

# PEST PROBLEMS OF COCONUT HYBRID PRODUCTION IN INDONESIA WITH SPECIAL REFERENCE TO SCDP <sup>1</sup>

by

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## 1. INTRODUCTION

SCDP is a World Bank and Government of Indonesia funded project managed by the Directorate General of Estates of the Ministry of Agriculture. This project is responsible for the planting of coconut hybrids as well as local tall, but mostly hybrids. Since 1981 to date, some 22,000 ha have already been planted to hybrids in 70 coconut working centers (CWC) widely scattered in 6 provinces such as Aceh, Lampung, South Sulawesi, Central Sulawesi, North Sulawesi, and Maluku (Fig.1).

At present, three hybrids (MYD x WAT, MRD x WAT, and NYD x WAT)<sup>2</sup>, are used in the planting program. Because these three hybrids are new under Indonesian conditions, it was deemed necessary to monitor the kinds of pest attacking these hybrids. Therefore, in 1982 a surveillance and early warning system was set-up with the following objectives: to determine whether these hybrids are equally susceptible to the major pests of the local coconut varieties, and to determine which pests are of economic importance in each CWC and Province.

It is not the intention of this paper to present the results of research for there are none, nor to describe the pests of coconuts in Indonesia for most of them are already well described (Van der Laan, 1981), but to provide information on the pest problems smallholder coconut farmers encounter in growing these hybrids from the nursery to the field. It is hoped, however, that by presenting these pest problems, coconut researchers, particularly in the fields of crop protection and breeding, are provided feedback and be guided accordingly in setting up their research priorities on the control of these coconut pests.

## II. MAJOR PESTS IN THE NURSERY

Coconut pests can be conveniently divided into four groups; the invertebrate pests, vertebrate pests, plant pathogens (diseases), and weeds.

In the nursery, these groups were all observed to be present. However, the plant pathogens seem to be more common than the others. The plant pathogens of importance are the fungi and MLO. The major diseases caused by these pathogens are LEAFSPOTS (Caused by *Helminthosporium* sp. and *Pestalotiopsis* (*Pestalotia*) *palmarum*), SPEAR ROT (caused *Fusarium* sp.), and DRY BUD ROT (caused by MLO and transmitted by a planthopper).

The invertebrate pests of importance are insects (*Aspidiotus destructor*, *Plesioa reichei* and *Valanga nigricornis*) and a species of red spider mite (*Tetranychus* sp.). They are mostly abundant during the dry season.

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<sup>1</sup> Smallholder Coconut Development Project

<sup>2</sup> MYD = Malayan Yellow Dwarf; MRD = Malayan Red Dwarf; NYD = Nias Yellow Dwarf; WAT = West African Tall.

For the vertebrate pests, rats and wild pigs are very important especially when the nursery is located near a forested area.

### III. MAJOR PESTS IN THE FIELD

In terms of prevalence, area affected, and damaged caused, the invertebrate and vertebrate pests are, so far, more important than the plant pathogens.

#### Invertebrate Pests

During the past three years, the invertebrate pests of importance in coconut hybrid fields were the leaf-feeding insects, particularly the beetles and caterpillars.

**Beetles.** The rhinoceros beetle (*Oryctes rhinoceros*) is still the number one beetle pest of coconut hybrids, especially to newly transplanted palms. It was particularly important in four provinces: Maluku, North Sulawesi, Central Sulawesi and South Sulawesi. In Lampung and Maluku provinces, *Brontispa longissima* is now one of the major insect pests of these hybrids. Last year, *Promecotheca cumingii* started to appear in SCDP fields in Central Sulawesi where there were high incidence in the local tall. *Rhynchophorus ferrugineus* var. *schach* has killed a few hybrids in North Sulawesi and South Sulawesi. In both cases, however, high incidence of *Oryctes* had been observed.

**Caterpillars.** Among the caterpillars of economic importance were the leaf-feeders. In the last three years *Parasa lepida*, *Thosea lutea* and *Hidari Irava* were of high incidence in Lampung province; *Chalcocelis albiguttata* in Maluku; and *Darna catenata* in North and Central Sulawesi.

Another caterpillar attacking female flowers, *Tirathaba rufina*, is fast becoming an important pest in all the provinces. It has caused heavy infestations in areas where hybrids are in their first year of flowering.

**Long-horned grasshoppers.** Although *Sexava* spp. are very important pests of local tall coconuts in Indonesia, at present they have not caused much damage yet to coconut hybrids in SCDP fields. Lately, however, they have been observed in a few CWCs located in the islands of Halmahera and Seram in the province of Maluku.

