ENVIRONMENTAL PROTECTION AGENCY'S PESTICIDE ENVIRONMENTAL STEWARDSHIP PROGRAM

APARTNERSHIP STRATEGY DOCUMENT A

for the

AMERICAN MOSQUITO CONTROL ASSOCIATION

2200 E. Prien Lake Rd.
Lake Charles, LA 70601
318-474-2723
FAX: 318-478-9434
E-mail amcaintlhq@aol.com

January 9, 1997

I. INTRODUCTION TO STRATEGY DOCUMENT. This Pesticide Environmental Stewardship Program (PESP) AStrategy Document@ is intended to describe the current policies and organizational structure of the American Mosquito Control Association (AMCA) (see attached flow chart with description of pertinent committees) and present a brief overview of the general control practices of its members. This document will also describe how the AMCA will strive to improve its ongoing policy of encouraging environmental stewardship by its members. In the future, reducing pesticide risk will be accomplished through the AMCA promoting the continued responsible use of mosquitocides. Also, the judicious use of pesticides will be encouraged.

II. OVERVIEW OF THE AMERICAN MOSQUITO CONTROL ASSOCIATION. The AMCA, a non-profit, technical, scientific and educational association, is international in scope and is made up of mosquito workers, entomologists, medical personnel, engineers, public health officials, industry representatives, military officers and personnel and laymen who are charged with, or interested in, the biology and control of mosquitoes and others vectors. The purpose of the AMCA is to:

A. Promote closer cooperation among those directly or indirectly concerned with, or interested in mosquito control and related work.

B. Work for the highest standards of efficiency in such work.

C. Encourage further research; to disseminate information about mosquitoes and their control.

D. Work for understanding, recognition and cooperation from public officials and the public.

E. Encourage the enactment of legislation providing for a sound, well balanced program of mosquito control work suited to local conditions wherever needed.

F. Meet fairly and understandingly, and thus reconcile potential differences with those who might oppose mosquito control practices.

G. Protect wildlife from avoidable harm and to seek control methods compatible with and/or which enhance environmentally sensitive habitats.

H. Work for the highest degree of understanding and cooperation with related organizations, to the end that the best interest of all may be most fully served.

I. Publish the JOURNAL OF THE AMERICAN MOSQUITO CONTROL ASSOCIATION, a scientific, peer-reviewed journal, in the furtherance of these objectives.

The above-mentioned AMCA goals are consistent with those of the PESP program, of which the AMCA is now a **A**Partner**@**. PESP advocates the development and implementation of specific use/risk reduction strategies that include reliance on biological pesticides and other approaches to pest control, that are considered to be safer than traditional chemical methodologies. Reduced pesticide risk and use are to be employed where practicable and effective.

Reducing pesticide risk can be accomplished in a variety of ways that are proposed and discussed below. Reducing pesticide use, even though it is a worthwhile long-term goal, is one which mosquito control as a whole may not be able to accommodate soon to any significant degree. Some of the reasons include: 1) Mosquito production is due, virtually entirely, to environmental factors - rainfall, tidal events, agricultural and wetland irrigation. These factors are outside the control of mosquito control agencies but are factors which usually result in the need for chemical applications to control resulting mosquito broods, 2) Mosquito control, unlike many other industries using pesticides, is in the unique position of having to deal with insect problems with both nuisance and public health implications. This is a situation that is exacerbated with the trend of exotic mosquito species being introduced into the U.S. that are capable of transmitting diseases (*e.g., Aedes albopictus*). Using pesticides is usually the only way to quickly respond to a public health problem posed by mosquito transmission of a pathogen. 3) Nationwide, residential development is increasingly encroaching in and around environmentally sensitive habitats (*e.g.*, fresh and saltwater wetlands, newly created wetlands) and agricultural areas with both types of locations frequently producing huge mosquito populations. People who live near these areas are affected by high mosquito populations. An increasing burden of mosquito control agencies is to provide needed mosquito control to these persons who are entitled to these services.

