



Course in Forest Conservation  
Bachelor Level  
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### Protection against Atmospheric factors

- ✓ Forests from the seedling stage up to maturity are subject to the influence of the weather and may thus be injured in various ways.
- ✓ The chief meteorological phenomena in question are frost, heat, wind, heavy rainfall, hail, snow, rime and ice.

# Temperature

- ✓ High temperatures may result in the death of small seedlings and in injury to sensitive portions where tender bark is exposed in trees of all sizes.
- ✓ Fire furnishes a special example of overheating, but otherwise temperatures excessive for forest trees are produced by heat of the sun.
- ✓ Such injuries occur chiefly on the southern and southwestern sides of the tree.
- ✓ temperatures above 50° C. make injuries to plant tissues, at the surface of the ground and in the top soil layer, reproduction may be entirely prevented on such areas.
- ✓ the southern side are more effected, Sometimes seedlings may recover from heat lesions. As seedlings advance in age, the bark becomes thicker.
- ✓ The tops of the trees shaded the stems inclined toward the south from the direct rays of the sun and hence the injury from excessive heat was small, whereas those inclined to the north had fully exposed stems nearly perpendicular to the rays of the sun and suffered heavy loss.
- ✓ Where this situation occurs the cambium under areas of thin bark is likely to be killed.
- ✓ The sun warms the plant tissues in late afternoon, and after sunset a rapid drop in temperature kills the plant tissues by freezing.



## Leaf Scorch Symptoms



## Sunscald symptoms on Stem

# Control

- ✓ Injury from excessively high temperatures can be avoided in forest nurseries by furnishing the tender seedlings with the requisite amount of shade.
- ✓ Among the most difficult situations upon which to establish natural reproduction are the south and southwest exposed edges of an old stand.
- ✓ Clear cutting or even heavy partial cutting on the south side of stands being reproduced should be avoided.
- ✓ On areas being artificially regenerated where high temperatures sufficient to kill the planted trees are expected, it may be best to plant the trees with their stems inclined toward the south and thus secure the benefit of the top in shading the stem.

# Frost

Trees may be injured in various ways or even killed outright by low temperatures.

The injurious effects of low temperatures upon trees may be classified into four groups as follows:

- A/ injury from late frosts in the spring
- B/ injury from early frosts in the fall
- C/ injury during the winter
- D/ and frost heaving.

The most commonly noticed effect of low temperatures is the killing of new terminal and side shoots and tender foliage by the action of late spring frosts coming after growth have begun.



## Frost injures





## Control

- ✓ Nothing can be done to prevent losses from the exceptional periods of winter cold, but sensitive species which need shelter in early youth can often be protected against late spring and early fall frosts and against frost heaving.
- ✓ The shelter of the old timber oftentimes will protect the young seedlings.
- ✓ Seedlings in the nursery can be protected by covering during the winter with a variety of materials such as leaves, straw, or burlap and if necessary during the early spring with lath screens and burlap.
- ✓ In planting dangerous sites, ,Planting should not be done in the fall, and only deep-rooted species and large-sized planting stock should be used.

# Drought

- ✓ Drought may be defined as a deficiency of soil moisture.
- ✓ A shortage in the normal precipitation, particularly at the time of year during which plants are growing rapidly and consequently require the most water, is the primary cause of drought.
- ✓ Danger from drought is made more acute by atmospheric conditions such as clear days, high temperatures, low relative humidities, and strong winds, all of which stimulate a high rate of evaporation, thereby rapidly reducing the already scanty supply of soil moisture.

## Effect of Drought

- ✓ Lack of sufficient water to provide for the needs of the forest results in extensive injury.
- ✓ The extent of the damage ranges from a slight diminution in growth to the death of the tree.



**Trees during the drought**

## Control

- ✓ The principle that should be followed is to maintain a more open forest than nature would provide on areas where drought injury is feared.
- ✓ Thinnings should be employed systematically, and a few vigorous stems with room for good crown expansion should be grown, instead of a large number of relatively weak competing trees.
- ✓ Caution is needed not to make the thinnings so heavy that wind movement and consequently evaporation are seriously increased.
- ✓ When stands are reproduced in regions of low precipitation, partial cuttings may assist in protecting reproduction from moisture deficiency.