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END OF TOUR REPORT of E. A. HEINRICHS, Plant Protection Advisor

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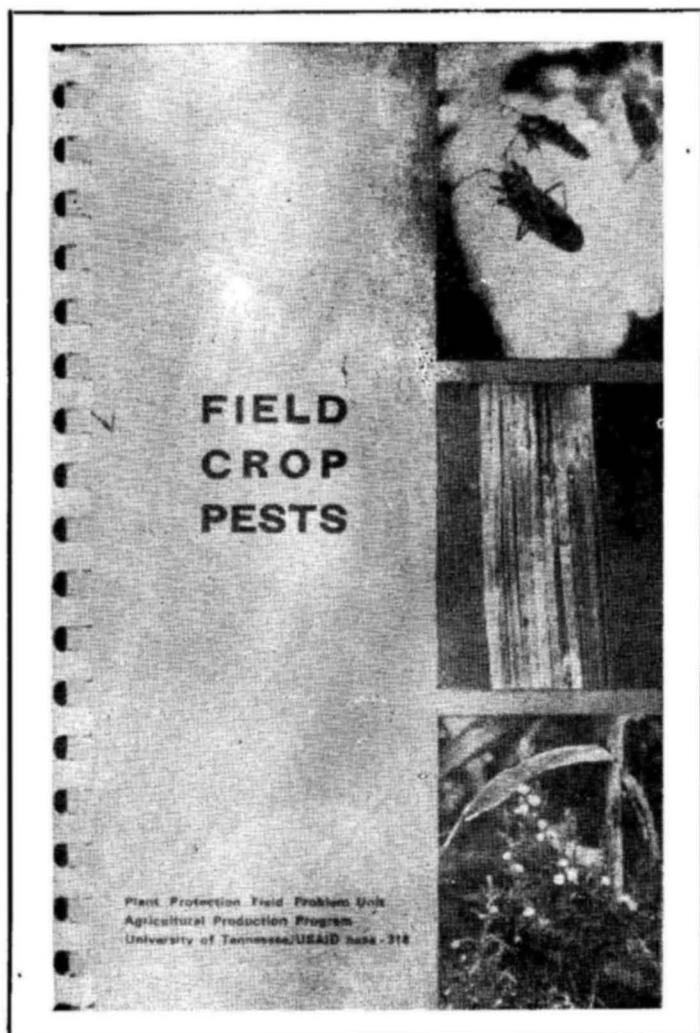
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END OF TOUR REPORT

of

E. A. HEINRICHS

Plant Protection Advisor



UNIVERSITY OF TENNESSEE—U.S.A.I.D.
Agricultural Production Program—Mysore State

April 1972

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*Reproduction of cover page of the publication, " Field Crop
Pests "*

INTRODUCTORY STATEMENT

The opportunity to spend two years in Mysore (March 1970 to April 1972) working with various individuals involved in plant protection has been personally a rewarding and satisfying experience. It has been a pleasure to work under the guidance and leadership of Mr. M. Gist Welling, former Chief of Party and Mr. T. R. Langford, Team Leader. Equally rewarding has been the cooperation and friendship which have developed between myself and all those involved in plant protection in Mysore State.

My counterparts have been Mr. Y. Chandrasekhar, Joint Director of Agriculture (formerly Plant Protection Officer) and Dr. H. C. Govindu, Professor of Plant Pathology at the University of Agricultural Sciences. In addition to these official counterparts there have been many "unofficial" counterparts with whom I have worked closely. To all of these counterparts I express my thankfulness for their excellent cooperation.

If I have any regrets from my tour in Mysore State it is only that I wish I could have served my counterparts better and thus the farmers of Mysore State.

PROJECT PURPOSE

In general terms, the purpose of the Plant Protection Advisor was to identify the problems relating to plant protection which limit the spread and production of high yielding varieties and to assist in solving these problems. The following Operational Work Plan, which was written by my predecessor, was followed and added to in order to achieve the overall objectives:

1. To promote widespread adoption of recommended plant protection practices.
2. To assist in planning and conducting training sessions for all field plant protection staff.
3. To assist in the identification of problems in plant protection and stimulate needed research to find solutions.