III. POTENTIAL PROBLEMS FACING MOSQUITO CONTROL NATIONWIDE.

A. RELATIVELY SMALL PESTICIDE MARKET. Mosquito control is also in the extremely difficult position of being a relatively small market so there is little economic incentive for chemical companies to spend tens of millions of dollars to develop and label new chemical products for our needs. If a new product becomes available to mosquito control, it typically is because the material has mosquito control applications in addition to the primary reason for which it was developed (*e.g.*, agriculture, urban pest control). However to mosquito control's benefit, recent passage of the Food Quality Protection Act by Congress, aided by AMCA efforts, will help to assure that valuable public health pesticides are not lost through a lack of registrant support or unwillingness to pay for the risk assessment studies because the mosquito control market is too small. Over the past several years, the AMCA has

been working to provide the EPA with pertinent information as mosquito control chemicals are reviewed for reregistration. In this continuing process, the AMCA looks forward to its Apartnership@ status to aid with this important work.

B. MOSQUITO RESISTANCE. Additionally, insects have the innate ability to stay one step ahead of us by developing resistance to the relatively few products available. Therefore, it is extremely important to the mosquito control industry that the current labels for approved chemicals be maintained and encouragement be provided for research and development of new products for the future that are consistent with our environmental stewardship goals. Practicing resistance management techniques that attempt to minimize the risk of mosquitoes becoming resistant to the existing chemicals will undoubtedly become increasing important. Such management techniques can include not using sublethal amounts of insecticides and the rotating/alternating of available chemicals.

IV. OVERVIEW OF A ATYPICAL@ MOSQUITO CONTROL PROGRAM. While it is not possible to provide a concise, generic overview of all mosquito control programs in the United States, there are certain program components that virtually all operational programs include. U.S. mosquito control agencies typically employ an Integrated Pest Management (IPM) approach to their control efforts. Such a Atypical@ IPM program will use a combination of resource management techniques such as source reduction (=permanent control), larviciding and adulticiding to control mosquito populations with control decisions being based on surveillance data. Biological control is also used to some extent by some U.S. programs. These control measures are necessary during routine pest mosquito outbreaks and the occasional situation of an epidemic of a mosquito-transmitted pathogen. Also, continuing education, for both employees and the general public, are important components of most mosquito control programs. This has resulted in a better informed public and an increased professionalism among mosquito control workers where significant progress has been made in attempting to reduce pesticide use and risk.

A. SOURCE REDUCTION. Source reduction (the removal or reduction of larval mosquito habitats) typically is the most effective and economical long-term method of mosquito control. Source reduction can be as simple as overturning a discarded bucket or disposing of a waste tire to complex water level manipulations in marshes. These efforts often minimize and/or eliminate the need for mosquito larviciding in the affected habitat and greatly reduces adulticiding in nearby areas. Source reduction includes numerous activities including the removal of waste debris (sanitation), Impoundment Management and Open Marsh Water Management (OMWM) all of which should be properly planned based on adequate surveillance data.

1. SANITATION. Discarded containers and tires are capable of producing mosquitoes, including species that can transmit several mosquito-transmitted pathogens. Sanitation/removal of debris is a continual process of eliminating such man-made mosquito breeding locations. Typically, such mosquito control related sanitation efforts are best accomplished by individuals who through their own carelessness, create mosquito breeding sites that frequently affect their homesites. Many mosquito control agencies include education programs so that individuals may be taught the mosquito control importance of sanitation.

