

PREFACE

This 2007 edition of the Mosquito Control Training Manual marks the third revision of the manual published originally in 1978 by the Louisiana Mosquito Control Association (LMCA). The manual continues to be a product of a concerted effort by a group of LMCA members who volunteered their time and effort to review, update, and expand the 1993 version.



C. Lamar Meek

However, one key figure missing from the production of this manual is Dr. Lamar Meek, the individual responsible for the last two revisions. The LMCA therefore wishes to dedicate this manual in his memory. There is a fitting tribute to Lamar included with Chapter 2.

This manual is directed primarily to individuals who wish to become certified as commercial pesticide applicators in Category 8A Mosquito Control, by passing a standard test administered by the Louisiana Department of Agriculture and Forestry (LDAF). The main purpose of the manual is to provide a source of information, which can be used to prepare for the test. It is not the intent of this manual to provide all of the information necessary for one to become an authority in mosquito control. Only extensive knowledge of mosquito biology, epidemiology, control strategies, and years of field experience involving mosquito control operations can give one that level of competence. However, once certified, an individual becomes a part of the public health team and is

charged with the responsibility of implementing his training to effect control of those mosquitoes that cause irritation and, more importantly, transmit pathogens within human and domestic animal populations. These duties must be accomplished in a manner that is effective, economical, and environmentally sound.

Another purpose of this manual is to serve as a source of information and reference concerning mosquito biology, identification, sampling techniques, control strategies, disease cycles, et cetera. A variety of mosquito abatement subjects are discussed in this manual, and many have been expanded since the 1993 revision. These updates include current biological information on mosquitoes, newly developed management tactics, innovative sampling techniques, recent introductions of mosquito species into Louisiana, et cetera. Photographs and/or line drawings have been used extensively throughout the manual to enhance and clarify the subject matter.

As a final note, the historical information provided in Chapter 2 gives the use of this manual a perspective of organized mosquito control in Louisiana. Questions on the Category 8A exam will not come from Chapter 2.

Respectfully submitted,

Coeditors

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TABLE OF CONTENTS

Preface	3
List of Figures and Tables	5
List of Contributors	6
Acknowledgements	7
LMCA Mission Statement	8
Chapter 1: Introduction	9
Chapter 2: History of Mosquito Control in Louisiana	10
Chapter 3: Mosquitoes and Human Diseases	21
Chapter 4: General Structure	32
Chapter 5: Bionomics and Recognition of Important Species	36
Chapter 6: Organization and Principles of Mosquito Control	49
Chapter 7: Mosquito Sampling and Surveillance	51
Chapter 8: Chemical Control of Mosquitoes	56
Chapter 9: Physical Control of Mosquitoes (Source Reduction)	64
Chapter 10: Biological Control of Mosquitoes	66
Chapter 11: Cooperative Mosquito Control	71
Chapter 12: Laws Affecting Pesticides in Louisiana	75
Chapter 13: Special Projects in Mosquito Control	78
Internet Resources	85
Illustrated Key to Common Mosquitoes of Southeastern United States	86

