GOVERNMENT OF HARYANA

TECHNICAL NOTE NO. 14

FOREST PROTECTION

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14.1 The protection of forests is as important as raising them. In most of the cases the failure of plantations can be attributed to lack of protection. Therefore, protection must receive close attention of every member of the staff of the department.

14.2 The damage to plantations occurs through natural as well as biotic factors. The measures of protection against damage to the forests are given below :—

Natural Factors

(1) Frost

14.4 The frost damage is caused by rediation frost and pool frost. The radiation frost damages younger crops. The pool frost affects the crops in depressions and valleys. This type of damage is generally localised. Even tall trees are damaged by pool frost.

The frost generally effects the trees during the months of January-February, although early and late frosts are not uncommon and they also do considerable damage. In severe frost years, plantations upto 3-4 metres height may be badly damaged. Groups of Neem, Kiker, Siris, Accacia tortilis and Mesquite are prone to heavy damage.

The following measures should be adopted to reduce damage by frost :—

(i) The plantations should be irrigated during the frost period, if water is available.

(ii) The plants whether raised through seedlings or direct sowings should be covered by vegetative material. This operation should be carried out during the month of December. The cover may be removed towards the end of February, depending upon local weather conditions. This operation should be continued during the first two years of plantations when plants grow beyond damage by frost.

(iii) In the nurseries smoke should be created during the frostly nights.

(iv) The plants should de kept free from weeds to minimise frost damage.

(1) Parasites

14.4 Cuscuta reflexa (Akash Bel) and Loranthus longiflora are common parasites found on the trees and shrubs. It is always desirable to control the parasites in the early stages by keeping a close watch. The infested branches should be completely removed and burnt. In case of cuscuta reflexa the last traces may be removed so that it may not spread again. In case of heavy infestation, the entire tree may have to be cut. Annual check of the plantations is required to control these parasites

(3) Pests and Insects

14.5 Termites do considerable damage to the plantations in the seedling stage in dry areas. The damage in the areas with better rainfall is generally sporadic. In case of dry areas 30% Aldrin should be applied at the rate of 10ml. per plant at the time of watering the plants. 10ml of Aldrin is mixed in one litre of water and applied to each plant which should then be irrigated with 15 litres (One Tin) of water. In cases of areas with better rainfall the application may only be done on sandy soils or where damage appears. Subsequent application depends on the re-appearance of the damage.

14.6 Fungus like ganderma lucidus cause damage to Shisham and Khair plantations occasionally. Defoliater attacks Kikar plants during June - July. Whenever any damage is noticed, a detailed report should be immediately submitted to the D.FO. who will take up appropriate action. The information should give the location sample and extent of damage. If possible, sample of the insect and Fungus may also be sent. To reduce damage through fungii, unsuitable sites should be avaided while raising plantations e.g. sites with poor drainage or clayey soil should not be taken up for Shisham plantation.

Rats

14.7 Rats do considerable damage to the seedlings by nibbling the roots. Burrows are made in the ground close to the plants. To detect an active rat hole, all the holes should be covered with sand in the evening and next morning the hole which has been opened out will indicate the presence of the rats. Rat poison (Zinc oxide) should be placed in the holes.

II Biotic factors

14.8 Biotic factors are of greater importance than the natural factors. Many valuable plantations have been wiped out because of lack of effective control on grazing, fire etc. Various protection measures are discussed below :—

(i) Grazing

14.9 Grazing does most of the damage to the plants and failure to protect against grazing leads to total loss o plantations. The protection measures vary according to the extent of the area. It must be clearly understood that regular patrolli g is the only measures for ensuring safety of plants and Forest Guard must patrol the plantations regularly and particularly in the morning and evening when the cattle go out and return to the village. The Range Assistants must make frequent surprise raids and results may be noted in the fortnightly diary. The Range Officer should also organise raids occasionally. Fencing of plantations is desirable and various types of fences appli able in different situations are as under :—

(a) Strip forests

14. 10 (i) Thorny fence :— It is erected either along the individual plant in case of single row planting or as a long fence in case of multiple row planting. The specifications of the individual fence are:—

(i) The fence should have a circumference of 3 metres.

(ii) The fencing material should be thorny and obtained from younger trees.

(iii) The fence should be 1.5 metres in height.

(iv) Not less than 6 holes may be made along the circumference. Each hole may be 15 cm in depth and should contain 3-6 sticks.

(v) The sticks should be firmly embedded in the holes.

(vi) The fence should be tied with grass rope all around near the centre of the fence.

(vii) Sticks must be replaced as and when needed and fence maintained in good condition.

