

A REPORT ON A SEMINAR
MANAGEMENT OF PESTICIDES AND PROTECTION OF THE
ENVIRONMENT

sponsored jointly

by

Ministerio de Agricultura y Ganadería, El Salvador,
Ministerio de Salud Pública y Asistencia Social,
USAID Mission San Salvador, Pan American Health Organization,
and UC/AID Pest Management Project

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Hotel Camino Real
San Salvador, El Salvador

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ABSTRACT

For a developing country, skills in pesticide management are an essential prerequisite to pesticide importation. They are also one of the essential prerequisites of integrated pest control.

In El Salvador over the last decade, serious pesticide management problems have occurred as a result of the importation and indiscriminate use of large amounts of agricultural chemicals; the use of parathion has particularly resulted in problems. In 1972 there were 2,787 hospitalized cases of human pesticide poisoning. This was a four-fold increase over the previous eight year figures. On the coastal plains in cotton producing areas, the agricultural use of pesticides has interfaced and interfered with the public health control of malaria by malathion and propoxur.

Areas of economic development have also been threatened by the injudicious use of agricultural chemicals. Current development of a sizeable beef industry has recently been jeopardized by contamination of some lots of meat with residues of DDT and dieldrin resulting in prohibition of the export of these lots. Assistance from USAID was requested by the involved agencies in El Salvador. The UC/AID Pest Management Project was invited to assist in the resolution of these pesticide management problems through an in-country training program.

The University of California under a contract with the State Department/AID sponsored a training seminar on "Management of Pesticides and Protection of the Environment" in the capitol of El Salvador. The seminar was directed by Dr. Ray Smith and held the first week in December 1973.

The seminar provided a multi-disciplinary approach to pesticide management and related pesticide problems in the community. Pest control

techniques were stressed from an agricultural point of view with human safety, occupational health and environmental protection as the goals emphasized. Problems of persistence, resistance and human poisoning were discussed.

Technical study groups were established and all of the more than 80 participants were involved. As part of the seminar the technical groups formulated questions, reviewed the papers presented and offered resolutions aimed at solving the problems with pesticides. The resolutions were condensed and forwarded to the Ministers of El Salvador for their consideration and possible implementation. The success of the seminar is evident considering the number of participants involved and the fact that the resolutions that they drafted are being seriously considered by the Ministers of Agriculture and Public Health.

As a result of the seminar it is planned to continue training on an intensive and then a long term period for all of the disciplines involved in this unique "Agro-Medical" approach. In addition, it was requested that a seminar of a more advanced nature be planned sometime during the last few months in 1974, and further it was requested by participants from other Central American countries that similar seminars be presented in their countries.

REPORT ON PESTICIDE MANAGEMENT TRAINING PROGRAM IN EL SALVADOR

Introduction

El Salvador is a relatively small country with an area of 21,000 square kilometers situated in Central America on the Pacific coast. The country is typical of a developing country which is faced with demands for increased food and fiber production and the problems of adequate agricultural pest and disease vector control. The country lies between the 13th and 14th parallel of latitude, insuring a warm and equable climate. There is a dry season between November and April, and a rainy season with somewhat warmer temperatures from May to October. The coastal plains are an extension of the plennipen of Central America. Rising just north of the coastal plains is a low range of mountains, and farther to the north are the central highlands of the country. In these ranges are numerous valleys which lend themselves to intensive agricultural production. Agricultural practices and special pest and vector control problems are related to these different geographical terrains. On the coastal plains one finds intensive cotton production, and cotton is a most important economic resource for the country. The climate here also promotes a special control problem for cotton pests. The coastal plain also encompasses an area where the Anopheles albimanus, the vector of malaria, is endemic. Thus, in these coastal plains there co-exists a serious public health vector problem and an agricultural pest problem involving cotton. In the hilly areas, coffee is grown, as well as sugar cane, fruit, corn and other crops. In recent years El Salvador has developed a sizeable beef export industry, and the feed base for this includes corn and the by-products of cotton production, in addition to the pasturage. In the coastal waters, there exists an important fishing industry with shrimp constituting the most important economic commodity.

