How to Grow Pine Trees from Seed:

You received your Pine tree seeds in the mail, now what?

Options:

- You can plant the seeds outdoors in the fall and let them naturally stratify during the winter and they will germinate in the spring.
- If the seeds require cold and or warm stratification period – you can stratify the seeds inside in your fridge during the winter months and then plant the seeds outdoors in the spring (after the last frost).
- You can stratify the seeds indoors in your fridge and then germinate the seeds indoors during the winter, growing the seeds into Pine tree seedlings and then transplanting the seedlings outdoors in the spring.
- If the seeds don’t require a stratification period, you can store the seeds in plastic bags in your fridge and plant the seeds outdoors in the fall or spring. Generally, spring is the best time to plant tree seeds outdoors because they have the spring, summer and fall to mature enough to survive the winter weather conditions.

What is stratification?

Seed stratification is a time for moist seeds to sit preparing to germinate. Most tree seeds need to be cold stratified indoors in your fridge. By placing your tree seeds in a container mixed with moist peat moss and organic seed starting mix, you are mimicking the natural winter conditions the seed goes through naturally to germinate in the spring. Tree seeds are smart in that they will not germinate if the weather conditions are low and the ground is cold or frozen. Tree seeds will only germinate when the weather conditions and temperatures are in their favor for survival.

How to stratify Pine tree seeds:

Many tree seeds require a cold stratification period in order to germinate while some require a warm stratification prior to the cold stratification. Cold stratification is at the temperatures of 34-41 degrees F (Fridge temps). Warm stratification is at the temperatures of 68-86 degrees F.

When a seed requires both a warm and cold stratification, the warm stratification is done first, followed by the cold stratification. A warm stratification is done to soften the seed coat or allow the seed embryo to mature.

- Seed should be stored cold prior to planting or stratifying. Allow the seed to warm to room temperature, and then soak the seed in warm water for 24 hours (for most
species). Drain and place seed in a plastic bag with 3-4 times the volume of seed with moistened milled sphagnum moss, moistened vermiculite, organic seed starting mixture or other suitable moisture medium.

- Add water to the bag to moisten the seed stratification mixture. After the moisture medium has soaked up the water, hold the bag upside down and squeeze like a sponge to remove any excess water. Vermiculite soaks up water fast while peat moss may take 8-10 hours before it has fully hydrated. The moisture medium should always be a sterilized material so you do not introduce any mold or fungi into the treatment.
- Shake up (seed/moisture medium mix) and place the bag in the refrigerator at 34-41 degrees F. We usually put the bag of seeds to be stratified in the vegetable keeper or crisper of our fridge. Remember, the seed does not know where it is, only the temperature. Do not put the seed in a freezer or in a place where the seed will be frozen all winter. In nature, snow and leaves on the forest floor forms an insulation blanket that keeps the seed at a temperature just around freezing on most days.
- Check every 2 weeks to look for molding or drying out. If the seed molds, just remove the seed and throw it away. Make sure the stratification mixture medium is moist and not dried out. If the mix starts to dry, add enough water to moisten, squeeze out any unused moisture and re-seal the bag.
- After the required time period (or after 20% germination is noticed), remove the seed and plant indoors, in a greenhouse or outside in the spring (after the last frost in your area).

**How to Warm Stratify Pine Tree Seeds:**

The warm stratification process follows the same rules as the cold stratification process but the temperature at which stratification takes place is 68-86 degrees F. You should use milled sphagnum moss as the moisture medium when warm stratifying. Milled sphagnum moss has anti-fungicidal properties and will help control mold and fungi problems.

Once stratification is started, a time clock begins ticking in the seed and the shelf life begins to decrease. Seed should not stay in stratification many months past its recommended stratification time as it will use up its energy reserves and die.

