Sarun Hongsakornprasert 2013: Growth and Development Evaluation of 4 Oil Palm Clones Grown on Acid Sulphate Soil of Rangsit Soil Series. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Assistant Professor Sutkhet Nakasathien, Ph.D. 68 pages.

Oil palm is a highly potential energy crop that can be utilized as raw materials for the biodiesel production. In addition to the alternative energy source, the palm oil and its by-products also serve as the food source and related industry. As indicated in the Oil Palm and Palm Oil Industrial Development Plan (2008-2012) by the Ministry of Energy, it is expected that oil palm plantation will be increased to approximately 4.65 million rais, covering the expanded areas in the central plains, eastern and northeastern areas of the country. Thus, oil palm production plan and cultural practices in the referred newly planted area, especially to accommodate the expanded planting areas in the acid sulfate soil of Rangsit area, is increased in its importance, ranging from the basic information of local farmers and their cultural practices, the meteorological data specifically to the plantation areas. From the survey in the newly planted areas of 5 sub-provinces in 4 provinces of Saraburi, Pathumtani, Nakhonnayok and Ayutthaya, it was found that the agricultural geographical information, the meteorological data, the irrigation system complied with the knowledge and skill of farmers, supportedly demonstrated that Rangsit area is a highly potential oil palm production area in central areas of Thailand.

In addition to the study of potential area of oil palm production, the oil palm varieties specific to the planting areas is one of the key factors for production accomplishment. Thus, another objective of this experiment is to evaluate the growth and development of 4 hybrid oil palm clones of Agr8, Agr9, Agr13 and Agr14 compared to that of Suratthani2 (ST2), under the acid sulphate soil of Rangsit, by transplanting the 10-months old seedlings to the field. From 17 months after planting, data were collected. The green index (GI) of Agr13 and Agr14 reached the maximum of 77.24 and 76.03 SPAD units, respectively, comparing to the lowest GI of Agr8 at 67.85 SPAD Units. This reflected on the highest net photosynthesis (A) of Agr13 at 8.92 µmol $CO_2m^{-2}s^{-1}$ that was highly significant when compared to those of Agr8 at 3.69 µmol $CO_2m^{-2}s^{-1}$. However, the Leaf Area Index (LAI) of Agr9, Agr8, ST2, Agr13 and Agr14 showed the highest to lowest values of 1.98, 1.73, 1.28, 1.10 and 1.05 m^2ha^{-1}, respectively. When the A per total leaf area is calculated, the Agr9, Agr13 and ST2 are not different but highly significant when compared to those of Agr14 and Agr8, respectively. From the indices used in this study, They can be applied for growth and development evaluation during 1-3 years of crop potential before the reproductive phase begins.

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