

should be carefully planted outside in a sunny area of the garden. Evergreens will not survive indoors because of low humidity levels, especially in winter. For the next few years, they will grow best when watered and fertilized regularly. During the winter the seedlings should be covered with snow or a cardboard box to prevent winter browning caused by drying winds or sun reflecting off the snow.

After about 5 years of growth the young trees are ready to be transplanted in the spring. Each small pine should be dug up with a ball of soil around its roots and moved to a carefully chosen, permanent location. At maturity the pine tree will be 3-5 m in diameter and 12-15 m in height. If it is planted too near to a sidewalk, house, or garage, or under overhead power or telephone lines, the tree will have insufficient space in which to grow, and it will have to be severely trimmed or even cut down in later years.

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## Pine cone seed extraction and seedling cultivation

JACK PINE CONE (CLOSED)



Forestry Canada Forêts Canada

In the forest the life cycle of a pine tree (evergreen) begins when the warmth of the sun or heat of a forest fire melts the resin binding the scales of a mature pine cone, which then releases its seeds. A homeowner wanting to grow seedlings from pine cones must reproduce natural growing conditions, as described in the following procedure.

## Cone Collection

All pine cones require 2 years to mature before they are ready for collection. During the first year, small immature cones develop to about the size of a thumbnail (13 mm); in the second year the cones grow to full size and complete their seed development. Mature pine cones, both young (brownish) and old (silvery), should be gathered between November and April when cones are in peak condition (quite moist). Cones can be collected from either the tree or the ground underneath; they can remain on a branch for 10–15 years without seed viability being affected. Trees older than 40 years produce a higher percentage of germinating (sprouting) cones than younger trees.

## Cone Treatment

Cones of all evergreen species should be air-dried immediately after collection to avoid mold development on the outside of the cone and prevent internal heating, which could lead to rapid seed deterioration. Drying can be completed within 60 days, either by spreading a thin layer of fresh cones on a dry surface in the sun or by placing the cones in burlap bags that are then hung from overhead beams in an unheated shelter, protected from the rain.

## Seed Extraction

The most efficient method of opening the air-dried cones is to arrange them on a baking sheet and place them for two minutes in a conventional oven that has been preheated to 180°C (335°F); this will break the resin bonds. After heating, the cones should be kept at room temperature for 3–4 days until scales are fully open. Shaking the cones or tapping them on a hard surface releases the winged seeds, which are then dewinged when rubbed gently between the palms of the hands. Wings and other debris can be blown away—for many species, blowing on the seed will also separate hollow and light (immature) seeds from the seeds that are sound. All evergreen seeds should be kept in a plastic bag in the refrigerator to maintain germination capacity for extended periods.

## Seed Germination

Most species of evergreen seeds must be stratified before germination by storage for 21 days or longer in the refrigerator. This step is vital to seedling growth: it simulates the cold and moist conditions of the annual spring thaw and triggers the biological reaction within the dormant seeds that is needed for rapid and complete germination.

To test germination capacity a few seeds are soaked in water overnight and placed on moist tissue paper in a saucer, which is then covered with plastic wrap and left in a warm place. Germination should occur in 14–21 days. The percentage of seeds germinating in this test should tell the homeowner how many seeds to put in each container.

February is the best time to start growing seedlings. They may be started in any type of container in which drainage holes can be made in the bottom—a biodegradable egg carton is both suitable and readily available.

The growing medium should be coarse peat moss to allow good drainage and aeration. Each container or cavity must be filled with lightly compacted, water-saturated peat with space left for additional sand and water. In a regular container, 4–6 well-spaced seeds (depending on the germination test) are then placed on top of the peat (an egg carton should have 3 seeds in each cavity), and these are covered with fine sand to a depth of one and a half times the diameter of the seed. Putting plastic wrap over the containers should ensure that the peat does not dry out before the seedlings grow (up to 21 days). If rewatering is necessary the wrap can be removed for top watering and then replaced, or the container can be watered from the bottom.

## Seedling Care

Following germination the seedlings should be thinned so that only one (the best developed) is left in each container or cavity.

Seedlings are most easily grown under strong artificial light (florescent or incandescent type), which should be placed about 30 cm above the seedlings and turned on for 18 hours every day. Care must be taken not to burn the seedlings, and the peat must be kept moist. Natural light is also appropriate, but the seedlings' growth rate may be somewhat slower.

When seedlings are 21 days old a once-a-week fertilizer program should be started, using RX-15 or RX-30. Any fertilizer on the seedlings must be washed off immediately to prevent burning.

## Transplanting

At the beginning of June (after the threat of frost damage has passed) the seedlings