2. **IMPOUNDMENT MANAGEMENT.** Impoundments are salt-marsh mosquito-producing marshes around which dikes were constructed thus allowing water to be pumped onto the marsh surface from the adjacent estuary. This eliminates salt-marsh mosquito ovipositional opportunities on the impounded marsh and effectively reduces their populations. 40,000 acres of impoundments were constructed on Florida's east coast and over the past 15 years a concerted effort has been made to manage these marshes for both mosquito control and natural resource interests. Rotational Impoundment Management (RIM) is the technique developed to minimally flood the marsh during the summer months and then use flapgated culverts to reintegrate impoundments to the estuary for the reminder of the year thus allowing the marsh to provide many of its natural functions. However, while impoundments usually, adequately control salt-marsh mosquitoes, there are situations where impoundments can collect stormwater or rainwater thus create freshwater mosquito problems.

3. **OPEN MARSH WATER MANAGEMENT (OMWM).** Ditching as a source reduction mosquito control technique has been used for many years. A salt marsh source reduction technique that is applied in some coastal areas of the U.S. is Open Marsh Water Management. OMWM is a technique whereby mosquito producing locations on the marsh surface are connected to deep water habitat (*e.g*., tidal creeks, deep ditches) with shallow ditches. Mosquito broods are thus controlled without pesticide use by allowing larvivorous fish access to mosquito-producing depressions or conversely the draining of these locations occurs before adult mosquitoes can emerge. OMWM can also be a technique whereby hydrological connection between the marsh and estuary is improved providing natural resource enhancement as well as mosquito control benefits. The use of shallow ditching (ditches approx. 3 ft. or less in depth rather than the deep ditching used in years past) is considered more environmentally acceptable because with shallow ditches, less unnatural hydrological impacts occur to the marsh.

   Recently, aggressive interagency efforts in both impoundment management and OMWM have been made by mosquito control agencies in association with environmental resource agencies and private organizations in coastal states, to very successfully manage salt marshes for *both* mosquito control and natural resource concerns.

B. LARVICIDING. Larviciding, the application of chemicals to kill mosquito larvae or pupae by ground or aerial treatments, is typically more effective and target specific than adulticiding, but less permanent than source reduction. Several materials in various formulations are labeled for mosquito larviciding including the organophosphate temephos (Abate), several **A**biorational@ larvicides - *Bacillus thuringiensis israelensis* (*Bti,* a bacterial larvicide), *Bacillus sphaericus* and methoprene (Altosid, an insect growth regulator), and several oils (Golden Bear-petroleum based and Bonide-mineral based) and in some limited habitats diflubenzuron (Dimilin, a chitin synthesis inhibitor).

Important goals when applying larvicides are that the material should be specific for mosquitoes, minimize impacts to non-target organisms and must, in many instances, be capable of penetrating dense vegetative canopies. Larvicide formulations (*e.g*., liquid, granular, solid) must be appropriate to the habitat being treated, accurately applied and based on surveillance data. An effective larviciding program is an important part of an integrated mosquito control operation. Accuracy of application is important since missing even a relatively small area can result in the emergence of a large mosquito brood resulting in the need for broad-scale adulticiding.

C. ADULTICIDING. Adulticiding, the application of chemicals to kill adult mosquitoes by ground or aerial applications, is usually the least efficient mosquito control technique. Nevertheless, adulticiding based on surveillance data is an extremely important part of any IPM program. Adulticides are typically applied as an Ultra-Low-Volume (ULV) spray where small amounts of insecticide are dispersed either by truck-mounted equipment or from fixed-wing or rotary aircraft. Ground or aerial applied thermal application of adulticides is also used in some areas but to a much lesser degree.

Barrier treatments, typically applied as high volume liquids with hand-held spray equipment using compounds with residual characteristics such as permethrin are common in some U.S. locations and their use is growing. This technique is especially attractive to individual homeowners living near mosquito producing habitats where residual chemicals applied along a property border can provide some control benefits to the residents.

Mosquito adulticiding differs fundamentally from efforts to control many other adult insects. For adult mosquito control, insecticide must drift through the habitat in which mosquitoes are **A**on-the-wing@ (*i.e*., flying - frequently in residential areas) in order to provide optimal control benefits. However, this technique also lends itself to the criticism that non-target organisms can be impacted by these control measures. While this is a constant consideration for control programs, especially those relying heavily on aerial adulticiding, experience demonstrates that adulticides when properly applied, have minimal effects on non-target organisms and provide an important benefit to the local economy and its citizens.

