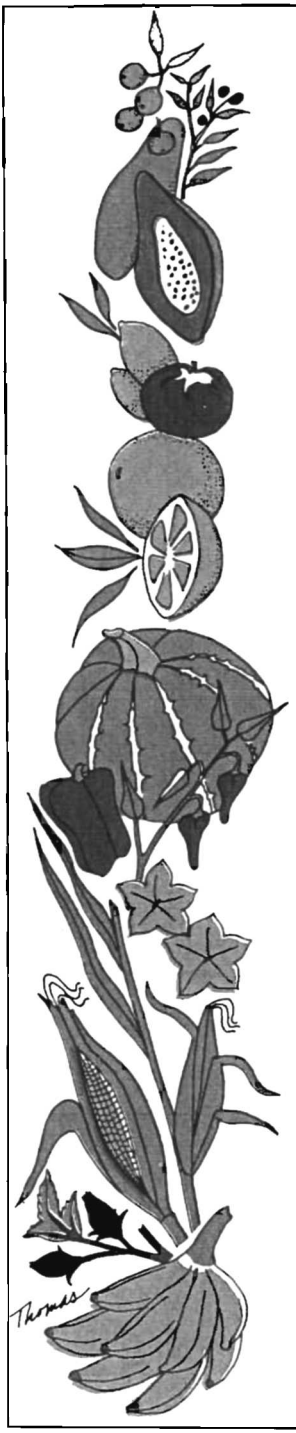

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GOOD LABORATORY PRACTICES FOR IR-4 FOOD USE PROJECTS IN FLORIDA AND PUERTO RICO

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ABSTRACT

The amended Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Good Laboratory Practice (GLP) Standards (40 CFR Part 160) regulations became effective on October 16, 1989. The revisions require all studies submitted to the Environmental Protection Agency (EPA) in support of pesticide registration to be in compliance with the regulations. Tolerances and registrations of pesticides under FIFRA require high standards of data quality and integrity. To assure this, the GLP standards delineate practices and procedures that must be followed during data collection. Residue data are required for obtaining residue tolerances for minor use pesticides in or on food and feed crops. Field researchers from Florida and Puerto Rico, cooperating in the Southern Region of the Interregional Research Project No. 4 (IR-4 Project) minor use pesticide program, have conducted field trials for the magnitude of pesticide residues on minor use crops. From 1989 to 1994, 98 IR-4 supported field trials were conducted under GLPs on tropical crops in Florida and Puerto Rico.

INTRODUCTION

The IR-4 program was established in 1963 and in cooperation with farmers, agriculture scientists (federal, state, and industry), and extension personnel perform the research needed, prepares, and submits petitions to the EPA for the registration or requests for tolerances (legal maximum residue concentration of a pesticide chemical allowed on food or feed), or exemptions of pest control materials on minor crops. Minor crops include food crops, ornamentals and landscape plants, commercially grown flowers, shade trees, and turfgrass. While the total acreage of minor crops is less than eight million acres in the U.S., the combined value of these crops is about $24 billion annually or 40% of all agricultural crop sales (USDA, 1991). Minor uses that involve limited treatments to large acreage crops are also considered. IR-4 receives federal funds from both USDA-Cooperative State Research Service (CSRS) and USDA-Agricultural Research Service (ARS). Participating scientists, consisting mainly of state and federal agricultural researchers, state extension personnel, commodity grower groups, and sometimes private consultants carry out field trials to develop crop safety dataand collect residue samples. These samples are analyzed in IR-4 regional and satellite laboratories at state universities, agricultural experiment stations, and federal analytical laboratories.

The program is coordinated from a headquarters at Rutgers University and the New Jersey Agricultural Experiment Station in New Brunswick, NJ, regional, and ARS laboratories. There are liaison representatives in each state and territory. Crop producers, the agrichemical industry, and the EPA participate in the program. The scope of IR-4 is limited to field testing (effectiveness against the pest(s) and crop safety) plus residue analyses. Core data requirements, such as chemistry, toxicology, and environmental fate, have been completed by the agrichemical registrant. IR-4 proceeds with research after obtaining written approval from the registrant.

