 to 10 hours.

TABLE 2 continued on page 4.

TABLE 2. Continued

Common Name	Scientific Name	Medium	Degrees F	Duration (days)	Other Methods
Maple, Amur	<i>Acer ginnala</i>	Sand	41°	150+	Light scarification plus stratification for 90 days at 41°. Collect <i>acer</i> species seeds before completely mature. Do not allow to dry out.
Maple, boxelder	<i>Acer negundo</i>	Sand			Soak in cold water for 2 weeks.
Maple, Norway	<i>Acer platanoides</i>	Sand	41°	90-120	
Maple, Rocky mtn.	<i>Acer glabrum</i>	Sand	41°	90	
Maple, silver	<i>Acer saccharinum</i>	No dormancy; plant immediately.			
Mountain ash, European	<i>Sorbus aucuparia</i>	Acid peat	33°	90	
Oak, Bur	<i>Quercus macrocarpa</i>	Plant immediately in fall. Do not allow to dry out.			
Peach	<i>Prunus persica</i>	Peat	35-45°	45-90	
Pear	<i>Pyrus communis</i>	Sand or peat	32-45°	60-90	
Pine, lodgepole	<i>Pinus contorta</i>	No treatment required.			
Pine, limber	<i>Pinus flexilis</i>	Perlite	41°	30-90	May not be required.
Pine, ponderosa	<i>Pinus ponderosa</i>	No treatment required.			
Pine, Scotch	<i>Pinus sylvestris</i>	No treatment required.			
Pine, western white	<i>Pinus monticola</i>	No treatment required.			
Plum, American	<i>Prunus americana</i>	Sand or peat	41°	150	
Poplar, bigtooth aspen	<i>Populus grandidentata</i>	No dormancy; plant immediately. Do not allow seed to dry out.			
Poplar, eastern cottonwood	<i>Populus deltoides</i>	No dormancy; plant immediately. Do not allow seed to dry out.			
Poplar, plains cottonwood	<i>Populus sargentii</i>	No dormancy; plant immediately. Do not allow seed to dry out.			
Poplar, quaking aspen	<i>Populus tremuloides</i>	No dormancy; plant immediately. Do not allow seed to dry out.			
Russian olive	<i>Elaeagnus angustifolia</i>	Sand	41°	90	Scarify before stratification.
Serviceberry, Saskatoon	<i>Amelanchier alnifolia</i>	Peat	35-37°	90-180	Scarify before stratification.
Spruce, blue	<i>Picea pungens</i>	Sand	32-41°	30-90	Only a small percent of seedlings will have the bright blue color.
Spruce, Norway	<i>Picea abies</i>	No treatment required.			
Spruce, white	<i>Picea glauca</i>	No treatment required. Plant immediately in fall.			
Viburnum, American cranberrybush	<i>Viburnum trilobum</i>	Sand	68-86° followed by 41°	60-270 60-120	
Viburnum, European cranberrybush	<i>Viburnum opulus</i>	Sand or peat	68-86° followed by 41°	60-270 60-120	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	Sand or peat	41°	60	Plant in fall or stratify.
Walnut, black	<i>Juglans nigra</i>	Sand or peat	35-50°	60-120	37° is most effective



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