

PD-ABD-984

76568

International Science and Technology Institute, Inc.

PROJECT EVALUATION

**GUINEA BISSAU FOOD CROP
PROTECTION III (657-0012)**

Prepared for:

**Agency for International Development
USAID/Guinea Bissau
(Contract No. 657-0012-C-00-8004)**

Prepared by:

**International Science and Technology Institute, Inc.
1129 20th Street, N.W.
Washington, D.C. 20036**

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February 12, 1988

PREFACE

The objective of the evaluation of the Guinea Bissau Food Crop Protection III (657-0012) project expressed in a November 25, 1987 telegram from the Guinea Bissau US AID agricultural development officer to the International Science and Technology Institute, Inc. evaluation contractor was given as "The objective of this evaluation is to assess the National food Crop Protection Service's capability to carry out a food protection program in order to determine whether present and proposed activities/interventions under the Food Crop Protection III project are appropriate or need to be modified, deleted or added".

The evaluation issues of particular interest set forth in the telegram are listed below with the page number(s) in the framework of the report where these issues are addressed beside them.

These issues principally pertain to the entire status of the Government of Guinea Bissau Crop Protection Service rather than to those individual elements or components derived from this particular project's inputs since there have been other projects and donors that have made significant contributions to the present status of the Crop Protection Service in addition to this project. Therefore, the issues of particular interest and major elements requested to be evaluated are not necessarily specific to evaluation of this project, but are instead a measure of the total outputs of many different project and donor inputs plus the activities of the Government of Guinea Bissau and entire staff of the Crop Protection Service that have all contributed to the present status of the Service. This evaluation was requested to review the Service's facilities, staff and program without direct reference to the inputs of the Food Crop Protection III project. Consequently, every effort was made to do this, but it must be concluded that some of the observations were not a result of this project.

In the interest of determining responsible project accountability, management and appropriateness of its direction, this evaluation also reviewed the specific budgetary inputs of project 657-0012 and the results obtained from these inputs. The evaluation also examined the way the basic IPM concepts of the project have been implemented in respect to presently appropriate and relevant technology, training and resources needs for crop protection in the rural agricultural countryside of Guinea Bissau where the National goal is to produce enough food to feed its people.

<u>Issues</u>	<u>Page(s)</u>
Planning and managing capability of senior staff.	35, 38, 39, 40, 41, 42, 43, 44, 86, 88, 93, 94, 111
Performance of field agents.	5, 35

State of vehicle fleet.....	24, 25, 26, 29, 30, 31, 86
Accomplishments of National crop protection strategies.....	35, 54, 64, 65, 66, 71, 100
Involvement of women in program.....	35, 53
Cooperation with related agencies...	54, 57
Contribution of other donors.....	57
Expansion of crop protection services into nonfood crops.....	54

The telegram also requested the evaluation to assess the current status of the National Crop Protection Service by reviewing major elements of the whole service with specific evaluation questions regarding each of the following elements:

<u>Elements</u>	<u>Page(s)</u>
Human resources - qualifications of staff, manager, technicians, agents, quality of training received, capacity to carry out particular functions.	38, 39, 40, 41, 42, 43, 44, 86, 88, 93, 94
Physical plant and equipment - conditions of physical facility, maintenance, adequacy of office space, laboratories, storage repair shops and garages, appropriateness of equipment, use and maintenance of vehicles, adequacy of communications equipment, sufficiency of office supplies and training material.	6, 7, 9, 10, 12, 13, 14, 15, 18, 24, 25, 26, 29, 30, 31, 32, 33, 34, 35, 36, 55, 87
Administrative procedures - use and effectiveness of work plans, budgets, quality of job descriptions, operational guidelines including implementation and monitoring, filing procedures and control of inventories.	10, 11, 31, 45, 46, 47, 48, 49, 50, 51, 52, 55, 100, 111

Program - efficiency of field operations, quality of laboratory work, accuracy of reporting, quality of pest data collections and pest reference collections, quality of control procedures. 5, 10, 11, 12, 13, 16, 17, 18, 19, 20, 21, 22, 23, 33, 36, 37, 56, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 100, 111

Training program - use and adequacy of annual plans, realistic targets, quality of training material, effectiveness of outreach, numbers being reached, women-men. 13, 16, 18, 20, 21, 22, 23, 32, 33, 34, 35, 36, 37, 54, 55, 86, 88, 89, 90, 91, 92, 93, 94

Coordination - cooperation with related National institutions, contacts and collaboration with international organizations. 54, 57

In response to the objective to determine whether present and proposed activities/interventions under the Guinea Bissau Food Crop Protection III project are appropriate or need to be modified, deleted or added, the evaluation team discovered that considerable modifications are needed, particularly in regard to the toxic chemical pesticide problems that were observed and reported.

The Crop Protection Service's present situation and circumstances and the current status of project 657-0012 found in Guinea Bissau during January and February 1988 are described by the evaluation team in this report with recommendations for the future made that were based directly on the actual observations during this review.

The first major area of recommendation was for implementation of seriously needed human and environmentally safer pesticide use and storage measures because pesticides are now well established and recognized in the Country as the most cost effective means of crop protection to increase food production. The second major area of recommendation was that resources be focussed on developing the rural agricultural zone and regional facilities and capabilities of the Crop Protection Service in order for the Service to provide the required assistance to the farmers of Guinea Bissau to produce more food.

CONTENTS

<u>Subject</u>	<u>Page number</u>
INTRODUCTION AND REVIEW	1
Project Purpose	3
Recurrent Costs	3
Project Goal	4
IPM	4
Environmental Assessment	4
Crop Protection in Guinea Bissau	5
Evaluation	6
PESTICIDES	6
Pesticides Stored in Guinea Bissau	7, 8, 9
Pesticides Risks	9
Pesticide Containers and Labels	9
Pesticide Control and Regulation	11
Pesticide Storage, Training and Office Space	12
Pesticide Misuse	13
Pesticide Storage, Office and Training Building Plan	14, 15
Pesticide and Container Disposal	16
Pesticide Poisoning	17
Pesticide Application Equipment	18
TECHNICAL ASSISTANCE	19
Short-Term Technical Assistance Recommendations	21
Long-Term Assistance Recommendations	23
VEHICLES	24
Vehicle Maintenance and Responsibility	24
Japan Versus USA Made	26
Boats	27
List of Needed Spare Parts	29
Parts Inventory	31
COMMUNICATIONS	32
Short Wave Radios	32
BUILDINGS	33
Headquarters	33
Library	33, 34

CROP PROTECTION SERVICE PERSONNEL	33
Headquarters	38
Zone I	41
Zone II	42
Zone III	43
Zone IV	44
JOB DESCRIPTIONS	45
Field Agents/Monitors	45
Drivers	46
Zone Supervisor	47
Training Officer	47
Plant Pathologist	48
Entomologist	49
Repair Maintenance Officer	49
Deputy Director	49
US AID Long-Term Technical Assistant	51
Director	51
INVOLVEMENT OF WOMEN	53
CROP PROTECTION SERVICE EXTENSION TRAINING	54
PLANT PEST QUARANTINE	56
INTERNATIONAL AGENCY COORLINATION	57
INCENTIVES	59
ESTABLISHED AGRICULTURAL PESTS IN GUINEA BISSAU	61
Rice	61
Millet	61
Sorghum	62
Peanuts	62
Cassava	62
Citrus	62
Maize	62
Cotton	62
Tomato	63
Watermelon	63
Banana	63
Beans	63
Stored Products	63
Grasshoppers	64
Biological Control of Cassava Mealybug	64

LISTA DAS PRAGAS DAS PRINCIPAS CULTURAS NA GUINE BISSAU	65
SECCAO DE FITOPATOLOGIA	67
CROP PROTECTION SERVICE IPM STRATEGIES	71
IPM strategy on Cassava Pests	71
ACTIONS NEEDED TO IMPLEMENT IPM STRATEGY FOR MANGROVE RICE IN 1988/89	72
ACTIONS NEEDED TO IMPLEMENT IPM FOR SORGHUM AND MILLET IN 1988	73
FARM STORAGE OF GRAINS	74
Summary Project Financial Report by Project Element	76
Comprehensive Pipeline Report by Project as of January 31, 1988	77
PERSONS CONTACTED DURING EVALUATION	82
ACKNOWLEDGEMENTS	84
ANNEX	85
Project Disbursements and Items Purchased as of 12/31/87	86
Long Term Training CPS Staff	88
Technical Assistance	89
Short Term Training	93
Memoranda Pertaining to Evaluation	95
A LUTA INTEGRADA CONTRA AS PRAGAS DE HORTALICAS	100
PROGRAMA ANNUAL DE TRABALHO DA DIRECCAO DOS SERVICOS DE PROTECCAO VEGETAL, ANO 1988	111

INTRODUCTION AND REVIEW

The Guinea Bissau Food Crop Protection III (657-0012) project has made many beneficial contributions to institution building of the headquarters and senior technical and administrative staff of the Guinea Bissau Crop Protection Service through providing technical assistance, training, vehicles and commodities and supplies including construction materials for the headquarters buildings. The result is that the staff and facilities of the headquarters have been and are in the process of being adequately strengthened by the inputs of the projects.

The project has not strongly emphasized rural farmer level agricultural development crop protection needs and strategies and these have been principally left to the devices of the Crop Protection Service. As a result, the Crop Protection Service is a relatively well equipped centralized Government agency that continues to be in need of basic facilities in the four zones and many regions of the Country to help implement the project and national goal of increased food protection and self-sufficiency.

The principle crop protection strategy of the project has been the teaching and implementation of integrated pest management (IPM) and biological control rather than the practical use of pesticides. The result is that, while some exemplary biocontrol projects have been initiated, the National need for more food has caused pesticides to be used as a primary tool to achieve the goal and pesticides are now being relied and depended upon throughout the rural agricultural countryside by farmers, agencies and projects as the first line of defense against crop pests because they produce the results desired by the National food goal while IPM and biocontrol has not inspite of their environmentally compatible bases and intentions. Pesticides are presently

recognized and appreciated by the farmers of Guinea Bissau as one the most appropriate technologies for their need to produce more food and they want to increase pesticide utilization. Because the project has not been directed at the rural situation and requirements, the Crop Protection Service is in critical need of decentralized pesticide storage facilities, office space, training space, transportation, communication equipment and appropriate pesticides at the village/farmer and regional levels. The Crop Protection Service made these needs apparent during the evaluation, however, they are also very appreciative of and thankful for the US AID assistance already provided to their agency and young country.

The pesticide use related problems documented by this evaluation require attention to protect the people and environment of Guinea Bissau. Appropriate level adapted technology recommendations are made in this report, but only slightly more than 16% of the entire project input funds remain unearmarked to address these pesticide problems that have been inadvertently growing during the last several years. If no more support and appropriate technical assistance are forthcoming to be provided for the rural crop protection needs, it is quite likely that the pesticide problems encountered will continue to mount until toxic chemical poisoning becomes commonplace and there are detrimental environmental side effects such as ground water pollution and the fish kills that have happened elsewhere when pesticide accidents occur or their use becomes indiscriminate. Approximately \$ 750,000 additional funding is needed over about a two year period to address the pesticide problems that have developed in Guinea Bissau and attempt to rectify them. Controls should be put into effect to make sure that this additional funding is not used for other purposes not relevant to this evaluation and its recommendations.

The Guinea Bissau Food Crop Protection III project was ratified August 26, 1985. Mid-term evaluation was scheduled

for September 1987, but not conducted. The January-February 1988 evaluation replaces the mid-term evaluation and will be used for a general strategy review planned for early 1988.

The Planned Project Assistance Completion Date was five years, September 30, 1990, from the date of initial obligation. However, by the February 12, 1988 date of the evaluation, \$ 1,045,454 of the total project obligations of \$ 1,250,000 has now been earmarked leaving a project unearmarked balance of \$ 204,546. According to the August 23, 1985 Project Paper Projected Expenditures by Fiscal Year, \$ 315,000 was to be available in the 1988 and 1989 years of the project life. In consideration that only a little over 16% of the project resource funding remains just past its mid-term time, there will be practically no money left to implement the recommendations derived by the evaluation and included in this report.

Project Purpose

The purpose of the project is to "strengthen the National Crop Protection Service's capacity to develop and direct a crop protection program and continue to implement the on-going program in crop protection."

Recurrent Costs

The Government of Guinea Bissau contribution in-kind to the project is \$ 870,000 which includes the salaries and benefits of the employees of the Crop Protection Service, the fuel for field transportation and office space and utilities. Other donors such as the Governments of Italy and Portugal provided vehicles, pesticides and technical training and assistance.

Much of the recurrent costs support problem remains because of the National economic situation. The Crop Protection Service is considering requesting farmers who can afford it to pay in cash or crops for crop protection services and

pesticides used to protect their crops. Payment would be required from only the larger farmers and other producers of export commodities such as cotton and peanuts and not from the small farmers unable to pay.

Project Goal

The project goal is "to increase productivity in staple food crops." this goal is shared by all US AID supported agricultural development projects in Guinea Bissau.

IPM

Integrated pest management is the Project Paper recommended principle of action. Pesticides have become the most significant element of IPM in Guinea Bissau and the first line or bastion of defense against agricultural crop pests in order to meet the goal of increased staple food productivity so that food will not have to be imported every year. Other methods of IPM including predators, parasites and pest diseases that are host density dependent requiring a reservoir population of the host/pest are being utilized as a second line of defense because of the immediate and urgent need to rapidly increase food production. All possible means are being pursued including better adapted and higher yielding crop varieties, fertilizers, more use of animal traction and improved farmer incentives. In this regard crop protection is a component of interdisciplinary crop production and its implementation should be integrated into the total economics of crop production and the National goal of food self-sufficiency.

Environmental Assessment

The evaluation revealed that this element of the project must be given immediate planning and implementation attention and action according to recommendations based on observations of the toxic chemical pesticide problems seen at 18 locations in three of the four zones of Guinea Bissau. Resources should be provided and directed to correct this hazardous situation as soon as possible

taking all due caution and safety measures in view of the toxic hazard of some of these pesticides.

Crop Protection in Guinea Bissau

When a farmer has a crop pest or disease problem, he communicates it to a local representative of the Crop Protection Service who has some basic training in crop protection. The local agent is an enquadrado and a village level volunteer who conducts pest and disease surveys and pesticide application. Enquadrados are typically 18 to 25 year old men. They may be paid by the Government in food from the World Food Fund instead of cash. There is fairly rapid turnover among enquadrados requiring frequent training.

The Enquadrado reports the farmer's crop pest or disease problem to a local Crop Protection Service Field agent or monitor who is a Government employee. There were 38 monitors in the Proposed Organizational Chart of the Crop Protection Service for 1990 in the Project Paper and 200 Enquadrados throughout Guinea Bissau. Current reports are that 9 or 10 Enquadrados report to each of 35 monitors.

The monitor or field agent reports the farmer's crop pest or disease problem to the Crop Protection Service zone supervisor who maintains a supply of pesticides and sprayers. The monitor may also have a store of pesticides and equipment and there is a large central warehouse at Crop Protection Service headquarters at the capital City of Bissau.

The zone supervisor makes the control recommendations or pesticide prescription and the monitor implements control action with a crop protection brigade consisting of enquadrados and participating farmers. The entire turnaround time from farmer complaint to control is about two days.

Each of the four zone supervisors has a 4 WD pickup truck, the monitors have 125 cc Honda trail motorcycles and some of the enquadros have bicycles. The pesticides come from various donors upon the request of the Crop Protection Service. The types and formulations of pesticides are decided by the Crop Protection Service based on technical assistance provided and the nature of available free pesticides.

Evaluation

The evaluation consists of a narrative report and recommendations based on examination of the project and present crop protection needs in Guinea Bissau and annexed supporting documentation from the Crop Protection Service and local US AID and USDA representatives.

The evaluation was conducted in accordance with the covenants and evaluation plan of the Project Paper of August 23, 1985.

PESTICIDES

Pesticide storage facilities were surveyed at 18 locations in three of the four zones of Guinea Bissau from January 25 through February 3, 1988 to identify the pesticides used, types and condition of containers, pesticide labels and storage problems and needs. The present situation regarding pesticide storage buildings, training facilities and office work space in the rural agricultural countryside outside the City of Bissau were also evaluated and observations were made on pesticide transfer, safety and application equipment available. It was not feasible to determine the exact quantities of pesticides because many were in large drums (55 gallons, etc.) that were partially used.

