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OVERVIEW OF FOREST PESTS

GHANA

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**Forest Resources Development Service
Forest Management Division
Forestry Department**

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DISCLAIMER

The aim of this document is to give an overview of the forest pest¹ situation in Ghana. It is not intended to be a comprehensive review.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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¹ Pest: Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (FAO, 2004).

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Background

This paper is one of a series of FAO documents on forest-related health and biosecurity issues. The purpose of these papers is to provide early information on on-going activities and programmes, and to stimulate discussion.

In an attempt to quantify the impacts of the many factors that affect the health and vitality of a forest, the Global Forest Resources Assessment 2005 (FRA 2005) asked countries to report on the area of forest affected by disturbances, including forest fires, insects, diseases and other disturbances such as weather-related damage. However, most countries were not able to provide reliable information because they do not systematically monitor these variables.

In order to obtain a more complete picture of forest health, FAO continues to work on several follow-up studies. A review of forest pests in both naturally regenerating forests and planted forests was carried out in 25 countries representing all regions of the world. This *Overview of forest pests* represents one paper resulting from this review. Countries in this present series include Argentina, Belize, Brazil, Chile, China, Cyprus, Colombia, Ghana, Honduras, India, Indonesia, Kenya, Kyrgyz Republic, Malawi, Mauritius, Mexico, Moldova, Mongolia, Morocco, South Africa, Sudan, Thailand, Romania, Russian Federation, Uruguay; this list will be continuously updated.

Comments and feedback are welcome. For further information or if you are interested in participating in this process and providing information on insect pests, diseases and mammals affecting forests and the forest sector in your country, please contact:

Gillian Allard
Forestry Officer (Forest Protection and Health)
Forest Resources Development Service
Forest Management Division
Forestry Department
FAO
Viale delle Terme di Caracalla
00153 Rome, Italy
Telephone: +39 06 570 53373
Fax: + 39 06 570 55137
E-mail: gillian.allard@fao.org

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GHANA

Introduction

Ghana's forest cover in 2005 was estimated at 5.5 million hectares or 24 percent of the total land cover (FAO, 2006). Principal tree species include *Triplochiton scleroxylon*, *Celtis mildbraedii*, *Piptadeniastrum africanum*, *Ceiba pentandra*, *Terminalia superba*, *Celtis zenkeri*, *Petersianthus macrocarpus*, *Nesogordonia papaverifera*, *Psycanthus angolensis* and *Antiaris toxicaria*.

Ghana's naturally regenerating forests occur in two ecological zones: the tropical high forest which covers one-third of the country's total land area and provides the major source of logs for the wood products industry; and the savannah zone, which covers the remaining two-thirds of the country and plays an important role in the supply of building poles, fuelwood and charcoal. Two-thirds of the population and most of the country's economic activity (cocoa, oil palm, timber and mineral production) is concentrated in the forest zone.

Ghana has a relatively small area of forest plantations. Some are industrial plantations and others are classified as protection forests (FAO, 2006). The most successful plantation species to date is teak (*Tectona grandis*). Other exotic species planted in Ghana include *Azadirachta indica*, *Cassia siamea*, *Eucalyptus* spp., *Gmelina arborea* and *Pinus* spp. (Wagner, Atuahene and Cobbinah, 1991). Since 2000, the area of planted forests has been increasing steadily. In addition to teak, *Cedrela odorata* and *Terminalia superba* are being planted.

Forest pests

Naturally regenerating forests

Insects

Indigenous insects

***Analeptes trifasciata* (Fabricius, 1775)**

Other scientific names:

Coleoptera: Cerambycidae

Common names: stem girdler; trunk borer; longicorn beetle

Host type: broadleaf

Hosts: *Bombax costatum*; *Eucalyptus tereticornis*; *Eucalyptus alba*; *Ceiba pentandra*; *Anacardium occidentale*; *Adansonia digitata*

Analeptes trifasciata is a longicorn beetle that attacks several trees in the family Bombaceae (*Bombax costatum*, *Adansonia digitata*, *Ceiba pentandra*) and is typically an insect of savanna ecosystems. It is also known to attack several species of *Eucalyptus* and causes significant damage to cashew trees. Larvae bore into the stems and large branches and cause stem breakage, deformity and loss of structural integrity of the wood.