4. To demonstrate the feasibility of placing Plant Protection Officers in each State division to make periodic surveys and reports on the current state of pests and diseases.
5. To assist in conducting demonstrations on the latest plant protection equipment available for use in Mysore State.
6. To assist in research to control the shoot fly on hybrid jowar.
7. To assist in the development of systems for use in government godowns and by cultivators in the control of stored grain insects and rodents.
8. To assist in the establishment of a research program to provide more effective pest control recommendations for the high-yielding varieties.

PROGRESS

The objectives as outlined above are in some cases quite general and broad and would require more than two years to successfully complete. However, progress has been made on all objectives listed. The progress made on these objectives and those areas not listed which needed immediate attention is as follows:

1. Production of visual aids to help the Agricultural Extension Worker identify insects, diseases and weeds

A. Kodachrome slides

There is a great need for the extension staff and the farmers to be able to identify insects, diseases, and weeds which limit crop production. Many training programs are conducted by the Department for their own staff and for farmers. Also the Rural Development Training Centers and the University of Agricultural Sciences teach courses in plant protection.

Most of the above listed organizations have few slides or none on plant protection. Since it is very difficult to show the students all of the actual pests under field conditions at one given time and place, Kodachrome slides would be an excellent substitute. With this in mind, I photographed a number

of insects, plant diseases, and weeds. Two categories of slide sets were developed: (1) "Slides on Pests of Field Crops, stored Grains and Beneficial Insects", and (2) "Field Crop Weeds".

Thirty seven copies of the Field Crop Pests and diseases set and 7 copies of the Weeds set have been duplicated. Of these, the Department purchased 30 of the former and 3 of the latter with its funds. These sets have been distributed to the Rural Development Training Centres, Farmers Training Centers, Deputy Directors in each of the 19 districts, and the teaching and extension staff at the University of Agricultural Sciences.

Each set has a syllabus which describes the insect or disease and symptoms of damage produced. The set on weeds has a syllabus providing the user with information regarding: (1) location where the weed grows (dryland, gardenland, wetland), (2) growth habit, (3) morphological characteristics, and (4) flowering time. The weed slide set was developed with the co-operation of Dr. K. S. Krishna Sastry at U. A. S. The set contains 80 of the most important weeds found in field crops in Mysore State.

The set, "Slides on Pests of Field Crops, Stored Grains and Beneficial Insects" is divided into the following categories:

<i>Serial Numbers</i>	...	<i>Description of Slides</i>
1- 30	...	Paddy insects and diseases
31- 60	...	Jowar insects and diseases
61- 64	...	Bajra insects and diseases
65- 77	...	Ragi insects and diseases
78- 90	...	Wheat insects and diseases
91- 95	...	Maize insects and diseases
96-107	...	Sugarcane insects and diseases
108-125	...	Cotton insects and diseases
126-130	...	Groundnut insects and diseases
131-138	...	Castor insects and diseases
139-150	...	Tobacco insects and diseases
151-158	...	Insects of stored grains
159-165	...	Beneficial insects— Parasites and Predators

Most of the above slides are mine, but several have been provided by the Department of Plant Pathology at U. A. S., Ford Foundation, International Rice Research Institute, and the United States Department of Agriculture.

B. Field Crop Pest Manual

There are approximately 5000 personnel involved in agricultural extension in Mysore State. Through my experience in training programs, I realized that these officers need a booklet to carry with them which would aid them in identifying field crop pests. In order to recommend the proper control measures a farmer needs to carry out, the pest should first be properly identified. Since there are so many pests on a variety of important crops, a manual entitled "Field Crop Pests" was printed. The 105 page manual contains 183 colored photos and descriptions. A total of 7250 copies have been printed by BNK Press in Madras. Of these, 4000 were purchased by UT/USAID, Bangalore, 3000 by the Department of Agriculture and 250 by UT/USAID, Coimbatore. The development of the booklet has definitely been a cooperative effort of all members of the FPU.

We have been extremely pleased with the color printing of BNK Press and are certainly satisfied with the result of this project. The table of contents is listed below:

	<i>Page</i>
Paddy Insects and Diseases	1
Jowar Insects and Diseases	17
Bajra Insects and Diseases	29
Ragi Insects and Diseases	33
Wheat Insects and Diseases	41
Maize Insects and Diseases	47
Sugarcane Insects and Diseases	51
Cotton Insects and Diseases	57
Groundnut Insects and Diseases	67
Castor Insects and Diseases	71
Tobacco Insects and Diseases	75
Stored Grain Insects	81
Weeds	85
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The blocks used in printing the manual are available for use by the Department of Agriculture and the UAS. The Kannada Department of UAS is presently writing a Kannada text book on plant protection and plans to use the blocks for printing colored photos to be included therein.