The long fence should h ve the following specifications:—

(i) The quality of fen ing material should be the same as given in secifications for individual fence.

(ii) The hole should be dug 30 cm apart in straight line, each being 15cm in depth,

(iii) Sticks should be firmly embedded in the holes. Each hole should contain 3 sticks.

Circular Trench Fencing

14.11 It is used generally near the village or on sites where the cattle movement is very heavy. On account of cost considerations, its use should be localised. The specifications are given below :—

(i) The inner diametre of the circular trench is 3 metres and the outer diametre is 4.2 metres. The cross-section of the trench is 60 cm.x60cm.

(ii) The dug out earth should be heaped along the outer edge of the trench.

(isi) Kiker sowing should be carried out on the circular ridge made out of dug up earth.

(iv) Cross-section of the trench should be maintained till the plantations are established.

Chappa binding

14.12 The practice consists of wrapping thorny shrubs around the stem of the Plant to prevent the damage through rubbing by cattle. It is used when the crown of the plant is high enough to be free from grazing damage.

The shrub should be secured to the stem by tying grass rope or jute string.

The bottom of chappa from the ground level should be kept at 60 cm. and the top is finished at 125 cm.

(2) Barbed wire fencing

14.13 The barbed wire fencing is generally used in multipel row plantations. Wooden posts should be 1.50m. long, reasonably straight and not less

than 8 cm. in diametre at the thicker end :. The thinner end should be pointedly finished. The lower 35 cm length which is to be embedded in the ground should be tarred. The posts are spaced 2.5 metre apart and they should be fixed in the holes firmly by ramming some brick bats or stones around. There should be 2 strands of barbed wire. The first strand will be at 45 cm from the ground and the second strand 90 cm. from the ground. The barbed wire should be tightened by using wooden batten having a notch at one end. The barbed wire is secured to the post with the help of U-Staple. Tightening of wire should never be ignored. Maintenance of barbed wire in proper form is very important.

14.14 (b) Compact Blocks.

(i) Barbed wire fence :—Details of barbed wire fencing are the same as in strip forests except that :—

(i) The height of the post will be 2 metres.

(ii) It will have three s rands, the first strand will be 30 cm from the ground, the second strand will be 75 cm. from the ground and the third strand will be 120 cm. from the ground.

14.15 (2) Trench fence :—Where barbed wire is not available, the areas can be protected against grazing by providing a linear trench with cross section of 1 M x 1 M along the border so that cattle can not enter the area by jumping over the trench. The dug up earth will be heaped on the inner edge of the trench. Kikar sowing will be done on the top of the ridge so prepared particularly near the village. In hilly tract instead of Kikar sowing Enphorbia planting can be done on the trench fence ridge.

Fire Protection

14.16 Forest crops are occasionally destroyed by fires. Chil trees, though fire resistant, need protection in the seedling stage. Broadleaved forest crops in Haryana are prone to fire damage both in summer and after a heavy frost in winter when they become very inflammable. Strict preventive measures are essential to a greater or lesser degree in the case of all forests whether in the hills or plains.

Causes of fires

14.17 Fires are either accidential or delibarate. The common causes are, lighting fires by travellers, shikaries and labourers; they are sometimes caused by sparks from railway engines; some times by carelessness in throwing away cigarette ends, accidents in charcoal burning, frequently they are lit from motives of revenge, for the sake of mischief; sometime to drive away wild animals or to conceal crime. It is a fact that accidential fires can be dealt with and brought under control without difficulty. In the case of wanton incendiarism it is quite impossible to take adequate measure to cope with the conflagration. Fires being, therefore, sooner or later inevitable it remains to take such adequate steps as lie in the power of the Forest Officer to mitigate this ever present danger and to reduce the fire hazard to the absolute minimum.

Fire Season

14.18 The greatest danger from fire occurs during the months of April, May and June and until the south-west monsoons break in early July. During the autumn there is ordinarily less danger from fire but the forests are not safe until after the first winter rain.

Relations of Forest Staff with the People

14.19 The practice of scientific forestry is impossible when there is enmity between the local populace and the Forest staff, as the forests are so inflammable that the results of years of effort can be destroyed by one fire. The Divisional Forest Officer and Range Officer must tour regularly through the forest area and must be accessible to local villagers and deal promptly on the spot with all complaints. It is essential that relations with local inhabitants should be friendly and these are secured only when rights recorded in Forest Settlements are fully satisfied and the obtaining of permits for forest produce is facilitated. Many forms of minor Forest produce are of no value for export but are of use to the local inhabitants and their removal can often be permitted. A contented peasantry and willing co-operation between them and the Forest Staff are the first essentials for successful fire protection.