<http://www.vitalieghianda.it/vitalfranz/foto.asp?Id=40>

http://www.hort.purdue.edu/newcrop/duke_energy/Eucalyptus.html

<http://www.ipgri.cgiar.org/Publications/HTMLPublications/348/ch5.htm>

***Anaphe venata* Butler**

Other scientific names:

Lepidoptera: Notodontidae

Common names: silk moth; African silkworm

Host type: broadleaf

Hosts: *Triplochiton scleroxylon*

Anaphe venata is a caterpillar that causes extensive defoliation of *Triplochiton scleroxylon* (wawa or obeche), a timber tree found in natural rainforests, along watercourses and monsoon forests that is used for furniture and veneers. The females lay eggs on leaves of tall *T. scleroxylon* trees. The larvae then feed extensively on the leaves often defoliating the tree. They then descend the trees in a procession and pupate in a communal nest with the urticating hairs protecting the cocoons. Attack by this caterpillar tends to occur on trees of at least 50 years old however the impact on the trees is not known. This insect is a food resource, although it is associated with ataxia in humans; the effects of this caterpillar sometimes reach epidemic proportions.

<http://www.worldagroforestry.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=1662>

<http://www.food-insects.com/Vol2%20no3.htm>

***Lamprosema lateritalis* Hampson**

Other scientific names:

Lepidoptera: Pyralidae

Common names:

Host type: broadleaf

Hosts: *Pericopsis elata*

Lamprosema lateritalis is a caterpillar that is considered the most serious pest of Afrormosia (*Pericopsis elata*) in Ghana. Only found in central and West Africa, these caterpillars feed gregariously on the leaves and shoots of *P. elata* (Wagner, Atuahene and Cobbinah, 1991). They live in communal shelters built from several leaves bound together with silk. There are 8-9 generations per year and each female lays eggs in batches of up to 200. Repeated defoliation by these caterpillars reduces growth of the trees hence lowering productivity (Wagner, Atuahene and Cobbinah, 1991).

***Trachyostus ghanaensis* Scheld**

Other scientific names:

Coleoptera: Platypodidae

Common names: ambrosia beetle; wawa borer

Host type: broadleaf

Hosts: *Triplochiton scleroxylon*

Trachyostus ghanaensis is an important pest of wawa, *Triplochiton scleroxylon*. This pinhole borer or ambrosia beetle attacks and breeds in living trees. The male initiates the attack on the tree and then stridulates to attract females. The female constructs egg laying

galleries. The larval stages feed on an ambrosia fungus in individual chambers constructed by the adults. Both the insect damage and the wood staining caused by the ambrosia fungus results in a loss of timber quality (Wagner, Atuahene and Cobbinah, 1991).

<http://www.worldagroforestry.org/Sites/TreeDBS/Aft/Print.cfm?SpID=1662>

Introduced insects

According to available data, introduced forest insects are of minor consequence in Ghana.

Diseases

Indigenous diseases

No information was available on the status of indigenous diseases in the naturally regenerating forests of Ghana.

Introduced diseases

No information was available on the status of introduced diseases in the naturally regenerating forests of Ghana.

Other pests

Indigenous other pests

No information was available on the status of indigenous other pests (e.g. mites, nematodes, mammals, etc.) in the naturally regenerating forests of Ghana.

Introduced other pests

No information was available on the status of introduced other pests (e.g. mites, nematodes, mammals, etc.) in the naturally regenerating forests of Ghana.

Diebacks and other conditions

No records were available for diebacks and other conditions affecting Ghana's naturally regenerating forests.

Planted forests

Insects

Indigenous insects

***Apate monachus* Fabricius, 1775**

Other scientific names: *Apate carmelita*; *Apate francisca*; *Apate gibba*; *Apate mendica*; *Apate monacha*; *Apate monachus rufiventris*; *Apate semicostata*; *Apate senii*

Coleoptera: Bostrichidae

Common names: black borer; twig borer; giant black bostrichid; date palm bostrichid

Host type: broadleaf

Hosts: *Acacia* spp.; *Azadirachta indica*; *Citrus* spp.; *Coffea arabica*; *Coffea robusta*; *Eucalyptus polycarpa*; *Khaya* spp.; *Melia composita*; *Pithecellobium dulce*; *Psidium guajava*; *Terminalia ivorensis*; *Theobroma cacao*; *Triplochiton scleroxylon*

Apate monachus is a large black bostrichid beetle that tunnels into its host plants. It is an important pest of both planted and naturally regenerating forests as well as agriculture. Adults bore into branches and twigs of a number of species of plants. Both adults and larvae feed on the host trees which includes a very wide range of plants including *Acacia* spp., coffee, citrus, guava and cocoa. Breeding attacks occur in species different from those used for maturation feeding (Wagner, Atuahene and Cobbinah, 1991).