The population is 3.8 million people, and El Salvador is one of the most densely populated areas in Central and South America. Obviously, in such circumstances, an expanded food and fiber production program is essential for the survival and economic growth of the country, and pesticides have formed an essential technology in the pursuit of these goals. Large amounts of agricultural chemicals have been used over the last ten years and the level of use has increased annually. In 1972, approximately eight million pounds of chemicals were imported into the country, with 60% being made up of combinations of ethyl- and methyl-parathion mixtures, primarily for use on cotton. Other pesticides of note included a toxaphene-DDT mixture and aldrin. The former has been used as a supplemental pesticide in cotton and the latter is used in pasture establishment and for the control of pests on cotton and other agricultural crops. In such circumstances, and with these quantities and types of pesticides being applied principally in the small coastal plain areas, serious health and agricultural problems developed. Officials from the Ministries of Agriculture and Health concluded that if these problems were to be corrected, there was an urgent need to obtain the assistance of scientific staffs with high level technical expertise in modern pesticide management. Through the AID Mission, assistance of the UC/-USAID Project was requested, and invitations were extended to members of this Project to make a preliminary review of the total problems in the country. In April, 1973, a short preliminary fact-finding visit was made by two consultants in the Project with expertise in agricultural and public health problems of modern pesticide management. Although the ultimate hope for the country was the institution of a nationwide integrated pest and vector control program, the need for a preceding pesticide management training program was recognized by both Ministries.

During this initial fact-finding visit, three serious pesticide management problems were recognized; all were important for public health and agriculture, and each had significant implications for the present and future health profile of the country, and the potential for economic growth through an expanded agricultural program. The three problems were: (a) human pesticide poisoning, (b) pesticide contamination of food and the environment from residues of persistent pesticides, and (c) resistance problems effecting both agricultural pests and the mosquito vector of malaria.

(a) Human Pesticide Poisonings.

Human pesticide poisonings were not officially recognized as a serious health problem in El Salvador until 1972. Although human pesticide poisoning is still not a notifiable disease in the country, excellent records of hospitalized cases of this eventuality had been kept by the public health authorities in the Ministry of Health. These are shown in the following table:

<u>Fatal and Non-Fatal Pesticide Poisoning</u> <u>Cases in El Salvador 1969 - 1972</u>		
<u>Year</u>	<u>Fatalities</u>	<u>Non-Fatalities</u>
1969	7	584
1970	7	674
1971	10	586
1972	5	2787

These represent data collected from the local hospitals where illnesses have been attributed to pesticide exposures. The incidence data for 1972 is of special interest for several reasons. Firstly, the number of cases reported reflects a four-fold increase over preceding years. Secondly, because the incidence data approximates data acquired by the Ministry of Labor during the

same year. Investigators from the Ministry of Labor, quite separately from the Ministry of Health, sought to find out the magnitude of the problem by themselves conducting a survey in 1972. Their investigators sought information from all areas of the country based upon a questionnaire to the hospitals and to local officials in the area, thus they acquired some additional information on hospitalized cases. They estimated that 2028 cases had occurred in 1972 and these included 202 women and 226 children. They obtained information of 30 deaths, 25 of whom were male, 3 were children and 2 were females. Although these data were unconfirmed, both sources of incidence suggest a serious problem and indicate essentially an occupational problem rather than an accidental domestic poisoning problem. The data does not suggest that the more toxic pesticides are freely available in the home environment. In the preliminary survey, during an interview with officials from the Ministry of Agriculture, the authorities felt that there were probably three factors contributing to the 1972 increases. These were: (1) the increased use of an ultra-low volume application of an ethyl-methyl parathion mixture on cotton; (2) the original selection of a 72 hour reentry interval which is now considered to be too short and which has been extended; (3) an unusually dry season with little rainfall to wash the residues off the cotton.

(b) Pesticide Contamination of Food and the Environment
from Residues of Persistent Pesticides

