THE IDENTIFICATION OF PESTS AND DISEASES OF YOUNG FAST GROWING TEAK (Tectona grandis L. f.) IN THE EXPERIMENTAL FIELD OF MERCU BUANA UNIVERSITY JAKARTA

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Abstract

The identification of pests and diseases of fast growing teak is still limited. Pests and diseases are specific to a certain location. This research is conducted to identify pests and diseases of fast growing teak in the Experimental Field of Mercu Buana University (MBU) Jakarta. It is expected that the results of this research can enrich the information of pests and diseases of fast growing teak.The diseases found were rust fungi on leaf surfaces and the plants were bent because of water deficit. The important pests found were the larva of Phyllopaga sp., Xyleutus sp., Hyblaea puera Crm., and Neotermes tectonae Damm. Most of pests and diseases could be controlled effectively.

Key words: pests, diseases, fast growing teak

Identifikasi hama dan penyakit pada jati dengan pertumbuhan cepat (*fast growing teak*) di Indonesia masih terbatas. Hama dan penyakit bersifat spesifik untuk tiap lokasi. Penelitian ini bertujuan untuk mengidentifikasi hama dan penyakit jati dengan pertumbuhan cepat di Kebun Percobaan Universitas Mercu Buana Jakarta. Diharapkan hasil penelitian ini dapat menambah informasi mengenai hama dan penyakit jati dengan pertumbuhan cepat. Penyakit yang ditemukan di lokasi adalah karat daun dan tanaman yang menjadi bengkok yang diperkirakan karena kekurangan air. Hama penting yang ditemukan adalah larva *Phyllopaga sp.*, *Xyleutus sp.*, *Hyblaea puera* Crm., dan *Neotermes tectonae* Damm.Sebagian besar hama dan penyakit ini dapat dikendalikan secara efektif.

Kata kunci: hama, penyakit, jati dengan pertumbuhan cepat

I. INTRODUCTION

As an expensive product, where the price of fast growing teak wood is US$ 300 per m^3 on average to US$ 700 m^3 (Akwasi & Oteng-Amoako published at ITTO Tropical Forest Update 14/1 2004), the management of the plantation is directed to avoid

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any factor that can reduce the wood production such as pests and diseases.

Pests and diseases are the important topics of agricultural production in wet tropical region such as Indonesia. In the world, the failure of pre and post harvest caused by pests and diseases was in the rate of 45 % of the production. The failure was even happened after using the chemical pesticide and resistant varieties (Strand, 2000).

The identification of pests and diseases of fast growing teak is still limited. One research on it was done by Supriatna (2002) in Ma'had Al-Zaytun, Indramayu, West Java. Pests and diseases are specific to a certain location (Lehmann-Danzinger, 2004, pers. comm). This research is conducted to identify pests and diseases of fast growing teak in the Experimental Field of Mercu Buana University (MBU) Jakarta. It is expected that the results of this research can enrich the information of pests and diseases of fast growing teak.

II. METHODS

The method used in this research is visual observation of 81 plants which were planted in three different level of water regimes. The water regimes are dry land, irrigation with 7 mm day^{-1} and irrigation with 14 mm day^{-1}. The irrigation were applied when rainfall less than 7 mm day^{-1} and 14 mm day^{-1} respectively. The irrigation were applied for ten months since one week after planting. However, pests and diseases were observed until two years after planting. The observation of the root pests and diseases was done every two months in one plant for each treatment.

Four months old 'Golden teak' seedlings derived from tissue culture were planted on 19 April 2002, two weeks after soil tillage, in the Experimental Field of MBU Jakarta. Before planting, the seedling polybags were put into the solution of 2 g l^{-1} Dithane M-45.

Planting pits of 40 x 40 x 40 cm were dug out and spaced at 2.5 x 2 m. Two days after soil tillage, 5.4 t ha^{-1} of lime was applied to increase soil pH from 5.4 to 6. Chicken manure (1.5 ton ha^{-1}) was applied a week after soil tillage. A week after planting, mineral tablet fertilizer with the dose of 40 g per plant consists of N 20%, P 10%, K 15%, Mg 4%, Ca 8%, and S 3% was applied.

III. RESULTS AND DISCUSSIONS

Some of pests and diseases found in Ma'had Al Zaytun by Supriatna (2002) were the same with were found in the Experimental Field of MBU Jakarta.

The disease found in the Experimental Field of MBU was rust fungi (*Olivea tectonae*) on leaf surfaces. The disease found in the lowest leaves near the ground until around two months after planting (MAP). At that time, leaves were far enough from the ground as the teak had been taller. This may related to the irrigation method used in the experiment by flooding the area around the plant in the afternoon. Therefore the lowest leaves were wet for some hours every day. However, this disease did not affect the growth of young teak seriously.

Diseases can be classified also as a non parasitic diseases or abiotic diseases (Lehmann-Danzinger, 2004). Five months after the end of irrigation, there were 30% of plants in the non-irrigated treatment were

bent, 3.7% in the irrigated treatment of 7 mm d^{-1} and 0% in the irrigated treatment of 14 mm d^{-1}. This may be caused by water deficit. The picture of the bent plant is presented in Fig. 1.

Fig. 1. The plant was bent

The important pests found in the research fields were the larva of *Phyllopaga sp.*, *Xyleutus sp.*, *Hyblaea puera* Crm., and *Neotermes tectonae* Damm. The pictures of some of those pests or the effects to the plants are presented in Fig. 2.

3.1. *Phyllopaga* sp.

In Indonesia, the larva of *Phyllopaga sp.* is known as *lundi* or in Java is called as *uret*. Its English name is grub. It was found just one grub in one plant of the irrigated plant of 7 mm d^{-1} on 2 MAP in the soil depth of 10 - 20 cm. The length of the grub was at about 1.5 cm, thin and its colour was greyish. It has three couples of feet.