Adulticides labeled for mosquito control include several organophosphates - malathion, naled, chlorpyrifos and fenthion. Some natural pyrethrins, synthetic pyrethroids (permethrin, resmethrin and sumithrin) and a carbamate (bendiocarb) also hold adulticide labels.

D. BIOLOGICAL CONTROL. Biological control (=biocontrol) is the use of biological organisms, or their by-products, to control pests, in this case insect pests. Biocontrol is popular in theory because of its potential to be host-specific with virtually no non-target effects. Overall, larvivorous fish are the most extensively used biocontrol agent for mosquito control. Predacious fish, typically *Gambusia* species, which occur naturally in many aquatic habitats, can be placed in permanent, or semi-permanent, water bodies where mosquito larvae occur providing some measure of control. Other biocontrol agents have been tested for use by mosquito control but to

date are generally not operationally feasible. These include the predacious mosquito *Toxorhynchites*,

predacious copepods, the parasitic nematode *Romanomermis* and the fungus *Laegenidium giganteum*. Biocontrol certainly holds a possibility of becoming a more important tool and playing a larger role in mosquito control in the future. On-going research is essential in order for this to occur.

V. RECENT AMCA ENVIRONMENTAL STEWARDSHIP PROGRESS. Over the past 10-15 years, the mosquito control community, with considerable encouragement from the AMCA, has made great strides in making environmental stewardship an important program consideration. This is evidenced nationwide by initiatives including:

A. The implementation of numerous **SOURCE REDUCTION** projects in environmentally sensitive habitats (*e.g.*, salt marshes) that enhance the natural resource, as well as mosquito control.

B. The increased use of the biorational products *Bti*, *Bacillus sphaericus* and insect growth regulators for **LARVICIDING** with applications being made based on accurate, scientifically valid surveillance.

C. Progress in improving the techniques used for **AERIAL ADULTICIDING**, applications of which, like larviciding, are based on careful surveillance.

D. **CONTINUING EDUCATION** programs to thoroughly train mosquito control personnel (from field workers to senior management) about all aspects of mosquito control.

E. **PUBLIC EDUCATION** programs to educate both children and adults about mosquito control and informing them about what measures they can take to help themselves (*e.g.*, waste container disposal). This dedicated effort has greatly enhanced the level of professionalism within the industry with more concern being given to environmental considerations.

F. **COOPERATION WITH INDUSTRY AND GOVERNMENT.** Over the past several decades through research and cooperative efforts, mosquito control agencies have worked with various industries and governmental agencies to try and correct mosquito problems brought about by industry or government practices. Several excellent examples of such progress include:

1. Virtually nationwide, planning and zoning requirements to contain **STORMWATER** rather than letting it flow into natural water bodies can be a source of mosquitoes. Cooperative efforts between mosquito control agencies and local government to engineer stormwater retention areas to minimize mosquito production has resulted in many locations in stormwater systems that minimally produce mosquitoes while accomplishing their water retention objectives.

2. **RICE CULTURE** can prolifically produce several mosquito species. Long-term research by university scientists and local mosquito control agencies in the southern U.S. identified that using *Bti* or methoprene as a larvicide in rice farms adequately controlled mosquitoes produced there without interfering with rice production and non-target organisms present in the rice ecosystem. However *Bti* is not always the answer. Research in California demonstrated that while *Bti* is effective in rice culture against several mosquito species, it was not effective against surface feeding *Anopheles* species.

3. **CITRUS GROVES** in southern Florida can be tremendous mosquito producers during drought periods when irrigation floods the ditches. Through research by mosquito control, low volume (*e.g.*, microjet) irrigation was identified as an irrigation technique that does not produce mosquitoes yet meets the farmer's irrigation needs.