**Sucking insects.** Of the sucking insects feeding on coconut hybrids, the scale insect (*Aspidiotus destructor*) and whitefly (*Aleurodicus destructor*) are the most important. The former is widely distributed whereas the latter is becoming an important pest in Central and South Sulawesi provinces.

#### Vertebrate Pests

Wild pigs (*Sus* spp.) and rats (*Rattus tiomancis*) are the most common vertebrate pests in the field. Wild pigs are particularly important in areas located near or at the edge of the forest. They attack newly transplanted areas, uprooting the seedlings and then eat the meat still intact in the nut. Rats, on the other hand, attack both the non-bearing and bearing palms. In non-bearing palms they chew the petioles causing them to break and dry up prematurely. In bearing trees, they feed on the green nuts. Rats are particularly abundant in fields with very thick cover crops.

#### Plant Pathogens

Fungi are the most important group of plant pathogens in SCDP fields. The fungus *Phytophthora palmivora*, causing bud rot disease in both immature and mature trees, is the most

important at the moment. Observations indicate that where there is high incidence of *Oryctes* and/or *Rhynchophorus* beetles there is also high incidence of bud rot disease.

Other fungi commonly present are *Helminthosporium sp.* and *Pestalotiopsis palmarmn*, both causing leafspot diseases.

#### IV. OTHER PESTS OF COCONUT HYBRIDS OBSERVED AND/OR REPORTED OUTSIDE SCDP FIELDS.

##### Insect Pests

**Beetle.** *Exopholis hypoleuca* (its grub feed on the roots and the adult feeding on the leaves) was observed in a hybrid coconut field in West Java and reported occurring in hybrid demplots in North Sulawesi, Bengkulu, and Bali (Wiryosoehardjo & Budiman, 1985).

**Caterpillars.** *Artana catoxantha* had been reported occurring in North Sumatra (Ginting & de Chenon, 1985),- *Batrachedra arenosella* had been reported occurring in hybrid demplots iii North Sulawesi, Bengkulu, and Bali (Wiryosoehardjo & Budiman, 1985); *Ploneta diducta* was observed in Central Java.

##### Vertebrate Pest

Squirrel. *Callosciurus sp.* was reported occurring in hybrid demonstration plots in South Sumatra and South Sulawosi (Wiryosoehardjo & Budiman, 1985).

##### Diseases

**Stem bleeding.** This disease, which is caused by the fungus *Ceratostomella (Thielaviopsis) paradoxa*, has been reported occurring in several demplots located in West Sumatra, South Surnatral, Bengkulu, Lampung, Bali, West Nusa Tenggara, North Sulawesi, Central Sulawesi, South Sulawesi, Sulawesi Tenggara, and Maluku (Wiryosoehardjo & Budiman, 1985). A number of hybrids of bearing age have been killed in Maluku.

**Immature nut fall.** This is caused by the fungus *Phytophthora palmivora* and reported occurring in hybrid demplots in Lampung (Wiryosoehardjo & Budiman, 1985) and North Surnatra (Bennet, Sitepu & Roboth, 1985).

**Leafspots.** Three species of fungi causing leafspot diseases were reported by Surnardiyono and Triharso (1985). These were *Curvularia sp.*, *Alternaria sp.*, and *Nigrospora sp.*

#### V. SUMMARY

1. As of April 1985, some 36 invertebrate pests, 3 vertebrate pests, 6 diseases, and 4 nutritional disorders were reported from the 70 CWCs (Table 1). Although there were several weed species growing in farmers' fields, only alang-alang (*Imperata cylindrica*), was given due attention.

2. The importance of a pest varies with location. Some are important only in a few locations while others are important in several locations. In addition, several insect pests vary in species or varieties in certain locations (Table 1).

3. In the nursery, diseases are more important than insect pests, whereas the reverse is true in the field. The diseases that have reached epidemic proportions in the nursery were the leafspots -used by *Helminthosporium sp.* and *Pestalotiopsis palmarum*. The insect pests that have reached

epidemic proportions in the field were *Parasa lepida*, *Thaana lutea*, *Darna catenata*, *Chalcocelis albipunctata*, *Brontispa longissima*, and *Oryctes rhinoceros*.