<http://www.cabicompendium.org/NamesLists/FC/Full/APATMO.htm>

<http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=560>

***Apate terebrans* Pallas, 1772**

Other scientific names:

Coleoptera: Bostrichidae

Common names: shot-hole borer; trunk borer; girdler

Host type: broadleaf

Hosts: *Acacia* spp.; *Anacardium occidentale*; *Azadirachta indica*; *Cedrela odorata*; *Citrus* spp.; *Coffea arabica*; *Coffea robusta*; *Eucalyptus polycarpa*; *Khaya* spp.; *Melia composita*; *Psidium guajava*; *Tectona grandis*; *Terminalia ivorensis*; *Theobroma cacao*; *Triplochiton scleroxylon*

Apate terebrans is a large polyphagous boring beetle that is an important pest of both planted and naturally regenerating forests. Its host range includes *Acacia* spp. coffee, citrus, cotton, guava, cashew and citrus. The larvae tunnel into both living trees and timber creating significant damage and lowering the commercial value of the timber. Adults attack living trees and can cause death of younger trees. Development can take one to three years depending on the moisture content of timber. This species is readily transported in timber unnoticed, over long distances.

<http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=82>

<http://www.padil.gov.au/viewPest.aspx?id=82>

<http://www.unctad.org/infocomm/francais/anacarde/Doc/issues.pdf>

***Diclidophlebia eastopi* Vondracek, 1964**

Other scientific names:

Hemiptera: Psyllidae

Common names:

Host type: broadleaf

Hosts: *Triplochiton scleroxylon*

Diclidophlebia eastopi is a sap-sucking psyllid that is a pest of young *Triplochiton scleroxylon* in Ghana. In nurseries it has been known to kill young plants. In planted forests it causes dieback, stunting, and copious branching which reduces the potential commercial value of timber produced.

***Distantiella theobroma* (Distant, 1909)**

Other scientific names:

Hemiptera: Miridae

Common names: capsid; mirid; cocoa mirid; cocoa capsid; cocoa capsid stem sapper; brown capsid

Host type: broadleaf

Hosts: *Theobroma cacao*

One of the major threats to planted cocoa forests in Ghana is several species of true bugs in the family Miridae. *Distantiella theobroma*, *Helopeltis lalandei* and *Sahlbergella singularis* are the major species of cocoa mirids present in Ghana. These species all have similar action. The bugs are only found on the trees in small numbers (6 per 10 trees). The bugs present a significant problem in the establishment and growing phases of planted forests. The bugs attack only young growth and new pods. Direct damage is caused by the bugs sucking on the new foliage and the necrosis caused by the saliva that the bugs inject into the plant tissue. The saliva causes blackening and collapse of the tissues. Hence the direct consequence of the bug feeding is limited to the growing season. The greatest impacts are those felt by young plants and the delay of fruit bearing by several years. However, the wounds the bugs cause by inserting their mouthparts into the plant tissue provides an entry point for several serious secondary diseases such as *Nectria rigidiuscula* which causes canker and dieback. There are records of 80 percent infection rates of the wounds.

<http://www.cabicompendium.org/NamesLists/FC/Full/DISTTH.htm>

<http://www.oardc.ohio-state.edu/cocoa/capsids.htm>

<http://www.cabi-commodities.org/Cocoa/CocTS/CocTS3E.htm>

***Epicerura pulverulenta* Hampson**

Other scientific names:

Lepidoptera: Notodontidae

Common names:

Host type: broadleaf

Hosts: *Terminalia ivorensis*

Epicerura pulverulenta is a caterpillar that feeds on the leaves of *Terminalia ivorensis* (shinglewood, black afara). At times it causes extensive damage and has been recorded causing complete defoliation in planted forests of *Terminalia ivorensis*, hence resulting in a significant loss in productivity potentially leading to death of the trees.

http://www.pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2_abst_e?cjfr_x00-063_30_ns_nf_cjfr