APPLICATION OF GLP STANDARDS TO FIELD STUDIES

As the cost of meeting regulatory requirements increased, pesticide registrants concentrated

their registration efforts in areas where they could obtain sufficient economic returns to justify their research and development costs. This resulted in greater registrations of pesticides for the large acreage crops and a lack of availability and variety of pesticides for use on minor crops (IR-4 project statement, 1994). The situation became more critical by the amendments to FIFRA in 1988 (FIFRA, 1988), which require a significant acceleration of the reregistration process for previously registered pesticides.

The purpose of the IR-4 project is to ensure that producers of minor crops have an adequate supply of pest control products (both traditional pesticides and biopesticides). To achieve its objectives, all research (field and laboratory), conducted by scientists cooperating with the IR-4 program, which is to be used in support of a tolerance and registration must follow GLP requirements mandated by the EPA.

The EPA is requiring compliance with the amended FIFRA GLP standards, which were finalized on October 16, 1989, and the Toxic Substances Control Act (TSCA, 1989). Amendment of the regulations expanded the GLP requirements to include field testing, environmental effects testing, and environmental fate testing. They specify minimum practices and procedures that must be followed to ensure the quality and integrity of data submitted to the EPA in support of a research or marketing permit for a pesticide product. Under the GLP regulations studies should be conducted according to scientifically sound protocols with detailed attention to quality control. These studies must be done as written in the protocol, and theresults accurately reported. Townsend (1992) stated that the most compelling reason the EPA applied the GLP standard to the agrichemical industry was the result of a new and subtle type of public activism that demands accountability, and they were inevitable since compliance is a public demand.

The EPA originally published the FIFRA GLP standards in the Federal Register of November 29, 1983 (40 CFR Part 160). Under these regulations, the EPA only required GLP compliance under FIFRA for health effects testing. At the same time, the EPA published GLP standards applicable to testing required under TSCA (40 CFR Part 792). In the preamble to the publication of the 1989 FIFRA GLP final rule, it was stated that these regulations were promulgated in response to investigations by the EPA and the Food and Drug Administration (FDA) in the mid-1970's which revealed that some studies submitted to the Agencies had not been conducted in accordance with acceptable laboratory practices. Some examples included that they did not adhere to specified protocols, were conducted by underqualified personnel and supervisors, were not adequately monitored by study sponsors, and results were selectively reported, underreported, or fraudulently reported.

IR-4 FOOD USE PROJECTS IN FLORIDA AND PUERTO RICO

IR-4 has established procedures for study conduct to comply with the GLPs. Each study has an approved protocol and the magnitude of the residue in or on the commodity must be determined according to the EPA's Pesticide Assessment Guidelines, Subdivision O (Schmitt, 1982), and following the EPA's data requirements and GLP standards. Subdivision O describes protocols that may be used to perform food, feed, or tobacco residue testing to support the registration of pesticides under the Federal Food, Drug, and Cosmetic Act (FFDCA) and FIFRA. These data are used to estimate the exposure of the general population to residues in food and to establish and enforce tolerances for pesticide residues in food and feed.

40 CFR Part 160.120(a) states that the approved written protocol must "clearly indicate the objectives and all methods for the conduct of the study." The IR-4 protocols are used for planning and executing studies, and consist of field trials and laboratory analyses. They include the establishment and maintenance of test plots; procurement, storage, and application of test chemicals; collection, storage, and shipment of samples for analysis; laboratory sample storage and preparation; acquisition of reference standards; analytical methodology; disposition of samples; documentation and recording keeping; reporting and archiving of data.

