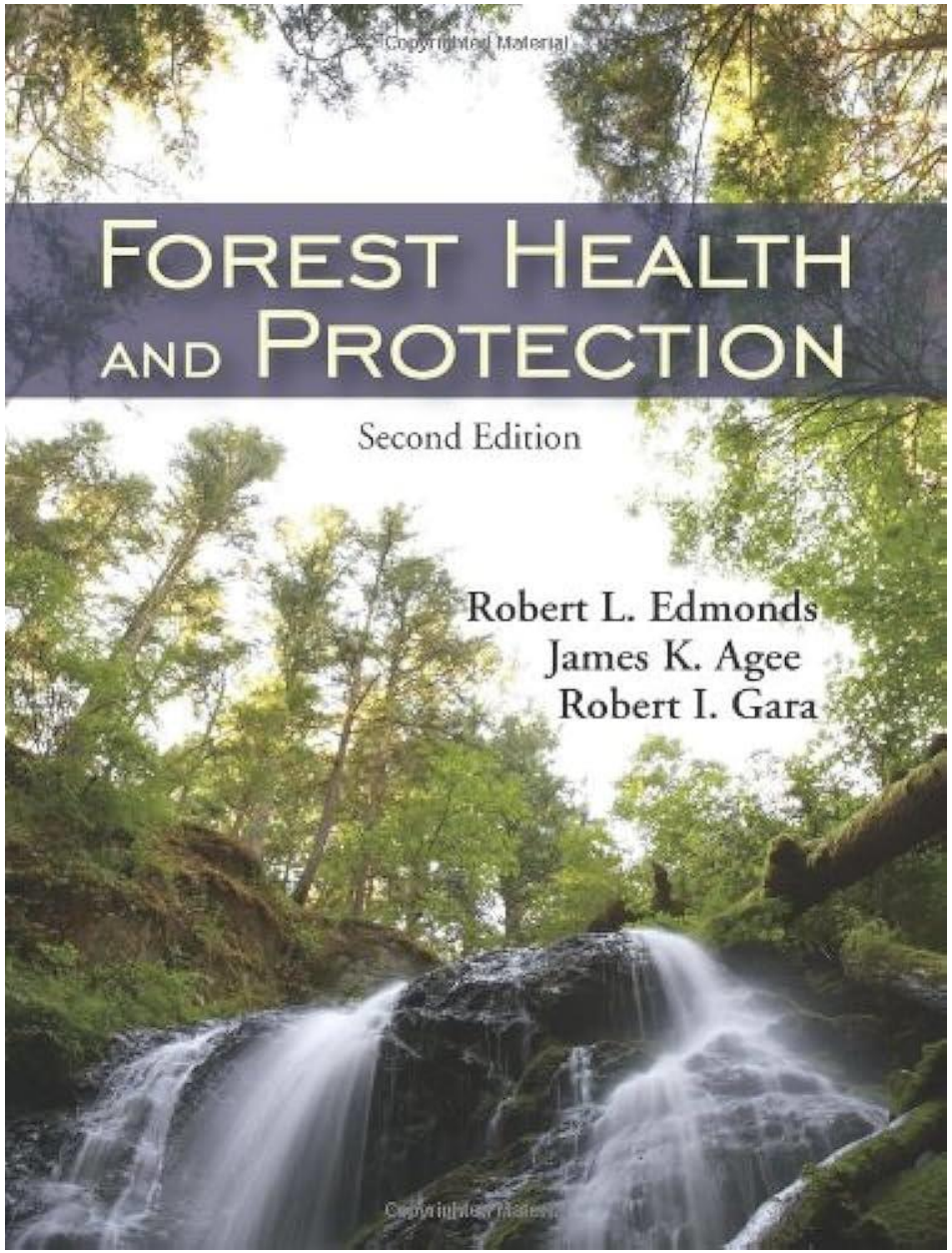

Course in Forest Protection
High Diploma Level
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Protection against injuries by plants

Introduction

- ✓ There are many plants which may pose threat to forest species in various stages of their life., i.e., seedling, sapling or even at mature stages.
- ✓ Such plants directly or indirectly have impacts on the growth and development processes.
- ✓ Plants injurious to forests may be weeds, climbers, parasitic phanerogams or fungi.

Injury to Forests by Plants

Injurious plants can be dividing in general into three classes:

- ✓ fungi
- ✓mistletoes and
- ✓ forest weeds

"A tree disease maybe defined as any interference with the normal functioning of a sound tree resulting in disturbed or abnormal physiological action or the deterioration of any of its parts." This is an exceedingly broad definition, so comprehensive as to take in injurious activities of practically all agencies affecting forests such as fire, insects, animals, atmospheric factors and man in so far as they interfere with the normal functioning of trees.