**Hot Water Treatment/Scarification**

Seed that has a hard seed coat-induced dormancy requires a stratification to break down the seed coat so that the seed may germinate or begin its stratification process. Hard seed coat
induced dormancy means the seed coat is too hard to allow water to enter. By stopping the entry of water, the seed coat stops the seed from germinating or being able to start any required moist stratification period.

One method to scarify many seeds is the hot water treatment, which is as follows:

1. Pour (4 times the volume of seed) almost boiling water over the seed and allow the seed to cool for 12-24 hours. Seed that is properly scarified will sink or swell depending on the type of seed.
2. Seed that is not properly scarified may take several years to germinate in an outside seed bed. Non-scarified, hard seed coat seeds planted in a flat may never germinate at all or only at very low percentages.
3. Another method of scarification is to rub the seed on a nail file or sandpaper. Be careful not to go too deep into the seed itself. Scratch the seeds just enough to nick the seed coat. Scarification via nicking the seed coat allows the seed to easily soak up water and moisture to begin the stratification and or germination process.

In nature, scarification is accomplished when the seeds pass through the digestive tract of some animals, through freezing temperatures or microbial activities that break down the seed coat.

What does Sow Under Glass mean?

Sow under glass is an older term and does not specifically mean that you need to use glass. It is a concept to be applied to your specific planting environment, whether in a greenhouse, window sill, or in a seed bed environment.

- Take a flat and fill ¾ full with moistened sterilized seedling starter mix. Use a sterilized seedling starter mix in the greenhouse or when planting a single flat. Plant the seed on the surface in an even manner. Try not to clump the seed in lines or certain spots. Do not plant too dense. It is better to plant the seed a little too thin that too thick. Place the flat inside a clear plastic bag and seal it with a twist tie.
- Place the flat in a sunny room where the temperature during the day goes up to at least 68 degrees F., with a temperature drop in the evening hours. Do not place in direct sunlight. Do not over water the flat. Watch for a color change in the soil which shows a moisture change. Usually the soil will lighten in color when it is drying.
- Water the flat by pouring water into the bottom of the bag and then be drawn up through the bottom of the flat. Pour out any water not drawn up after one hour. Most seed that is planted under glass is very small in size and seedlings end up being very small as well. If you water from the top, you may damage the seedlings or move the seed around to form clumps. Seed planted under glass usually germinates in 2-4 weeks.
• The humidity inside the mini-greenhouse you have created is much higher than the humidity outside of the bag. After germination and prior to removing the flat from the bag, you must slowly acclimate the seedlings inside the bag to the low humidity of the air outside of the bag. To do this, you can gradually open the bag wider and wider over a 2-3 week period prior to removal. Another method is to poke holes in the bags. Start with a few holes, and then every 3-4 days add some more holes to the bag. The idea is to slowly acclimate the seedlings to the lower air humidity outside of the bag over 2-3 week period. Once you start the acclimation of the seedlings you will have to increase the frequency of watering as the flats will dry out more quickly.

Pine Tree Seeds Stratification Requirements:

Knobcone Pine (Pinus attenuate): Seed requires 60 days cold moist stratification. Zones: 7 to 9
Slash Pine (Pinus elliotti): Seed requires 21-30 days cold moist stratification. Zones: 8 to 10
Torrey Pine (Pinus torreyana): Seed requires 30 days cold moist stratification. Zones: 7 to 9
Bristlecone Pine (Pinus aristata): No pretreatment required. Zones: 4 to 7
Coulter Pine (Pinus coulteri): 30-60 days cold moist stratification. Zones: 8 to 9
Eastern White Pine (Pinus strobus): 60 days cold moist stratification. Zones: 3 to 7
Japanese Black Pine (Pinus thunbergii): No pretreatment required. Zones: 5 to 8
Japanese Red Pine (Pinus densiflora): 14-21 days cold moist stratification. Zones 3 to 7
Jeffrey Pine (Pinus jeffreyi): 21-30 days cold moist stratification. Zones: 6 to 8
Korean Pine (Pinus koraiensis): Seed requires 60 days warm stratification followed by 90 days cold moist stratification. Seed germinates best in light. Zones: 3 to 7
Lacebark Pine (Pinus bungeana): 7-14 days cold moist stratification. Zones: 4 to 7
Loblolly Pine (Pinus taeda): No pretreatment required. Zones: 6 to 9
Ponderosa Pine (Pinus ponderosa): 30-45 days cold moist stratification. Zones: 3 to 6
Red Pine (Pinus resinosa): No pretreatment required. Zones: 2 to 5
Western White Pine (Pinus monticola): 60-120 days cold moist stratification. Zones: 4 to 8
Sugar Pine (Pinus lambertiana): 60-90 days cold moist stratification. Zones: 6 to 7