***Helopeltis lalandei* Carayon**

Other scientific names:

Hemiptera: Miridae

Common names: capsid; mirid

Host type: broadleaf

Hosts: *Theobroma cacao*

One of the major threats to planted cocoa forests in Ghana is several species of true bugs in the family Miridae. *Distantiella theobroma*, *Helopeltis lalandei* and *Sahlbergella*

singularis are the major species of cocoa mirids present in Ghana. These species all have similar action. The bugs are only found on the trees in small numbers (6 per 10 trees). The bugs present a significant problem in the establishment and growing phases of planted forests. The bugs attack only young growth and new pods. Direct damage is caused by the bugs sucking on the new foliage and the necrosis caused by the saliva that the bugs inject into the plant tissue. The saliva causes blackening and collapse of the tissues. Hence the direct consequence of the bug feeding is limited to the growing season. The greatest impacts are those felt by young plants and the delay of fruit bearing by several years. However, the wounds the bugs cause by inserting their mouthparts into the plant tissue provides an entry point for several serious secondary diseases such as *Nectria rigidiuscula* which causes canker and dieback. There are records of 80 percent infection rates of the wounds.

<http://www.oardc.ohio-state.edu/cocoa/capsids.htm>

<http://www.cabi-commodities.org/Cocoa/CocTS/CocTS3E.htm>

***Mesoplatys cincta* (Olivier, 1790)**

Other scientific names: *Chrysomela cincta* Olivier, 1790

Coleoptera: Chrysomelidae

Common names: leaf beetle

Host type: broadleaf

Hosts: Fabaceae; Convolvulaceae; Malvaceae; *Elaeis* spp.; *Sesbania grandiflora*

Mesoplatys cincta is a leaf-feeding beetle that causes severe defoliation of host plants. It feeds on a range of plants in the families of Fabaceae, Convolvulaceae and Malvaceae. It is considered a serious pest of oil palm (*Elaeis* spp.) and of young stands of *Sesbania grandiflora*.

<http://www.cabicompendium.org/NamesLists/CPC/Full/MES2CI.htm>

***Phytolyma lata* Walker (Scott)**

Other scientific names:

Hemiptera: Psyllidae

Common names: iroko gall fly; iroko gall bug; milicia gall bug

Host type: broadleaf

Hosts: *Milicia excelsa*; *M. regia*

Milicia spp. (*Milicia excelsa* and *M. regia*) are among the most valuable indigenous timber species in sub-Saharan Africa. Efforts at establishing plantations of *Milicia* spp. have been constrained by the gall-forming psyllid *Phytolyma lata* that causes extensive damage to young plants. The insect attacks the new shoots on young trees, causing heavy gall formation, suppression of the terminal bud and severe stunting of the tree. Seedlings in nurseries are very susceptible to damage, and many succumb to repeated attacks.

***Phytolyma fusca* Walker, 1852**

Other scientific names:

Hemiptera: Psyllidae

Common names: gall-forming psyllid

Host type: broadleaf

Hosts: *Milicia excelsa*

A major pest of planted forests of Iroko tree (*Milicia excelsa*), *Phytolyma fusca* is a gall-forming psyllid that sucks sap from trees. Feeding by this psyllid results in the formation of leaf galls. Mature galls erupt to release the insect and the remnant gall tissue is attacked by a decay fungus which results in dieback of the shoot. The plants that do survive attack by this bug usually have considerably reduced commercial value. The extent of attacks and damage has had a significant detrimental effect on attempts to establish plantations of *Milicia*, preventing the establishment of these trees in some areas. The effect of this insect is particularly severe in pure plantings of Iroko trees but less so in mixed plantings.

