

Abstract

This project aimed to evaluate potential of pine in terms of growth rate of each pine species planted in species and provenance trials experiment at Wat Chan Royal Project Foundation. Natural regeneration and pine growth left after thinning also continuous recorded. We also studied the probability of introducing exotic pines for forest extension compared to those indigenous pine. Moreover, the effects of burning on pine regeneration and non-timber forest products were also investigated. Here we reported the 4th year results of the study.

Provenance trails of five pine species at 2-year-old showed that survival rate and growth rate of all exotic pines were greater than those of indigenous pines, of which growth of *Pinus oocarpa* and *P. tecunumanii* were higher than *P. caribaea*. Growth rate of *P. Merkusii* was lowest among all pines species owing to its grass stage.

Concerning to the natural regeneration of *P. Merkusii* stand, the result revealed that natural regeneration of pine was normal, where small and young trees were ready to replace the old ones. Based on 3-yr result, tree and sapling density tends to increase, while seedling density changes was not clear. Thinning has great effects on growth of *P. caribaea* significantly, compared to those of controlled non thinning plots.

From the study of the growth of three species of exotic pine tree, which are *P. caribaea*, *P. tecunumanii* and *P. oocarpa* planted in the house-hold use forest of farmers. It was found that at the age of 12 months, the three species of exotic pine tree was decreased from forest fire in last february. The survival rate of *P. tecunumanii*, *P. caribaea* and *P. oocarpa* were 46.7, 44.7 and 38.7 percent, respectively. For diameter at ground level, it was found that *P. tecunumanii* had the highest, followed by *P. caribaea* and *P. oocarpa*, with average of 0.50, 0.43 and 0.42 cm., respectively. For growth of height, it found that *P. tecunumanii* was highest, followed by *P. oocarpa* and *P. caribaea*, with an average of 48.16, 45.76 and 41.48 cm, respectively. The result showed after planted for 12 months, *P. tecunumanii* had better growth than *P. caribaea* and *P. oocarpa*.

Fire causes all seedling dies after burning experiment. However, post burning seedling germination increase 3 months after burning experiment due to forest floor opening (so called "seedbed") that suitable for germination. Regarding to Sapling changes, its changes both in terms of density and growth rate cannot be made due to the short time of experiment. Monitoring at 6 months or 1 year after burning will be managed to determine effects of burning on growth of sapling.

The production of non-timber forest product (Puff Ball Mushrooms) is very high in June-July. The study showed that the value Puff Ball Mushrooms for this area is about

14 million baht for this year. The cost of Puff Ball Mushrooms is range form 30-200 baht per liter. The villager collect 104780 liter of Puff Ball Mushrooms only for this year.

The result of restoration conservation forest activities (such as repairing check dam) and forest fire management in three village 2019 were operated. However, forest fire management activities fail because of dry weather, few of rain in last season that effect to amount litter on the forest ground, and hence resulting in high fire intensity and burned area for this year. The factors for success of project is participation of people as multiple sectors that the community leaders as key players.

Keywords: Pinus species, forest plantation, Watchan Royal Project