Regeneration areas

14.20 The Chief demand of the villagers is for grazing, particularly in the areas close to villages and it is essential to take up concentrated regeneration in forests under a regular system of management so as to afford reasonable facilities for grazing by the flocks and herds of right-holders. An undue concentration of regeneration fellings is to be avoided.

Closures

14.21 Closure to grazing is necessary in the interests of regeneration, but care must be taken to enforce closures only against practices which are definitely harmful. The cutting of grass and bushes should be permitted as soon as the seedlings are established and grazing by limited number of cattle, but not by sheep and goats, should be allowed when the plantation are 5 years old atleast in order to reduce inflammable undergrowth. As soon as the plants have grown sufficiently to be out of the reach of sheep and goats these animals should be admitted where they have recorded rights, but not elsewhere. The removal of fallen pine needless for litter should be allowed to pine forests as the inflammability of the soil covering is thereby reduced.

The harmful effects of fires in pole crops and semimature forests where grass and bushes are kept in check by cattle grazing are markedly less than in forests closed to grazing, and it is now recognised, that a lowering in the quality of the locality and a consequent retardation in the growth of the crop due to grazing are far to be preferred to the risk of complete destruction by fire. Excessive grazing and browsing are, however, definely harmful and lead to serious erosion and cannot be allowed.

Prevention of fires entering from outside

14.22 The prevention of the entry of fire from outside is a matter of considerable difficulty. Fire patrols, the erection of notice boards, and the enforcement of rules and legal remedies are resorted to as a matter of course. Standard notices should be posted along public roads passing through the forests. Right-holders, consumers of forest produce, and Government officials are bound to furnish help to extinguish a forest fire whether called out by a forest officer or not and may not be permitted to evade their responsibility.

14.23 Exterior fire lines are kept clear of undergrowth, either by cutting or by burning, but in order to be effective they must be oorrectly located along ridges or along horizontal belts below the ferests. The cost of

efficient upkeep is high but they form lines from which fire fighting operation can be initiated, and their value is increased when paths along them add mobility to the laboure force. It is important that on clear lines the labour force can be effectively supervised and concentrated at spots where the fire is spreading rapidly. Boundary lines are kept clear o undergrowth and to some extent are substitutes for regular fire lines

Interior Fire line

14.24 The Sub-division of large blocks of forest and the isolation of plantations by cut lines are essential in order to render it possible to localise fires. Interior fire lines in the hills must run along ridges and along them must be constructed small foot-paths. These must be connected by level foot-paths, as thereby is not only the area divided into units of manageable size, but a labour force is rendered mobile and enabled to proceed with speed to the site of the out-break of fire. A fire can usually be extinguished provided that labourers can reach the spot before the fire has spread over a wide area and speed of movement is the first essential to successful fire extinguishing. These contour paths and fire lines along ridges also serve as bases from which counter-fires can be started with the object of confining the outbreak to definite limits. The roads and compartment lines of the irrigated plantations serve as interior fire lines. In case of strip forests a fire-line of about 5 M width will be made along the width of the strips after each K.M. length.

Reduction of Inflammability

14.25 The reduction of the inflammability of a forest throughout its life is essential, and the foundations of immunity from the more serious effects of fire are laid with the first seeding felleng, which must be as heavy as the silvicultural requirments of the species permit, in order to allow the burning of the very extensive refuse from conversion. A clean seed bed is essential to subsequent fire protection. The refuse from secondary and final felling cannot ordinarily be burnt in situ but must be removed by hand, thrown into nullah beds or burnt on blanks or merely piled and left to decay. Plantations should be confined between fire lines, or should and at definite nullahs, obstructions or brakes. All roads open to traffic travarsing the forests should be swept of needles during the hot weather. The use of grazing, grass cutting and the removal of fallen needles for litter in areas under regeneration has been referred to above. Young seedlings must be separated out at a very early age and the cut plants got rid of by the time and young plants are 2 M high; their average distance apart should be about 1 to 1.5 M. Early thinnings in pole crops reduce the danger from fire provided that the cut material is got rid of.

Special Measures of fire Protection in Chirforest

14.26 The chir forms a thick bark at a very early age which enables it to resist the affects of a slow fire and this property has been taken advantage of during the past which have witnessed the introduction and development of controlled burning. The chir forests will be burent after winter rain at 5 years rotation by fires constrained to more progressively in a down hill direction without appreciable damage to pole crops. Not only are the villagers more content with forest management by reason of the improvement in grass and grazing but the forests are rendered comparatively immune from the effects of fires during the hot weather owing to the reduction of inflammable soil covering.