PESTICIDES STORED IN GUINEA BISSAU

PESTICIDE NAMES	FORMULATIONS	Location where observed															
		Bissau	Polunda	Cachou	Bissora	Manaba	Farim	Sarainjoba	Bafata	Contubuel	Gabu	Soinumbatu	Tite	Fulacunda	Catio	Jedanada/Uajma	Cabonamque/DEPA
Acephate (Orthene ●)	50 % SP																
Aldrin	40 % EC	x															
Alfamethrin (Fastac ●)	4.75 % EC																
<u>Bacillus thuringiensis</u> (Thuricide ●)	16,000 IU/mg WP											x			x		x
Benomyl (Benlate ●)	50 % WP	x					x					x					
Carbofuran (Furadan ●)	10 % Granules	x		x													
Chlo-pyrifos (Dursban ●)	12 % EC								x								
Deltamethrin (Decis ●)	2.5 % EC	x															
Endosulfan (Thiodan ●)									x						x		
Dieldrin	20 % EC									x							
Dimethoate	86,87 % EC, 40 % EC																
Penitrothion (Sumithion ●)	96 % ULV, 3 % dust	x					x		x								x
Fenvalerate (Sumicidin ●)	11 % EC	x	x	x	x	x	x						x	x	x		x
Heptachlor	25 % WP	x	x		x		x						x	x	x		x
Lindane, BHC	90 % WP												x				
Malathion	50 % EC, 96 % Tech.				x	x			x				x	x	x	x	
Propoxur (Baygon ●)	50 %, 75 %, 80 % WP, 75 % ULV		x	x													
Deltamethrin + Dimethoate	0.45 % + 10 % ULV	x	x	x	x		x	x		x		x		x			x
							x										
								x									

PESTICIDES STORED IN GUINEA BISSAU

<u>Pesticide Names</u>	<u>Class</u>	<u>EPA signal word</u>	<u>Antidote</u>	<u>Uses</u>	<u>Basic producers</u>
Acephate	OP insecticide	Caution	Atropine, 2-PAM	broad spectrum	Chevron
Aldrin	CLH insecticide	Warning	None	USA cancelled	Shell
Alfamethrin	SP insecticide	Caution	None	Not reg. in USA	Shell
<u>Bacillus thuringiensis</u>	Microbial insecticide	Caution	No need	Lepidoptera larvae	Sandoz
Benomyl	Carb. fungicide	Caution		Crop diseases	E.I. duPont
Carbofuran	Carb. insecticide	Warning, Danger	Atropine, homotropine	Systemic	F.M.C.
Chloropyrifos	OP insecticide	Warning	Atropine, 2-PAM	Broad spectrum	Dow
Deltamethrin	SP insecticide		None	Broad spectrum	Poussel Uclaf
Endosulfan	CLH insecticide	Danger	None	USA cancelled	FMC
Dieldrin	CLH insecticide	Warning	None	USA cancelled	Shell
Dimethoate	OP insecticide	Warning	Atropine, PAM 2-PAMCL, 2-PAM, Toxogonin®	Systemic	Several
Fenitrothion	OP insecticide	Warning		Broad spectrum	Sumitomo
Fenvalerate	SP insecticide	Warning	None	Broad spectrum	Sumitomo
Heptachlor	CLH insecticide	Warning	None	USA cancelled	Sandoz
Lindane	CLH insecticide	Warning	None	USA cancelled	Drexel
Malathion	OP insecticide	Caution	same as dimethoate	Broad spectrum	Am. cyanamid
Propoxur	OP insecticide		Atropine	Broad spectrum	Bayer

Pesticide Risks

The greatest hazard in pesticide use is to the applicator or person who opens the container of concentrated or formulated pesticide, mixes it and applies it. Common routes of exposure are through the skin or dermal contact and inhalation of pesticide fumes or vapor. Oral exposure is often accidental when a person uses an empty pesticide container for food or drink or transfers pesticides from large labeled containers to smaller containers with no labels. Many of the pesticide formulations in Guinea Bissau are of very high potency such as fenitrothion 96% ULV, malathion 96% technical grade used as ULV and propoxur 75% ULV. They are applied with hand carried or gasoline motor, ULV sprayers rather than by airplane and many people participate in their application to crops and for grasshopper control.

Pesticide Containers and Labels

Most of the pesticides observed were in drums. Some had been badly dented and others had rust. Many of the container labels were damaged and illegible from dirt and abrasion or were missing. It was difficult to determine what was in certain drums such as the aldrin and dieldrin because only the words aldrin 40% and dieldrin 20% were written on the drum heads and covered with dirt. There was no other label information. Many other drums or barrels of pesticides had inadequate and unsafe labels with only identification of the pesticide, no warnings and no identification of origins or manufacturing dates. Most of these containers would have been illegal in the USA.

Since most, but not all of the pesticides were in heavy drums, it was apparently necessary to transfer them to smaller containers for delivery and use. This introduces a potential hazard during transfer to small unlabeled containers. Additional handling during transfer increases the risk of dermal exposure and intoxication especially with the high potency formulations used for ULV application. Nearly all of the pesticide storage areas surveyed did not

have a convenient water supply which is necessary for cleaning skin and clothing contaminated by pesticide spills. The use of drums has introduced much more exposure hazard than if smaller and properly labeled containers of 0.5 to 5 or 10 liters had been available and used.

Additional hazards of oral poisoning are introduced when unlabeled or inadequately labeled small containers are used to transfer pesticides from drums to sprayers in the field. This results when such small containers are then used for food and drink. Some spraypersons do not have adequate protective clothing while others avoid using protective devices because of their discomfort in hot and humid conditions. No water and soap near by in case of a spill on clothing or skin and no antidotes at local medical clinics and hospitals also add to the risk of pesticide poisoning in Guinea Bissau.

It is strongly recommended that smaller, more convenient and safer pesticide containers with legally proper labels be imported for use in Guinea Bissau rather than 55 gallon or other large drums. Use of protective clothing and devices are encouraged as well as more provisions for washing and a supply of organophosphate and carbanate antidotes.

Further recommendations are that the pesticide selection process be reviewed in consideration of safety to man and the environment and accurate and complete labels in addition to their efficacy against target pests including grasshoppers, armyworms and others. Technical assistance is prescribed in this area. A supply of antidotes is urgently needed. Safer low active ingredient formulations of trichlorfon, diazinon, permethrin, carbaryl, malathion, pirimiphos-methyl, etc. are suggested for evaluation and adoption.

Since many of the pesticide labels were found inadequate, missing and in inappropriate languages, this should be

corrected for the purposes of proper use, handling, mixing, storage and safety of all pesticides used in Guinea Bissau. For example, all pesticides from the USA must have EPA approved labels, preferably in Spanish since it is close to Portuguese and nearly all USA pesticide manufacturers have made their labels available in Spanish because of the large number of Hispanic farm workers in many states.

Pesticide Control and Regulation

Many of the toxic pesticides surveyed in storage places in Guinea Bissau such as aldrin and dieldrin belonged to other projects and Government agencies than the Crop Protection Service which has neither control nor authority over storage, safety and use of these pesticides. One example of this problem was 13 large, badly dented and inadequately labeled drums of dimethoate 40% EC of unknown origin stored outside without protection and uphill from an open well and about four hectares of fresh vegetable gardens tended by barefoot women near the town of Contuboel.

There is a need for pesticide regulation in Guinea Bissau that will require all pesticides imported for use in agriculture to be controlled by the Crop Protection Service. Regulatory criteria that are recommended include: satisfactory or adequate efficacy or performance against target pests and crop diseases; minimal hazard to humans, crops, livestock and the environment when used as directed according to clear instructions, training and the labels; and selection of pesticides that do not leave residues beyond EPA established tolerances on food or feed destined for export and local consumption. Other regulatory functions could be approval of labels on pesticide containers, suspension of pesticides and uses constituting imminent hazards and training and certification of pesticide applicators who are responsible for and use the more toxic, hazardous or restricted use type of pesticides such as the ULV formulations.

It is recommended that all continued US AID support of crop protection in Guinea Bissau be contingent on the enactment

of pesticide regulation to control use of these toxic chemicals for safety to people and the environment.

Pesticide Storage, Training and Office Space

Pesticide storage facilities throughout Guinea Bissau are very inadequate and mostly not under jurisdiction of the Crop Protection Service. Storage space ranges from old Portuguese defense bunker and arsenals to adobe structures. Most of the storage buildings were kept locked, but they usually belonged to other Government departments, agencies or projects and were used to store many other items including lumber, cement, bicycles and peanuts. The person with the key was frequently an employee of a different agency than the Crop Protection Service. Some buildings had poor ventilation and lighting. Occasionally, during a pest outbreak that requires urgent action, the person with the key could not be quickly located resulting in lost time and added crop damage. Most facilities are lent to the Crop Protection Service and the only adequate storage facility they control is in the City of Bissau. In some other storage areas, desks were located near pesticides where their mercaptan odor was nauseating and fumes possibly dangerous.

It is recommended that the Crop Protection Service regulate and control all agricultural pesticide storage in Guinea Bissau in order to protect the people and environment. Adjacent office space for a desk to keep pesticide inventory and use records is also recommended for most storage buildings as well as a roofed porch area for exhibits or displays and demonstration extension training in crop protection and safe use of pesticides.

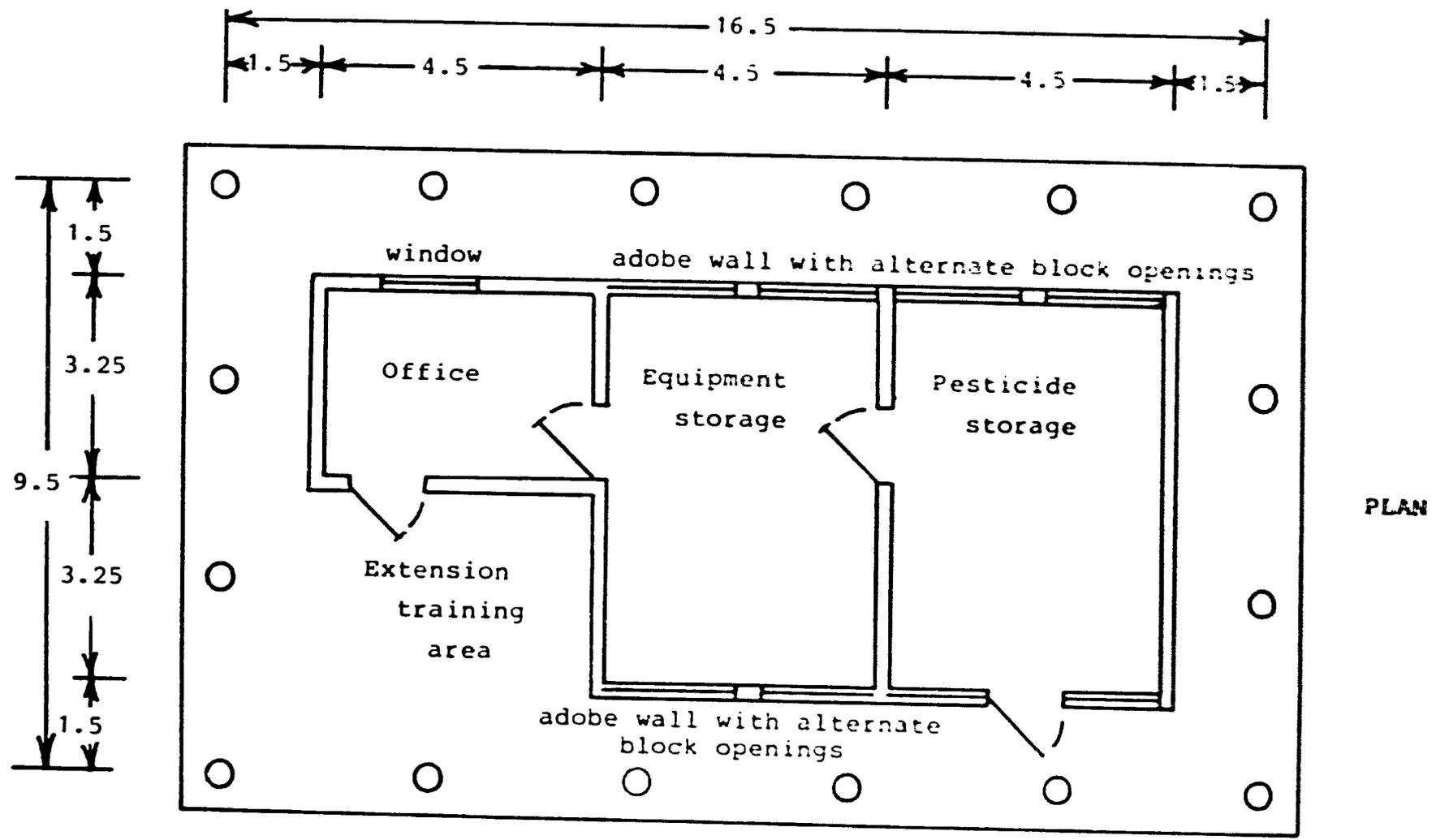
The Crop Protection Service has inadequate or nonexistent zone and regional facilities. About 16 pesticides storage buildings with connected, but separate offices and extension training space are required to greatly improve the effectiveness of the Crop Protection Service at the rural farmer and village level in the agricultural countryside of Guinea Bissau.

A proposed design for the pesticide storage building plus office space and training area was made by the Crop Protection Service with advice and assistance by the evaluation team. These modest buildings made of adobe with corrugated metal roofs and costing no more than about \$ 3,000 to \$ 4,000 per building will provide safer pesticide storage under lock and key throughout the countryside where the pesticides are needed and used to increase agricultural food production. These buildings will provide office work space for field agents or monitors and zone supervisors of the Crop Protection Service. They will also provide pest, disease and pesticide training, meeting, exhibit and demonstration space where local farmers and encadrados can meet about once per fortnight for training and field level feedback experience to improve crop protection and, therefore, food yields. These local facilities will be centers of functional interface for rural village level extension training by the Crop Protection Service. The buildings should be within about 100 meters of a water supply for washing, but not close uphill/upstream of water sources to prevent contamination of water by accidentally spilled pesticides. They should be at least 30 meters from such water sources. Some may have electricity if it is already in a town, but no generators are recommended at this time because of cost, maintenance and fuel restrictions.

PESTICIDE MISUSE

Fenitration 3% dust normally used for grasshopper nymph control was observed in the Mansaba pesticide storage facility applied as a grain protectant on peanuts. This is not a recommended usage and could lead to excessive pesticide residues. US EPA fenitrothion labels state not to store this chemical near food or feed products. These treated peanuts were to be sent to Bissau for sale and possible export for foreign exchange. This example of pesticide misuse was not done by the Crop Protection Service. Many developed countries regulate pesticide tolerances on imported food commodities and will reject food with pesticide levels above established tolerances.

Guinea Bissau Crop Protection Service Zone and Regional Pesticide Storage, Office and Training Building

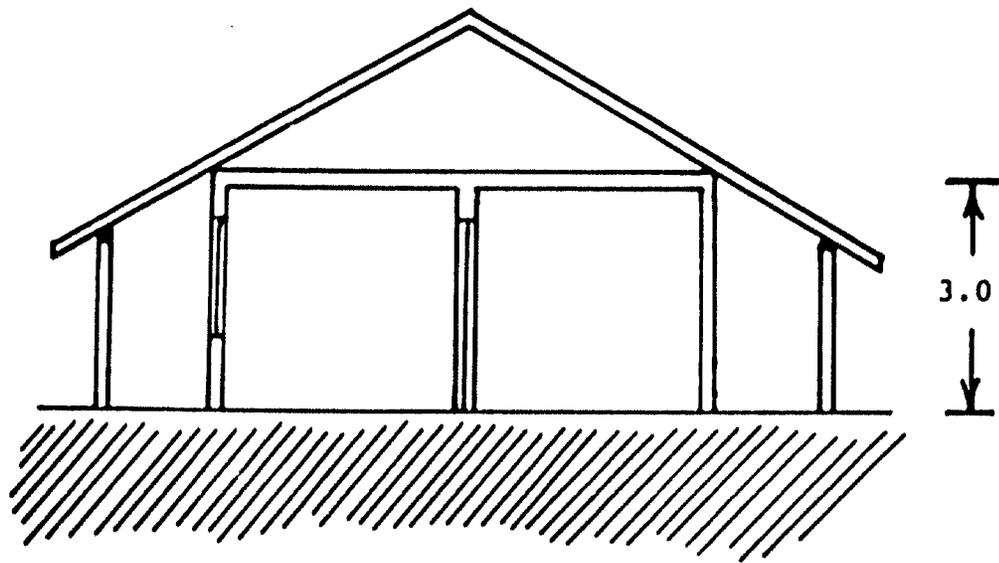


PLAN

Construction materials: Walls of adobe block, corrugated galvanized sheet steel roof and wood pillars. Cost estimate for approximately 150 square meters X 26,000 Guinea Bissau pesos /square meter: 3,900,000 pesos.

2

14.



Side view of building.

Other foreign assisted or managed projects do not necessarily follow the advice of the Crop Protection Service and independently decide which pesticides they use and how to use them. There are no regulations or controls presently governing the import, storage, use and safety of agricultural pesticides imported by the various agencies and projects. Some toxic pesticides have been sent as gifts in large drums with only the name and formulation, but with no mixing, use and safety information and no manufacturing date and place of origin. Other pesticides are imported by foreign agencies which purchases crop commodities from Guinea Bissau such as cotton and they deduct the cost of the pesticides from the price paid for the commodity.

Recommendations are that the Crop Protection Service be officially designated by the Central Government of Guinea Bissau to control and regulate all agricultural pesticides and their use in the Country. Further technical assistance and training should concentrate on this and other pesticide related problems and needs.

Pesticide and Container Disposal

Several old, badly labeled and hazardous toxic pesticides and damaged containers were observed during the evaluation which should be properly disposed of before drums start to leak and exaggerate the problem. The disposal procedures discussed in their order of human and environmental safety were:

- Disposal by utilization according to safe agricultural pesticide practices,
- Disposal by application and spread over uninhabited nonagricultural land to allow natural degradation. Warning signs should be erected.
- Detoxification by use of chemical agents from pesticide manufacturers to neutralize unwanted pesticides.

- Burial at a remote and uninhabited site with permanent warning signs erected. Warning, this method may lead to ground water contamination and appropriate precautions should be taken.
- Incineration at a remote and uninhabited site with appropriate road blocks and temporary warning signs. Warning, this method may lead to air contamination because combustion temperatures may not be high enough to degradate the pesticides. There should be no human presence down wind for at least 3 km.

These disposal procedures will involve some risk and hazard, but disposal may be necessary to prevent future poisoning and contamination problems. It is recommended that pesticide and container disposal procedures be developed by the Crop Protection Service with appropriate technical assistance in pesticide management. Pesticides should be imported in easily and safely managable properly labeled containers of about 0.5 to 5 to 10 liters instead of steel drums weighing up to 450 lbs. The small containers must be returned to the Crop Protection Service local storage/office/training facility for safe disposal and prevented from use for storage of other materials like food and drink.

Pesticide Poisoning

The Crop Protection Service reported that there have been no cases of pesticide poisoning among its staff nor knew of cases of poisoning among the farmers and encadrados they have trained and worked with.

Pesticide poisoning was discussed with a missionary who has spent over two years in Guinea Bissau near Bissora. He reported pesticide poisoning to be common in his locality and the medical clinic of his mission has treated two men suffering from classical symptoms of cholinesterase inhibition including convulsions. The missionary considered that the administration of atropine by their clinic may have saved the lives of these two victims of pesticide poisoning.

He undertood that poisoning may have resulted from possible use of insecticides such as propoxur or others on agricultural crops without protective apparel or devices. Atropine or other pesticide antidotes are not present or available at the clinics or hospitals in the rural countryside of Guinea Bissau.

The evaluation recommends additional and continued basic training in pesticide use, safety and treatment of poisoning in all rural agricultural zones and regions and the placement of injectable and oral antidotes in each and every clinic and hospital to help prevent injury and loss of life from improper use of toxic pesticide chemicals.

