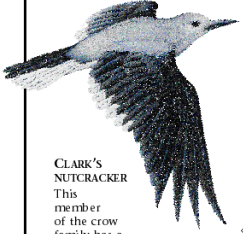


THE SECRET LIFE OF TREE SEEDS

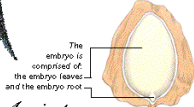
EVERY TREE SEED CONTAINS A MINIATURE LIVING TREE

When you see a giant tree in the forest, do you ever stop and think that it all began with a tiny seed? A Sitka spruce seed weighing 2.2 mg can produce a tree 93 m high, with a weight more than 32 billion times that of the original seed. Here are some more interesting facts about a few of the tree seeds of British Columbia.



CLARK'S NUTCRACKER

This member of the crow family has a powerful bill that can tear apart whitebark pine cones and crack the seeds inside. It can carry about 90 seeds in its throat pouch.



Angiosperms

Broad-leaved trees are called angiosperms because their seeds develop inside a protective container called a fruit. The word, angio means "vessel," and sperm means "seed".

"The seed is the start, the seed is the end, and what takes place between the two is biochemical mystery."

DAPHNE OSBORNE 1981



The lobed seeds of the bigleaf maple, *Acer macrophyllum*, have the little helicopter rotors.

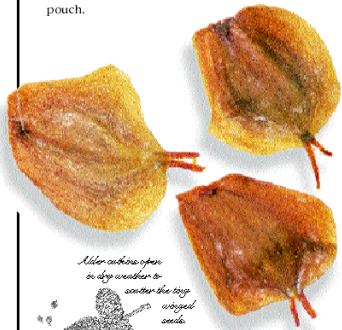
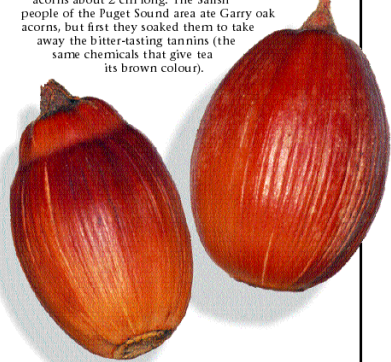
BIGLEAF MAPLE
Acer macrophyllum

These seeds grow in pairs and are heavier than most tree seeds found in the Pacific northwest. In spite of their weight, they can fly great distances. The spinning of the wings helps the seeds stay air-borne longer and travel farther on the wind.

GARRY OAK
Quercus garryana



Garry oak seeds are large acorns about 2 cm long. The Salish people of the Puget Sound area ate Garry oak acorns, but first they soaked them to take away the bitter-tasting tannins (the same chemicals that give tea its brown colour).



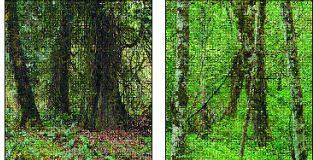
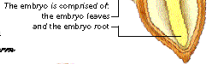
RED ALDER
Alnus rubra

Some cones react to moisture like tiny rain gauges. The cone-like catkins of red alder remain closed in wet weather. Dry weather opens the woody catkins.



Gymnosperms

Conifers are called gymnosperms because their seeds have no protective covering, but sit naked on the scales of a cone. Gymnosperm means "naked seed." Gyno is the Greek word for "female".



Conifers stay green during winter. An exception is the larch, which sheds its needles in fall and grows new needles each spring. Most broad-leaved trees lose their leaves in winter. Exceptions are arbutus and holly, which keep their leaves all year.

Resin vesicles



Some seed coats contain little resin pockets; the seeds, gummy, probably if these are punctured.



WHITEBARK PINE
Pinus albiculis

Whitebark pine seeds are large and have no wings. The trees grow in alpine regions where food is scarce; animals eat the seeds and scatter them.



AMABILIS FIR
Abies amabilis

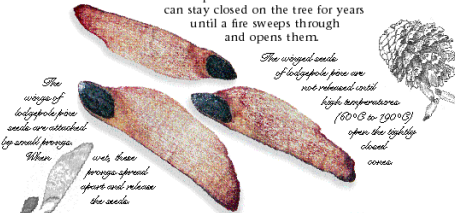
Amabilis fir seeds develop in large cones that sit upright on the branch. Ripe cones shed their scales along with their seeds, leaving only a "candle" attached to the tree. True fir seeds can germinate in very cold conditions (0°C to 5°C), and even when buried in snow.



The seed wings of amabilis fir have a little resin coating around the seed.

LODGEPOLE PINE
Pinus contorta

The seed cones of most lodgepole pine trees usually will not open without heat. Cones can stay closed on the tree for years until a fire sweeps through and opens them.



The wings of lodgepole pine seeds are attached by small pegs. When these pegs spread apart and release the seeds.

The winged seeds of lodgepole pine are not released until high temperatures (100°C to 200°C) open the tightly closed cones.

WESTERN REDCEDAR
Thuja plicata

In a nursery, western redcedar seeds must be planted by hand because of their small size and attached wings.

Pelleting covers the seeds with a special coating to make them larger and easier to plant by machine.

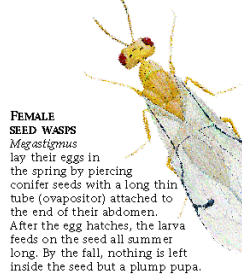
Western redcedar seed wings cannot be removed without damaging the seed.



WHITE SPRUCE
Picea glauca

Tree seeds have the ability to remain viable for long periods of time. White spruce seeds have been kept alive for 50 years under good storage conditions.

Some seeds sit in a spoon-shaped hollow at the end of the wing. When the wings are wet, the seeds are easily released.



FEMALE SEED WASPS
Megastigmus

Female seed wasps lay their eggs in the spring by piercing conifer seeds with a long thin tube (ovipositor) attached to the end of their abdomen. After the egg hatches, the larva feeds on the seed all summer long. By the fall, nothing is left inside the seed but a plump pupa.

Sometimes, we assist in reproduction by collecting tree seeds, and using them to produce new seedlings to reseed British Columbia's forests. Some may be collected by climbing tall trees or using a helicopter to get down from the trees.



ENVIRONMENTAL CUES

For British Columbia tree seeds, the most important environmental cues are temperature, moisture, and light. When a tree seed falls on the ground, usually during the fall, it doesn't start growing right away. This waiting period, called dormancy, has survival value. When winter weather limits a seedling's chance of surviving, a seed can wait until spring for better conditions. Then, when a seed receives the right environmental cues, it breaks dormancy and germinates.



RELATIVE SIZES

Tree seeds come in many different shapes and sizes. Winged bigleaf maple seeds are V-shaped and fuzzy; while Garry oak acorns are round and smooth. A Garry oak acorn is about 7300 times bigger than a tiny red alder seed.

TEXT BY DR. CAROLE LEEDER AND JUSTIN SLEPITZHOFF, PHOTOGRAPHY BY BILLY HENNINGSEN, ILLUSTRATION BY SOPHIE WARRICK AND HEAR WOOD, ART DIRECTION AND DESIGN BY DEBORA PENNEFORD FOR PLANET SCIENCE DESIGN, PROJECT CO-ORDINATION BY PAUL HENST