El Salvador has recently developed a sizeable beef industry for export. During the preliminary investigation, members from the Ministry of Agriculture as well as representatives of the industry expressed considerable concern about the reports of pesticide residues in beef cattle which were in excess of acceptable tolerances. USDA officials analyzed the meat samples and as a result, importation of some lots of beef to the U.S. was prohibited. These contaminations posed a serious threat to the export industry and cattlemen

were at a loss as to why the pollution had occurred and as to how they should dispose of contaminated cattle fattened and ready for slaughter. The need for in-country residue analysis capability was stressed as well as the need for analyses of animal feed. Members of the preliminary fact-finding team went out into the fields and the explanation for this accidental contamination soon became apparent. The cattle were observed to be grazing in pasturage adjoining the cotton fields - and often cattle were seen to be grazing in the harvested cotton fields. The contamination had occurred in two ways. Cotton is subjected to treatment with DDT-toxaphene mixtures particularly in the latter part of the realm. The residues were on the cotton plants and were being ingested by the cattle. The proximity of their pasturage to the cotton fields almost certainly meant contamination also from overspray during aerial application. Another mechanism of contamination resulted from the use of aldrin as a pre and post emergent insecticide on corn - with resultant acquisition of dieldrin residues. Corn fodder so treated was being widely used for fattening purposes.

Concern for the residue problem was also expressed by representatives from the Ministry of Health. Having learned of the unsatisfactory tolerances in beef, they were concerned that other food commodities might contain undesirable pesticide residues and were concerned that food destined for export, but which failed to meet international standards, might be re-directed for internal consumption. They regretted the absence of baseline information of general population levels of persistent pesticides and expressed the hope that future residue monitoring programs of food and feed stock should also include a subsample of analyses of specimens from humans.

(c) Resistance

The problem of increased pest resistance has been especially

problematic for cotton in the past. The problem has been only partly resolved by using larger amounts and more frequent applications each year. Resistance is also of concern to public health in control of A. albimanus, the local vector of malaria. The vector is resistant to DDT and to dieldrin but could be controlled until recently by malathion and propoxur. Now, within the last two years cross resistance to these organophosphate and carbamate insecticides has been demonstrated. Georghiou has shown that the propoxur resistance in El Salvador is related to the agricultural uses of pesticides. This problem of cross resistance was one well recognized by malariologists in the country and was an issue to both the agriculture and public health authorities.

The conclusions and recommendations of this preliminary fact-finding visit was the urgent need of a pesticide management training program. The problem would require the collaborative investigation and recommendations of both the agricultural and medical skills of the country. An in-country training program, to be planned and developed by the USAID Project with assistance from the Pan American Health Organization, was proposed with the emphasis on the "agro-medical" approach.

Planning the Seminar.

In planning this program, it was the hope of the UC/AID Project staff that, as a result of the seminar, in-country representatives would formulate their own recommendations for solutions to problems. These recommendations would express ways in which they themselves felt the several pesticide management problems could best be resolved in El Salvador. The recommendations would be submitted to the Ministries of Agriculture and Health for their consideration after the seminar. During the earlier survey, problem areas of present pesticide management practices had been recognized by both

agriculture and public health officials in El Salvador. Therefore both Ministries as well as other persons representing both disciplines became involved in the planning and implementation of the program.

Upon receipt of the request for the training program, the AID Project at the University of California was given initial responsibility to begin development of the program. Very early in this process the Pan American Health Organization and the AID Mission in El Salvador, and a number of officials of the government of El Salvador became involved in the planning and arranging of the program. There is no doubt but that the input from these several interested and highly motivated individuals and organizations, contributed much to the ultimate success of the seminar. Both the Minister of Agriculture and the Minister of Health of El Salvador, played an active and important role in the planning and presentation of the seminar. It was decided that the theme of the seminar should be "Pesticide Management in El Salvador," with emphasis on the problems of persistence, resistance and poisonings. The need for a multi-disciplinary agro-medical approach would be emphasized and pesticide management recognized as a preliminary step to the ultimate goal of integrated pest control. The program was developed along three phases: Phase One - Pre-seminar planning; Phase Two - The training seminar; and Phase Three - Intensive training of chemists and follow-up plans. The evolution of this program can best be described under these three categories.

PHASE ONE - Pre-seminar planning

This phase consisted of establishing a basis of cooperation with representatives from Health and Agriculture in the design of the seminar. The first step to be taken by the UC/-USAID Project was the recruitment of a full-time Project Coordinator. Mr. Stephen Poznanski, a senior chemist

from the Department of Epidemiology and Public Health, University of Miami School of Medicine, was selected for this post. Mr. Poznanski in the past has had extensive training experience and was responsible for the training of many pesticide chemists from sixteen states in the United States attached to the Community Pesticide Studies Program.