Pesticide Application Equipment

Various types and brands of sprayers and application equipment were noted at the pesticide storage locations throughout the country. They included:

- Gasoline motor backpack sprayers:
 - KWH from Holland,
 - Solo and Pulnorto from W. Germany,
 - Hudson from USA,
 - Nuvold from Italy and
 - Vieira from Portugal.
- Manual hydraulic sprayers:
 - Signa and Nuvola from Italy and
 - Hudson from USA,
- Dusters and dust applicators made from coarse cloth bags and specialized
- ULV sprayers:
 - Micron from England

It is recommended that a few brands be standardized upon for convenience in maintenance and replacement of parts.

23

TECHNICAL ASSISTANCE

The Guinea Bissau Food Crop Protection III. Project Paper listed project technical assistance needs on p. 12 as:

- Long term
Plant Protection Advisor - 2 years

- Short term
Plant Quarantine
IPM Specialist
Extension Specialist
Weed Control Specialist

and on p.29 as: one long-term crop protection specialist and limited short-term technical consultants in the areas of plant quarantine, pesticide use, plant pathology, etc.

Technical assistance provided for this project consisted of the following according to the latest available US AID budget printout:

USDA Project Officer
USDA PASA Local Support
Training / Extension Specialist

An itemization of the people, their areas of technical assistance and the amount of time they spent in Guinea Bissau is provided in the attached information by Mr. John Franklin, project officer. The earmarked budget total was \$ 113,089 and there is no unearmarked balance to provide for the technical assistance recommendations of this evaluation.

Additional short-term technical assistance is recommended by the evaluation in the areas of pesticide selection usage, safety, storage and regulation because of the number of pesticide problems observed and described in the PESTICIDES

section of the evaluation report. It was apparent that these problems are of paramount importance at this time and deserve the major attention of the Crop Protection Service, the remaining resources of the project and additional funding inputs to correct the existing situation for the safety of people and protection of the environment in Guinea Bissau.

Other short-term technical assistance is needed to help set up the SW radio communication system and provide training for its use, maintenance and basic repair procedures. A short-term photography trainer would be useful to advise and assist in utilizing the 35 mm SLR cameras to their fullest capacity to provide visual photographic aids for extension training done by the Crop Protection Service. This would include macrophotography of crop pests and disease symptoms. Short-term technical assistance is also recommended to continue to improve vehicle maintenance because of the unusually severe amount of stress applied by difficult road conditions, dust and dirt. The same person could also advise and assist in gasoline motor backpack sprayer maintenance and repair. This type of technical assistance is recommended to prolong the useful life of the vehicles and motorized sprayers. Minor technical assistance is recommended for training in microscope and laboratory equipment optimal use and maintenance to maximize benefits and life of equipment already purchased. The last major area of short-term technical assistance recommended is in economic pest and their parasite and predator taxonomy to help build the reference collection of the Crop Protection Service. Training in collection maintenance must be included.

Short-Term Technical Assistance Recommendations:

Area of technical assistance	Qualifications	Recommended work time in Guinea Bissau
1. Training advice and assistance on recommendation of appropriate pesticides, formulations, efficacy on target pests and diseases and safest possible use.	M.S. or Ph. D. with experience in pesticide, performance, recommendations and their use for crop protection, preferably in less developed countries.	Two months consecutively or or two one month periods.
2. Training, advice and assistance on pesticide safety including safe use and storage, treatment of pesticide poisoning and disposal of hazardous toxic waste pesticides and their containers.	M.S. or Ph. D. with experience in pesticide safety training and disposal, preferably in less developed countries.	May be combined with # 1 above or two months consecutively or two one month periods.
3. Training, advice and assistance in pesticide regulation for control of imported pesticides used by all Government projects. Pesticide regulation will take the place of pesticide registration because pesticide manufacturers are not represented in Guinea Bissau.	M.S. or Ph. D. with experience in pesticide regulation, preferably in less developed countries.	May be combined with # 1 or # 2 above or one month.

Area of Technical assistance	Qualifications	Recommended work time in Guinea Bissau
4. Training, advice and assistance in vehicle and gasoline motor sprayer maintenance and repair.	Appropriate experience with vehicles and small motors.	Periodic visits of one to two weeks every three to six months.
5. Training, advice and assistance in microscope and laboratory equipment use and maintenance.	Appropriate experience.	Combine with # 1, # 2 or # 3 above or # 7 or # 9 below.
6. Photography training.	Appropriate experience.	Combine with # 1, # 2 or # 3 above or # 7 or # 9 below
7. Training, advice and assistance in crop pest and biological control agent recognition, taxonomy and reference collection maintenance.	M.S. or Ph. D. in entomology with experience in insect and possibly plant disease and weed identification, preferably in W. Africa.	One month. May possibly be combined with # 1, # 2 or # 3 above depending on available experience and qualifications.
8. Training, advice and assistance in SW radio use and maintenance.	Appropriate experience such as military or commercial.	Two weeks.

Long-Term Assistance Recommendations:

Area of Technical assistance	Qualifications	Recommended work time in Guinea Bissau
9. Training, advice and assistance for project implementation, liaison and extension crop pest management training.	B.S. or M.S. in agricultural education, extension or production with interest or experience in crop protection and some pesticide use and safety knowledge.	Full-time Peace Corps volunteer.

A long-term assistance recommendation is made because the Crop Protection Service believes that project implementation has been less effective since the departure of the general plant protection assistant in May 1986. A Peace Corps volunteer will be adequate, acceptable and office space is already provided by the Crop Protection Service.

VEHICLES

The original August 23, 1985 schedule of vehicles for the Guinea Bissau Food Crop Protection III Project was for:

Vehicles (to include 20% spare parts)

- One Toyota Coaster minibus with seating capacity for 25,
- Two Toyota Landcruiser stationwagons, 4WD, 4 cyl. diesel,
- Ten Toyota Landcruiser pickups, 4WD, 4 cyl. diesel,
- Thirty Honda motorcycles.

The project has purchased:

- One Toyota minibus,
- Two Toyota Landcruiser stationwagons, 4WD, diesel,
- Five Toyota Landcruiser pickup trucks, 4WD, diesel,
- One Toyota Tercel 4WD stationwagon, 4WD (automobile),
- Fourteen Honda 125 CC trail motorcycles.

Vehicle Maintenance and Responsibility

Of the five Toyota Landcruiser pickup trucks bought, two have been in accidents and rolled over and another has a broken windshield. Drivers were found at fault for the two accidents and required by the Government to pay the cost of repairing the two vehicles. In addition, one of the drivers was discharged. One of these trucks is currently being repaired by the Ministry of Agriculture garage and the other is inoperative awaiting repair. Drivers of vehicles involved in

such accidents and found at fault will probably not be able to pay for their repair due to their extremely low wages and living costs, particularly if they have children.

Maintenance of project vehicles except motorcycles is done by the Ministry of Agriculture garage. The Crop Protection Service has prepared a list of spare parts and service items for the project vehicles for US AID to buy. Proper inventory and control procedures are recommended by the evaluation because oil filters, fuel filters, tires, etc. are valuable commodities absolutely necessary to prolong the useful life of the vehicles as well as to keep them safe for personnel of the Crop Protection Service that need and use them.

The evaluation recommends that the vehicles be serviced by the Ministry of Agriculture garage at least once per month in addition to daily inspection and routine maintenance by the drivers and staff that use them. Daily inspection should include checks for body and structural damage, tire pressure and damage, lights, engine oil and coolant levels, washer/wiper fluid level, brake fluid level, weekly battery fluid level and daily engine, transmission and brake functions.

The life of the project vehicles and their functional and structural condition is also directly proportional to the speeds at which they are driven over the many rough and unimproved roads in Guinea Bissau. It is recommended that the Crop Protection Service monitor the speed of their vehicles to that which is appropriate to local road conditions thus minimizing damage to prolong their useful life and for the safety of occupants such as those in rear seats or without seat belts who may be hurt if banged against the roof, sides or other passengers over rough roads.

Fourteen of the thirty Honda motorcycles scheduled for the project have been bought and are in use by the Crop Protection Service. As of October 1987, all fourteen were

reported to be working. They are inspected once per year by the Crop Protection Service in Bissau and have local routine maintenance outside Bissau in the four zones of the country done at periodic time intervals rather than kilometers driven. Zone supervisors are responsible for care and maintenance of equipment in their zones including the motorcycles and gasoline 2-cycle motor backpack pesticide sprayers from various other donors and projects such as the Government of Italy and US AID emergency funding for grasshopper control.

Vehicles stationed at the Crop Protection Service headquarters in Bissau have been assigned to supervisory, senior technical or administrative staff who have been responsible for their care and regular maintenance in the past. However, there are not enough vehicles for all of these staff members and the system of responsibility is planned to be changed to that of a motor pool for the headquarters in Bissau. There are to be administrative controls over use and maintenance of the motor pool vehicles. The motor pool system remains to be put in effect and tested in comparison to the previous to present system of individual senior staff responsibility for each vehicle which is a common procedure for such projects.

The evaluation recommendations are to try the new motor pool system and test it for a year to determine if it results in any better care and maintenance than the other system.

Japan Versus USA Made

An Action Memorandum for the Deputy Assistant Administrator for Africa was done August 27, 1985 on the subject of Guinea Bissau Food Crop Protection III Source/Origin Vehicle Procurement Waiver in order to buy Japanese made vehicles instead of those made in USA.

The two Toyota Landcruiser stationwagons, 4 WD, 4 cyl. diesel cost \$ 26,819 per car. They were bought from a dealer in

Dakar and cost much more than planned because they were urgently needed for transportation of technical assistance people. Toyotas are preferred because they are common now in Africa with available and interchangeable spare parts. They are also sturdy and come with standard accessory equipment including stereo radio/tapedeck, air conditioner, etc. The Toyota 4WD pickup trucks cost \$ 17,538 each.

The USA dollar has devalued greatly against the Japanese yen and major European currencies making many items from Europe and Japan about two times more expensive than two years ago.

The military in Guinea Bissau has 30 Jeeps of the type made by American Motors. These jeeps were seen on numerous occasions. Some French expatriates were observed using American Motors USA made Jeep vehicles in Guinea Bissau. Renault sells Jeep vehicles in Europe and possibly Senegal as well. Jeep vehicles have a 2.1 liter diesel engine option that may be available in their compact 4 WD pickup trucks.

It is recommended by the evaluation that consideration be given to buying USA made 4WD Jeep pickup trucks (and stationwagons) for any future AID purchases for Guinea Bissau and that Renault be contacted for supply of spare parts and regular maintenance items. The Renault agent in Bissau is Sahili, Ltd., Electro/ Mechanical; Bairro de Ajuda A2; telephone number: 21-11-16.

Boats

The project paper specified four aluminum 18 foot workboats, suitable for tidal rivers and six USA Johnson 40 h.p. outboard motors. No boats have been ordered as yet this project and the project funds have been mostly exhausted by the time of evaluation. Therefore, it does not appear feasible to purchase boats and motors with the amount of funding remaining because of other emergent and important priorities. It is also recommended by the evaluation that

justification for these boats be reconsidered in proportion to the pesticide problems that have become preeminent in the rural countryside. Should boats be bought, USA made boats and motors ought to be selected because of the large and adequate selection available from the USA.

35

Lista de Peças de Land/Cruiser "Toyota" Encontradas no Armazém
da direcção dos Serviços de Protecção Vegetal

Baterias	6	
Filtros de óleo	25	
Colector de escape	2	
Aventoinhas	2	
Reflector completo	10	
Rolamento de cubo traseiro	3	
Rolamento de cubo dianteiro	4	
Capas de biela	3	jogos
Amortecedor dianteira	3	
Amortecedor traseiro	5	
Tambor traseiro	3	
Alternador	2	
Bomba injectora	1	
Junto de raparação	1	jogo
Filtro de gasóleo	17	
Parábola de piscas traseira	8	
Relay	4	
Diafragma	2	
Segmento	1	jogo
Rolamento de caixa de velocidade	2	
Parabola de piscas dianteira	3	
Radiator	2	
Caldievas de escape	1	
Tubos de injectores	3	
Esticadores de maxilas	6	
Sino-blocos	29	pares
Arrancadores de ignição	3	
Cruzetas	2	
Juntas de colector	1	jogo
Retentor de cambota	1	jogo
Tubo flexível de gasóleo	6	
Tubo flexível de gasóleo	6	
Motor de lâmpa parabrisa	1	
Guarda pó	7	

Terminais de semi-eixo	2
Tampa de filtro de gasóleo	1
Aquecedor	5
União charnelas.....	4
Tubos de radiador	10
Carborador	2
Bomba de alimentação	3
Retentores de rodas	4
Bulão	1
Caretos de caixa de velocidade	3
Pistão	5
Cabos de de baterias	19
Cabos de de baterias	13
Pistões de cubo	6
Semi-eixo de cardan	3
Bichas de acelerador	1
Dobradixas de portas	5
Vidros de parabrisas traseira	4
Molas traseira	4
Molas dianteira	3
Calços de travão	33
Veio de direcção	3
Direcção	4
Tubos de escape	2

Bissau, 08/02/88.

37.

**Relacção de Materiais Existentes na Oficina Mecânica
da Direcção dos Serviços de Protecção Vegetal**

- 1) - 15 pares de maxilas
- 2) - 3 pares de bixa de conta kilometro
- 3) - 11 pares de embreagem
- 4) - 9 pares de acelerador
- 5) - 3 pares de cramalheira
- 6) - 4 jogos de junta de reparação
- 7) - 3 " " porcas de cabeça
- 8) - 5 " " disco de embreagem
- 9) - 14 " " retentor de amortecedor
- 10) - 8 " " cachimbo de vela
- 11) - 18 " " guarda-pá de amortecedor
- 12) - 5 " " esticador de corrente distribuição
- 13) - 2 " " pedal de travão
- 14) - 9 " " de careto de comando
- 15) - 1 jogo " tampa de valvula
- 16) - 12 jogos " carrilha de pistão
- 17) - 1 " " preios de pistão
- 18) - 5 " " retentor de valvula
- 19) - 3 " " valvulas
- 20) - 8 " " martelos de valvulas
- 21) - 4 caixas de farol de Stop
- 22) - 2 " " velas
- 23) - 1 " " farol de frente
- 24) - 2 " " " " ponto morto
- 25) - 3 " " " " placas
- 26) - 3 jogos de perna de motor
- 27) - 5 " " filtro de ar
- 28) - 2 pistões

Dinnau, 09/02/88

O Mecânico

Alexandre Manuel Fonseca

COMMUNICATIONS

Short Wave Radios

The telephone system in Guinea Bissau is not considered to be dependable or adequate enough to meet the sometimes critical and urgent needs of the Crop Protection Service to mobilize its resources, manpower, pesticides and sprayers quickly enough to combat crop insect and disease attacks. This may be particularly valid during the rainy season when many of the rural roads are impassible because of deep standing water and mud and electric telephone systems are shorted out. The evaluation was conducted during dry weather and the telephone system appeared to be functional, but telephones were few and far between.

Short wave radios are recommended by the evaluation, not only to improve the logistical operations of the Crop Protection Service, but also and importantly to provide dependable communications to call for medical help or evacuation in case of toxic pesticide accidents and poisonings.

Six Japanese made ICOM, Inc. IC 735 (HF) radios, five Maxcon antennas with cables, five solar panels, five 12 volt batteries and five rolls of cable with a total quoted cost of \$ 11,495 have been proposed for the Crop Protection Service headquarters and four zones of Guinea Bissau. They are designed to be placed in buildings, not vehicles. However, the Crop Protection Service presently lacks adequate buildings and office space in the zones and regions for the radio units and temporary or borrowed facilities would have to be used until more permanent space is found or constructed. The broadcasting power/wattage of these radios should be checked before purchase to verify adequate range to communicate with all locations in Guinea Bissau.

Short-term technical assistance is recommended by the evaluation for training, advice and assistance in SW radio selection, use and maintenance.

The present library facilities at the Crop Protection Service Headquarters consist of only two small tables surrounded by seven chairs. There are four book cases of six shelves each against the wall with a couple of metal/glass bookcases and two magazine or periodical racks. The bulk of old periodicals, magazines, bulletins, textbooks, etc. seem rather old with most of the latest periodicals dated 1983 and 1984. The two existing tables with chairs are not adequate for library study and visitor conferences. Visitors need more space to sit around tables and discuss pest problems with the senior staff. The library system of books has no logical order with various publications intermixed regardless of subjects whether entomology, plant pathology or weed control. Some books are upright while others lay flat.

Two to four additional tables with chairs need to be added in the present library area to best accommodate existing staff and visitors. Perhaps, a few book shelves could be added or those present better utilized where there are empty shelves and missing shelf boards. Current and appropriate pest publications need to be added either by subscription or direct purchase. Some of the older material is good, however, Farm Chemicals Handbook and Insecticide Product Guide published by Meister Publishing Co., FAO Crop Protection Bulletins, Tropical Pest Management (formerly PANS) and the bulletins and journals of the Entomological and Phytopathological Societies of America should be added to the library.

The valuation also recommends that an appropriate staff member of the Crop Protection Service be trained for one to two weeks in library organization and maintenance.

CROP PROTECTION SERVICE FACILITIES

The Guinea Bissau Food Crop Protection III project is perceived by the Government and many visitors to be an effective and beneficial US AID project. There is a relatively well organized system in place which is respected in the countryside and currently reaches over 1,100 farm families. The planning and management abilities of the senior staff were found to be strong and performance of the field staff is satisfactory although limited because they lack regional facilities. In-service training is provided to extend skills to field personnel.

The evaluation visited the following towns and villages in Guinea Bissau: Bachil, Bafata, Ganjara, Bedanada/Uagma, Bissora, Buba, Bula, Cacheu, Cacoca, Candiambary, Carboxanque, Catio, Contuboel, Fajonquito, Farim, Fulacunda, Gabu, Mansaba, Pelundo, Pirada, Quebu, Sarainjobo, Sorinumbatu, Sao Joao and Tite. All village chiefs and elders met expressed appreciation and thanks for past assistance by the Crop Protection Service and requested more help in the future from the Service and US AID. They were pleased with the grasshopper ootheca/egg soil surveys conducted each year from about November 20th through December 20th to forecast outbreaks. In 1986, an entire village near Farim was abandoned due to a grasshopper outbreak with a population of 90 grasshopper nymphs per square meter. At that time, the nearest available pesticides to combat the grasshoppers were stored 40-60 kilometers away from the village and transport was lacking. A pickup truck was provided by US AID in 1987 to respond to emergency needs in the area.