2. Sprayer Maintenance and Repair Training

A very serious problem is the lack of knowledge concerning the proper maintenance and repair of pesticide application equipment. In order to

alleviate this situation the FPU organized four training courses, one in each of the four divisions of Mysore State. District plan protection mechanics, Plant Protection Officers, AEOs, bi-cycle repairmen, and American Peace Corps Volunteers were trained. Tool kits were provided to the mechanics. Instruction was provided by the FPU and various commercial firms.

I was personally pleased with the cooperation of all involved and everyone concerned thought the program was very useful. Many districts have conducted similar programs on their own and some districts are planning programs for this year. For further details of the program refer to the Quarterly Report, January 1 thru March 31, 1971.

3. Pest and Disease Surveillance

Two types of surveillance programs have been started by the Department of Agriculture: (1) an intensive surveillance program on paddy in one block of Mandya district involving one AEO and four VLWs on a full time basis, and (2) an ad-hoc program involving officers of the sugarcane, tobacco, and cotton schemes on a part time basis. The purpose of these programs is four-fold: (1) To detect pest population and disease incidence build ups so as to prevent economically damaging outbreaks; (2) To identify new pest and disease species, (3) To determine the incidence of pests and diseases on various crop varieties, and (4) To obtain data so that after a number of years pest and disease forecasts can be made.

The paddy program started in July 1970 and is still functioning with the original team members. The team is reporting to Bangalore weekly and a great deal of useful information has been received. Further information is available in the Quarterly Report, July 1 to September 30, 1970, and in the Semi-Annual Report, July 1 to December 31, 1970.

The ad-hoc program on sugarcane, tobacco, and cotton has also been fairly successful. Even though this surveillance work is in addition to the normal duties of this special staff, most of the staff members have been reporting and useful information has been obtained.

The success of both types of programs has been hampered by the lack of any one officer at the State level being designated to conduct the programs. This is a full time job and someone qualified to train the staff and analyse the report is necessary to get maximum usefulness from the field reports.

4. Jowar Shootfly Control

The jowar shootfly is the most serious pest limiting the spread of hybrid jowar. Detailed information on the research and trials conducted on the control of the shootfly has been reported in the Quarterly Reports July 1 to September 30, 1970; and January 1 to March 31, 1971; and in the Semi-Annual Reports July 1 to December 31, 1970 and July 1 to December 31, 1971.

A successful and hopefully cheap method of control has been found in the form of carbofuran as a seed treatment. Implementing this procedure has not happened because of import difficulties. One firm planned to supply the Department with the chemical by March 30, 1971, but at this writing none has been received. I hope this difficulty will be overcome because this chemical could revolutionize hybrid jowar production in Mysore.

5. Plant Protection Training Programs

Training programs for the Plant Protection Officers have been regularly conducted twice yearly for the past several years. This training or some form of it should be continued because of the frequent shifting of personnel from one speciality to another. In one of our recent training programs, 40% of the officers were new to the plant protection section and had never attended a plant protection training course. This training, however, should be greatly improved.

Until recently no visual aids and few handouts were provided to the trainees. The training consisted simply of oral presentations. I have attempted to demonstrate the usefulness of visual aids, such as flip charts and Kodachrome slides, and the value of handout material for later reference. I feel that our training programs have greatly improved. However, most of the specialists involved in the training are senior officers and set in their ways and not readily amenable to change. I doubt they will produce their own visual aids in the future.

6. Grain Storage

With the departure of the Agricultural Engineering Advisor, Mr. F. W. Bennett, I became responsible for the grain storage program. This program seemed doomed to failure from the beginning. As planned, asbestos, con-

crete, and steel bins were to be erected at the various Rural Development Training Centers. These were to be filled with grain and data taken monthly to determine the ability of the various structures to maintain grain quality while in storage. After 3 years, only the concrete bin at UAS has provided any data. All of the other bins, if they have been filled at all, were emptied shortly thereafter and the grain sold because of the good market price. This was done in spite of the fact that they had orders from the Directorate to obtain research data from these structures. Several of the concrete tube type bins have been lying where they were dumped two years ago and have yet to be erected. Due to these reasons, plus the fact that most of the Officers who were trained in taking the samples have been transferred, the program has lost momentum and is likely to yield little data of value.