Overall approval for the seminar was obtained from Sr. Roberto Llach Hill and Dr. Julio Astacio, Ministro de Agricultura y Ganadería, and Ministro de Salud Pública y Asistencia Social, respectively. Both Sr. Llach and Dr. Astacio endorsed the program and offered their participation. Preliminary requirements called for the recruitment of key personnel in El Salvador and assistance in this respect was provided by the Ministries of Agriculture and Health, who suggested individuals for a Management Committee. A suitable date and site was selected. Advance notices and invitations were sent out to individuals in the field of public health, malaria control, agriculture and industry in San Salvador and were also extended key personnel in neighboring Central American countries and to the local Pan American Health Organization representatives. The distribution of these preliminary notices was determined by the Management Committee, in consultation with representatives of the UC/-USAID Pest Management Project. It was agreed to limit the attendees to approximately fifty, including representatives from industry and from neighboring countries. Additional invitations were extended to the Ministry of Labor and other interested officers in the other governmental departments. Dr. Damon Boynton of USAID was invited to assist in the development of the program. His presence, enthusiasm and vigorous assistance was a critical factor for the success of this program. Dr. Boynton, who at the time was advisor to the Ministry of Agriculture, was able to advise all concerned on how to reach experts in other fields and was instrumental in

obtaining participants with a wide variety of expertise.

Significant assistance from the Ministry of Agriculture was also provided through the services of personnel in the Agricultural Center at Santa Tecla. Secretarial help, both before and during the seminar was made available by the Director General of Santa Tecla. Office equipment and supplies, as well as copying facilities were made available. Assistance was also provided by Oregon State/AID Weed Project in El Salvador.

Outside of the country assistance was provided by the Pan American Health Organization. Simultaneous translation equipment from PAHO in Guatemala was made available to the Project. The Director of PAHO in Guatemala also made the necessary arrangements for shipping these to El Salvador. PAHO also contributed by providing a speaker on malaria resistance for the seminar. The Project Director, Mr. Stephen Poznanski, made three trips to El Salvador in preparation for the seminar, and Phase One was ultimately successfully implemented through combined efforts of in-country representatives, members of the UC/-USAID Project and officials from the Pan American Health Organization in Washington.

PHASE TWO - The Seminar

The seminar was opened on December 3rd with clear, incisive statements by the Minister of Agriculture and the Minister of Health indicating the commitment of their government to the program, and outlining the needs for the seminar and setting forth the objectives. From that time through the next three and a half days, the format of the meeting was one of technical presentations and discussions. The program can be found in Appendix A., and Appendix B. presents the list of speakers. It will be seen that six experts were selected from San Salvador, six from the UC/-USAID Project and two from the Pan American Health Organization. The topics ranged over chemistry, toxicology and chemodynamics of pesticides, development of resistance, quanti-

tative methods, epidemiological aspects of pesticides, integrated pest control and malaria particularly as they relate to El Salvador. The presentations provided a background of information and stimulus for the activities of the working groups. A very important objective was to obtain active involvement of in-country participants in the aforementioned discussions. It was hoped to achieve this through the media of technical committees which would record the content of the preceding days' discussions and collect questions from the audience and present these to an expert committee for answers. At the outset of the seminar technical committees were elected by the floor and every participant joined one of the groups. The groups identified specific problems of pesticide management and then sought to enunciate objectives and devise programs and methods of implementation of such programs for solution of these problems. At the conclusion of the seminar, a certificate, signed by the Ministries, USAID and the UC/AID Pest Management Project was provided to each participant.

PHASE THREE - Intensive training of chemists and follow-up plans.

The seminar was the first step in the training process. It was followed by special intensive training of in-country chemists. This was conducted by Mr. Stephen Poznanski, and took place the week after the seminar in the Santa Tecla laboratory. This was the first part of the follow-up training program of chemists. Time was spent in the laboratory working with the chemists, reviewing the existing instrumentation, introducing new analytical methods for residue analysis on a micro-scale. It is planned that additional training will be conducted in the laboratory the last two weeks in February, 1974. An in-dept sample study is planned for all personnel based on micro methods and then introduction of an in-house quality control program to update the efficiency of the personnel. Additional equipment instruction is also

planned on a Gas Chromatograph and the Infra-red spectrophotometer with emphasis on daily care and repairs.