LIST OF FIGURES AND TABLES

- Fig. 1** Dr. Edward S. Hathaway (1886 - 1984) p. 10
- Fig. 2** Anderson B. Ritter (1904 - 1968) p. 11
- Fig. 3** Graves of yellow fever victims, p. 12
- Fig. 4** Lab staff at Mound, LA (1920) p. 13
- Fig. 5** Pioneer mosquito control workers, p. 14
- Fig. 6** C. Lamar Meek (1944 - 2000) p. 19
- Fig. 7** WNV age associated disease & fatalities, p. 22
- Fig. 8** Human SLE in U.S. (1964 - 2005) p. 24
- Fig. 9** Human EEE in U.S. (1964 - 2005) p. 25
- Fig. 10** Human WEE in U.S. (1964 - 2006) p. 25
- Fig. 11** Human LAC in U.S. (1964 - 2006) p. 26
- Fig. 12** Venezuelan virus transmission cycle, p. 26
- Fig. 13** Dengue worldwide distribution, p. 27
- Fig. 14** Malaria worldwide distribution, p. 28
- Fig. 15** Malaria parasite life cycle, p. 28
- Fig. 16** Dog heartworm life cycle, p. 29
- Fig. 17** WNV and SLE cycle, p. 30
- Fig. 18** EEE transmission cycle, p. 31
- Fig. 19** Mosquito life cycle stages, p. 34
- Fig. 20** Mosquito head and mouthparts, p. 35
- Fig. 21** Typical mosquito breeding habitats, p. 43 - 44
- Fig. 22** Important mosquito species in LA, p. 45-46
- Fig. 23** Conducting landing rate counts, p. 52
- Fig. 24** Dipping for mosquito larvae, p. 53
- Fig. 25** Ovitrap or little black jar (LBJ) p. 54
- Fig. 26** Typical inspection supplies, p. 54
- Fig. 27** Aspiration, p. 55
- Fig. 28** CDC light trap, p. 55
- Fig. 29** New Jersey light trap, p. 55
- Fig. 30** Hourly rotational trap, p. 55
- Fig. 31** Omni-Directional Faye-Prince trap, p. 55
- Fig. 32** Gravid trap, p. 55
- Fig. 33** Hand-held spray tank, p. 59
- Fig. 34** Thermal fog generator, p. 59
- Fig. 35** Ground ULV application, p. 60
- Fig. 36** Aerial ULV application, p. 60
- Fig. 37** Helicopter ULV application, p. 63
- Fig. 38** ATV barrier application, p. 63
- Fig. 39** Backpack spraying, p. 63
- Fig. 40** ULV hand fogging, p. 63
- Fig. 41** Granular larviciding, p. 63
- Fig. 42** *Gambusia affinis* mosquito fish, p. 67
- Fig. 43** Cyclopoids copepod, p. 68
- Fig. 44** *Toxorhynchites* larvae, p. 69
- Fig. 45** B.t.i. granules, p. 70
- Fig. 46** Altosid pellets and briquets, p. 70

TABLES

- Table 1.** WNV disease and death in U.S. & LA, p. 22
- Table 2** Biological data on LA mosquitoes, p. 47
- Table 3** Ecological data on LA mosquitoes, p. 47
- Table 4** Mosquitoes in LA & relative importance, p. 48
- Table 5** Conversion Factors & Calculations, p. 77

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ACKNOWLEDGEMENTS

The co-editors wish to thank the Louisiana Mosquito Control Association (LMCA) and the Board of Directors for its assistance, encouragement and financial support that made possible this revision of the training manual. Many members of the LMCA are to be commended for their efforts in revising and rewriting their respective chapters. A list of those who contributed can be found at the end of this acknowledgement.

A special thanks is extended to Dr. Robert C. Lowrie for his tireless effort in reviewing and editing the final transcripts. Dr. Lowrie served on the LMCA Board for many years and he is a past recipient of the LMCA Hathaway - Ritter distinguished achievement award given in recognition of outstanding contributions to the cause of mosquito control in Louisiana. He is retired from the Tulane National Regional Primate Research Center and now resides in Georgetown, TX. His willingness to take on this task is a testament to his service to the association over the years.

Our sincere appreciation goes out to Charlie Anderson, retired from Louisiana Department of Health and Hospitals and a Past LMCA President and longtime Board Member, for his service. Mr. Anderson was the first reviewer of all chapters.

Thanks also go out to Scott Willis, Scott Harrington and Lucas Terracina for committing their time and energy towards the completion of this revision. Many hours were spent retyping each chapter and organizing charts and images for the manual. Calcasieu Parish Mosquito Control is also to be commended for allowing these individuals time to work on this project.

We express our gratitude to Dr. Dawn Wesson who initially took on the task of revising this manual and to Mark Fox, for revising the key. Both are from Tulane University.

The following individuals are to be commended for their contributions in revising the chapters: Charlie Anderson, Ed Bordes, Mike Carroll, Guy Faget, Mary Grodner, Roy Hayes, Robert Lowrie, Gerald Marten, Max Meisch, Chuck Palmisano, Steve Sackett, Lucas Terracina, Rod Wells, Dawn Wesson and Matt Yates.

Special thanks goes to Doug Fischer for his desktop publishing skills. We appreciate his patients, time and commitment in completing this edition of our training manual.

DISCLAIMER

This training manual was written for individuals preparing for certification in Category 8A-Mosquito Control and for general reference and review of mosquito biology, ecology, and control. Mention of a pesticide, by common or trademark name, or any commercial product does not constitute a specific recommendation or an endorsement for sale or use by the LMCA, the LSU Agricultural Center, or the Louisiana Department of Health and Hospitals (formerly, Louisiana Department of Health).