Fenitrothion 3W dust has been applied effectively on grasshopper nymphs (stages 1-4) by burlap bag application. Although there is a strong, well organized cadre of Crop Protection Service staff of about 70 people in place, continual in-service training is needed for them and the volunteer encadrados.

Many of the major pests of rice, sorghum, millet, cassava, groundnuts, citrus, maize, cotton, banana, melons, legume grains and vegetables have already been collected and are recognized, but not yet identified to genus and species. It is recommended that future technical assistance include a taxonomist familiar with West African crop pest insects and diseases and weeds if possible. Taxonomic training, aid and assistance will be beneficial to better identify collected specimens in the reference collections of the Crop Protection Service. Facilities for the collections are ample and include eleven insect specimen cabinets with a total of 108 drawers of which, 13 now contain collected insects. There are additionally about 38 Schmitt boxes with many containing insects and many yet to be filled. Collecting equipment including nets, pins and killing jars are well provisioned, however, there was no naphthalene or paradichlorobenzene to protect the dried specimens. Some of these valuable specimens have already been eaten and destroyed by ants and possibly dermestid carpet beetles. The recommended short-term taxonomy technical assistance should also provide training and advice on maintenance of the reference collection and known information on the life cycles of the species of pests that are identified because knowledge of crop pest life cycles is useful for the development of timely and effective control strategies and methods.

The new entomology and plant pathology laboratories are properly equipped with the necessary items for collection, identification and storage of specimens. Some of the specimen cabinets and/or boxes are to be sent to zone or regional facilities when and if they become available in the future.

Economic Insect Pests

The following economic insect pests were observed in an "extension training box" for use in practical exercise instruction. Specimens were not identified as pests of any specific host crop.

Lepidoptera:

Attsacta moloneyi
Lophygma exempta
Eldana saccharins
Heliothis armigera, American bollworm
Masalisa nubila
Raghurra bucolaris semegaleusis
Raghurra albipundella
Segamia sp.
Acigona ignefusalis
Pelepedius mathias
Cirphis loreyi

Coleoptera:

Psalydolitta sp. blister beetle
Mylabris holosericea
Rhumpten reflexa, chafer grub
Coryna argenteata
Nyleris abdominalis, hister beetle
Cylindrothorax dunauli, blister beetle

Hemiptera:

Agonoscelis versicolor, shield-backed bug
Dyndercus superstitionis, cotton stainer
Nezara aridula, (viridula), stink bug

Orthoptera:

Zonocerus variegatus, variegated locust
Oedaleus senegalensis, grasshopper

Dermaptera:

Forficula senegalensis, earwig

Crop Protection Service Human Resources (Headquarters at Bissau)

CROP PROTECTION SERVICE PERSONNEL

<u>Name</u>	<u>Training</u>	<u>Date born</u>	<u>Sex</u>	<u>Education Institution</u>	<u>Country</u>	<u>Language</u>	<u>In or out of country</u>
Lourenco Abreu (1)	Biological control	August 10, 56	Male	Oklahoma State University B. Sc.	USA	Portuguese, French, English	(out) Texas A & M working on M.Sc.
Mustafa Cassama (1)	Stored product IPM	October 10, 48	Male	University of Zagreb B. Sc.	Yugoslavia	Portuguese, French, Yugoslav	(out) Kansas State University working on M.Sc.
Marcelino Vaz	Integrated pest management	April 28, 50	Male	University of Novi Sad B. Sc.	Yugoslavia	Portuguese, French, Yugoslav	(in) Acting director Crop Protection Service
Maria Rosa Evora Ferreira	Plant pathology, agronomy	June 16, 57	Female	Agrian Academy of Kliment Avca de Vitch (Timirazev) B. Sc.	Russia	Portuguese, Russian, Spanish, French	(in) Acting plant pathologist
N'Queba Cia	Agronomy	January 15, 60	Female	Institute of Agronomy of Briansk	Russia	Portuguese, Russian, French	(in) Assistant plant pathologist
Basilio da Costa	Agricultural engineering	May 23, 57	Male	Institute of Juan Pedro (Carbo Servia)	Cuba	Portuguese, Spanish	(in) Acting administrator

Ana M.V.I. Balde	Education	April 6, 53	Female	Teacher training (Education)	Portugal, France	Portuguese, French	(in) Extension training officer
Domingos Tchentckelan (1)	Agronomy, IPM	April 15, 53	Male	Louisiana State University Southern University B.Sc.	USA	Portuguese, English, Czech, French, Spanish	(in) Zone II supervisor
Alfesene Balde (1)	Entomology		Male	University of Arizona (Tucson) B.Sc.	USA	Portuguese English, Spanish	(out) Entomology laboratory supervisor
Florentino J. Fernandes (1)	Plant pathology		Male	Oklahoma State University B. Sc.	USA	Portuguese, English, French, Spanish	(out) Louisiana State University working on M.Sc.
Cirilo Varela (1)	Crop protection		Male	Georgia Tech. (Tifton)	USA	Portuguese, English, French	(out) University of Missouri working on B.Sc.
Geraldo S. Menout (1)	Integrated pest management		Male	Agriculture, mid-level degree	Algeria	Portuguese, English, French	(out) Colorado State university working on B.Sc.

45

Luis Tavares (1)	Plant pathology, quarantine		Male	Agriculture, mid-level degree	Russia	Portuguese, Russian, English	(out) University of California Working on B.S
Quintino I. Correia (1)	Administration		Male	High school, Guinea Bissau	Portugal	Portuguese	(out) Portugal working on mid degree
Lassana S. Celu	General agriculture	Jan 15, 60	Male	Agriculture school of Abel Djassi BOE	Guinea Bissau	Portuguese	(in) Entomology Laboratory ass
Pedro C. Landim	Agro-chemistry	Oct. 22, 58	Male	University of Patrice Lumumba	Russia	Spanish, Portuguese, Russian, French	(in) Pesticide regulation

Crop Protection Service Human Resources (Zone I - Guinea Bissau)

<u>Name</u>	<u>Training</u>	<u>Date born</u>	<u>Sex</u>	<u>Education Institution</u>	<u>Country</u>	<u>Language</u>	<u>In or out of co</u>
Serifo Djalo	General agriculture	Oct. 25, 59	Male	Mid-level polytechnical Bactilatero	Cuba	Portuguese, Spanish, French	(in) supervisor of zone I
Calabus Nancanha (1)	Junior high school	Oct. 9, 60	Male	Junior high in Guinea Bissau	Guinea Bissau	Portuguese	(in) supervisor of Cacheu region
Suleimane Dabo	Junior high school	March 5, 61	Male	Junior high in Guinea Bissau	Guinea Bissau	Portuguese, French	(in) monitor
Luis N. Tchigna	General agriculture	April 14, 60	Male	Agriculture school of Abel Djassi BOE	Guinea Bissau	Portuguese	(in) supervisor of Oio region
Joao C. Gomes	High school	Jan. 12, 63	Male	High school in Guinea Bissau	Guinea Bissau	Portuguese	(in) monitor
Antonio Simoes	Junior high school	May 14, 63	Male	Junior high in Guinea Bissau	Guinea Bissau	Portuguese	(in) monitor
Claudino A. Prieria	High school	Dec. 16, 64	Male	High school in Guinea Bissau	Guinea Bissau	Portuguese	(in) monitor

f 7

Crop Protection Service Human Resources (Zone II - Guinea Bissau)

<u>Name</u>	<u>Training</u>	<u>Date born</u>	<u>Sex</u>	<u>Education Institution</u>	<u>Country</u>	<u>Language</u>	<u>In or out of cc</u>
Carlo J. Delgado (1)	General agriculture	Sept. 1, 59	Male	Agriculture school of Abel Djassi BOE	Guinea Bissau	Portuguese	(in) Acting supervisor of zone II, Baf
Tome S. Sisse	High school	Nov. 13, 61	Male	High school, Yahenda	Guinea Bissau	Portuguese	(in) monitor
Adulai Dembo		May 28, 56	Male	Agriculture school of Dr. Silva Tavares	Guinea Bissau	Portuguese	(in) monitor
Silvestre A.K.O. Cabral	High school	Jan. 1, 63	Male	High school Guinea Bissau	Guinea Bissau	Portuguese	(in) monitor
Jose P. Serra	Junior high school	Jan. 16, 64	Male	Junior High of Mansoa	Guinea Bissau	Portuguese	(in) monitor
Julio Nasulnate	General agriculture	Feb. 5, 64	Male	Agriculture school of Abel Djassi BOE	Guinea Bissau	Portuguese	(in) supervisor of Gabu region
Joaozinho Kim	Junior high school	Sept. 31, 59	Male	Junior high of Justador	Guinea Bissau	Portuguese	(in) monitor
Jose M. Da Silva	Junior high school	Oct. 13, 55	Male	Junior high of Salvador Aliende	Guinea Bissau	Portuguese	(in) monitor
Raul Correia	General agriculture		Male	Agriculture school Abel Djassi BOE	Guinea Bissau	Portuguese French	(out) monitor (Nigeria)

Crop Protection Service Human Resources (Zone III - Guinea Bissau)

<u>Name</u>	<u>Training</u>	<u>Date born</u>	<u>Sex</u>	<u>Education Institution</u>	<u>Country</u>	<u>Language</u>	<u>In or out of country</u>
Viriato J. Da Silva	Mid-level	June 25, 56	Male	Technical school (Bulgaria)	Bulgarian	Portuguese, Bulgaria	(in) supervisor of zone III
Augusto Vaz	General agriculture	Dec. 19, 61	Male	Agriculture school of Abel Djassi BOE	Guinea Bissau	Portuguese, French	(in) supervisor of Quinara region
Dimingos P. Davares		Oct. 5, 52	Male		Guinea Bissau	Portuguese	(in) monitor
Victorino G. Indi		May 11, 51	Male		Guinea Bissau	Portuguese	(in) monitor
Amadu Sissoko	Junior high school	June 10, 55	Male	Junior high school in Catio	Guinea Bissau	Portuguese	(in) monitor
Bibiano Da Silva	Junior high school	August 22, 57	Male	Junior high school	Guinea Bissau	Portuguese	(in) monitor
Sebastiao Quiyora	Junior high mission school	April 10, 49	Male	Junior high mission school of Catio	Guinea Bissau	Portuguese	(in) monitor
Rogerio B. Sawana	Junior high mission school	June 14, 53	Male	Junior high mission school of Catio	Guinea Bissau	Portuguese	(in) monitor

Crop Protection Service Human Resources (Zone IV - Guinea Bissau) (2)

NAME	TRAINING	Date born	Sex	EDUCATION INSTITUTION	Country	Language	In or out of co
Joaquim Q. Mbunde							
Fode Cassana							
Jorge Lamine Camaria							
Coio Mane							

(1) Indicates US AID Funds spent in formal education

(2) Zone IV was not visited during the evaluation

JOB DESCRIPTIONS

Field Agents/Monitors (Translated from Portuguese)

The guidelines for and job descriptions of the field agents or monitors have not been updated since the Crop Protection Service program and positions functioned differently in the past. There needs to be a clearer definition of specific duties and responsibilities of these key positions. There are adequate and clear job descriptions for the counselor (US AID long-term technical assistant), director, deputy director (chief of field operations), training officer, entomologist, plant pathologist, zone supervisors, maintenance supervisor and drivers. The following field agent duties are proposed by the evaluation in cooperation with the Crop Protection Service:

1. Responsible for transmitting information from the enquadros, village level volunteers to the Crop Protection Service zone supervisors.
2. Training the enquadros and farmers in crop protection.
3. Responsible for Crop Protection Service activities within their sector.
4. Responsible for the Crop Protection Service motorcycle and bicycle service and maintenance in their sector.
5. Responsible for pesticide use and safety in their sector.
6. Responsible for motorcycle fuel and distribution of the bicycles in their sector.
7. Keeps records of pesticide spray application, type of pesticides used and total areas treated.
8. Enlists new enquadros as needed. Distributes payment in food from World Food Fund for work done. Obtains "volunteer" farmers that want to learn and not require payment in food.

9. Surveys for crop pests and diseases.
10. Estimation of crop loss from pest and disease damage.

Drivers (Translated from Portuguese)

1. Responsible for assigned vehicle.
2. Must check the vehicle every day and do daily maintenance before use and after leaving vehicle and verify its condition.
3. Has an obligation to do any mission given at any time during the schedule of daily work and especially during the periods of pest control campaigns and may be requested to do special jobs any day of the week.
4. Must perform all duties requested by the chief of the Service or chief of the brigade.
5. The driver is not responsible to do spraying. However, they can do it if the technician needs help.
6. Responsible to check the car with respect to lubrication, change of oil, washing and other routine service.
7. Drivers are not authorized to stop or give a ride to people who do not belong to the Service or Ministry without permission by their supervisor. If unauthorized vehicle use occurs, the driver is responsible for all consequences.
8. The driver should not do any other missions or jobs that have not been assigned to him by his supervisors.

Zone Supervisor or Chief of Brigade (Translated from Portuguese)

1. Responsible of all activities in their zone.
2. Authorizes pesticide application based on available information.
3. Responsible for all vehicles, equipment and their maintenance and repair in their zone.
4. Responsible to obtain fuel and pesticides.
5. Submits monthly reports to the chief of the field operations or deputy director. The report contains information on the following:
 - a. summary of spray applications,
 - b. amount of insecticide used and inventory of those remaining in storage,
 - c. total area treated,
 - d. condition of vehicles and sprayers,
 - e. record of worker attendance,
 - f. crops treated,
 - g. miscellaneous questions related to the job,
 - h. description of any new experience gained in the field.
6. Farmer training.

Training Officer (Translated from Portuguese)

1. Responsible for developing the program of training of technicians as well as farmers.

2. Develops training in entomology, plant pathology, nematology and seed protection with assistance from technicians for local farmer information and training programs.
3. Field travel visits with the chief of the brigade or supervisor in agricultural communities for extension training in pest control programs.
4. Prepares a training programs for rural agricultural communities of a minimum of 10 days for each agricultural year or crop season.
5. Organizes two training programs for field technicians.
6. Organizes a small training program for new technicians for certification in pest control.

Plant Pathologist (Translated from Portuguese)

1. Responsible for the National collection c. plant diseases.
2. Responsible for identification of diseases.
3. Makes a plant disease specimen collection in the field with the assistance of brigade chiefs or supervisors for crop disease surveys.
4. Develops and maintains a program for aflatoxin experiments.
5. Makes recommendations of resistant varieties to plant disease.
6. Makes recommendations concerning seed treatment.
7. Participates in farmer training.
8. Other duties as requested by the supervisor.

Entomologist (Translated from Portuguese)

1. Responsible for insect collection for the entire country.
2. Responsible for identification of all insects.
3. Makes an insect collection in the field with the assistance of brigade chiefs or supervisors for crop insect surveys.
4. Participates in insecticide experiments.
5. In charge of other duties which are requested by the supervisor.
6. Participates in the training of farmers.

Repair Maintenance Officer (Translated from Portuguese)

1. Repair of all the equipment that is not operational.
2. Keeps periodical record of all serviced vehicles, sprayers and other equipment including: change of oil, utilization of fuel, mileage, lubrication and tires.
3. Submits monthly reports to the finance person or administration about maintenance concerns, mileages of vehicles, etc.
4. Submits lists of required spare parts to the administration.
5. Responsible for service of sprayers and vehicles.
6. Responsible for inventory of spare parts.

Chief of Field Operations of Deputy Director (Translated from Portuguese)

1. Provides information directly to the director about the progress of the annual plan.
2. Has authority over all zone supervisors.
3. Supplies all the equipment, provisions and other materials needed by the zone supervisors and brigades.
4. Keeps records or reports of activities of all zones such as:
 - a. treated areas,
 - b. types of plants or crops,
 - c. types of pesticides used,
 - d. types of pests and
 - e. levels of infestation.

This information is transmitted from the zone supervisors.

5. Makes monthly and annual reports to the director and counsler or US AID long-term technical assistant informing them about the activities done and problems encountered during the year.
6. Responsible for inspection of:
 - a. field of treatments,
 - b. storage of pesticides,
 - c. condition of sprayers and
 - d. monitoring the attendance/performance of workers.
7. Provides a monthly inventory list of the pesticides stored including those needed to the finance person or administration.

Counselor or US AID Long-Term Technical Assistant
(Translated from Portuguese)

1. Gives technical assistance to the Director in planning annual budgets and activities of the department.
2. Assists in obtaining and supplying materials for the Crop Protection Service.
3. Assists field supervisors in technical subjects.
4. Gives training assistance to members of the Service.
5. Gives assistance in pesticides experimentation.
6. Gives assistance in identification of insects, weeds and plant pathogens.
7. Introduces new methods or products to control grasshoppers.
8. Field travel visits to the areas affected by the pests with the supervisors or brigade leaders.
9. Assists stored product manager in inspection and treatment of stored materials.

Director (Translated from Portuguese)

1. Responsible for management decisions concerning the Crop Protection Service.
2. Prepares an annual budget for the Service.
3. Prepares an annual plan of activities for each year.
4. Prepares legislation which is required by the department.
5. Gives advice to technical supervisors in the field.
6. Responsible for malariaion.

7. Conducts meetings with all the workers as necessary for information or planning activities.
8. Responsible to provide information to other departments in the Ministry of Agriculture about activities and requirements of the Crop Protection Services.
9. Field travel visits to areas where insect problems are more likely and during such visits, the director will be accompanied by the supervisor of the zone or region.

INVOLVEMENT OF WOMEN

Involvement of women in the Crop Protection Service program now includes Mrs. Maria Rosa Evora Ferreira, acting plant pathologist; Mrs. N'Queba Cia, assistant plant pathologist and Mrs. Ana M.V.I. Balde, extension training officer, all located at the headquarters in Bissau. Ms. Maria Jose Araujo, trained as an IPM field technician, has left the Crop Protection Service and is now employed elsewhere.