Each IR-4 field/laboratory researcher has a set of Standard Operating Procedures (SOPs) which are required under GLP regulations. These are written procedures for routine operations that trained personnel must follow to ensure the quality, integrity, and consistency of the work performed during a study. Together with the protocol they assure that studies are conducted with good planning, proper execution, and complete documentation. SOPs are written for all technical functions and for all other functions required by the GLP regulations. They aid in training, eliminate some supervision, and add consistency and uniformity to data generation. The GLP regulations require "management" to approve all SOPs and be satisfied that these procedures ensure the quality and integrity of the data generated during a study. The study director must ensure that the SOPs are followed or deviations from the SOPs are properly documented.

Testing facilities are mandated to establish a quality assurance unit (QAU) which has the responsibility for monitoring each study for conformance with the regulations. Commitment of management is necessary in implementing a successful GLP program, and the IR-4 technical committee has provided resources for maintaining a QA program. The QAU is defined in 40 CFR Part 160.3, as "any person or organizational element, except the study director, designated by testing facility management to perform the duties relating to quality assurance of the studies." IR-4 has established a QAU, consisting of a QA officer at headquarters, regional QA officers, laboratory QA officers, and other QA personnel as required. Members of the QAU are responsible for educating and training the field and laboratory personnel performing IR-4 trials on the GLP standards. They also conduct annual facilities inspections at all IR-4 test locations, inspect critical phases of each study at intervals adequate to ensure the integrity of the study, review the final report to assure that it accurately reflects the raw data of the study and prepare a signed statement noting dates the inspections and findings were reported to management and the study director (Operational Handbook of IR-4, 1993). All other requirements under 40 CFR Part 160 are monitored to ascertain data integrity.

Florida and Puerto Rico are within the southern region of IR-4. Due to the low acreage used on tropical crops, and few incentives for chemical companies to register pesticides for minor crops, there is a lack of availability and variety of pesticides for use on these crops. Growers may face the loss of many needed pesticide uses without the assistance of IR-4, which is the only publicly supported research program in the U.S. created to clear and maintain pest management agents for minor uses (IR-4 Project Statement, 1994). IR-4's contribution to clear pest control agents is important fortropical crops, and the program has generated and is developing data for residue trials in these areas. The following is a list of field trials, for tropical crops, conducted in Florida and Puerto Rico since the GLP regulations have been in effect.

IR-4 SUPPORTED FIELD TRIALS CARRIED OUT ON TROPICAL CROPS ACCORDING TO GLP's IN FLORIDA AND PUERTO RICO 1989-1994

	Crop	Pesticide
Fungicides	Guava	Ferbam
	Mango	Chlorothalonil
	Papaya	Chlorothalonil, Metalaxyl
	Sugar Apple	Metalaxyl
	Nonbell Pepper	Triadimefon
Insecticides	Atemoya	Chlorpyrifos, Malathion
	Avocado	Hexakis, Permethrin
	Mango	Esfenvalerate, Malathion
	Papaya	Malathion
	Passion Fruit	Esfenvalerate, Malathion
	Pineapple	Esfenvalerate, Malathion
	Sapote, Mamey	Carbaryl, Malathion Methidathion
	Coffee	Carbaryl, Chlorpyrifos, Cyhalothrin, Fluvalinate
	Pigeon Pea	Esfenvalerate
Herbicides	Arracacha	Ametryn
	Cassava	Ametryn, Glyphosate Sethoxydim
	Tanier	Ametryn, Fluazifop Paraquat, Sethoxydim
	Yam	Ametryn, Fluazifop Glyphosate, Sethoxydim
	Banana	Oxyfluorfen
	Pineapple	Fluazifop, Quizalofop
	Calabasa	Clomazone, Oxyfluorfen Paraquat
	Coffee	Fluazifop, Quizalofop
	Pigeon Pea	Fluazifop, Glyphosate
	Pepper Nonbell	Clomazone, Fluazifop Oxyfluorfen

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