In addition to the chemists training program, provisions are being made for the intensive specific training of the other members of the pesticide team. Pan American Health Organization has consented to support training for a medical doctor in Miami. Preliminary steps were taken in conjunction with PAHO and the Minister of Health of El Salvador to explore the selection of an appropriate physician who has some skill in epidemiology and toxicology. The candidate would be supported through the mechanism of a PAHO scholarship in Miami at the Department of Epidemiology and Public Health under the direction of Dr. John E. Davies. Negotiations are underway to instigate this program. Future training is planned for ingenieros agronomos at the University of California under the direction of Dr. Ray Smith.

In addition, agricultural training for the chemist will be conducted under Dr. Virgil Freed. This will be a three-month session devoted to agricultural chemistry.

Seminar Results

Evaluation of any training seminar is not easy, and with a topic as complex as pesticide management, progress can only be measured some time after the initial training endeavor. This is certainly the case for an ultimate evaluation of the program in San Salvador. There were, however, certain immediate responses observed in the training program which suggest that the initial impact of this program was highly successful and augurs well for the future. The first of these events was the number of attendants. Although the initial plans were for fifty participants, 88 individuals attended for the entire course. The total registration was as follows:

a. Ministry of Health	19 participants
b. Ministry of Labor	4 participants
c. Ministry of Agriculture	27 participants
d. University of San Salvador	8 participants
e. Industrial (in-country)	16 participants
f. Other out-of-country representatives: Speakers, ICAITI, AID Washington, and Project personnel	<u>14</u> participants
TOTAL	88

A list of the individual participants is shown in Appendix C.

A second indication of the success of the program was the number and caliber of questions raised by participants from the floor. Approximately 70 questions were raised from the floor and referred to the Technical Committee. These questions are indicative of the close scrutiny and grasp of the topics that the participants exhibited and are testimony to the interest of the groups.

Third and finally, the results of the working groups could also be measured by the recommendations and resolutions subsequently adopted by the participants. The resolutions formed by each group are testimony to the success of the seminar, for they are reflective of the multi-disciplinary agro-medical involvement. They represent recommendations that each group formulated which they wished to be presented to the Ministers for their observation. An additional committee was selected to review the resolutions and condense them for presentation to the Ministers by the Director General of the Agricultural Center. The condensed resolutions are found in Appendix D. There is good reason to believe that the implementation of these recommendations and resolutions might go far to alleviate the pesticide management problems in El Salvador.

Future Plans - Long Term Training

A long term in-country training program must be established. This was one of the recommendations presented by the committee to the Ministers. After enough pesticide management teams have been established, training and courses must begin on the University level to bring new people into the areas involved. Continuous updating of all concerned must follow, including all laboratory personnel, technical backup, and supporting roles. The formation of a library which has all literature, references and periodicals must be maintained and made available to all. It should be the responsibility of the committee appointed by the Ministers to activate the educational facilities and to implement a long term program. It is planned that UC/-USAID Project members will visit at various times to assist in the intensified training and to help plan an advanced technical seminar for the last few months of 1974.

It should be mentioned that as a result of this seminar, attendees from neighboring countries indicated a strong desire to have similar training and seminars in their countries.

Appendix A. The Seminar Program

SEMINARIO SOBRE EL MANEJO DE PLAGUICIDAS Y PROTECCION DEL MEDIO AMBIENTE

HOTEL CAMINO REAL - SALON EL ROBLE

DICIEMBRE 3-7, 1973

PROGRAMA DE INAUGURACION

LUNES 3 DE DICIEMBRE

Maestro de Ceremonia: Sr. Hildebrando Juárez

1. Himno Nacional
2. Palabras de bienvenida a los participantes al Seminario
Sr. Ricardo Cabezas Rivas
Director General del Centro
de Tecnología Agropecuaria
3. Objetivos del Seminario
Sr. Roberto Llach Hill
Ministro de Agricultura
y Ganadería
4. Palabras de inauguración
Dr. Julio Astacio
Ministro de Salud Pública
y Asistencia Social

LUNES 3 DE DICIEMBRE

8:00 - 9:00 A.M.

Inscripción

9:00 - 10:00 A.M.

Inauguración

10:00 - 10:15 A.M.

RECESO

10:15 - 10:30 A.M.

Introducción al Seminario

Dr. Ray Smith

10:30 - 12:00 M.