CROP PROTECTION SERVICE EXTENSION TRAINING

The National Crop Protection Service extension training work appears to be developing adequately. There is an established system of extension in place and information is getting down to the farmer in spite of the numerous language difficulties. Senior staff of the Crop Protection Service know several languages in addition to Portuguese, the official National language. The lingua franca is crioule. Field agents often communicate with village leaders in local languages such as Fula, Balanta, Nalus or others since there are about 18 tribal dialects. The extension organization has published crop protection calendars, (1) participated in carnivals on the theme of "Good Bugs" and "Bad Bugs" before large audiences, conducted monthly radio programs, etc. However, due to the absence of research programs in the country, extension has depended primarily on research findings of various international organizations such as FAO. The Crop Protection Service has a working relationship with DEPA for providing applied practical information to the farmer. Biological control programs were began in 1984-85 with releases of a parasitic Epidino carsis Lopezi and a predator beetle, both for biological control of the cassava mealybug. Training has been conducted in IPM theory and concepts and also pesticide safety and use. Expansion of Crop Protection Service activities into nonfood crops such as cotton and forestry is considered for the future when and if they have the appropriate and needed responsibility and authority in these nonfood crop areas.

An annual training program including subjects of insect and plant disease identification, grasshopper ootheca survey techniques and crop pest control campaign preparation is held during the last two weeks of April for zone supervisors and field agents or monitors who then train enquadrados and

- (1) There were 2,000 1986-87 calendars ordered and paid for by the project at a budget cost of \$ 16,502 or \$ 8.25 per calendar. These calendars were printed in Dakar, Senegal, but not yet (February 1988) delivered.

farmers in the fields. The training room at the Crop Protection Service headquarters in the city of Bissau is well equipped with 20 tables, 80 chairs, two blackboards and other visual training aids including slide projectors. There are two 35 mm cameras with macro lenses at headquarters. At least four more cameras are needed so each zone supervisor will be able to take photographs of crop pests and disease symptoms in the field for use in the training program.

The Crop Protection Service quarterly newspaper, Bombolon Da P.V. Informa has been successful with about 200 copies made of each issue. It contains information on pests and diseases and is written in Portuguese. The newspaper has not been published regularly and the evaluation recommends more frequent use and distribution to the rural agricultural zones of this training and educational tool. It is also recommended that more illustrative and diagrammatic training publication aids be used because most of the rural population is not able to read. The existing training program emphasis on IPM and biological control needs to be adjusted in consideration of the growing recognition and use of pesticides to increase food crop production by control of pests such as grasshoppers and plant diseases. Recommended pesticide training subjects include storage, toxicity, labels, environmental side effects, crop residues, formulations, mixing, application, first aid, medical treatment, record keeping, disposal, etc.

PLANT PEST QUARANTINE

The Food Crop Protection III project is making arrangements for a member of the Crop Protection Service to be trained at the Los Angeles, California Port Authority and airport in USA plant pest quarantine standard operating procedures. Guinea Bissau has one major seaport at the capital city of Bissau and there have been regular imports of rice from Pakistan, the USA and Thailand in order to meet the needs of providing enough food to feed the people. One shipment of rice was reported to have been heavily contaminated with stored grain insects. The immediate and urgent need for more food in the country will require the Crop Protection Service quarantine officer to develop fumigation techniques to control the pests in imported foodstuff.

Considering the situation in Guinea Bissau and its immediate needs for more food, it will be difficult, but eventually desirable for the quarantine officer to develop a program to prevent the introduction of foreign pests such as the green spider mite of cassava from South America which is now present in Nigeria or the greater grain borer which has been introduced in Tanzania. There is also extensive trade in foodstuff across the borders to the north with Senegal and Guinea Conakry to the east and south. The establishment of an effective quarantine authority is expensive and requires many trained personnel. It will require a long period of continued development to be able to introduce the kind of quarantine program in Guinea Bissau that will prevent the inadvertent introduction of foreign pests. The quarantine officer will not be able to inspect most of the food products that are imported or exported and will probably have to concentrate on imports of bulk rice that are contaminated with pests. Quarantine procedures will be extremely difficult to enforce in Guinea Bissau. Seed and food export certification are also worthy objectives for the future after the present periodic problem of imported food contamination is addressed and solved.

INTERNATIONAL AGENCY COORDINATION

It is recommended that international agencies with significant plant protection inputs in African countries coordinate activities whenever feasible in each country. This is being done in Guinea Bissau, but coordination needs to be improved for immediate activities, long range plans and to avoid duplication of inputs and efforts to prevent redundancy. Contributions of countries and agencies other than US AID are the following:

- Sweden - 1 vehicle, 32 sprayers, 62 bicycles.
- FAO - Pesticides, 35 sprayers, taxonomist for grasshopper identification, survey and control.
- Senegal (ISRA) - Stored products, pest control specialist.
- IITA (International Institute of Tropical Agriculture)
 - Cassava mealybug biological control project, 1 boat with 2 motors and 4 motorcycles.
- Denmark - One month grasshopper technical assistance services (see FAO contribution).
- Portugal - Pesticide regulation specialist, training of Crop Protection Service staff at the National Center for Plant Product Protection in Portugal.
- EEC - Pesticides with a value of \$ 178,612.
- ICIPE (International Center for Insect Physiology and Ecology)
 - M.S. thesis research program in entomology in cooperation with Texas A & M University.
- Italy - One Toyota 4WD Landeruiner station wagon, 2 Toyota 4WD Landeruiner pickup trucks, pesticides, sprayers and safety equipment with a value of \$ 155,150.

WARDA (West African Rice Development Association)
- Rice stem borer project .

ORSTOM (France)- Nematode and cassava mealybug projects.

64

INCENTIVES

Independence from the Portuguese was obtained on September 12, 1974 and officially proclaimed in September 1975. After independence, many people moved from the rural areas to the city in hope of a better standard of living. This became undesirable to the government because these people were needed in the rural countryside to produce more crops for local consumption and export. People have recently begun to return to the country to grow crops due to new profit incentives.

The government goal is to create food self-sufficiently with production of surpluses for export. The use of credit incentives are being developed at Caboxanque in the country's major rice producing zone. Water cans are provided to the farmer which the farmer later pays for in either rice or cash. The money is then used to buy additional local materials needed in the village for crop production. This new program will determine if such incentives are acceptable to the people and contribute to increased food crop production.

It was discussed with Crop Protection Service senior staff that an incentive program could be slowly introduced starting with a low charge for pesticides and crop protection services. This will contribute to recurrent costs support. The small farmer would not be charged, but the larger farmers which benefit most from the Crop Protection Service would be required to pay a fee for the pesticides and crop protection services that are provided. The present system does not guarantee sustainability to the Crop Protection Service. Perhaps, a 1% charge of the crop value could be levied for the pest or disease diagnosis and prescription. Another 10% of the crop value could be charged (5% for pesticide & 5% for application) to provide funds for the Crop Protection Service budget. In the USA, the state agricultural extension service is no longer free. There is a charge for pest diagnosis, publications and educational

tapes. The money received goes to support the budget. The Government of Guinea Bissau cannot sustain all these services free and without some charge because the funds and inputs from various projects sources such as US AID and the Italian Government will eventually terminate.

Another example of incentives in crop protection is used by the evangelical missionaries in Guinea Bissau to develop vegetable gardens around the towns and villages. It is very difficult to have a vegetable garden because domestic pigs and goats are allowed to wonder free and fences made of sticks or bamboo will not hold them out well nor last long. The mission subsidizes the sale of wire hog fence to vegetable growers in Guinea Bissau and is paid back in cash for the fencing. People continually come to ask for this wire fencing. Money received is then used in a fund to provide wheelbarrows and hoes which are also sold to the vegetable garden farmers at a price subsidized by the mission.

ESTABLISHED AGRICULTURAL PESTS IN GUINEA BISSAU

Rice:

African Armyworm, Spodoptera exempta
Caseworm, Nymphula stagnalis
Beetle, Epilachna similis
Rice Stem Borer, Chilo sp.
Stem Borer, Maliarpha separatella
Stalk-eyed Borer, Diopsis thoracica
Termites
Heterocyclus oryzae
Hispa spp.
Aspavia sp.
Blast, Pyricularia oryzae
Blight, Helminthosporium oryzae
Village weaver, Ploceus cucullatus
Morning dove, Streptopelia sp.
Baboons
Monkeys
Wild Pigs

Millet:

Stem Borer, Acigona ignefusalis
Stem Borer, Sesamia calamistis
Bollworm, Heliothis armigera
Blister beetle, Mylabris holosericae
Blister beetle, Paalydolytta fusca
Blister beetle, Cylindrothrox dussaulii
Amsacta moloneyi
Busseola fusca
Raghava sp.
Covered smut, Tolyposporium penicillariae
Downy mildew, Sclerospora graminicolum
Village weaver, Ploceus cucullatus
Witchweed, Striga hermontheca
Monkeys

Sorghum (Similar Pests as for Millet)

Long tailed parakeet, Psittacula krameri
Morning dove, Streptopelia sp.

Peanuts:

Aphid, Aphis craccivora
Leafhopper, Empoasca sp.
Odontotermes spp.
Leaf spot, Cercospora arachidicola

Cassava:

Cassava mealybug, Phenacoccus manihoti
Variegated locust, Zonocerus variegatus
Odontotermes spp.
Cassava mosaic, Mosaico africano

Citrus:

Orange dog, Papilio demodocus
Leaf-footed bug, Leptoglossus australia
False codling moth, Cryptophlebia leucotreta
Mediterranean fruit fly, Ceratitis capitata
Gummosis, Botryodiplodia theobromae

Maize:

Corn earworm, Heliothis armigera
African armyworm, Spodoptera exempta
Village weaver, Ploceus cucullatus
Stem borer, Chilo sp.
Long tailed parakeet, Psittacula krameri

Cotton:

Bollworm, Heliothis armigera
Cotton stainer, Dyanderus superstitiosus

Whitefly, Bemisia sp.
Leaf-eating worm, Spodoptera sp.

Tomato:

Tomato fruitworm, Heliothis armigera
Whitefly, Bemisia sp.
Nematodes
Wilt, Fusarium oxysporum
Leaf spot, Cercospora sp.

Watermelon:

Fruit flies
Nematodes
Leaf spot, Cercospora sp.

Banana:

Nematodes

Beans:

Aphid, Aphis craccivora
Leafhopper, Empoasca sp.
Armyworm, Spodoptera littoralis
Thrips, Megalurothrips apostecti
Mylabris sp.
Maruca testulalis
Fungi, Fusarium oxysporum
Rhizoctonia solani

Stored products:

Rice Weevil, Sitophilus oryzae
Lesser grain borer, Rhyzopertha dominica
Confused flour beetle, Tribolium confusum
Sawtoothed grain weevil, Oryzaephilus surinamensis

Angoumois grain moth, Sitotroga cerealella
Bean weevil, Acanthoscelides obtectus
Cowpea weevil, Callosobruchus spp.
Sweetpotato weevil, Cylas formicarius
Caryedon serratus
Acarus siro

Grasshoppers:

Homoxyrhopes punctipennis
Oedaleus nigeriensis
Zonocerus variegatus
Kraussaria angulifera
Cataloipus fuscocoerulipes
Hieroglyphus sp.
Gastrimargus africanus
Kraussella amabile
Catantops sp.

Biological Control of Cassava Mealybug (Releases)

Wasp, Epidino cارسis Lopezi
Beetle

LISTA DAS PRAGAS DAS PRINCIPAIS CULTURAS NA GUINE BISSAU

<u>Arroz praga</u>	<u>Parte atacada</u>	<u>Controle</u>
<u>Termitas</u>	Raizes, Caule	Furadan, Thiodan
<u>Heteronychus oryzae</u>	Raizes, Caule	Furadan, Thiodan
<u>Spodoptera exempta</u>	Folhas	Malathion
<u>Nymphula stagnalis</u>	Folhas	Malathion
<u>Epilachna similis</u>	Folhas	Malathion
<u>Hispa spp.</u>	Folhas	Malathion
<u>Chilo sp.</u>	Caule	Diazinao
<u>Maliarpha separatella</u>	Caule	Diazinao
<u>Diopsis thoracica</u>	Caule	Diazinao
<u>Aspavia sp.</u>	Grao	
<u>Pyricularia oryzae</u>	Folhas	Fungicida
<u>Helminthosporium oryzae</u>	Folhas	Fungicida
<u>Milho</u>		
<u>Amsacta moloneyi</u>	Folhas	Malathion
<u>Busseola fusca</u>	Caule	Furadan, Diazinao
<u>Acigona ignefusalis</u>	Caule	Furadan, Diazinao
<u>Sesamia calamistis</u>	Caule	Furadan, Diazinao
<u>Heliothis armigera</u>	Espigas	Carbaryl
<u>Raghuva sp.</u>	Espigas	Carbaryl
<u>Mylabris holosericae</u>	Flores, Grao	Fenitrothion, Sumicidin
<u>Paalydollyta fusca</u>	Flores, Grao	Fenitrothion, sumicidin
<u>Cylindrotorax dussaulii</u>	Flores, Grao	Fenitrothion, Sumicidin
<u>Tolyposporium</u>	Espigas	Fungicida
<u>penicillariae</u>		
<u>Sclerospora graminicola</u>	Folhas, Espigas	Fungicida
<u>Feijao (Vigna sp.)</u>		
<u>Aphis craccivora</u>	Folhas	Malathion
<u>Empoasca sp.</u>	Folhas	Malathion
<u>Megalurothrips spontedti</u>	Flores	Diazinao
<u>Mylabris sp.</u>	Flores	Sumicidin
<u>Spodoptera littoralis</u>	Folhas	Malathion
<u>Maruca testulalis</u>	Vagens	Sevin
<u>Fusarium oxysporum</u>	Raizen	Fungicida
<u>Rhizoctonia solani</u>	Caules	Fungicida

Ginguba (Arachis hypogala)

<u>Ahis craccivora</u>	Folhas	Malathion
<u>Empoasca</u> sp.	Folhas	Malathion
<u>Odontotermes</u> spp.	Raizes, Caule	Thiodan
<u>Cercospora arachidicola</u>	Folhas	Fungicida

Mandioca (Manihot esculenta)

<u>Odontotermes</u> spp.	Raizes	Thiodan
<u>Zonocerus variegatus</u>	Folhas	Propoxur
<u>Phenacoccus manihoti</u>	Rebentos	L. biologica
<u>Mosaico africano</u>	Folhas	

Citricos -----

<u>Papilio demodocus</u>	Folhas
<u>Leptoglossus australis</u>	Frutos
<u>Cryptophlebia lencotreta</u>	Frutos

Pragas de Productos Armazenados

<u>Sitophilus oryzae</u>	Cereais	Actellic 25 CE ou Actellic (Cartucho)
<u>Rhizopertha dominica</u>	Cereais	
<u>Tribolium confusum</u>	Cereais	
<u>Oryzaephilus surinamensis</u>	Cereais	
<u>Sitotroga cerealella</u>	Cereais	
<u>Caryedon serratus</u>	Ginguba	
<u>Acanthocephalus obtectus</u>	Feijao	
<u>Callosobruchus</u> spp.	Feijao	
<u>Acarus siro</u>	Farinha	

SECCAO DE FITOPATOLOGIA

LISTA DAS DOENCAS QUE ATACAM AS PRINCIPAIS CULTURAS NA GUINE BISSAU

<u>Cultura</u>		<u>Doença</u>	<u>Fatogénio</u>
<u>Nome comum</u>	<u>Nome científico</u>		
Milho bacil	<u>Zea mays</u>	Curvularia Fusariose	<u>Curvularia</u> spp. <u>Fusarium</u> spp.
Arroz	<u>Oryza sativa</u>	Pyricularriose	<u>Pyricularia oryzae</u>
		Cercosporiose	<u>Cercospora oryzae</u>
		Helminthosporiose	<u>Helminthosporium oryzae</u>
		Rhynchosporiose	<u>Rhynchosporium oryzae</u>
Milho preto	<u>Pennisetum</u> spp.	Lepra do milho preto	<u>Sclerospora graminicola</u>
		Carvão	<u>Tolyposporium penicillaciae</u>
Milho Cavalo	<u>Sorghum</u> sp.	Carvão da Panicola	<u>Sphaeclotheca reliana</u>
		Manchas ovais da folha	<u>Ramulispora sorghicola</u>
		Helminthosporiose	<u>Helminthosporium turcicum</u>
		Manchas entriadas da folha	<u>Leptosphaeria</u> spp.

Mandioca	<u>Manihot</u> <u>esculenta</u>	Mosaico	Virus
		Mancha parda da folha	<u>Cercospora henningsii</u>
Tomateiro	<u>Lycopersicum</u> <u>esculentum</u>	Virus do mosaico do tabaco (TMV)	Virus
		Podridão dura do fruto	<u>Phytophthora parasitica</u>
		Alternariose	<u>Alternaria solani</u>
		Fusariose	<u>Fusarium</u> spp.
		Necrose apical	Doença abiótica originada pela deficiência de cálcio ou irregularidade na irrigação
		Cara de gato (cat face)	Doença abiótica originada pelo tempo muito frio na altura da formação do fruto.
		Murcha da planta inteira	Nematode de Salhas Meloidegynae
Feijoeiro	<u>Phaseolus</u> sp.	Cercosporiose	<u>Cercospora cruentae</u> , <u>Cercospora canescens</u> .
		Rhizoctonia	<u>Rhizoctonia solani</u>
		Ferrugem	<u>Uromyces</u> sp.
		Murch de Sclerotium	<u>Sclerotium rolfsii</u>
		Mosaico	Virus
Repolho	<u>Brassica oleracea</u>	Podridão negra	<u>Xanthomonas campestris</u>

Pimentao	<u>Capsicum annuum</u>	Mildio	<u>Pseudoperonospora cubensis</u>
		Phytophthorose	<u>Phytophthora capsici</u>
		Tombamento	<u>Rhizoctonia solani</u>
		Podridao do caule	<u>Sclerotium rolfsii</u>
Cenoura	<u>Daucus carota</u>	Queima do alternaria	<u>Alternaria radicina</u>
Alface	<u>Lactuca sativa</u>	Mancha bacteriana	<u>Pseudomonas chichorii</u>
Jagatu	<u>Solanum anomalum</u>	Tombamento	<u>Pythium</u> spp.
		Cercosporiose	<u>Cercospora</u> spp.
		Diplodiose	<u>Diplodia</u> spp.
		Lesoes nas folhas	<u>Doença fisiologica</u>
Quiabo	<u>Hibiscus esculentus</u>	Oidium	<u>Erysiphe poligonii</u>
		Murcha da planta inteira	Nematodo de galha da familia Meloidogynae
Pepino	<u>Cucumis sativus</u>	Mildio (Downy milden)	<u>Pseudoperonospora cubensis</u>
		Mosaico do tabaco (TMV)	Virus
		Mosaico do Pepino (OMV)	Virus
Mancarra	<u>Arachis hipogaea</u>	Cercosporiose	<u>Cercospora</u> spp.