4. **WASTE TIRES** are a huge mosquito production source. Throughout the nation (*e.g.*, Illinois, Minnesota, Louisiana, Texas, Florida) cooperative efforts between local mosquito control agencies and state government have mounted tremendous efforts to properly dispose of waste tires to eliminate local sources of mosquitoes and at the same time beautify the landscape.

As shown by these several examples, mosquito control has actively worked with industry and government to identify potential mosquito problems, study ways to correct the problems and implement the solutions. Such positive, cooperative efforts will continue as part of the AMCA's participation in the PESP program.

VI. PROPOSED AMCA INITIATIVES TO MEET PESP GOALS AND OBJECTIVES. To meet the PESP goals of reduced pesticide risk/use in the future, the AMCA proposes to accomplish this by strongly encouraging the AMCA membership to incorporate certain fundamental initiatives in their programs wherever possible, much of which is a furtherance of the ongoing efforts described above. These items include:

A. SOURCE REDUCTION. An increased dedication to implementing source reduction projects will be stressed among the AMCA membership. This will include sanitation as it relates to mosquito control, in particular waste tire disposal. In environmentally sensitive habitats, whenever possible, any source reduction efforts will also attempt to improve habitat for fish and wildlife over existing conditions by working closely with environmental resource agencies. Examples of techniques include implementing Rotational Impoundment Management in Florida salt marsh impoundments and using OMWM in coastal U.S. salt marshes where practicable. These methods result in greatly reduced mosquito populations with a minimal need for pesticide use.

B. **LARVICIDING.** The increased use of Abiorational@ larvicides (*Bti*, *B. sphaericus* and insect growth regulators) is a move that has been ongoing in the mosquito control community for the past 10-20 years and will continue to be encouraged. Mosquito control professionals recognize that Abiological@ larvicides are quite target-specific and these products are basically considered by both mosquito control and environmental resource professionals to be environmentally safe. However, given the paucity of larvicide materials available, mosquito control must keep its options open using other materials *(e.g.*, the organophosphate temephos (=Abate)) where the biorational materials are not efficacious or practicable.

Another important consideration for promoting environmental stewardship in regard to larviciding, is the encouragement of means to accurately guide aircraft when making aerial applications. This can be as simple as using flags atop poles to accurately guide a pilot or, as is becoming more common and technologically improved, using Loran and Global Positioning Systems (GPS) for electronic airplane guidance. Aircraft guidance results in the more efficient and effective dispersal of chemicals thus promoting sound environmental management. Also the use of computer models (*e.g.*, the USDA Forest Service's FSCBG model) to better predict the movement, fate and efficacy of pesticides will be encouraged where appropriate, to achieve a more efficient use of pesticides.

C. **ADULTICIDING.** Adulticiding, while typically the least effective of the components of a mosquito control IPM program, is still an extremely important component of it. In fact, the general public typically associates mosquito control agencies with their spray truck or aircraft, not realizing the existence or importance of the other parts of the integrated program. A mosquito adulticide program can be responsive to the PESP goals of reduced pesticide risk/use by spraying only when the need truly exists (verified through surveillance) and being accurate in dispersal of the material. As with larviciding, GPS is playing an increasingly important role in adulticiding. The encouragement of using such guidance equipment and models (as discussed in the LARVICIDING section above) is an AMCA initiative that will help meet PESP goals.

The AMCA will encourage its members to incorporate into their programs, the use of the latest available techniques and equipment for ground and aerial adulticiding. The AMCA will also encourage members to avoid using formulations that involve mixing pesticides with a carrier that may pose environmental risks.

