The Acorn
Acorns of the red oak group take two years to mature on the tree while white oaks mature in one year. Red oak acorns exhibit dormancy. Dormancy means that seeds will germinate slowly or not at all unless subjected to cool, moist conditions for a period of time. Breaking this dormancy through a process known as “stratification” is done by simulating the natural conditions found on the forest floor over winter. Germination is the beginning of visible growth of a seed by rupture of the seed coat and the extension of shoots and roots. The white oak group does not exhibit dormancy and the seeds may germinate and produce young roots soon after seeds fall.

Seed Collection
Acorns mature and fall from the tree in autumn months. A high proportion of the first to drop are often defective and will not germinate. Defective acorns are seeds which are worm infested or otherwise hollow. Once the main acorn crop starts to fall, however, seed should be collected as soon as possible. It is important to inspect the seeds and discard any obviously damaged, moldy, and wormy acorns.

Storage and Care
To store acorns for later use, place in heavy, 4-mil polyethylene bags and refrigerate at about 35°F. After a few days in storage, acorns should be “floated” in a container of water. Those acorns that float should be discarded. Floaters are empty seeds and will not germinate. After floating, remove acorns from the water and place back into storage. Maintaining moisture content of the acorns is important. An indication of proper moisture content is the accumulation of a few droplets of moisture on the inside of the storage bag. Bags should be opened periodically during storage and checked. Overly moist or immature acorns may develop a sweet, fermented smell and should also be discarded. Although storing acorns will reduce germination to some extent, acorns of the red oak group can be stored under controlled conditions for up to three years. Acorns of the white oak group will start to germinate under storage conditions and should not be stored an extended period of time.

Stratification
As previously noted, acorns of the red or black oak group are dormant and require a cool, moist treatment to stimulate germination. This treatment can be achieved by sowing in the fall or by an artificial treatment known as stratification. For best results, stratify in moist, but well-drained sand or a sand and moss mixture at a temperature of 32° to 41° F for 30 to 90 days prior to sowing. After about 30 days in the treatment, the acorns should be checked to see if germination has begun (seed coat has broken and shoot development is occurring). If germination has started the acorns should be planted.

Growing Oak Seedlings - Container Alternatives
A variety of containers can be successfully used to grow oak seedlings. Due to the very long taproot produced by oaks, a deep container (more than eight inches deep) is best. Several large holes in the bottom are necessary for drainage, and these allow the longest roots to emerge from the container where they may be pruned off. Container shape is also important. A square pot is ideal because it reduces the number of roots circling the container. Specially designed pots for tree seedlings can be bought. A quart milk carton with several one-half inch diameter drainage holes also works well.
Two or three acorns may be sown in each container, and any extra seedlings removed after a few weeks. Only one seedling should remain because two or more in a pot will result in badly tangled roots which will be very difficult to separate later.

**Growing Medium**
The best growing medium for starting oak seedlings is similar to other potted plants. A light textured, rapid draining, moderately absorbent peat moss-based mixture is ideal. The potting soil sold at most nurseries is excellent.

**Seedling Care**
Oak seedlings can grow well outside in partial shade. However, for indoor growth, full sun is needed. Ideally, the light should come from above, as in a greenhouse or cold frame. A sunny, south-facing window is a good alternative, but the pots will need to be turned almost daily during shoot flushes as the seedlings bend towards the light. Frequent rotating of the containers will prevent a permanent crook from forming in the stem. One month after germination, weekly applications of a dilute liquid fertilizer should begin. Most house plant fertilizers work well, especially if the nitrogen content is equal to or greater than the phosphorous and potassium. Most oak seedlings are planted out after one year in the nursery. A good alternative, especially if pint sized containers are used, is to plant the seedling out when it is three months old. If the acorns are germinated in December and January, grow the seedlings indoors until March, when they should be moved outside to a sheltered location to harden off. One week later, the seedlings should be moved to a location similar to the planting site, to allow further acclimation to the elements. Removal from the pots and planting outside can occur in late March, allowing the seedlings two months to establish before the heat of summer. Even if the seedlings are to remain in the pots for a year, they should be grown outside from spring to fall. Exposure to full sun and wind will produce stronger, hardier growth. The containers should at least be moved outside in early fall, and fertilization discontinued. The shorter daylight and cooler temperatures will cause the seedling to become dormant and prepare for winter. Overwintering seedlings in containers can be difficult due to freezing, drying, and rodent damage. Near a window of an unheated shed or garage makes a good overwintering site, as does a location between two buildings sheltered from direct sun and wind. Remember to continue watering the pots. The seedlings should be planted the next February or March.

The photograph on the left shows the transformation of a water oak seed to a seedling. Note that the shoot and the root exit the seed at the same spot.