Química de Plaguicidas

Dr. Santiago Vilanova

2:00 - 2:50 P.M.

Preside: Dr. Ray Smith

La Quimodinámica

Dr. Virgil Freed

2:50 - 3:30 P.M.

Toxicología de Plaguicidas

Dr. John E. Davies

3:30 - 3:45 P.M.

RECESO

3:45 - 4:45 P.M.

Problemas sobre resistencia, aumento
y su significado en América Central

Dr. R. Elliott

4:45 - 5:30 P.M.

Reunión del Comité Técnico*

* Este Comité estará constituido por los jefes de cada rama y los diferentes oradores del día. Ellos revisaran todas las presentaciones, harán preguntas y revisaran los temas a tratar en la siguiente reunión. Este Comité tendrá tres Presidentes.

MARTES 4 DE DICIEMBRE

Preside: Dr. Santiago Vilanova

8:30 - 9:00 A.M.

Reunión del Comité Técnico

9:00 - 9:40 A.M.

Métodos Instrumentales Cuantitativos Disponibles

9:40 - 10:00 A.M.

RECESO

10:00 - 10:40 A.M.

Contaminación de cosechas alimenticias a consecuencia de plaguicidas

Ing. Octavio Duarte

10:40 - 11:20 A.M.

Aplicación de la Estadística al manejo de plaguicidas

Sr. Oscar Gracias Molina

11:20 - 12:00 M.

Investigaciones sobre residuos en el hombre

Dr. John E. Davies

2:00 - 2:50 P.M.

Preside: Dr. Lou Falcon

Inter-dependencia del acercamiento químico utilizando observaciones de campo y laboratorio poniendo énfasis en la colección de muestras

Dr. Stephen A. Poznanski

2:50 - 3:30 P.M.

Análisis cualitativos de residuos

Dr. Santiago Vilanova

3:30 - 3:45 P.M.

RECESO

3:45 - 4:45 P.M.

Análisis cuantitativos de residuos

Dr. Virgil Freed

4:45 - 5:30 P.M.

Reunión del Comité Técnico

Miércoles 5 de Diciembre

PRESIDENTE: Ing. GUSTAVO DUARTE

8:30 - 9:00 A.M.

COMITE TECNICO - Presentación de Preguntas y
Reposo de los temas del día anterior

9:00 - 10:00 A.M.

Control Integrado y su Implementación
Práctica

Dr. Ray Smith, Director
Proyecto UC/AID Sobre el manejo de
insectos nocivos relacionado con la
protección del medio ambiente
Universidad de California

10:00 - 10:10 A.M.

RECESO

10:10 - 11:10 A.M.

Plaguicidas y Control de Plagas
Integradas - Tejas y México

Dr. P. Adkisson
Universidad de Tejas A and M

11:10 - 12:00 A.M.*

Plaguicidas y Control de Plagas
Integradas - Centro y Sur América

Dr. Lou Falcon
Universidad de California

* LOS ULTIMOS 30 MINUTOS SERAN DEDICADOS A PREGUNTAS Y RESPUESTAS

12:00 - 2:00 P.M.

ALMUERZO

2:00 - 3:30 P.M.

PRESIDENTE: Dr. DAMON BOYNTON

Resistencia y Salud Pública

Dr. Oscar Nave Rebollo, Director
División de Malaria

3:30 - 3:45 P.M.

RECESO

3:45 - 5:00 P.M.

Formulación y Aplicación de Plaguicidas Dr. Virgil Freed

5:00 - 5:30 P.M.

Reunión del Comité Técnico

JUEVES 6 DE DICIEMBRE Preside: Dr. Oscar Nave Rebollo

8:30 - 9:00 A.M.

Reunión del Comité Técnico

9:00 - 10:30 A.M.

Epidemiología del envenenamiento
en el hombre causado por plagui-
cidas

Dr. John E. Davies

10:30 - 10:40 A.M.

RECESO

10:40 - 11:15 A.M.

Fisiopatología de la Intoxicación
con Pesticidas

Dr. Juan José Fernández

11:15 - 12:00 M.

Síntomas y Tratamiento de Envenena-
miento a Causa de Plaguicidas

Dr. Mario Tito Alvarenga

2:00 - 3:20 P.M.