Another topic that the AMCA will encourage is the use of labeled adulticide rates that actually provide good control benefits. There has been a tendency in recent years among some mosquito control agencies to apply adulticides at rates that are economically attractive, rather than truly efficacious. This issue was a discussion item at a Pyrethroid Stewardship Workshop held in late May 1996 in New Jersey chaired by AMCA President Dr. Robert Novak. This practice of applying doses lower than those that provide adequate control can in fact result in the need for additional adulticide treatments and can also encourage insect resistance by treating with sub-lethal doses. In the long run, adulticiding with low chemical rates can be counterproductive to environmental stewardship goals unless adequate research has demonstrated the safety and efficacy of these below maximum label rates.

D. **BIOCONTROL.** To date, the use of biocontrol agents in most mosquito control programs is limited. In the future, it is hopeful that biocontrol will play a greater role in mosquito control programs. However, to accomplish this, ongoing, dedicated research is necessary to attempt to make biocontrol useful to mosquito control programs. To meet the PESP goal of increased use of biocontrol agents in place of more conventional pesticides, AMCA will encourage, and where possible support, biocontrol research.

E. **RESEARCH.** The key to meeting the scientific challenges of the mosquito control community is through competent, well-focused applied research. The future of mosquito control needs to address topics as diverse as basic mosquito biology, wetland ecology, chemical efficacy, non-target effects of mosquitocides, the biology, surveillance and control of mosquito-borne pathogens, molecular biology and (as discussed above) biocontrol. Without research into these and other topics, future environmentally sound progress will be compromised. The AMCA will strongly encourage, and whenever possible, support applied research as the primary tool to deal with tomorrow's problems.

F. **EDUCATION.** The topics listed above (*a*-*e*) are all important environmental stewardship considerations. However, in our opinion, educating the AMCA membership as to their importance is the key to meeting PESP goals. Some states, for example California, Florida, Louisiana and New Jersey, have made tremendous strides over the past several decades in educating their mosquito control workers and the public about all aspects of mosquito control work. For some states, this includes examinations and continuing education to improve a mosquito control worker's expertise in their field. Passing an examination results in the worker receiving certification in Apublic health pest control@, or some similar title. In meeting PESP goals, the AMCA will strongly support the continuation and expansion of these education and certification programs to increase the level of professionalism and safety within the mosquito control industry.

The AMCA plans to make educational progress by regularly informing its membership on the above-mentioned key items in AMCA literature (*e.g*., Vector Review-The Newsletter of the AMCA, the Journal of the AMCA) and through symposia and presentations at AMCA meetings. It is through these avenues that the PESP education of AMCA members will be effectively accomplished and environmental stewardship properly promoted.

Education of the general public will be encouraged by the AMCA to teach residents how they can aid mosquito control by disposing of (or modifying) containers. The proper disposal of such items results in a reduced need for pesticide use. Additionally, informing the public of the benefits of using the safest, yet effective, mosquito control pesticides available will be stressed.

VII. MEASURING PROGRESS IN MEETING PESP GOALS. Given the broad geographical scope of the AMCA and regional industry needs, we recognize that some difficulties may be faced in accurately evaluating the progress being made in meeting the PESP goals through the initiatives listed above. However, we are certain this is a problem

shared by other PESP Partners and through growing experience in the program, can be resolved. We expect that the AMCA's evaluation plan will evolve over time, will clearly identify trends and also quantify some items, such as educational progress including annual data on the number of presentations provided, students instructed and papers printed or published as they pertain to the PESP program.

We initially plan to verify progress through input from AMCA members (individual and agency) located throughout the country in different positions within the association. These will be individuals currently serving on AMCA committees (*e.g.*, Legislative and Regulatory Affairs Committee, Environmental Protection Subcommittee) and other members-at-large (*e.g.*, chemical company employees, individuals from key geographic locations around the U.S.). The AMCA is also considering the possibility of authorizing AMCA member organizations to assume PESP partnership status through the AMCA's auspices. If possible, this could provide an effective means of allowing qualified members to be more officially recognized as a PESP partner and also provide a methodology for the AMCA leadership to receive information from around the country on how individual organizations are meeting PESP goals and objectives. These and other possibilities will be considered as the AMCA's partnership with the EPA evolves.