Damage due to excessive number of desired species

- ✓ At the initial stage, number of plants per unit area of a forest – natural or plantation– remains quite high. For example, a plantation normally starts with 1500 to 2500 plants per ha. Transplanting in large number per unit area is done to take care of natural mortality that will take place.
- ✓ However, excessive crop density even of the desired species is not sustainable or desirable for the forest to grow healthy.
- ✓ Each plant, for its survival and growth, demands space, food, water and light, which are all limited in a given site.
- ✓ As the plants grow, the demand of each plant increases and soon a stage is reached when the site cannot afford to meet the increasing demand.
- ✓ The plants therefore enter into competition for the essentials and with time the competition becomes fiercer.
- ✓ The dominant individuals which suppress the weaker ones are also denied of optimum growth because the weaker plants still continue to share the limited food and water the site can afford. If the situation is not intervened, the resulting crop of the desired species will consist of under-nourished, under-sized and disease prone trees/plants with little utility.

The management intervention that is necessary is to progressively reduce the number of plants per unit area, as the demand of each plant for food and water increases with its age.

The objective is to restrict the total demand of the entire stock for essentials within the limit that the site can provide.

It is done by carrying out cleanings in the sapling stage and regular thinning at pole stage and thereafter.

This will result in a mature crop of the desired species which would consist of healthy individuals of optimum growth and vigor.

Damage or Injuries by unwanted species

Forests are damaged by the following unwanted species:

A/ Damage by Forest Weeds and its Protection

- ✓ The term forest weed usually comprises plants which by their vigorous growth in masses more or less retard the development of young forest plants.
- ✓ By extending the meaning of the term, shrubs, and even many otherwise useful trees, may be included, which injure the growth of the principal local forest species.
- ✓ Weeds are undesirable and troublesome plants that grow profusely in forest floor, particularly in the blanks, cleared lands and in young plantations.
- ✓ The weeds may be shrubs, herbs or grass. If left unchecked, the weeds will suppress the seedlings of the desired species, retard their growth and, in extreme circumstances, can annihilate them.
- ✓ Certain weeds also act as host to insect pests and rust diseases. When weeds infest open areas and blanks of forests and plantations in their infancy, regeneration of desired species becomes extremely difficult.

The forest weeds can be managed by following certain rules as described below:

Maintenance of the Density of the Forest: Care is needed particularly in shelter-wood systems in which soil is liable to become weedy.

- ✓ Long rotations should be avoided and woods of light-demanding species (oak, pine etc), should be under-planted at the right time with shade-bearers (silver fir, spruce). If a soil-protection-wood is to serve its proper purpose, it must be introduced before grasses have sprung up and helped to dry the soil.
- ✓ Clear-cuttings should be rapidly re-stocked with strong transplants planted closely.
- ✓ The natural soil-covering of dead leaves, needles or moss should be maintained, by keeping up a dense cover, and by preventing the removal of litter.
- ✓ Spaces between plants may be covered with moss, dead leaves or sawdust. This prevents the soil from caking and retains moisture near the surface, and thus replaces completely the expensive processes of working the soil, weeding and watering.
- ✓ Cutting the forest weeds is the simplest and usually the method first tried. Such work often proves to be expensive unless the forest weeds have a sale value. Hence a cheaper method is sought.

Injuries from Fungi

The fungi are parasitic and saprophytic in nature.

It is the parasitic fungi which attack the growing forest.

Fungi cause a number disease in forest trees. Parasitic fungi prey upon living trees and directly affect the yield and quality of forest crops.

Under favorable conditions some fungi generally classed as saprophytic attack living though usually weakened trees.

They then become parasitic in nature.

The two most destructive classes of fungi attacking forest trees are the wood-destroying heart rots and the epidemic diseases which are virulent enough to cause rapid death of their host over wide areas of country.

Where a fungus of this epidemic type becomes established it causes more widespread and wholesale loss than the heart rots.

Decay fungi, in contrast, work very slowly, and though ultimately they may totally destroy the timber value of the stand, they require decades to accomplish this result.

Methods of Controlling Fungi

- ✓ Under ordinary circumstances indirect methods must be used in preventing the inception of tree diseases and in controlling those already started.

- ✓ The damping-off fungi are controlled directly by the application of various chemicals, either in solution or as dusts, which act to disinfect the soil or render it more acid. The chemicals are usually applied before the seeds are sown although sometimes treatment is given after the seedlings are up. Sulphuric acid, Bordeaux mixture, formaldehyde and aluminum sulphate are some of the chemicals which are effective against damping-off (Hartley 1921).

- ✓ Various needle diseases of coniferous nursery stock may be controlled by means of chemical sprays.

Parasites plants

- ✓ In some parasitic plants like species of Cuscuta (Swarnalata), small adventitious root-like structures, i.e rootlets called haustoria or sucking roots develop from stems of the parasites.
- ✓ These roots penetrate the tissues of the host plant and suck the latter.
- ✓ The parasite thus lives by sucking the host plant with the help of sucking roots.
- ✓ They weaken the host plant, cut into the stem of host plant as they twine up and may even kill the host plant