Preside: Dr. L. Harlan Davis

Necesidades de sistemas de inves-
tigación para protección del hombre
y su medio ambiente

Dr. P. Adkisson

3:20 - 3:40 P.M.

RECESO

3:40 - 5:30 P.M.

Nuevas leyes sobre plaguicidas de
1973 y su aplicación

Dr. Santiago Vilanova

5:30 - 6:30 P.M.

Reunión del Comité Técnico

VIERNES 7 DE DICIEMBRE

Preside: Dr. Ray Smith

8:30 - 9:00 A.M.

Reunión del Comité Técnico

9:00 - 10:30 P.M.

Reunión de grupos de trabajo

10:30 - 10:45 A.M.

RECESO

10:45 - 12:30 P.M.

Reunión de Grupos de Trabajo

12:30 P.M.

ALMUERZO BUFFET

2:00 - 3:20 P.M.

Reunión del Comité Técnico

3:20 - 4:00 P.M.

Planes futuros

Dr. H. Hubbard

5:00 - 5:30 P.M.

Presentación de certificados de asistencia

OBJETIVOS DE LOS GRUPOS DE TRABAJO

1. Colaboración y coordinación en el medio agro-médico para el manejo de insectos nocivos.
2. Sistema de control para envenenamiento causado por plaguicidas.
3. Programa sobre investigaciones continuas de residuos.
4. Papel que juega el laboratorio en el manejo de plaguicidas.
5. Formación de los equipos para el manejo de plaguicidas: nacional y del distrito.
6. Seguridad con pesticidas: manejo, almacenamiento, formulación y aplicación.

Appendix B. List of Speakers

CONFERENCISTAS DEL SEMINARIO SOBRE EL MANEJO DE PLAGUICIDAS Y

PROTECCION DEL MEDIO AMBIENTE

- | | |
|--------------------------|--|
| Dr. Ray Smith | Director, Proyecto UC/AID sobre el manejo de insectos nocivos relacionado con la protección del medio ambiente - Universidad de California |
| Dr. Santiago Vilanova | Jefe de la Sección de Química Agrícola, Centro Nacional de Tecnología Agropecuaria, Santa Tecla |
| Dr. Virgil Freed | Director, Instituto de Ciencias sobre la salud del medio ambiente - Universidad de Oregon. |
| Dr. John E. Davies | Profesor y Jefe, Depto. de Epidemiología y Salud Pública - Universidad de Miami |
| Dr. R. Elliott | Asesor en Entomología, Organización Panamericana de la Salud
Apartado 383, Guatemala |
| Ing. Octavio Duarte | Jefe, Departamento del Algodón, Centro Nacional de Tecnología Agropecuaria, Santa Tecla |
| Sr. Oscar Gracias Molina | Jefe de la Sección de Biometría, Centro Nacional de Tecnología Agropecuaria, Santa Tecla |
| Dr. Stephen A. Poznanski | Proyecto UC/AID - Universidad de Miami |
| Dr. Oscar Nave Rebollo | Director, División de Malaria, San Salvador |
| Dr. Lou Falcon | Universidad de California |
| Dr. Mario Tito Alvarenga | Director, Hospital de Usulután
El Salvador |

Dr. Juan José Fernández

Director, Hospital Rosales, San
Salvador

Sr. Roberto Llach Hill

Ministro de Agricultura
y Ganadería, San Salvador

Dr. Julio Astacio

Ministro de Salud Pública y
Asistencia Social, San Salvador

Appendix C. List of Participants

List of Participants

Dr. José Ascención Marínero Cáceres
Médico
Hospital Rosales

Ing. Francisco Monroy Palacios
Ing. Bioquímico
Depto. Tecnología de Alimentos
Universidad de El Salvador

Ricardo Harrison Parker
Ing. en Alimentos
Depto. de Tecnología de Alimentos
Universidad de El Salvador

Dr. Renato Matamoros
Médico
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Appendix D.

Condensed Resolutions Submitted to the Ministers

Introduction

After approximately 30 years of using pesticides in El Salvador, for the first time entities involved with the formulation, handling and application of the same, were brought together. This seminar, which was sponsored by US/AID, Universities of Miami, California and Oregon State, Ministry of Agriculture and Livestock, and the Ministry of Public Health, was held December 3 to 7, 1973, with the participation of approximately 60 persons. The principal objective of this seminar was to learn of the work being done by persons specializing in pesticides as well as to make recommendations from the several integrated working groups to the corresponding fields.