Longleaf Pine (Pinus palustris): No pretreatment required. Zones: 6 to 9

Pinyon Pine (Pinus edulis): No pretreatment required. Zones: 4 to 5

Scotch Pine (Pinus sylvestris): No pretreatment required. Zones: 3 to 7

Austrian Pine (Pinus nigra): No pretreatment required. Zones: 3 to 6

Chinese White Pine (Pinus armandi): 30 days cold moist stratification. Zones: 5 to 7

Aleppo Pine (Pinus halapensis): No pretreatment required. Zones: 8 to 10

Chinese Red Pine (Pinus tabulaeformis): No pretreatment required. Zones: 5 to 7

Border Pine (Pinus flexilus reflexa): 21-90 days cold moist stratification. Zones: 4 to 7

Sierra Nevada Lodgepole Pine (Pinus contorta, murrayana): 30 days cold moist stratification. Zones: 4 to 8

Which Zone are you in?
How to start Pine tree seeds indoors:

1. Stratify the Pine tree seeds in the fall or winter. Fill a plastic sandwich bag with a handful of damp peat moss or vermiculite and place the seeds in the bag. Store the seeds in a refrigerator at 33-41 degrees F for recommended stratification time.
2. Fill a seed tray with 3-4 inch layer of rich, but well-draining seed starting mixture. You can also use a mixture of equal parts peat moss, organic compost, vermiculite and coarse sand.
3. Plant the Pine tree seeds a quarter-inch to 1-inch deep in the seed starting mixture, spaced about 1 or 2 inches apart. Plant the stratified seeds indoors in late winter or early spring.
4. Water the seed starting mix to keep the seeds evenly moistened, but allow the water to drain thoroughly. Let the seed starting mix dry out completely between watering’s.
5. Set the seed tray in partial sunlight (about 50%) when the seeds begin to germinate. Keep the seed tray at room temperature while germinating and sprouting the maple tree seeds.
6. Transplant the strongest Pine tree seedlings outdoors or into individual planter pots after they’ve developed their second set of leaves, or “true leaves.”

FAQ

Q. How deep to plant Pine tree seeds?
A. Pine seeds should not be planted deep. Barely cover the seed with soil. You want your seeds to be about 1 inch under the soil.

Q. How often do I water Pine tree seeds/seedlings?
A. Pine tree seedlings require a regular supply of water (moisture) to grow well. A new Pine trees requires one to two watering sessions per week. The amount of water depends on the tree’s size. Each week, a tree needs roughly 5 gallons of water plus an additional 5 gallons of water per 1 inch of tree diameter as measured 4 ½ feet above the ground. If 1 inch of rainfall occurs in a week, then usually no supplemental watering’s required. You don’t need to overwater Pine tree seedlings. Overwatering can cause serious stress to the tree, attract fungi and diseases and potentially drown it.

Q. How much space should I leave between each seedling?
A. Pine trees should be spaced so that there branches won’t touch another tree. If the diameter of the tree is 20-40 feet, then trees should be spaced at least 40 feet apart. The recommended average space between Pine trees is 30 feet.

Q. What type of soils do Pine trees prefer?
A. Pine trees prefer full sun but can tolerate partial shade. Pine trees prefer a neutral to acidic PH soil.