

Growing Trees and Shrubs from Seed

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Starting your own plants can be fun and educational and can save you some 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 possibility of successful plant production.

Collection

Where. Gather seeds from parent plants that have good form and are the dominant trees in stands where there are many other plants of the same species. This makes cross pollination probable. Don't collect from lone trees that are likely self pollinated. Some species, like willow and poplar, are dioecious—they have 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 attacked by squirrels and birds (Table 1).

You can 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 test 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. Take care not to leave fleshy fruit in piles for more than an hour or so to reduce the chances for 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 method works well for arbovitae, 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 degrees F for three hours) and Scotch pine (130 degrees F for five to 24 hours) are extracted this way.

Threshing. Spread fruit on a concrete floor and walk on them. 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 depulping.

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 to remove chaff.

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

Storage

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 degrees 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.

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 for the seed to germinate (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 internal 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 moisture, temperature and oxygen.

Seed coat dormancy. Seeds that have seed coat dormancy need only have their coats injured in order to germinate. Some commercial treatments require the use of concentrated sulfuric acid to do this, 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 approximate the winter conditions they might normally be subject to. Generally this treatment includes holding seeds under moist conditions at 32 to 41 degreesF 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 peatmoss, 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 more detail.

Double dormancy. About a sixth of the woody species have both seed coat and internal dormancy and must be subjected to different treatments to break their dormancy. 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. Provide proper

moisture, which means that the sprouting media is kept damp but never waterlogged or allowed to 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 degrees F, while Norway maple do best at any temperature between 41 and 50 degrees F. Seeds of American bittersweet germinate best between 50 and 77 degrees. Some species require fluctuating temperatures. For example, boxelder needs 50 degrees night temperature and 77 degrees 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.

<u>Spring</u>	<u>Summer</u>	<u>Fall</u>		<u>Winter</u>	<u>Anytime</u>
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 these artificially or sow seeds of most species outdoors in the autumn.

Common Name	Scientific Name	Medium	Stratification		Other Methods
			Degrees F	Duration (days)	
Amorpha, Leadplant	<i>Amorpha canescens</i>	Sow in autumn.	—	—	
Apple, common	<i>Malus domestica</i>	Peat	41°	75	
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	32-50°	30-60	
Ash, green	<i>Fraxinus pennsylvanica</i> var. <i>lanceolata</i>	Sand or peat	41°	60-90	
Barberry, Japanese	<i>Berberis thunbergii</i>	Sand or peat	32-41°	15-40	Sow fruit outdoors in moist soil in autumn.
Birch, paper	<i>Betula papyrifera</i>	Sand or peat	41°	60-75	
Birch, European white	<i>Betula pendula</i>	Sand or peat	32-50°	30-60	
Bittersweet, American	<i>Celastrus scandens</i>	Sand or peat	41°	90	
Buckthorn, European	<i>Rhamnus cathartica</i>	No dormancy; plant immediately.			
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 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, clove	<i>Ribes odoratum</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	Macerate pulp before treatment.
Hawthorn	<i>Crataegus mollis</i>	Peat	75-80° followed by 41°	45 75-90	
Honeylocust	<i>Gleditsia triacanthos</i>	—	—	—	Soak in water at 190° until water cools.
Honeysuckle, Tartarian	<i>Lonicera tatarica</i>	Sand or peat	41°	30-60	
Horsechestnut, common	<i>Aesculus hippocastanum</i>	Sand	41°	120	
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° night, 86° day.

Juniper, Rocky mtn.	<i>Juniperus scopulorum</i>	Sand	<i>followed by</i> 68-86° 41°	120 120	
Lilac, common	<i>Syringa vulgaris</i>	Sand	41°	30-90	
Locust, black	<i>Robinia pseudoacacia</i>	—	—	—	Soak in boiling water for 10 sec. to 5 min., then in water at room temp. for 8 to 10 hours.
Maple, Amur	<i>Acer ginnala</i>	Sand	41°	150+	Light scarification plus stratification for 90 days at 41°F.
Maple, boxelder	<i>Acer negundo</i>	Sand	41°	90	
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, Burr	<i>Quercus macrocarpa</i>	Sand	41°	30-60	Stratification may not be required.
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>	Sand or peat	41°	30-90	May not be required.
Pine, limber	<i>Pinus flexilis</i>	Sand or peat	41°	30-90	May not be required.
Pine, ponderosa	<i>Pinus ponderosa</i>	Sand or peat	41°	30-60	May not be required.
Pine, Scotch	<i>Pinus sylvestris</i>	Sand or peat	41°	60-90	
Pine, western white	<i>Pinus monticola</i>	Sand or peat	32-40°	90	
Plum, American	<i>Prunus americana</i>	Sand or peat	41°	150	
Poplar, bigtooth aspen	<i>Populus grandidentata</i>	No dormancy; plant immediately.			
Poplar, eastern cottonwood	<i>Populus deltoides</i>	No dormancy; plant immediately.			
Poplar, plains cottonwood	<i>Populus sargentii</i>	No dormancy; plant immediately.			
Poplar, quaking aspen	<i>Populus tremuloides</i>	No dormancy; plant immediately.			
Russian olive	<i>Elaeagnus angustifolia</i>	Sand	41°	90	
Serviceberry, Saskatoon	<i>Amelanchier alnifolia</i>	Peat	35-37°	180+	
Spruce, blue	<i>Picea pungens</i>	Sand	32-41°	30-90	
Spruce, Norway	<i>Picea abies</i>	None required.			
Spruce, white	<i>Picea glauca</i>	Sand	41°	60-90	
Viburnum, American cranberrybush	<i>Viburnum trilobum</i>	Sand	<i>followed by</i> 68-86° 41°	90-150 60	
Viburnum, European cranberrybush	<i>Viburnum opulus</i>	Sand or peat	<i>followed by</i> 68-86° 41°	60-90 30-60	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	Sand or peat	41°	60	
Walnut, black	<i>Juglans nigra</i>	Sand or peat	35-50°	60-120	37°F is most effective



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