At a meeting held on December 12, 1973, at the Centro Nacional de Tecnología Agropecuaria (CENTA), Dr. Stephen A. Poznanski, Ing. Marcelo Brito, Ing. Germán Rodolfo Morales, Dr. Napoleón Oliva Torres, Dra. Alba Gloria Cañas, Dr. Santiago Vilanova and Ing. Octavio Duarte,

CONSIDERING:

1. That the progress reached by the agricultural industry in the country during the last few years has spread widely the use of pesticides, with the purpose of fighting pests and vectors which affect men, animals and plants.

2. That agricultural technology requires the adequate use of pesticides to obtain high agricultural production.

3. That it is necessary to take measures to protect human health and environment in order to avoid intoxication, persistence and resistance to pesticides.

4. That it is necessary to procure coordination among the involved institutions, namely: Ministry of Agriculture and Livestock, Ministry of Public Health, Ministry of Labor, Salvadorean Social Security, Ministry of

Economy, National University of El Salvador, and private enterprises.

RECOMMENDED ONLY:

To create in a short time by an Executive Decree, an academic body jointly in which the Ministry of Public Health, Ministry of Agriculture, Ministry of Labor, Ministry of Economy, Ministry of Defense, National University of El Salvador and private enterprises are represented, to coordinate, control and execute the legal regulations on pesticides and conservation of the environment. This body should be governed by a board of directors representing all of the mentioned institutions.

THE FUNCTIONS OF THIS BODY WOULD BE:

1. To guide national policies related to pesticide management quality control, determination of pesticide residues, investigation of environmental contamination, new pesticides and similar things.
2. To oversee compliance with Decree No. 315 and to prepare the respective regulations as soon as possible, especially on Chapters VI, VII, VIII, Articles 24, 26, 30.
3. To propose to the appropriate authorities that our country be included in the Codex Alimentarius and analogous bodies, and assure the effective participation of qualified technical personnel in these institutions.
4. To coordinate the laboratory work being carried on in the Republic involving pesticide management (control and investigation).
5. To propose to the national authorities that technicians from Central America and Panamá participate in the elaboration of programs of work of regional bodies such as INCAP and ICAITI, in relation to pesticides; also these would be included proportionally in the permanent personnel of these institutions.
6. In the field of training for persons related to pesticide management, the body would recommend as a fundamental measure, the creation

of a Chair of Toxicology in the Faculty of Medicine of our university. Practical training related to treatment of intoxication should be given to all medical doctors who work in areas where pesticides are used.

7. The body will propose to the Ministry of Public Health that, in the five regions of the country, a control of all intoxicated persons should be carried out and periodically reported to the body in question: also in each one of those regions, a chemist specializing in pesticides, and an agronomist should be added to the medical team. By all methods and to all persons as much as in the field as in the city, knowledge about first aid for treatment of intoxication should be imparted. This recommendation includes pilots.

8. To establish a library where all literature related to pesticides, chemical analyses, treatments for intoxicated persons and the safe use of pesticides should be found. This library should be available to everyone interested.

9. Support the resolution of regional problems on intoxication, persistence and resistance, to avoid serious ecological upsets due to the inadequate pesticide management.

10. Continuously provide training and support in and out of the country to medical doctors, chemists and entomologists. Among the consulting offices we can mention PAHO.

11. To arrange that the Ministry of Health and the Ministry of Agriculture establish immediately a program of investigation and survey (monitoring), of pesticide residues in blood and fatty tissues of persons exposed to intoxication in pesticide management.

Appendix E.
Certificate Presented to Participants

Seminario sobre el Manejo de Plaguicidas y Protección del Medio Ambiente

San Salvador, El Salvador, 3 Diciembre 7 - 1973.

Por la presente Certifica que:

Ha participado en el Seminario sobre el **MANEJO DE PLAGUICIDAS Y PROTECCION DEL MEDIO AMBIENTE**, organizado por la Universidad de California, AID y Universidad de Miami, con los auspicios del Gobierno de El Salvador.

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Ministerio de Agricultura y Ganaderia

.....
Ministerio de Salud Pública

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Representante del A. I. D.

.....
Universidad de California