<http://www.metla.fi/iufro/iufro95abs/d2pap122.htm>

<http://honeybee.helsinki.fi/mmeko/vitri/studies/theses/appiahtes.pdf>

***Sahlbergella singularis* (Haglund, 1895)**

Other scientific names:

Hemiptera: Miridae

Common names: capsid; mirid; cocoa mirid

Host type: broadleaf

Hosts: *Theobroma cacao*

One of the major threats to planted cocoa forests in Ghana is several species of true bugs in the family Miridae. *Distantiella theobroma*, *Helopeltis lalandei* and *Sahlbergella singularis* are the major species of cocoa mirids present in Ghana. These species all have similar action. The bugs are only found on the trees in small numbers (6 per 10 trees). The bugs present a significant problem in the establishment and growing phases of planted forests. The bugs attack only young growth and new pods. Direct damage is caused by the bugs sucking on the new foliage and the necrosis caused by the saliva that the bugs inject into the plant tissue. The saliva causes blackening and collapse of the tissues. Hence the direct consequence of the bug feeding is limited to the growing season. The greatest impacts are those felt by young plants and the delay of fruit bearing by several years. However, the wounds the bugs cause by inserting their mouthparts into the plant tissue provides an entry point for several serious secondary diseases such as *Nectria rigidiuscula* which causes canker and dieback. There are records of 80 percent infection rates of the wounds.

<http://www.oardc.ohio-state.edu/cocoa/capsids.htm>

<http://www.cabi-commodities.org/Cocoa/CocTS/CocTS3E.htm>

***Strepsicrates rhothia* Meyrick**

Other scientific names:

Lepidoptera: Tortricidae

Common names: eucalyptus leaf roller; leaf roller

Host type: broadleaf

Hosts: *Eucalyptus tereticornis*; *Eucalyptus alba*; *Eucalyptus cadambae*; *Eucalyptus citriodora*; *Psidium guajava*; *Eugenia* spp.; *Mangifera indica*; *Mansonia altissima*

Strepsicrates rothia is a caterpillar that defoliates trees. In Ghana, it was first reported as a pest in 1970 and has caused damage in nurseries. It is a major pest of eucalypt plantations, particularly those in shaded areas. Other hosts include guava, *Eugenia* spp. and *Mangifera indica*. It has also been reported skeletonizing leaves of *Mansonia altissima* in both nurseries and planted forests. It has up to 8 generations per year with an average of 44 days for development with each female laying an average of 42 eggs.

http://www.hortnet.co.nz/publications/nzpps/proceedings/99/99_108.pdf

http://www.hort.purdue.edu/newcrop/duke_energy/Eucalyptus_saligna.html

***Tridesmodes ramiculata* Warren, 1899**

Other scientific names:

Lepidoptera: Thyrididae

Common names: picture wing moth

Host type: broadleaf

Hosts: *Terminalia ivorensis*

Tridesmodes ramiculata is a moth that bores into growing shoots and tips. It is a pest of *Terminalia ivorensis* in nurseries and planted forests. This moth tends to attack 2-3 year old trees. They tunnel in smaller twigs and branches as young larvae, progressing to larger stems as they get older. The life cycle is 1 to 3 months with overlapping generations (Wagner, Atuahene and Cobbinah, 1991).

Introduced insects

***Hypsipyla robusta* Moore, 1886**

Other scientific names: *Epicrocis terebrans* Oliff, 1890; *Magiria robusta* Moore, 1886;

Hypsipyla scabrusculella Ragonot, 1893; *Hypsipyla pagodella* Ragonot, 1888

Lepidoptera: Pyralidae

Common names: mahogany shoot borer; cedar tip moth

Host type: broadleaf

Hosts: *Khaya* spp.; *Entandrophragma* spp.; *Carapa procera*; *Lovoa trichiliodes*

Hypsipyla robusta caterpillars bore into the tips and shoots of several species of high quality timber species including African mahogany (*Khaya* spp.), *Entandrophragma* spp., *Carapa procera*, and *Lovoa trichiliodes*. The caterpillars destroy the apical shoot causing the tree to form many side branches and frequently a deformed trunk which leads to a decreased value of the timber. This species of moth mainly attacks trees in high light areas, hence the biggest effects are observed in young planted forest areas, particularly those planted with a single species. Young understorey trees in naturally regenerating forests suffer far less damage. Plantings of mahogany have been almost completely abandoned in some areas because of the damage caused by this insect.

[http://www.aciar.gov.au/web.nsf/att/JFRN-6BN983/\\$file/pr97chapter2.pdf](http://www.aciar.gov.au/web.nsf/att/JFRN-6BN983/$file/pr97chapter2.pdf)

http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

<http://www.fzi.uni-freiburg.de/InsectPestKey-long%20version/hypsipyl.htm>

<http://linus.socs.uts.edu.au/~don/larvae/pyra/robust.html>

Diseases

Indigenous diseases

No information was available on the status of indigenous diseases in planted forests of Ghana.