LMCA MISSION STATEMENT

To carry on, to support and to encourage research on the biology of mosquitoes and on the methods for their control, with special reference to those methods which are practicable under conditions existing in Louisiana, and which are, so far as possible, conducive to the welfare, not only of man and his domestic animals and cultivated plants, but also of the natural vegetation and animal life of the State.

To encourage and to assist in the formation and development in Louisiana of local and parish mosquito control organizations.

To carry on and to aid other organizations (local, parish, state and national) in carrying on mosquito control programs.

To procure funds and to aid other organizations in procuring funds, both private donations and by taxation, to support mosquito control research and control operations.

To promote the training of personnel for mosquito control work.

To disseminate knowledge of mosquitoes and of methods for their control to the general public and to workers in mosquito control programs, both within the state and elsewhere.

To promote friendly, cooperative relations between different communities within the state and between Louisiana and neighboring states, in the interests of effective, coordinated action in the attempt to solve their common problems of mosquito control.

To do each and every thing necessary, or proper for the accomplishment of any of the purposes or the attainment of any one or more of the objects herein enumerated, or which shall, at any time appear conducive to, or expedient for the benefit of this corporation.



The LMCA has established several academic scholarships within the field of mosquito control and research. Scholarships are available to college students in Louisiana, Arkansas, Mississippi, Oklahoma and Texas. For information: Visit the LMCA website at www.lmca.us



Chapter 1

INTRODUCTION

Mosquitoes are one of the major scourges of mankind. They have rendered vast areas of the world unusable by the ferocity of their attacks and by causing illnesses of great dimension where man has ventured upon the mosquitoes' home turf. Most sportsmen, farmers, lumbermen, oil-field workers, and other outdoorsmen are familiar with the irritation and annoyance of mosquitoes. Frequently, outdoor sport or business pursuits must be cut short or deferred until the peak of mosquito broods is past. Domestic animals and wildlife do not escape severe harassment from unrelenting, bloodthirsty mosquitoes even to the point of death from loss of blood or suffocation. In areas where mosquito broods follow preceding ones closely, land values may be permanently depreciated.

In the continued era of rapid technological advancement and environmental awareness, mosquito control has matured significantly. Yesterday's slow and laborious manual ditching to achieve drainage has been replaced by machinery capable of doing the work of 50 men with shovels. Powered spraying equipment mounted on trucks, all-terrain vehicles, or aircraft have generally replaced men in waders tramping throughout woods and wetlands muscling knapsack or trombone sprayers. Global Positioning System (GPS) and Geographical Information System (GIS) tracking have assisted all phases of operations allowing for more complete mapping, disease monitoring and pinpoint application. Couple this with the modern computerized flow control spray technologies and you have a much more cost-effective control program. Laboratory-synthesized pesticides and biological control agents continue to increase the effectiveness of mosquito killing while sparing non-target organisms and delicate ecosystems.

Since second- and third-generation organic pesticides now in use exhibit considerable acute toxicity, the workmen mixing and spraying these materials must be thoroughly familiar with safety procedures. Protective clothing minimizes dermal (skin) absorption, respirators and air-supplied masks reduce or prevent respiratory exposure, while enlightened personal habits reduce the likelihood of oral (mouth) exposure. Frequently laundered clothing along with habits of personal cleanliness is stressed in ensuring a minimum of hazards from frequent association with pesticides. Safety of the mosquito-control operator is an ongoing matter of major concern.

Integrated pest management (IPM) is now a standard in modern mosquito control. Simply stated, IPM means combining the most effective methods for achieving mosquito control. These include the use of chemical pesticides, biological agents (predators, parasites, and pathogens), and physical control (alteration of mosquito breeding sites by draining, impounding, consolidating, or filling water-holding areas). Needless to say, the operational personnel responsible for mosquito abatement possess more knowledge of their subject than their predecessors. Not only is this desirable, but it is also mandated by federal law, the Federal Insecticide, Fungicide and Rodenticide Act as amended (FIFRA), and state law (Louisiana Pesticide Control Act of 1975). Therefore, persons applying pesticides in public health programs must show competency (become certified) by passing written examinations covering their activity, or work under the direct supervision of someone who has. This manual provides the information necessary for one to prepare to meet certification requirements.