The attack was not heavy as the symptoms could not be seen from the performance of the above part of all plants. In the experimental field of SEAMEO-BIOTROP Bogor where the same research was conducted, there were at least 2 grubs per plant even found 8 grubs per plant until the research was canceled because three fourth of the plants are died. It ate almost all of the root therefore the plants could not absorb the water and the nutrients. It attacked the plants since one week after planting to the date when the study was canceled at around three months after planting (Eliyani, pers.comm).

The size of the grub found in the Experimental Field of MBU was smaller to the ones found in the Experimental Field of SEAMEO BIOTROP. The length of grub in SEAMEO BIOTROP was at about 3 cm, fat and liked to make its body in the shape of C letter. The head colour was brown with a strong mouth but without any eye. The body colour was almost white. It also had three couples of feet but moved slowly.

Besides the kind of grub was different, the type of soil also was different in both location. The soil in the Experimental Field of SEAMEO-BIOTROP was the loose soil but in the Experimental Field of MBU Jakarta was the heavy clay soil. The loose soil seems favourable for the grub.

The suggestions from "Klinik Tanaman" Bogor Agricultural University to control this pest were mechanical control, environmental sanitation, or pesticide with active

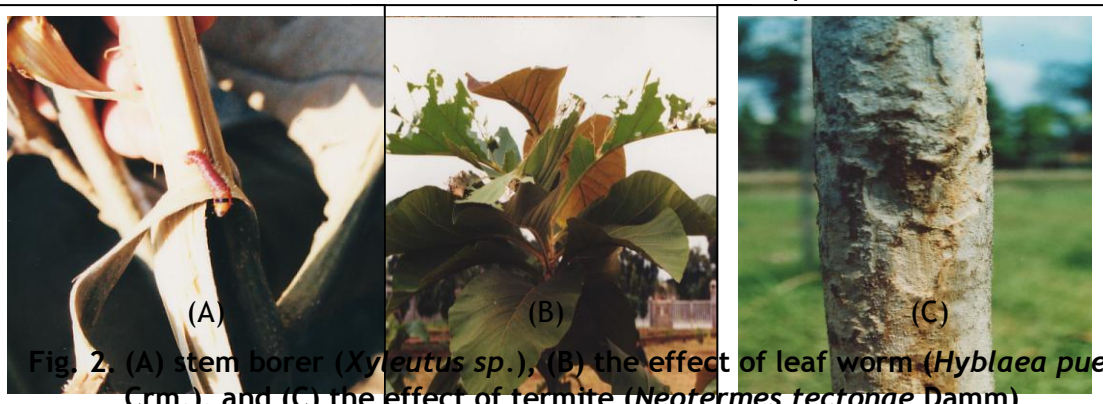

Fig. 2. (A) stem borer (*Xyleutus sp.*), (B) the effect of leaf worm (*Hyblaea puera* Crm.), and (C) the effect of termite (*Neotermes tectonae* Damm)

ingredient of carbofuran. When the attact is heavy as the case in SEAMEO-BIOTROP, all the suggested efforts did not work. There was no specific control for this pest in Jakarta because of almost no attack.

3.2. *Xyleutus sp*.

This reddish brown larva with the length was at about 2 cm was found in 1.5 years after planting. It attacked especially the upper part of the stem at around four last internodes. It was also found in the lower part of the stem at around 10 cm from the soil surface. This pest attacked the non-irrigated plants, which the diameters were lower than the irrigated plants.

The pest bored the stem then moved upward while ate the sapwood, which is the important part in transfering the nutrients to the leaf. The failed transfer caused the leaf to wilt, dry then the upper part of the hole died.

The attacked stem was cut to control the attack or if still possible, by injected the pesticide with the brand "Curacron". This reduced the economic value of teak because stem branched before the economic height.

3.3. *Hyblaea puera* Crm. (Lepidoptera: Hybaeidae)

This pest was found in the early rainy season around November every year. The larva ate almost all of the young leaf except the main vein in all treatments.

Although the leaf had been injured, it continued to grow. The insecticide with the brand "Decis" was applied to control the attack but the method was effective for the short plants.

3.4. *Neotermes tectonae* Damm

Termites attack the two-year-old plant on April 2004. The termites build their house from the soil and ate especially the most outside part of the stem from the bottom to the top. But there was an indication that termites also ate the sapwood. The control by applied the pesticide named "Curacron" and it was effective.

IV. CONCLUSIONS

There was almost no important desease found in the experimental field of Mercu Buana University Jakarta. However, there were some dangerous pests, i.e. the larva of *Phyllopaga sp.*, *Xyleutus sp.*, *Hyblaea puera* Crm., and *Neotermes tectonae* Damm. Almost all of the pests found still could be controlled.

REFERENCES

Lehmann-Danzinger, H. 2004. ***Introduction to Integrated Pest Management of Plant Diseases and Pests in the Tropics/Subtropics***. 6.1a ed. H. Lehmann-Danzinger, Georg-August University of Göttingen. Göttingen, Germany. 437 p.

Strand, J.F. 2000. ***Some Agrometeorological Aspects of Pest and Desease Management for the 21st Century***. Agric. For. Meteorol. 103: 73 – 82.

Supriatna, J. 2002. ***Inventarisasi Hama dan Penyakit Jati Emas (Tectona grandis L.f.) di Ma'had Al Zaytun, Indramayu, Jawa Barat***. Skripsi. Jurusan Hama dan Penyakit Tanaman, Fakultas Pertanian, Institut Pertanian Bogor. Bogor.

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