Introduced diseases

***Nectria rigidiuscula* Berkeley & Broome**

Other scientific names: *Calonectria eburnea*; *Calonectria lichenigena*; *Calonectria rigidiuscula*; *Calonectria sulcata*; *Calonectria tetraspora*; *Fusarium decemcellulare*; *Fusarium rigidiusculum*; *Fusarium spicariae-colorantis*; *Scoleconectria tetraspora*; *Spicaria colorans*

Ascomycota: Nectriaceae

Common names: green point gall; cushion gall disease; witches' broom of mango; dieback of cocoa

Host type: broadleaf

Hosts: *Theobroma cacao*; *Hevea brasiliensis*

Nectria rigidiuscula is usually a secondary invasive; it often occurs in wounds caused by insect damage or infection by *Phytophthora palmivora*. The wounds created by members of the family Miridae, for example, which insert their mouthparts into the plant tissue provides an entry point for several serious secondary diseases. There are records of 80 percent infection rates of the wounds. This secondary infection causes canker and dieback.

<http://www.cabicompendium.org/NamesLists/FC/Full/CALORI.htm>

<http://www.oardc.ohio-state.edu/cocoa/capsids.htm>

Other pests

Indigenous other pests

No information was available on the status of indigenous other pests (e.g. mites, nematodes, mammals, etc.) in planted forests of Ghana.

Introduced other pests

No information was available on the status of introduced other pests (e.g. mites, nematodes, mammals, etc.) in planted forests of Ghana.

Diebacks and other conditions

No records were available for diebacks and other conditions affecting Ghana's planted forests.

Capacity for forest health protection

Government level

In Ghana there is basically one main type of land ownership, the communal or customary ownership. Lands in Ghana are owned by traditional rulers and held in trust for them by the state. This applies to all land classes including forests. All forest lands are considered in public ownership (FAO, 2006).

The mandate for overall forestry activities in Ghana is vested in the Ministry of Lands and Forestry. This Ministry is responsible for policy formulation and coordination of programmes that lead towards attainment of national goals. These programmes are carried out by a semi-autonomous Forestry Commission which is headed by a Chief Executive and is governed by its own board and chairperson, appointed by the President of Ghana. The Forestry Commission was created outside the civil service to replace the previous Forestry Department. The Forestry Commission of Ghana is responsible for the regulation of utilization of forest and wildlife resources, the conservation and management of those resources and the coordination of policies related to these resources.

Work in forest protection, including forest entomology and forest pathology, is conducted by the Forestry Research Institute of Ghana (FORIG), in Kumasi under the Council of Scientific and Industrial Research (CSIR). For more information please visit the FORIG Web site at: <http://www.forig.org/forig/index.html>.

Monitoring and detection

Annual forest insect, and presumably forest disease, surveys are not conducted in Ghana. However, a series of annual reports by the Forest Entomology Section of the Forestry Research Institute of Ghana, issued between 1964 and 1986 contain a great deal of qualitative information on forest insect problems observed during those years (Wagner, Atuahene and Cobbinah, 1991).

Data management

Virtually no quantitative data are available on forest insects and diseases in Ghana. In addition to the annual reports mentioned in the preceding section, a comprehensive review of the forest insects of Ghana is documented in Wagner, Atuahene and Cobbinah (1991).

Pest management

Chemical insecticides have been used for the control of forest defoliators such as *Strepsicrates rhotia* in planted forests. On an experimental scale, the microbial insecticide, *Bacillus thuringiensis*, has been effective when applied to manage the defoliating caterpillar *Lamprosema lateritalis*. Establishment of mixed plantations has been evaluated as a means of reducing damage to *Milicia excelsa* by the gall-forming psyllid *Phytolyma lata* (Nichols *et al.*, 1999).

Private landowners

All forest lands are considered in public ownership (FAO, 2006).

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^{OSN} = Other Scientific Name (other names, synonyms, other combinations, etc. that have been used for this species)

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<i>Analeptes trifasciata</i> , 1	<i>Apate monacha</i> ^{OSN} , 3
<i>Apate terebrans</i> , 4	<i>Apate monachus</i>
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<i>Adansonia digitata</i> , 1	<i>Azadirachta indica</i> , 3
<i>Anacardium occidentale</i> , 1	<i>Citrus</i> , 3

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