Controlled Burning of Areas under Regeneration

14.27 All regeneration areas must be isolated by fire traces until they are sufficiently advanced to be burnt departmentally. Interior fire lines must be cleared of grass in order to enable fires to be localised. The chir seedlings develop a thick bark by the time it is 1 to 1.5 M in height which enables it to resist the effects of a slow fire during the winter. The foundations of successful fire protection are laid with the first seeding fellings which must extend evenly over the whole compartment under regeneration, appart from compact groups of poles which are left intact.

when the seedlings are 1 M in height the grazing by cattle should be permitted in order that the inflammble grass may be reduced : grass cutting may be allowed when the seedlings are considered by the Divisional, Forest Officer to be large enough not to be cut along with the grass but it must be noted that very young seedlings are normally cut by grass cutters, and that this has proved to be a reason for the failure of some areas to regenerate. The young plants must be thinned to a distance of 1 M when about 1 to 1.5 M in height and the cut material removed from the regeneration area.

Controlled Burning of Forest Not under Regeneration

14.28 Along ridges and level paths narrow traces are cleared of needles and a fire is started on the lower side and made to burn down hill only. Sufficient men must be present, armed with small branches for beating out the fire in the event of its jumping the trace. The fire burns slowly down hill and after it has burnt a few yards, the trace may be left under the watch of only a very few men and a fresh trace started some little way down the hill and a second fire started below it in order to expedite operations. Subsidiary ridges are useds a base lines for starting similar fires. Throughout the operation the line of fire should be kept as straight as possible and a few men must remain below it, particularly where the ground is steep, in order to extinguish at once fires caused by rolling cones. Operations must be so planned as to cease by night fall or then be confined to places where the fire can burn it self out without fear of extending to other areas, and two or three men must keep watch. Burning is safe during the winter months December to Fabruary and should commence as soon as the soil covering has dried out sufficiently after winter rain. Villagers are glad to give help free during the day as they benefit from the improved growth of the grass after fire and they should be consulted as to the dates when firing is convenient and as to the areas to be burnt as it undesirable to burn the whole of a village's grazing ground until there is no further need of winter fodder.

In forests tapped for resin it is difficult to prevent the blazes catching fire. Throughout the tapping season the bases of the trees must be cleared of needles, chips and resin by the tapping mazdoors and at end of season the ground at the basis of the trees must be left absolutely clean to a radius of 1 M all round,

Organization For Fighting Fires

14.29 During the fire season and particularly where the season has been very dry, the forests should be frequently patrolled by the whole of the forest staff; occasionally a night patrol should go round and every one found moving in the forest should be questioned. Every guard should look on his beat as his own property and should be considered personally responsible for its safety. Men can only be judged by their performance and inability to obtain immunity from fire will count against a man's record.

when a fire is observed, Forest Guards and Fire Watchers at 'look out' points should at once send a message to the Range Officer. They should immediately inform all Lambardars and Chowkidars of the right and concession holding villages in the vicinity as well as contractors and mates in charge of gang of labourers working near the scene of the fire. The senior officer present will immediately take command of the operations. He should know the local geography and have some idea of the labour force present and he should organise his labour in sections each under the orders of one man and should allot them definite tasks. He should keep a couple of man in waiting to take message and instructions to the various sections. Should a fire get beyond control, it is necessary to localise it by counterfiring. Counterfiring should only be done under orders of the senior officer incharge of operations and should only be attempted from defined line such as a road or ridge or fire line. A line is formed along a ridge by cleaning the soil covering and cutting bushes. From this a fire is started so as to consume the fuel in advance of the on coming forest fire. Roads are even more useful to conterfire from and even a narrow path is sufficient, provided enough men are present. After the fire has been brought under coutrol a roll should be taken of all villagers present so that absentees can be prosecuted.

A patrol is to be kept on duty until all danger of the fire spreading has been removed,

Each range should have a written plan of operations in case of an outbreak of fire and every members of the staff should have definite instructions exactly what is expected of him until the arrival of his senior officer.

Prosecutions

14.30 Proved cases of incendiarism should be punished with the atmost severity. Prosecutions under section 26 and 33 of the Indian Forest Act, are of little use in such cases and action should be taken under section 435 of the Indian Penal Code. The Divisional Officer should himself enquire into such cases and if necessary, conduct the case for the prosecution before the Magistrate and press for an adequate penalty.

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