Bananeira	<u>Musa</u> spp.	Malade <u>sigatoka</u>	<u>Mycosphaerella musicola</u>
		Fusariose (Malade Panama)	<u>Fusarium oxysporum</u>
Citrinos	<u>Citrus</u> spp.	Trisfeza	<u>Citricollet</u> <u>viatoris</u> (Virus)
Abacateiro	<u>Persea gratissima</u>	Murcha de verticillium	<u>Verticillium</u> sp.
		Cladosporiose	<u>Cladosporium</u> spp.
		Sarna ou verrugose	<u>Sphaceloma perseae</u>
		Alternariose	<u>Alternaria</u> spp.

Obs: Atraves de estudos feitos pelo Nematologista Senhor Jean Claud de Prot em 1985 foi identificado mais dois generos de nematodes: Rotylenchulus e Paratrichodorus parasita das culturas horticolas.

Quanto aos produtos armazenados podemos citar o bolor da farienha de trigo causado pelo fungo Penicillium spp., Aspergillus no arroz, mancarra e coconote.

**CROP PROTECTION SERVICE
IPM STRATEGIES**

IPM Strategy on Cassava Pests

Cassava mealybug (Phenacoccus manihoti)

Crop Protection Service strategy:

1. Planting date to start with first rain since Phenacoccus manihoti infestation is more severe during dry season.
2. Continued releases, monitoring and surveillance of E. Lopezi, the most effective parasite.

The elegant grasshopper (Zonocerus variegatus)

Crop Protection Service strategy:

Encourage the introduction of pest pathogens such as the protozoan pathogen, Nosema locustae, or the fungal pathogen, Beauveria bassiana. These pathogens will greatly reduce our dependency on insecticides and the detrimental residual effects in the ecosystem.

Cassava mosaic virus

Crop Protection Service strategy:

1. Encourage the introduction of resistant varieties from IITA.
2. Monitor the plant phenology of white fly, Bemisia tabaci, populations.

Green spider mite (Mononychellus spp.)

Crop Protection Service strategy:

Surveys should be continued to monitor the presence of the green spider mite.

**ACTIONS NEEDED TO IMPLEMENT IPM STRATEGY FOR MANGROVE RICE
IN 1988/89**

ACTION	DATE	RESPONSIBILITY
Identify the key pests, secondary pests and occasional pests of rice.	June/Novembre 88	Baldé/Silva
Institute pheromone trapping of <u>Maliarpha separata</u>	August 88/89	Baldé/Seidi
Set up a monitoring and surveillance system for <u>Spodoptera exempta</u> and <u>Nymphula stagnalis</u>	July 88/89	Baldé/Silva Djaló/Tchen- chelan
Nacional survey of pyricularia and helminthosporium diseases.	July/October 88	Rosa/Cia
Advise farmers on cultural practices to have several varieties in one field and to adjust plant density.	June 88/89	Sylva/Vaz

ACTIONS NEEDED TO IMPLEMENT IPM FOR SORGHUM AND MILLETS IN 1988

ACTION	DATE	RESPONSIBILITY
National survey of <u>Raghuva albipunctella</u>	August/Sept 88	Baldé/Djaló Tchenchelan
Set up a field trial for millet varieties IBV-8001 and Souna III	June 1988	Rosa/Cia
Set up a field trial for Sorgho varieties CE-151 AND SSV-8 against smut	June 1988	Rosa/Cia
Advise farmers to use burning methods against blister beetles	September 88	Tchenchelan/ Djaló

FARM STORAGE OF GRAINS

The extension staff of the Crop Protection Service in Guinea Bissau has the responsibility of advising farmers on stored product pest control. During farm storage, damage is caused by insects, fungi, rodents and birds. Some insects infest the crop in the field and continue damage in storage. Consumption and fouling of produce and the destruction of bags and other receptacles by rodents are the major problem. Birds become pests when farmers dry the crops in the open sunlight to minimize insect and mold infestation. Molds causing aflatoxins in oil seeds can be a problem. Mites, yeasts and certain bacteria can also cause stored product deterioration. Some rules to follow in storage are:

- Storage Structures: Rats and mice cause most of the post-harvest losses. To prevent rats from getting into grain stores, villagers can make metal inverted basket collars to attach around the wooden legs of their stores (rat-guard devices). Structures like clay jars and drums can also be made vermin proof for storage.
- Hygiene: Farmers should be taught how to properly clean the storage receptacles and surroundings, not to mix old and new produce and the disinfestation of receptacles before storage. Store only unbroken sound grain if possible to reduce insect penetration.
- Drying: Farmers usually dry the produce at harvest and periodically during the storage period. Most drying is done by radiation from the sun and pests fly out and insects become desiccated. It also helps stop mold. Other methods of drying include suspending small quantities of produce above the fire place and use of air currents when the harvest is suspended from trees.
- Nonchemical: Traditional methods of fumigation, such as smoking with burning millet chaff mixed with pepper, appear to be effective. Leaves of certain plants (grasses-Andropogon and vines - Combretum) whose odor is thought to repel both insects and rodents are sometimes placed in the grain. More important is the use of ash of

Boscia senegalensis and millet stalks as a mixture scattered on the floor and rubbed into the walls of the granary. (Source: Post-harvest food losses in developing countries, National Academy of Sciences, USA, 1978). Neem has also been used to protect stored grains in India. Fungal damage may be negligible when millet is stored on the head for up to 4 years with the addition of ash. However, the grain may lose some flavor due to deterioration. Some rural villagers mix seeds with inert dusts or undiluted banana juice and dry them in the sun. Millet heads are classified during harvest and good grain is kept for stage. It is spread on flat surfaces to dry and then protected against insect attack by smoke from low fires.

- Chemical: Chemicals are the most effective weapon for stored product pest control. Extension efforts should teach farmers the benefits and correct usage of insecticides and also help make them available. Tests in The Gambia have shown pirimiphos-methyl (Actellic®) to be more effective than malathion in the dust formulations for protection of peanuts or groundnuts against certain stored grain insects. Both 2% pirimiphos-methyl dust and 2% malathion dust are recommended to be mixed with unshelled groundnuts to prevent insect pest damage. Pirimiphos-methyl is relatively safe to the user and the environment, destroys existing infestations, prevents reinfestation of stored products, controls stored grain pests resistant to other chemicals, has vapor action, kills by contact, ingestion and fumigant action and is effective at low rates with fast killing action.
- Rodents: Cats are traditional. Some farmers construct their grannaries with rat-guards which should be a standard feature of every grannary and crib. Some use poison baits such as coumafene (Warfarin) to kill rats and mice.

Summary Project Financial Report by Project Element

as of 01/31/88 Project Number: 6570012.00

Field Crop Protection III

US \$ Dollars

Title/Element		Obligations to date	Earmarked to date	Commitments to date	Expenditures to date	Pipeline
Food Crop. Prot. III	08/26/85 to 08/30/90	1,250,000	1,045,895	972,487	421,548	828,452
Technical assistance		300,000	313,089	281,516	142,546	157,454
Training		350,000	348,935	348,935	48,581	301,419
Vehicles		350,000	253,280	301,032	151,859	198,141
Studies and evaluation		50,000	5,300	51,300	690	49,310
Commodities and supplies		200,000	124,850	105,704	77,872	122,128
Contingency		0	0	0	0	0

US AID / Guinea Bissau
 Comprehensive Pipeline Report by Project as of January 11, 1988
 US AID Project Budget Printout
 Project N° 6570012
 HALS-907A

<u>Element 1</u>	<u>Obligated/ Earmarked</u>	<u>Committed</u>	<u>Disbursed</u>	<u>Unliquidated Oblig./Earmarked</u>	<u>Unexpended Oblig./Earmarked</u>
<u>Technical assistance</u>	300,000	281,517	142,546	157,454	157,454
USDA project officer	200,000	200,000	81,069	116,931	116,931
USDA PASA local support	86,911	68,428	46,188	53,612	53,612
Training/extension specialist	13,089	13,089	13,089	0	0
Earmarked totals	313,089				
Unearmarked balance	0				
<u>Element 2</u>					
<u>Training</u>	350,000	348,935	48,581	301,419	301,419
Laurenco A/Lassana Sellu	780	780	270	510	510
Tavares, plant pathology B.S.	94,628	94,628	2,999	91,629	91,629
Abreu, agric. pest control M.S.	45,000	45,000	0	45,000	45,000
Fernandes, plant pathology M.S.	45,000	45,000	840	44,160	44,160

8

Varela, entomology B.S.	60,000	60,000	10,226	49,774	49,774
Mustafa Soares Cassara	40,000	40,000	0	40,000	40,000
Short term training	20,000	20,000	13,767	6,233	6,233
Marcelino Vas/Lourenca Azeu	4,754	4,754	4,754	0	0
Fernando Mendonca	400	400	342	58	58
Marcelino Vaz, english training	0	0	0	0	0
Anna M. Palme, Dakar/Niamey training	2,000	2,000	1,599	401	401
7th Ann meeting, entomologists	3,000	3,000	500	2,500	2,500
Jose Fernandez	650	0	0	0	0
M. Sassara/L. de Abreu	13,500	13,500	3,675	9,825	9,825
Cirilo Varela	9,374	9,374	1,562	7,812	7,812
Quinto Lopes	8,400	8,400	5,948	2,452	2,452
Mustafa Casara, Portugal trip	2,099	2,099	2,099	0	0
Earmarked totals:	348,935				
Unearmarked balance:	1,065				

Element 3

<u>Vehicles</u>	350,000	251,032	151,859	198,141	198,141
Vehicles, motorcycles and parts	250,000	247,752	148,579	101,421	101,421
Add to vehicles	50,000	0	0	0	0
Vehicle repairs and parts	3,280	3,280	3,280	0	0
Earmarked totals:	253,280				
Unearmarked balance:	46,720				

Element 4

<u>Studies and Evaluations</u>	50,000	5,300	690	49,310	49,310
Dakar/Praia, invitational travel	900	900	197	703	703
J. Nunnes	428	0	0	0	0
INSIT-Proj. Evaluation-Biss 3235	46,000	0	0	0	0
Nunes, travel to Lisbon/Biss 5/1-6/22	3,000	3,000	0	3,000	3,000
Dr Francis Can, NGO	500	500	493	7	7
Earmarked totals:	5,300				
Unearmarked balance:	44,700				

Element 5

<u>Commodities and suppliers</u>	200,000	85,704	77,872	122,128	122,128
Commodity procurement in Africa	50,000	25,273	20,830	29,170	29,170
Local commodity shelf items	25,000	10,581	10,565	14,435	14,435
Gas tank/elect. installation	13,921	13,921	13,921	0	0
Installation of generator	1,250	1,250	1,250	0	0
Plumbing installations	1,020	1,020	1,020	0	0
Service calendars	16,502	16,502	16,502	0	0
Electric submersible water pump	2,780	2,780	2,780	0	0
Mesto sprayer parts	2,850	2,850	804	2,046	2,046
Misc. construction materials	2,911	2,911	2,911	0	0
Beats and motors	20,000	0	0	0	0
Telephone installation	4,014	4,014	3,293	0	0
Gas/electrical hook-ups	1,778	1,778	1,739	39	39
100 wooden pallets	903	903	882	21	21
Leasing of bulldozer	1,110	1,110	654	456	456
Earmarked totals:	124,850				
Unearmarked balance:	75,150				

Element 6

<u>Contingency</u>	0	0	0	0	
TOTAL PROJECT OBLIGATIONS:	1,250,000	972,488	421,548	828,452	828,452
PROJECT EARMARKED TOTALS:	1,045,454				
PROJECT UNEARMARKED BALANCE:	204,546				

97

PERSONS CONTACTED DURING EVALUATION

Abel Nkougourou Ebongue	FAO Statistics Division, Italy
Dave Heil	US Embassy, communications
Howard Sharlach	US AID representative
Joesph Beausoleil	US AID agricultural development officer
Felicia Baker	US AID executive assistant
John D. Blacken	US Embassy, Ambassador
John Davison	US Embassy political/economic/consular
Vasco Mateus	US AID administrative assistant
Ousmane Sane	US AID secretary/program and training
Vanita Sacrdando	US AID assistant project/translator
Moustapha Caszama	Crop Protection Service, director
Lourenco Abreu	Crop Protection Service, entomologist
Domingos Tchentchelan	Crop Protection Service, field supervisor (zone II)
Marcelito Vaz	Crop Protection Service, director of field operations
Ana Balde	Crop Protection Service, training officer
N'Queba Cia	Crop Protection Service, assistant plant pathologist
Djarga Seidi	Guinea Bissau apiculture director
Maria Rosa Evora Ferreira	Crop Protection Service, acting plant pathologist
Lynn Stevens	US Embassy general services officer
Sirifo Djallo	Crop Protection Service, field supervisor (zone I)
Dan Dwyer	Bissora evangelical mission
Viriato DaSilva	Crop Protection Service, field supervisor (zone III)
Joaquim Quinhou	Crop Protection Service, field supervisor (zone IV)

William L. Jacobsen, Jr.	Washington D.C., Chargé d'affaires
Isabel Najera	US Embassy, executive secretary
Lars Hedfors	Sweden, PDRI coordinator
Halvdan Jakobsen	Norway, agricultural research advisor
Bissafrat Na Brama	Mansaba regional director (zone I)
Malam Sadjo	Contuboel director of extension - DEPA
Adolfo Gomes Sa	Gabu apiculture training (zone II)
Mangla Na Intchia	Gabu regional director (zone II)
Pedro Vaz	Pirada administration - CPS
Judy Tryens	Guinea Bissau, Quaker service
Antonio Cajugan Nhaga	Falacunda, President (zone III)
Domingos Perira Tavares	Fulacunda, monitor (zone III)
Sadjo Baio	Bafata, director of cotton & peanut project (zone II)
Manuel Dias Junior	Fulacunda, director M.D.R.8 (zone III)
Pedro Da Silva	Catio, regional director (zone III)
Wagna Tchuda	Bedanda, Governor of Balana sector
Carimbalde	Caboxanque, seed production, DEPA
Lassana Cassama	Caboxanque, extension service, DEPA
Gabrida Miquel Da Costa	Caboxanque, social economics, DEPA
Alfred Quidon S. Creolts	Caboxanque, agriculture credit, DEPA
Jean Claude	Caboxanque, (OXFAM, Belgium) DEPA
John A. Franklin	USDA, APHIS, PPQ
Gene McBride	Guinea Bissau, director, evangelical mission
Ann Stevens	US AID warehouse manager
Steve Crabtree	Abidjan, REDSO-WAAC, financial analyst

ACKNOWLEDGEMENTS

The evaluation team is grateful to US AID for vehicular transport, entry formality assistance at the airport and agenda assistance. Thanks are also expressed for housing space to live in and draft the report. Assistance was also appreciated from the USA Embassy staff in sending telegrams to locate a lost and robbed suitcase.

The Crop Protection Service staff provided documented information, transportation, and organized the field visits into the three zones which were essential to survey crop protection activities and needs in the rural zones and regions of Guinea Bissau. The evaluation team expresses its thanks and appreciation to the Crop Protection Service for its assistance, generous hospitality and good will during much of the evaluation process including trips to the field and participation in drafting the evaluation.

ANNEX

Project: Disbursements and
 Items Purchased as of 12/31/87
 Project Number: 657-0012

DETAILED PROJECT ELEMENT

COMMITMENT TO DATE ACTUAL EXPENDIT. TO DATE

1. TECHNICAL ASSISTANCE

USDA PASA Project Officer	200,000	176,107
USDA PASA Support	81,285	59,255

SUB-TOTAL:

2. TRAINING

TAVARES - Plant Pathology	94,629	2,999
ABREU - Pest Control	45,000	
FERNANDES - Plant Pathology	45,000	840
VARELA - Entomology	60,000	10,226
CASSAMA - Food Storage	40,000	- 0 -
VARIOUS - Short-term training	64,748	33,418

SUB-TOTAL:

3. VEHICLES

SEDAN (Toyota) #1		
PICK-UP #2	32,258	32,258
- - #3		
- - #4		
- - #5		
- - #6	70,151	70,151
LAND CRUISER #1		
- - #2	53,638	53,638
MINIBUS	30,100	30,100
MOTORCYCLES (10)	21,604	21,283
- (4)	10,800	9,457
MOTORCYCLES (16 + parts)	50,000	- 0 -

2

LONG TERM TRAINING CPS STAFF (6 mos?)

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Proposed Assignment</u>
I. Academic									
A. Project Funded									
(1) Fernandes (MS) Plant Path. LSU					Jan-----			June	In Charge Plant Path. Dept.
(2) Abreu (MS) Entomol. (Bio-control) Texas A/M						Jan-----		June	In Charge Ent. Dept.
(3) Tavares (BS) Univ. Calif./ Davis - Plant Pathology				Nov.-----				June	In Charge Plant Path. Dept.
(4) Varela (BS) Ent. Co/Mis*			Jan-----		Dec.*			June	Zone III Supervisor
(5) Delgado Mid-level/Braz. p**					Jan-----			June	Zone II Supervisor
(6) N'Canha Mid-level Brazil p**					June-----			June	Pilot Project Lead.
(7) Cassina (MS) Storage KSU pos.						Jan-----		June	CPS Director
B. AMDP Funded									
(1) Balde (BS) Univ. Ariz. Ent.								Dec***	Ent. Lab. Sup. (MIS)
(2) Menout (BS) Colorado St. Univ								June	Zone I Sup.
(3) Tchunchelan (BS) LSU Pitt. Pat.								May****	Zone II Sup.
II Non-Academic									
(1) Correia (Admin.), Lisbon, Port.					May-----			Feb	Admin. Officer

* May be extended one year

** Proposed date/Program cancelled/lack of response from Brazil and lack of Project funds

*** Delayed to Feb. 88

**** Delayed to end of Oct. 87.

JAFRANKLIN (87)
(Revised Feb. 88)

94

TECHNICAL ASSISTANCE

	<u>1986</u>						<u>1987</u>					<u>1988</u>					
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.

