Effects of fire frequency on vegetation in dry dipterocarp forest at Sakaerat, Changwat Nakhonratchasima.

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ABSTRACT

Effects of fire frequency on vegetation in Dry Dipterocarp Forest was conducted at Tum Bon Sakaerat, Amphur Pak – Thong – Chai, Changwat Nakhon Ratchasima during 1984 to 1988 in order to find the effects of fire frequency on tree growth, growth and survival of saplings and seedlings and to find appropriate fire frequency for the Dry Dipterocarp Forest. Five permanent sample plots of 20 X 40 $m.^2$ size of each were laid out for investigating effect of fire on tree growth and were treated at different fire frequencies which were annual burn, biennial burn, triennial burn, quadrennial burn and control. Ten meters wide firelines were constructed around the permanent sample plots. Four subplots of 4 x 4 $m.^2$ in size of each were laid out permanently within each of the permanent plots for determining growth, survival of saplings . One plot of 1 X 2 $m.^2$ in size was permanently set within every sub – plot for studying growth , survival and density of seedlings. The results revealed that the average tree growth of the triennial burn plot was the highest with the diameter growth rate of 0.4 cm./yr. (2.2 %) and the basal area increment of 0.001 $m.^2$/yr. (4.5%) and the lowest ones were in the annual burn plot with the rate of diameter and basal area growths of 0.2 cm./yr. (1.29%) and 0.0007 $m.^2$/yr. (2.65 %) respectively. Regarding to saplings the sapling growth of the control plot was the highest both in diameter and height with the average rate of 0.4 cm./ yr. (24.7%) and 25.75 cm./yr. (15.4 %), respectively and the lowest ones were in the triennial plot with the rates of diameter and basal area growths of 0.25 cm./yr. (5 %) and 3.0 cm./ yr. (6%), respectively. Four years after burning, the highest density of saplings was appeared in the control plot with the value of 3,281 stems per hectare. The development of seedling to sapling of the control plot was 71 % which was the highest value comparing to those of quadrennial burn, triennial burn, biennial burn were 53 %, 33 % and 20 %, respectively but there was no any seedling develops to sapling in the annual burn plot. With respect to seedling survival after burning, the seedlings which have diameter at base less than 1 cm.

were completely dead and the ones have diameter at base more than 2.5 cm. were survival from fire. Besides, the effects of fire frequencies on natural regeneration and development of undergrowth were found that the fire activated natural regeneration by showing that one year after burning the number of plant species of burned plots were more than that of control plot but for long term fire control, the number of plant species was increased, especially herbaceous plants and forbs. In burned area, the numbers of plant species between preburn and postburn were the same. Finally, the height growth of *Shorea obtusa* 's seedling was highest in control plot with the rate of 3.94 cm./yr. (7.71 %) and the average height was 66.7 cm. The lower height growth of the seedlings in sequences were in quadrennial burn plot in triennial burn plot, in biennial burn plot and in annual burn plot, respectively. The average height of the seedling in annual burn plot was 50.1 cm.