7. Complete Kit of Inputs Program

The "Kit Program" has provided an excellent opportunity for all of the APP advisors to work on one project as a team. The various districts were divided among the advisors and we were responsible for attending distribution functions, field visits, and field days. By visiting the kit plots of various crops in the different districts, I had the opportunity to observe the pest and disease situation. Visits to the kit plots also provided opportunities to discuss plant protection problems with the Departmental officers and the farmers.

RECOMMENDATIONS

1. Surveillance

The pest and disease surveillance program should be strengthened before maximum usefulness will be derived from it. It is weak at the directorate level. An officer with the cadre of Deputy Director should be appointed in charge of the program. He should be provided with at least two assistants; one with M.Sc. degree in Entomology and one in Plant Pathology. The duties of this team would be: (1) training field reporters in the identification of pests and diseases and in reporting procedures, (2) collecting the data of the various surveillance programs over the State and putting it into easily readable form for analyses, such as graphs and tables, (3) cooperating with the information section in the writing of newspaper releases, and (4) participating in meetings such as the annual review of the "Package of Practices".

2. Duties of the Specialists

The entomologist and plant pathologist are the technical persons in the plant protection section. Their duties as outlined in the "Organization and Functions of the Department of Agriculture" are: (1) identify crop pests and diseases; (2) lay out pesticidal trials in RDTCs and Departmental farms, (3) perform regulatory functions; (4) maintain liaison with other entomologists and plant pathologists; (5) prepare control schedules; (6) prepare abstracts from journals; (7) training of in-service personnel and farmers; (8) issue forecasts on pest and disease outbreaks; (9) prepare literature on the identification and control of crop pests, and (10) establish field laboratories at the district and sub-divisional levels.

I believe that much improvement can be made in numbers 2 and 7. The conduct of trials is only of value if the specialists can be present for the application of the chemical and on a regular basis thereafter for recording data. To expect him to conduct these trials on a Statewide basis is too much. A departmental farm near Bangalore should be selected to carry out these trials. Trials on crops which cannot be grown near Bangalore can be carried out on the RDTCs and departmental farms. In any case the number should be limited so that the specialist can give each trial personal attention. One good trial yielding reliable data is worth a hundred on which the data cannot be trusted.

There is also a great need for improving the training of departmental officers who in turn should train the farmer. There should be much more use of visual aids. The department now has a large number of slides. A number of handouts and flip charts should be prepared. The information section is available to help with the production of visual aids and should be used by the specialists.

The existing training courses for Assistant Plant Protection Officers and Assistant Agricultural Officers—Plant Protection, which are conducted twice yearly should be replaced. Instead, an annual training course should be conducted at the directorate. It should be of about four days duration. Instructors should consist of departmental specialists, Plant Protection Officer, Deputy Plant Protection Officer, UAS faculty, and qualified commercial individuals. In this way, instructors who are specialists in a particular field can be called upon for a lecture in their area of interest.

From the list it can be seen that the specialists have a large number of duties. To this list should not be added the duties such as recording stocks

of pesticides in the various districts. I believe the technical knowledge and time of this specialist can better be used elsewhere.

3. Sprayer Repair Training

The sprayer repair training should become a regular feature of the Department's total program. It is heartening to note that the Department has provided funds for spare parts which can be used in this type of training.

4. Transfer of Personnel

If any one item has inhibited progress in plant protection work in Mysore it has been the frequent transfers of officers from one location to another and one discipline to another. The latter of course is the most serious. To properly train a person, who has the level of a B.S. degree in Agriculture, in plant protection takes several years. Just to become familiar with the multitude of pests and diseases and various chemicals available for control is no small task. For a person to do good work he must develop an interest in his job, and to do this takes a knowledge of the field. To place some one in plant protection who is not interested in that area, or to move someone out of plant protection who is interested, is very undesirable and destroys morale. A change in this policy of frequent interdisciplinary transfers would do more to improve the strength of the Department than anything else.

5. Kodachrome Slides of Pests and Diseases

The Department of Entomology and Plant Pathology, UAS, and the Information Section of the Department of Agriculture should add to the existing slide set by taking slides of pests and diseases which are not now included. In addition to field crops, they should include all horticultural crops, an area in which we have practically no identification aids. Both departments have all of the equipment necessary for professional close-up photography which was provided by the Ford Foundation. These slides should then be made available to all agencies concerned with agricultural extension.