7. R. Bruggers, Vertebrate Pest Control Spec. (2) USDA-APHIS (17 Sept-11 Oct. 87**)

8. Pesticide Legislation Consultant, Crop Prot. Service, Portugal (1-16 May 87, 16-20 Jun 87***)

— —

9. V. Wright/Seck - Storage Spec. Kansas State Univ /National Agr Research Service, Senegal (IPM Project) 6-13 Apr 87

—

* Originally scheduled for an additional week but notice/Air Senegal (only flights) to cancel all air service to Bissau caused early departure.
 ** 2nd trip cancelled (lack of funds)
 *** Rescheduled for FY 88, Mr. Nunes has been replaced by Mr. Seabra.

86

TECHNICAL ASSISTANCE

	<u>1986</u>					1987					1988						
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.

10. Motorcycle Mechanic/Portugal (26 Oct.-11 Nov.)

11. Scott Campbell, International Programs Coordinator, USDA-APHIS (11-26 Sep.87*)

12. J. Franklin - Plant Quarant. Specialist, USDA-APHIS (19-27 June 87)

13. J. Ferras, Plant Patholog. Oct.** 1 weeks with follow up April 88

14. D. Pletch (small motor/ULV sprayer repair)*** 15-22 Aug. 87

15. J. Anderson, Trg/Ext.*** 13 Oct.-15 Dec. 87

* Cancelled - Broken leg

** Rescheduled March 88

*** Paid under Grasshopper Project

**** Cancelled - lack of funds, rescheduled C. Welty for Jan 88 (cancelled) lack of funds.

97

TECHNICAL ASSISTANCE

	<u>1985</u>					<u>1986</u>					<u>1987</u>						
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.

16. C. Castleton, USDA-APHIS
1 Oct. 85-May 86

17. D. Castleton, Ext. Spec.
1 Oct. 85-May 86

JFranklin/Scott Campbell
USDA-APHIS Program Review
Nov. 85

JFranklin USDA-APHIS
July, August

JAFRANKLIN (Feb. 37)
(Revised Feb. 88)

20

SHORT TERM TRAINING (Less than 6 months)
Third Country/U.S.

<u>PARTICIPANT NAME</u>	<u>FIELD /COUNTRY OF TRAINING</u>	<u>DATE OF TRG.</u>
Cassama	A. Plant Protection and Quarantine Lisbon, Portugal	7-20 Oct 87
	B. (as above)	7-9 Feb 87
Vaz	A. 1st International Conference on Tropical Entomology, Nairobi, Kenya	31 Aug-5 Sep 86
	B. Parasitic Hymenoptera, University of Maryland	2-8 June 86
	C. Rational Use of Pesticides, National Center for Tropical Agriculture, Montpellier, France	6 Jan-5 Feb 87
	D. English Language Training	May/Jun 87 (cancelled)
TchentcheJan	Conference, Association of African Insect Scientists Dakar, Senegal	7-10 Dec 87
Abreu	A. 1st International Conference on Tropical Entomology, Nairobi, Kenya	31 Aug-5 Sep 86
	B. Parasitic Hymenoptera, University of Maryland	2-8 June 86
	C. Conference, Association of African Insect Scientists Dakar, Senegal	7-10 Dec 87
	D. Biology, Survey and Control of Insect Pests of Sorghum/Millet Senegal, Kaolack	15-19 Sep 86
Cia	Root and Tuber Crop Production Research, IITA Ibadan, Nigeria	5 May-11 Jul 86

99

<u>PARTICIPANT NAME</u>	<u>FIELD /COUNTRY OF TRAINING</u>	<u>DATE OF TRG.</u>
Balde	Plant Dev. and Available Resources CPS/Senegal Training Center, Dakar CILSS Plant Protection Training Center, Niamey, Niger	26 Sep 87 18-25 Sep 87
Tavares	A. OJT-CPS/Bissau, Grasshopper, Plant Quarantine B. CPS Portugal to visit/discuss development of working relationship in Plant Quarantine	22 Jun-5 Se 87* 6-9 Sep 87
Celu	Study and the Control of Insect Pests of Sorghum/Millet Senegal, Kaolack	15-19 Sep 87
Abreu Tchigna Dabo Camara	Plant Protection: Methods and Organizing, National Center for Tropical Agriculture Studies, Montpellier, France	18 Mar-9 Apr 87
Delgado Nassulnate	Plant Protection: Methods and Organizing	17-28 Mar 86
Correia	National Center for Tropical Agriculture Studies, Montpellier, France	
Mendonca	Use of and development of Agricultural Radio Methods, Bamako, Mali	24-27 Apr 87

Note: Above does not include the many hours of OJT provided by through Technical Assistance.

* Summer Intern Program

(JAF, 2/88)

memorandum

DATE: February 2, 1988

REPLY TO
ATTN OF: Joseph W. Beaumont, Acting AID Representative

SUBJECT: Food Crop Protection Project (657-0012) Meeting
with Cassama, Feb. 5, 1988 at 10:00 at CPS Headquarters

TO: Robert Rose/William Lyon

Mr. Cassama, Director CPS has requested a meeting with the evaluation team, USAID and the project manager to review/discuss the evaluation team's findings to date. He has specified Friday 10:00 a.m. as the best and last time he will be able to meet with the team. As the senior CPS official he wants to be brought up to date and have some input into the team's findings before his departure to the U.S. that evening.

We have responded in the affirmative.

OPTIONAL FORM NO. 10
(REV. 1-80)
GSA FPMR (41 CFR) 101-11.6
5010-110

U.S. GOVERNMENT PRINTING OFFICE 1983 381-526/8335

MEMORANDUM

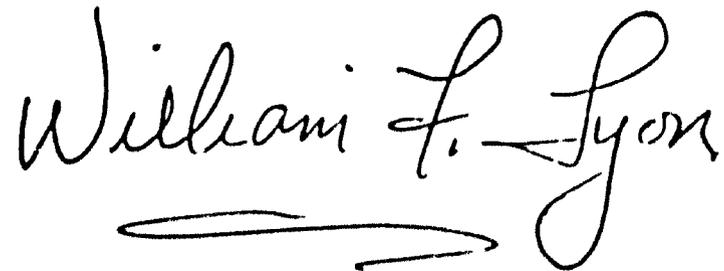
To: Mr. Joseph Beausoleil, US AID Guinea Bissau
From: Drs. W.F. Lyon & R.I. Rose
Date: February 11, 1988
Subject: Evaluation of Guinea Bissau Food Crop Protection
III (657-0012)

Dear Joe:

With this memo are the first 37 pages of our 1st/2nd draft of the evaluation of Guinea Bissau Food Crop Protection III by Drs. Lyon and Rose.

These pages are for your information and we do not need to have them typed in Guinea Bissau nor do we request you to have them typed because they will have to be typed later in order to produce a professional quality report in the numbers required. If you want to have them typed, it will not be our responsibility to pay for it. Our draft has been printed in block letters for legibility.

We note that we did not receive the forms we asked your office to complete on project disbursements and items purchased that was given to you on January 31, 1988, but instead we were given a modified and reduced version of this information prepared by Mr. J.A. Franklin which we hope will be adequate.

UNITED STATES GOVERNMENT

memorandum

DATE: February 12, 1988

REPLY TO
ATTN OF: Joseph Beausoleil, ADO

SUBJECT: Food Crop Protection III Evaluation - Preliminary Report

TO: Dr. Robert Rose
Dr. William Lyon

Appreciate the opportunity to review the first 37 hand-written pages of your evaluation report. It is evident that you have been able to familiarize yourselves with the Project and the Crop Protection Service, have met a sufficient number of people and have enough information to meet the evaluation objectives.

It appears to me, however, that the report emphasizes too much crop protection problems at the expense of evaluating the Project. I do not propose rewriting but editing and reorganizing the report.

National pesticide management issues for instance are discussed at length. All your recommendations are valued. However, these problems point to the need for regulations. The point that needs to be evaluated concerns the project and what it has done, is doing and plans to do regarding this.

The contract with ISTI calls for addressing eight issues (see Section C.3). I feel that you touched on most of these issues but failed to assess each or provide specific recommendations. For example, the first evaluation issue is the "planning and managing capability of senior staff". References are made to the quality of the staff but say little about their planning and management capability. How capable are they? What have they learned? What has the project contributed? What should the project do to improve that capacity?

There are a number of minor items that should be clarified or corrected. Reference to a U.S.A.I.D funded project in Contuboeil has negative implications. It should be deleted or clearly explained. Reference to a specific person as a source of information is inappropriate as A.I.D. is not the individual who provided you with the information. Many times reference to accounting terms or amounts are incorrect or misinterpreted.

I strongly suggest that you review the draft with the PASA project manager as is stipulated in Section C.4 of the Contract. This will help to eliminate inaccuracies and misleading information. The vehicles purchased in Dakar during the Emergency Grasshopper Program were approved by the A.I.D. Representative after discussing the pros and cons with Abidjan and AID/W. They cost approximately \$3,000 more than similar vehicles purchased at the same time. The other vehicles took three months longer for delivery. Another misconception regards commitments. The fact that funds are committed only means that they have been allocated to a specific case. The funds are then spent over time. We tried to make as much useful accounting information available. I feel that you are not satisfied so I am attaching a recent comprehensive pipeline report.

Unfortunately you have decided not to use the WANG word-processor for preparing the report. Already you are into a second draft. A.I.D. has found that using the word-processor facilitates the preparation of reports of this kind. The word-processor makes it easy to redraft without rewriting the entire report. You are still welcome to use our WANG equipment, if you so decide.

As you recall, the Contract calls for leaving behind a final draft. If you need more time to do this, we can amend the Contract for that purpose. The procedure would be to request it in writing with an estimated budget of the cost for two or three extra days.

Attachment: a/s

cc: Howard R. Sharlach, AID Representative.

104

MEMORANDUM

To: Mr. Joseph Beausoleil, US AID Guinea Bissau
From: Drs. W.F. Lyon & R.I. Rose
Date: February 12, 1988
Subject: Evaluation of Guinea Bissau Food Crop Protection
III (657-0012)

Dear Joe:

With this memo are pages 38 through 91 of our 1st/2nd draft of the evaluation of Guinea Bissau Food Crop Protection III by Drs. Lyon and Rose. These pages are for your information and we do not need to have them typed in Guinea Bissau. Our draft has been printed in block letters for legibility.

We note that we were given the US AID Project Budget Print-out Comprehensive Pipeline Report; a list of Short-Term Training (less than six months) Third Country/U.S.; a copy of the Crop Protection Service Vegetable Crops IPM Strategy paper; and a copy of the Crop Protection Service Stored Product Pest Report by Mr. J. Franklin on February 12, 1988 at 11:30 A.M. We also note your absence from Guinea Bissau February 12, 13, 14 and 15, 1988 and that February 15 and 16 are your holidays.

William F. Lyon

R.I. Rose

Para que possamos dar um atendimento mais eficaz às horticultoras, desenvolvendo uma atitude de interesse não só para a produção imediata, mas como também para um estabelecimento de um sistema duradouro, sem danos ao meio ambiente, propõe-se um plano de Luta Integrada.

Isto através de um trabalho em conjunto paralelo ao de treinamento dos grupos sobre as técnicas aprovadas.

Levantamentos

Primeiro passo é estabelecer um sistema de levantamento das pragas, com um registro dos dados colhidos.

As técnicas de levantamentos são as mesmas adotadas para as outras culturas podendo-se utilizar a ficha do P.V.

O levantamento é essencial no processo da luta integrada, pois só assim é possível estabelecer o limiar económico, saber precisamente a época da aparição das pragas o que ajuda no trabalho de alerta e prevenção para os outros anos.

Apresentamos aqui um modelo baseado nos dados colhidos durante os trabalhos na Granja Peseubé, entre Outubro de 1984 a Maio de 1985.

P R A G A	C U L T U R A	E S T R A G O S
N I S O T R A	C A N D J A D J A G A T U B A G U I T C H E	Fazem pequenos buracos nas folhas
D U S D E R C U S	H A L A G U E T A	Este parecevejo como os grãos

PRINCIPAIS PRAGAS
REGIÃO DE BISSAU

PRAGA	CULTURA	ESTRAGOS
PODOPTERA OCTUIDAE)	COUVE ALFACE REPOLHO TOMATE	As lagartas alimentam-se principalmente das folhas mas ocasionalmente comportam-se como um Agrotis, cortam o caule rente à superfície do SOLO. Alta infestação pode resultar numa severa defoliação mas isso raramente ocorre.
HELIOTHIS ARMIGERA (OCTUIDAE)	TOMATE REPOLHO PIMENTO	No tomate a lagarta ataca o fruto perfurando-o e provocando muitas vezes o seu apodrecimento por infecção de fungos e bactérias. As flores e rebentos novos também são danificados.

PRINCIPAIS PRAGAS HORTICOLAS NA
REGIÃO DE BISSAU

P R A G A	C U L T U R A	E S T R A G O S
<p>H E L L U L A U N D A L I S</p>	<p>A L F A C E C O U V E R E P O L H O</p>	<p>As lagartas se alimentam de novas folhas, em seguida elas cavam o coração de planta ou do caule. As plantas mais velhas mostram um crescimento tardio.</p>
<p>P L U T E L L A</p>	<p>C O U V E A L F A C E</p>	<p>As lagartas recém nascidas raszejam para a parte inferior das folhas, penetram o epidermis e durante o primeiro instar alimentam - se dos tecidos das folhas. Os três últimos instares comem as folhas na parte inferior fazendo janelas ou buracos nelas</p>

RECOMENDAÇÕES

CONTROLE DE PRAGAS HORTÍCOLAS



PRAGA	Producto Comercial Recomendado	Dosagem		Limiar Económico	Observações
		Mínima	Máxima		
larvas					A maioria das se- mentes importadas já vêm tratadas.
do folhas	Nonhum				São recomendadas as práticas cultu- rais: uso de var- dade resistente, rotação de cultu- e exposição do lo no Sol.
gudros folhas	Malathion 50 (solú- vel na água)	27ML/18LS	36ML/18LS	10 plantas in- festadas em cada 20 plan- tas examinadas	Eficaz em planta- novas e no iní- cio da frutificação. As aplicações de- vem fazer-se no início do ataque repetir-se semp- que necessário. Intervalo de se- rança é de 7 di-
	Difmetoato	11ML/18LS		Idem	Eficaz em planta- novas e adultos antes de fruti- ção (sem frutos) Intervalo de se- rança 7 dias.

<u>lercus</u>	Decamethirin (Decis)	11NL/18LS		Presença de dois ou mais insectos em 8 plantas entre 10 analisadas	Intervalo de se- guração 3 dias
<u>loene- curvi-</u>	Nenhum			Nenhum	Devido à baixa ataque foi reco- mendado apenas c tar os insectos.
<u>rtas olla stela</u>	Thuricide(Dipol) (pó-molhável)	27GR/18LS	36GR/18LS	10 plantas in- festadas entre 20 analisadas	O tratamento pod ser feito pelos horticultores u- gando os próprio regadores. O tratamento coi pleto deve ser c 3 vezes num per: do de 30 dias c 10 dias de inter valo. -Este tratamento é mais eficaz n culturas de alfi ce e couve em v voiros e plantas adultas.
	Decamethrin (Decis)	11NL/18LS		Idem	Mais aconselháv para plantas mé- dias. Tratar e repeti o tratamento qu do necessário c intervalo de 3 semanas.
<u>lula llis</u>	Idem à <u>Plutella</u> <u>xylostela</u>				

<u>Elites</u> <u>rmigera</u>	Malathion 50	27ML/18LS	36ML/18LS	8 frutos infestados em 20 frutos analisados	Colher os frutos somente 7 dias depois de fazer o tratamento.
	Decis	11ML/18LS		Idem	Mais aconselhável para os viveiros e plantas adultas antes da maturação.
<u>doptera</u> <u>pralis</u>	Thuricide (Dipel)	27GR/18LS	36GR/18LS	10 plantas infestadas entre 20 analisadas	Muito apropriado para os viveiros de alface, couve repolho. Os horticultores podem fazer os tratamentos com os roçadores. Intervalo de segurança 6 do 1 dia.
	Malathion 50 Decis	27ML/18LS 11ML/18	36ML/18LS	Idem	Depois do transplante e em plantas adultas. Desde o viveiro até a maturação da planta.
<u>optera</u> <u>ra sp.</u>	Malathion 50	27ML/18LS	36ML/18LS	8 insectos por planta analisada	
	Decis	11ML/18			Mais eficaz nas grandes infestações em plantas jovens e adultas
<u>hoto</u> <u>ptus</u> <u>ntus</u>	Urdene- 70 (pó molhável)	20GM/18LS	30GM/18LS	Verificação a olho de nível de infestação.	Tratamento pelo ser repetido 7 dias após a primeira aplicação. Intervalo de segurança, no mínimo uma semana.

Estratégias para o Controle

Para que tenhamos um controle eficiente das pragas será necessário envolver:

- a horticulora
- a Protecção Vegetal
- outros departamentos

que estão a trabalhar em horticultura como o Cinturão Verde na Zona Autônoma, o DEPA em Geba, o Projecto Integrado na Zona I, etc.

- outras organizações como o C.D.H., Centro de Pesquisas das culturas hortícolas, em Dakar, a SOMIVAC em Ziguinchor, que presta assistência nesta área.

A horticulora - esta é a pessoa mais interessada e que pode ajudar mais num trabalho de luta integrada. Para isto temos que trabalhar em conjunto, ensinando, trocando idéias e acreditando sinceramente na habilidade da horticulora.

É responsabilidade da horticulora:

- seguir práticas culturais recomendadas para evitar os ataques, como monda constante, distância adequada entre plantas, uso de variedades resistentes, rotação de cultura;
- alertar a aparição da praga assim que observar os primeiros sinais, inspecção das plantas para achar ovos, as primeiras lagartas, etc;
- apresentar amostra da praga sempre que possível;
- auxiliar no emprego do método mais recomendado; mecânico, químico ou biológico.

