



Tropentag, October 7-9, 2008, Hohenheim

“Competition for Resources in a Changing World:
New Drive for Rural Development”

Needle Morphological Variation within and among a Population of *Pinus merkusii* in Central Aceh, Indonesia

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Abstract

Pinus merkusii, also called Sumatran Pine, is one of the truly tropical pines in the world, is a native to South East Asia which is extensively distributed in Thailand, Laos, Cambodia, Viet Nam, Sumatra (Indonesia) and the Philippines. It has a large altitudinal range from a few meters above sea level to over 1800 m. It is one of the major plantation species in South East Asia and is favoured for both timber and pulpwood production.

P. merkusii is a medium large size tree, reaching 25–45, with a trunk diameter up to 1 m pyramidal to conical crown on young age, and flatter and spreading on old age. The needles are very slender, rigid, straight 15–25 cm long and less than 1 mm thick, green to yellow colour and are found in a pair of two. The two needles in a same fascicle are almost similar in size with just 1 mm different with each other. The needles are persistent for 2 years and its dried leaves weigh around 60–90 milligram per fascicle.

The length and shapes of needles, stomatal density etc are dependent on the local environment, CO₂ concentration, the availability of water and light intensity hence the study on needle morphological variation within and among population of *P. merkusii* in central Aceh has been conducted in November, 2007 with the main objective of identifying the needle morphological variability. The length of needles and fascicle, shape of the needle and stomata density are taken as the major traits to identify the variability. Altogether 1820 needles from 90 trees from 6 populations were collected and analysed for morphological traits. Out of these, 60 needles from 6 populations were microscopically studied for stomata density. Furthermore, 10 needles (all are 2 months natural dried) from each population were weighed and length measured for the analysis of needle length - weight relationship. Statistica 6.0 programme has been used for the statistical analysis and interpretation of data.

The lengths and shape of needles are found significantly different according to population whereas the stomata density is found insignificant.

Keywords: Needle, *Pinus merkusii*, population, sites, stomata, stomata density