IX. SUMMARY. The AMCA looks forward to this AMCA/EPA PESP Partnership to strive to continue our on-going efforts to reduce pesticide risk/use while recognizing that the environmentally sound use of chemicals will remain an important component of mosquito control's IPM programs for the foreseeable future. We recognize the benefits that this partnership can provide to our association, in particular in having an effective avenue of communication with the EPA during the on-going process of registration (and reregistration) of mosquito control products. We hope this partnership will allow recognition of mosquito control's legitimate concern of having a decreasing number of products at our disposal while trying to fulfill our legislative mandates of providing citizens a safe and enjoyable environment in which to work and play.

ATTACHMENT

AMCA ORGANIZATIONAL DESCRIPTION

(see attached flow chart)

Board of Directors: Responsible for making and implementing policy and financial decisions dealing with all aspects of the association's activities.

Executive Committee: Responsible for making policy and financial decisions and recommendations when action by the full Board of Directors is not necessary.

AMCA Office: Responsible for carrying out the day-to-day business activities of the association.

****

AMCA COMMITTEES PERTINENT TO PESP

****

Bylaws & Policy:

1. Considers all proposals to amend AMCA Bylaws submitted to the Executive Director or the Committee Chairperson.
2. Submit to AMCA Board of Directors a report and recommendation of the Bylaws Committee regarding each proposed amendment to the Bylaws.
3. Act upon topics regarding Association Policy suggested by AMCA officers and membership.
4. Submit written recommendations regarding Association policy to the AMCA Board of Directors.

Legislative & Regulatory Affairs:

1. Seeks means for establishing better lines of communication between the Association and Federal, State, and International Agencies involved in the regulation of mosquito control.
2 Review proposed federal legislative bills, regulations and guidelines having a bearing on mosquito control, and keep the AMCA Board and membership informed of such bills, regulations and guidelines and the nature of their impact on the membership of the Association.
3. Develop and implement an active program that provides accurate information on the policies, goals and needs of the AMCA membership to Federal, State and other legislative and regulatory bodies.
4. Seek out and review the policies and goals of allied associations, societies, etc. that could provide beneficial working partnerships with the Association.

Science & Technology:

1. Seeks means for establishing better lines of communication between the Association and Federal, State and International Agencies involved in the coordination, implementation and funding of mosquito and mosquito-borne disease research and control.
2. Develop and implement an active program that provides accurate information on key topics on the biology, systematics and control of mosquitoes or mosquito-borne diseases or other research topics important to the Association.
3. Develop an active role for the promotion and stability of Medical Entomology/Mosquito Biology/Vector Ecology training at the University and other academic levels.
4. Explore ways in which the AMCA may contribute to making available throughout the world any needed knowledge regarding mosquitoes, mosquito-borne diseases and mosquito control technologies.
5. Apprise AMCA members regarding noteworthy trends in overseas mosquito research and mosquito control activities.
6. Provide professional expertise on the ethical use and implementation of modern technological advances for mosquito research and control.

Public Relations Education:

1. Work to preserve and enhance the image of organized mosquito control activities that benefit the health, welfare and quality of life of humans, domestic and wild animals and the environment.
2. Develop and execute projects which will accomplish A. above and which will otherwise enhance the image of AMCA and its stated goals and policies in the eyes of the general public.
3. Develop educational materials, bulletins and training programs to enhance the general public's knowledge of mosquitoes, mosquito-borne diseases and mosquito control.

Industry & Operations: This committee is to act as a liaison between Industry and the Association, presenting an opinion or position on issues of interest to the President as expressed in periodical mandates presented to the Committee through the Industry Board member.

Training & Education: This newly established committee is currently responsible for synthesizing the existing mosquito biology and control training and educational materials available throughout the nation, then arriving at how best to promote education within the Association.