## VI. CONCLUSION

Observations made on the pest populations in the 70 CWSs, in the past three years, have shown that all the three hybrids are equally susceptible to all the pests of the local coconut varieties in Indonesia. Likewise, they are quite sensitive to nutritional deficiencies or imbalances in the soil, particularly to nitrogen and boron.

The experience of SCDP in its pest monitoring shows further that crop protection will, undoubtedly, play a very important role in the cultivation of coconut hybrids in this country.

## VI. SUGGESTED RESEARCH AREAS

1. Biological control of the major insect pests of coconut must be looked into particularly in mass rearing methods and release of the biological agents.
2. More tests on microbial insecticides (bacteria, fungi, viruses) either applied alone or in combination with standard chemical insecticides thereby reducing built up of insect resistance and effects on the environment, and on parasites and predators.
3. Developing more, efficient techniques of applying pesticides to very tall coconut trees.
4. Incorporating pest resistance to hybrids being developed, particularly to the leaf-feeding insects and to certain diseases affecting the whole tree.

## REFERENCES

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**Table 1. Distribution of Pests of Coconut Hybrids at SCDP.**

PEST MONITORED FROM JANUARY 1982 TO APRIL 1985	P R O V I N C E					
	Aceh	Lampung	South Sulawesi	Central Sulawesi	North Sulawesi	Maluku
INVERTEBRATE PESTS						
Brontispa longissima	-	**	-	-	-	-
B. longissima var.selebensis	-	-	*	-	*	**
Leucopholis sp.	-	-	-	-	*	-
Oryctes rhinoceros	*	*	**	**	**	**
Plesispa reichei	*	*	*	*	*	*
Promecotheca cumingii.	-	-	-	**	-	-
Rhynchophorus ferrugineus	-	*	-	-	-	-
R. ferrugineus schach	-	-	*	-	*	-
Amathusia phidippus	*	*	0	*	-	-
Artona catoxantha	0	0	-	-	-	-
Cephrenes chryosoma	-	-	*	*	*	*
Chalcocelis albiguttata	-	-	-	-	0	**
Darna catenata	-	-	*	**	**	-
D. trima	*	*	-	-	-	-
Hidari irava	*	**	0	0	0	0
Mahasena corbetti	*	*	*	*	*	*
Parasa lepida	-	**	0	-	-	-
Ploneta diducta	-	0	-	-	-	-
Setora nitens	*	*	*	*	0	-
Thosea asigna	-	-	*	-	*	-
Tborea lutea	*	**	-	-	-	-
Tirathaba rufivena	*	**	**	*	**	*
Trichogyia albistrigella	-	-	-	*	*	-
Aleurocanthus sp.	*	0	*	-	*	-
Aleurodicus destructor	*	0	*	*	*	0
Aspidiotus destrucloer	*	*	*	*	*	*
Astegopterix spp.	*	*	*	*	*	*
Cerataphis lataniae	*	0	*	0	*	-
Hysteroeura setariae	*	*	-	-	*	-
Pseudococcus sp.	*	*	*	*	0	*
Stephanitis typicus	*	*	-	*	0	*
Tetranychus sp	-	*	-	-	*	-
Sexava coriacea	-	-	-	-	-	*
S. nubila	-	-	-	-	-	*
Valanga nigricornis	*	*	*	*	*	*
Coptotermes curvignathus	-	*	-	-	*	-
VERTEBRATE PESTS						
Bear	0	-	-	-	-	-
Rat	*	*	*	*	*	**
Wild pig	**	**	**	*	*	*

	P R O V I N C E					
	Aceh	Lampung	South Sulawesi	Central Sulawesi	North Sulawesi	Maluku
DISEASES						
Dry bud rot						
Helminthosporium leafspot	-	*	-	-	-	-
Pestalotiopsis leafspot	*	*	*	*	*	*
Marasmius basal rot	*	*	*	*	*	*
Phytophthora bud rot	*	*	-	-	-	-
Spear rot	*	*	**	*	**	0
	*	*	*	*	*	*
NUTRIENT DEFICIENCY						
Boron	*	*	*	*	*	-
Magnesium	-	0	*	-	-	-
Nitrogen	0	*	*	*	*	*
Potassium	-	0	-	-	*	-

Legend :

- \*\* = high incidence  
 \* = reported and confirmed  
 - = no report or not yet observed  
 0 = reported, but not confirmed

Number of CWC per Province:

D.I. Aceh	6
Lampung	8
South Sulawesi	12
Central Sulawesi	12
North Sulawesi	24
Maluku	8
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Total	70

FIGURE 1. SCDP COCONUT WORKING CENERS