†

A Protecção Vegetal

Na luta integrada, é responsabilidade da Protecção Vegetal:

- identificar correctamente a praga que está a causar problema;
- recomendar na execução destes métodos;
- ensinar os agricultores sobre pragas, os métodos de luta e os meios de prevenção;
- entrar em contactos com os centros de experimentação, as outras organizações nacionais e internacionais, que estão a trabalhar em horticultura, como por exemplo o Cinturão Verde para se informar sobre as recomendações e aquisição de variedades resistentes; ou procurar saber os resultados dos experimentos realizados nos centros de experimentação, solicitar publicações, materiais de divulgação.

A luta Integrada contra as pragas hortícolas, exige um trabalho mais bem planeado, melhor coordenado e talvez mais demorado do que só uma defesa química, mas garante resultados por muito tempo e ajuda a proteger o meio ambiente.

REPÚBLICA DA GUINÉ-BISSAU

MINISTÉRIO DO DESENVOLVIMENTO RURAL E PISCAS

PROGRAMA ANUAL DE TRABALHO DA DIRECÇÃO DOS SERVIÇOS DE PRO-
TECÇÃO VEGETAL

ANO 1988.-

DIRECÇÃO DOS SERVIÇOS DE PROTECÇÃO VEGETAL
PLANO DE TRABALHO PARA O ANO DE 1988

INTRODUÇÃO:

A perda de produtos agrícolas originada pelas doenças e pragas é um dos factores que contribui para a insuficiência alimentar. Anualmente à nível mundial essa perda chega a atingir 20% à 30%.

Como a Protecção Vegetal é uma parte integral de complexo tecnológico para o cultivo das plantas, desempenha um papel importante na conservação da colheita ou seja na obtenção de produtos sadios.

Para o cumprimento desta tarefa e para um bom funcionamento de nesso trabalho a D.S.P.V. elaborou um plano de trabalho para o ano agrícola 1988 esperando assim o apoio da Direcção Superior do MDRP e de todos os Departamentos e Serviços.

Em anexo segue o Plano de trabalho das Secções componentes da Direcção.

SECÇÃO DE OPERAÇÕES DE CAMPO

Para a campanha agrícola de 1988 a Secção de Operações de campo, em colaboração com a Secção de Entomologia, Fitepatologia e os supervisores das zonas, pretende realizar as seguintes tarefas:

JANEIRO

Prevenção, desinfectão dos celeiros antes de entrada dos produtos armazenados como: mancarra, arroz de sementeira e outros produtos agrícolas.

Obs: Depois de armazenamento luta química se for necessário.

FEVEREIRO à MARÇO

Contacte com os enquadrados e os camponeses. Em colaboração com os supervisores e os monitores tentar organizar seminário de 1-2 dias para os camponeses e os enquadrados.

ABRIL

Organizar seminário anual da D.S.P.V..

INSPECÇÃO NO CAMPO

- MAIO-JUNHO - Coordenação logística
- Reunião trimestral com os supervisores.

das zonas

- Contactes com os Directores das zonas, Delegados regionais e comités das Tabancas
- Contactos com os Ministres Residentes assim que for necessário

JULHO - AGOSTO

- Prospeção larval nas zonas I e II
- Luta química (utilização de Fenitrothion 3% com sacos polvilhadeira se for necessário).
- Levantamento ^{de pragas} a nível Nacional em colaboração com a Secção de Entomologia, supervisores e monitores

Obs: Tomar em conta a sinalização dos enquadros e principalmente dos camponeses.

SETEMBRO - OUTUBRO

- Recolha de dados para efeito de elaboração de relatório anual e avaliação da campanha
- Visitar as Tabancas mais afectadas pelas pragas durante a campanha
- Reunião com os camponeses se for necessário

NOVEMBRO - DEZEMBRO

- Prospeção de Ootecas nas duas zonas afectadas com gafanhotos (Zonas I e II)

- Melhor prevenir para não ser surpreendido porquê?

Porque aparecimento das diferentes espécies das pragas depende de muitos factores climáticos!

PRAGAS ESPERADAS

<u>PRAGAS</u> *****	<u>PERÍODO</u> *****
Heteronychus oryzae -----	Mai-Julho
Spodoptera exempta -----	Julho-Agosto
Orseolia oryzae -----	Julho-Agosto
Nymphula sp -----	Julho-Agosto
Diopsis sp -----	Julho-Agosto
Gafanhotos -----	Assim que aparecerem
Meloidae sp -----	Assim que aparecerem

Produs ULV e mais outros produtos químicos que vão ser usados só se for necessário.

SECÇÃO DE ENTOMOLOGIA

A Secção de Entomologia programa realizar as seguintes tarefas para o ano agrícola 88/89.

Laboratório de Diagnóstico

- Fazer colecção de ensino englobando a maioria das ordens dos insectes.
- Colecção das principais Ordens e Famílias de insectos de interesse agrícola.
- Continuação da elaboração das Fichas Técnicas com ilustração.

Levantamentos

Pragas do arroz

- Fazer um estudo sobre a dinâmica da população do Maliarpha separatella utilizando o feromona-Setembro/Novembro.
- Elaborar mapas de distribuição das pragas Heteronychus mozambycus, Nymphula depunctalis e Orseolia oryzivora.

Pragas do milho

- Fazer a colecção de todos os inimigos naturais (predadores e parasitas) encontrados no afídeo Rhopalosiphum maidis.
- Elaborar um mapa de distribuição de Rughuva albipunctella
- Fazer a colecção de todos os gafanhotos e relídeos encontradas na cultura do milho.
- Colaborar nos ensaios de variedades de milho preto e sorgo

Pragas de horticultura

- Elaborar em colaboração com o Projecto de Cintura Verde e Instituto Nacional de Investigação Agrícola de Cabo-Verde (INIA) uma lista das pragas hortícolas nas diferentes culturas e inimigos naturais indígenas (já existentes) a fim de preparar um programa de Luta Biológica.

Pragas de Citrinos

- Introduzir armadilhas de feromonas de Cryptophlebia leucotreta nas Granjas de Prábia, Paiol e Cumura a fim de estabelecer um calendário de tratamento preventivo.

Pragas de mandioca

- Continuar a elaborar mapa de distribuição de parasita da Cochenilha Epidinocarsis lopesi.

Treinamento Técnico

- Participar no seminário anual de superação dos monitores de IV.
- Dar treinamento aos técnicos de Projecto de Cintura Verde e de IEPA.

No laboratório de diagnóstico e Secção de Fitepatologia pretendi:

- Coleccionar as doenças nas diferentes culturas, diagnósticá-las e fazer o herbário de doenças de importância económica.

II

JANEIRO-MARÇO

- Fazer levantamento das doenças nas fruteiras e culturas hortícolas do Sector Autónomo de Bissau e arredores.
- Contacto com os agricultores a fim de dar conselhos para o combate das doenças encontradas.
- Preparação de fichas técnicas para o seminário anual.

III

ABRIL-MAIO - Seminário anual da D.S.P.V..

- Contacto com os agricultores das zonas I e II
- Estudo da doença do ananás (Granjas de Prábis, Palesti - nianas e região de Kafatá)

JUNHO-OUTUBRO - Levantamento de doenças nas culturas de sequeiro do Sector Autónomo de Bissau e arredores (milho bacil, Feijão, mancarra, arroz e mandioca).

Colheita de estacas de mandioca do IITA resistentes ao vírus de mosaico africano nas Granjas Estatais e distribuição das mesmas aos agricultores.

- Distribuição das estacas de batata-doce da variedade de IITA
- Fazer um campo experimental de diferentes variedades de milho preto ou sorgo resistentes ao carvão (Junho/Setembro)
- Levantamento das doenças de arroz Piriculariose e Helminthosporiose à nível Nacional (Julho/Octubro).
- Encontro com os agricultores que receberam as estacas de mandioca e visita de inspecção a esses campos (Agosto).
- Levantamento de doenças nas principais culturas das zonas I e II com a colaboração dos supervisores das referidas zonas (Agosto)
- Levantamento de doenças na zona IV (Bolama/Dijagós) (Agosto)

NOVEMBRO - Levantamento de doenças das principais culturas da zona II.

DEZEMBRO - Estudo de fungos de armazenamento em especial Aflatoxinas

- Visita de inspecção aos armazéns de produtos alimentícios à nível Nacional. Recomendações sobre os requisitos para uma boa armazenagem.

- Jan eire - Preparação de série "A B C" II livre de PV
- Fevereiro - Encontro dos supervisores das zonas em Bissau
- Março - Distribuição de calendários de PV para os agricultores e enquadrados
- Seminário sobre os reedores (ratos)
- Programa para a rádio Rural
- Abril - Programação do seminário anual de PV
- Mai - Elaboração de materiais didáticos e fichas técnicas
- Junho - Tiragem de "BOMBOLON"
- Programa para a rádio Rural
- Visitas de contactos com os nossos monitores no campo
- Série "A B C" III livre
- Feira Agrícola/88
- Julho - Preparação de série "LASSANA DE OLHO VIVO".
- Agosto - Série A "A B C" IV livre
- Setembro - Tiragem de "BOMBOLON"
- Programa para a rádio Rural
- Elaboração de materiais áudio-visuais
- Distribuição de Posters "LASSANA DE OLHO VIVO"
- Calendário de 1989
- Outubro - Encontro com os camponeses
- Novembro - Tiragem de "BOMBOLON"
- Dezembro - Distribuição de calendários de PV
- Visitas de contactos
- Relatório final

FORMAÇÃO ACADÉMICA

Seguirão para os E.U.A. a fim de continuarem os seus estudos as seguintes Camaradas:

- Mustafa Soares Casamá para especialização nos produtos Arzenados.
- Lourenço Monteiro Carvalho de Abreu, especialização na Entomologia
- José Correia e Claudino André Pereira, partirão para Niamey, Níger para uma formação média no Centro de Formação de Protecção Vegetal do CILSS em Niamey.

APERFEIÇOAMENTO TÉCNICO E CIENTÍFICO

Dentro do programa da formação e superação técnico e científico de PV, estão previstos estágios de superação técnica no exterior. Mas, estamos com limitações financeiras.

- A USAID, deixou de financiar os estágios de curta duração para o C.N.E.A.R.C..

- Escrevemos uma carta à Secretaria de Estado da Cooperação pedindo o financiamento para estágios de curta duração. Mas, até a data presente não temos tido a resposta.

ESTÁGIOS PREVISTOS:

- Limitação das perdas depois da colheita. De 12 de Outubro à 2 de Dezembro/88 - Montpellier, Berdeau, Paris.

- As pragas das culturas Tropicais. De 4 Fevereiro à 2 de Abril /88 Montpellier.

- Reconhecimento das famílias de insectos de interesse económico nas regiões quentes. De 2 de Junho à 4 de Julho/88-Montpellier.

- Métodos e Organização da Protecção Vegetal. De 14 de Março à 1 de Abril/88v Montpellier.

- Técnicas de Laboratório em Fitopatologia, Março/88-Montpellier

- Utilização Racional de Produtos fitossanitários. De 9 Fevereiro à 11 de Março/88-Montpellier.

SECÇÃO DE ADMINISTRAÇÃO E GESTÃO

No cumprimento do Programa que foi traçado para o ano 1987/88, através de nesse plano, verificaram-se várias dificuldades nas seguintes situações ligadas aos Serviços de Administração, Gestão e consumo de Património, julgados como erros que devem ser emendados neste presente plano, assim como se segue:

1 - Atraso de autorização do abaldio (contra-partida) por parte do H.N.G..

a) - Compra dos bens de consumo- combustível lubrificantes e outros para que se possa fazer face a combate aos gafanhotos no momento exacto (colónia).

2 - Pedido de encomendas de peças sobressalentes para reparação das viaturas, motorizadas, atomizadoras e pulverizadores.

3 - Recursos Humanos.

a) - Enquadramento de mais quadras para atingirmos um número

de 76 pessoas para o ano 1988/89 e dar cobertura aos Sectores projectados como: Piche, Xitole, Cambadjú, Cantohungo, Caió, Mansabá, Safim, Nhacra, São João, Cacine, Bedanda e Beó.

OBJECTIVOS:

Julgamos citar todos os objectivos atingidos e a serem atingidos durante o ano 1988, no âmbito dos Serviços de Administração, Gestão, Bens e Património.

2 - Resultados obtidos:

Foi construída uma Sede para os Serviços de Protecção Vegetal, sita no alto da Granja de Pessubé, equipada de três Laboratórios, uma sala de aulas, uma cozinha, seis gabinetes de trabalho, uma Secretária, uma Sala de recepção das amostras, uma Oficina, duas bombas de abastecimento de combustível, um armazém para géneros do PAM já estava construída há mais de um ano e que foi inaugurada no mês de Abril de 1987, um armazém para stockagem de pesticidas e materiais com capacidade de 100 toneladas.

3 - Actividades a serem levadas a cabo no ano 1988

3.1. - Contabilidade

Janeiro - Abertura de livro de contabilidade-pastas de facturas pagas nas diferentes categorias orçamentais
à
Dezembro - gerais, ajuste de contas com GAPLA, FND e Finanças.

3.2. - Compra de bens de consumo

Aquisição de combustível, lubrificantes e outros artigos existentes no mercado local, providenciar sobre alimentação dos seminaristas e preparar a lista para importação de outros bens de consumo não existentes no País.

b) - Proceder o inventário nas regiões, Sectores e Secções onde se encontram os agentes da D.S.P.V. - a mesma deverá efectuar-se semestralmente.

c) - Criação de mapas de controle para regiões e zonas de forma a poder controlar os bens da D.P.V. e a mesma deve ser remetida a Sede Central trimestralmente.

3.3. - Manutenção e controle de Viaturas, Motorizadas, Atomizadores e Pulverizadores

a) - Seleccionar as viaturas irreparáveis, incluindo as motorizadas a fim de serem postas a venda em hasta pública; em Marge controlar e fazer a manutenção das restantes viaturas e

motorizadas, materiais diversos ligados a campanha de combate as pragas e doenças nas regiões.

b) - Proceder a inventariação de todos os materiais de pulverização, Viaturas, motorizadas e Bicicletas, com numeração e identificação de forma a permitir a utilização de fichas para gastos de peças, combustível e lubrificantes.

3.4. - Distribuição/Inspeção

Janeiro - Fazer levantamento de equipamento de tratamentos,
à Pesticidas e gêneros de PAM

Abril

Maio - Recolha mensal dos dados das áreas tratadas durante
à o andamento da campanha o número dos camponeses en-

Dezembro - quadrados, mediante os nomes nos diferentes sectores das nossas actividades.

3.5. - Assiduidade/Deveres dos Funcionários

Continuar a manter o livre de Ponte para controle do pesal e as folhas de pagamento.

No que concerne as férias, dado que a campanha activa começa em Maio e termina em Novembro, só se admitirão férias de Janeiro à Abril e do Novembro à Dezembro.

4 - Meios Materiais

a) - TOYOTA PICK-UP ----- 4
b) - CAMIÃO DE 7 TONELADAS ----- 1
c) - UNIMOG ----- 1
- MOTORIZADAS TIPO XL 125S ----- 5

Produtos Químicos

a) - FENITROTHION 3% ----- 50 Toneladas
- PROPOXUR 2% ----- 50
- SACOS POLVILHADEIRAS ----- 5000 sacos

Materiais de Prospecção

a) - Jogos de materiais de dissecação ----- 50
- Redes de capturas ----- 30
- Caixas de colecção ----- 40 (GM-20-PM-20)

Materiais de acampamento

- Camas de campanha ----- 100
- Tendas de campanha com capacidade de 6 pessoas-10
- Lampadas à gás -----10
- Caixas Papotes ----- 2

COMBUSTÍVEL

- Gasolina normal ----- 40.000 L
- Gasolina super ----- 2.000 "
- Gasóleo -----35.000 "
- Óleo à gasóleo ----- 1.000 "
- " " gasolina ----- 1.000 "
- Valvolina 90 ----- 200 "
- " 140 ----- 200 "
- Líquidos de travão ----- 60 "
- Massa consistente ----- 100kg

RÁDIOS

- Posters de rádio de emissão e receptor ----- 6
- Micronair ----- 2

Quanto aos justificativos, a necessidade da utilização dos materiais acima citados estão inseridos dentro de processo de combate aos gafanhotos e outras pragas nocivas às culturas.

5 - Meios Financeiros

O orçamento em moeda local para os próximos períodos.

Para figurar como se segue o quadro das diferentes categorias:

Nº	TRANSAÇÕES	Orçamento
1	Construções e reparações	6.000.000,00 PG
2	Combustível e lubrificantes	27.234.800,00 PG
3	Reparação das Viaturas	6.000.000,00 PG
4	Alimentação das Brigadas	10.000.000,00 PG
5	Diversos	600.000,00 PG
6	Majoração de 10%	4.983.480,00 PG
		54.818.280,00 PG

A Direcção dos Serviços de Protecção Vegetal conta actualmen-
te com os seguintes quadros Nacionais:

Nacionais ----- 68 pessoas
a) - Há necessidade de afectação de seguinte quadros nos serviços
da DSPV:

Técnicos superiores ----- 10 pessoas
" médios ----- 10 "
" Profissionais ----- 66 "

As áreas julgadas por nós determinantes para ocupações des
supracitadas são:

Superiores: Quarentena ----- 1 pessoa
Entomologia ----- 5 pessoas
Nematologia ----- 1 pessoa
Luta Integrada ----- 1 "
Fitopatologia ----- 2 pessoas
Médios responsáveis regionais ----- 9 "
Sector Administrativo ----- 1 pessoa
Profissionais responsáveis Sectoriais ----- 66 pessoas

Deve-se aumentar o número dos trabalhadores nas seguintes
áreas:

Laboratórios; Recção de amostras ----- 1 pessoa
Serventes ----- 2 pessoas
Auxiliares de Laboratórios ----- 3 "
Administração ----- 2 "
Oficina ----- 3 "

INTERVENÇÃO DO PROJECTO

No que concerne a intervenção do Projecto nas actividades
da D.S.P.V. podemos salientar e realçar que os benefícios refle-
ctem-se através dos rendimentos agrícolas das populações desde
regiões, sectores e Tabancas dada a diminuição considerável das
perdas causadas pelas pragas e doenças no campo após a colheita
em prol da insuficiência alimentar de que já falamos na intre-
dução.

PREVISÕES

Está prevista para o mês de Março próximo uma obra de cons-
trução de uma ponte e de terraplanagem da estrada que dá acesso
às novas instalações da Direcção dos Serviços de Protecção Vegetal
sita no alto da Granja de Passubé.