

MOSQUITO PROBLEMS IN ALABAMA

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Alabama's mosquito problems are perhaps not as extensive nor as important economically as those of some of the adjoining states. Local situations of high mosquito densities are frequently experienced, however, and a great diversity of breeding conditions and mosquito species complicates the picture. Within the rather complex picture can be discerned a few

typical patterns which are worth considering by those involved in mosquito control.

For many years health authorities were concerned primarily with *Anopheles quadrimaculatus*, since malaria was a major disease problem in the state. Malaria transmission is now non-existent. It is not within the province of this paper to try to evaluate the contribution of the

various control efforts made over the years, including the extensive DDT residual house spraying program, to the eradication of malaria. It should be noted however, that heavy populations of *Anopheles quadrimaculatus* still exist seasonally in some of the areas which were formerly malarious, notably along the Tombigbee, Warrior and Alabama Rivers.

Alabama was a leader in the development of *Anopheles* prevention and control methods on impounded waters. In 1923 the State Board of Health adopted regulations pertaining to man-made lakes, setting forth definite requirements as to construction of dams, preparation of reservoir areas, and making the owners responsible for the prevention or control of *Anopheles* breeding. Without such measures malaria would undoubtedly have spread geographically within the state and malaria eradication would probably have been delayed. These regulations with some modifications are still in effect. There are approximately 9,000 impoundages on record with the State Health Department, ranging in size from 0.1 acre to 67,000 acres. The estimated total area of farm ponds in the state is 55,000 acres. There are approximately 242,000 acres in large impoundments. At the present time there are two major impoundments under construction and nine others in final stages of planning. Three of these will serve to complete the development of the Chattahoochee River and five of them will complete the development of the Coosa River. The other three are located on the Warrior and Tombigbee system. Ultimately it is planned to construct additional dams on the Alabama and Tombigbee which will completely harness these streams for purposes of navigation, power generation and flood control.

The owners of artificial lakes are legally responsible for the prevention or control of *Anopheles quadrimaculatus* breeding in their lakes. In most instances mosquito control activities by the owners of major impoundages have fully satisfied and exceeded this responsibility. The vast

amount of research conducted in Alabama related to the production of mosquitoes in impounded waters is well-known. Equally well-known is the development and practical application of various naturalistic control measures, water level management specifically for mosquito prevention, permanent shore line alterations, and the correlation of these methods with fish and wildlife interests. Lake owners, already equipped for *Anopheles* control, frequently carry out temporary anti-mosquito operations against *Aedes* and *Psorophora* mosquitoes which may be produced when flood control policies require that surcharges be maintained for a time. Such operations are not required legally, but have proved to be good public relations investments.

The salt-marsh species, *Aedes sollicitans* and *Aedes taeniorhynchus*, are troublesome only in portions of two counties, Baldwin and Mobile. The coastal portion of Mobile County is relatively undeveloped tourist-wise, but following the opening a few months ago of the Dauphin Island bridge, that island is being developed rapidly. Fortunately, invasions of the City of Mobile by large numbers of salt-marsh mosquitoes are rare. The coastal portion of Baldwin County is developing rapidly as a resort. This area is plagued by salt-marsh mosquitoes intermittently. Large numbers of fresh-water woodland mosquitoes, particularly *Aedes atlanticus*, and *Culiseta inornata* are also found in this area, frequently predominating within a mile of the beach.

An interesting extension of the salt-marsh mosquito problem consists of the development in 1954 of a focus of breeding for *Aedes sollicitans* and *Aedes taeniorhynchus* at McIntosh, about 40 miles north of the City of Mobile. In the development of several large salt-water wells by a chemical plant, large quantities of highly saline water were pumped to waste, and flooded for several weeks a wooded depression. Heavy breeding of both salt-marsh species occurred. The following year breeding recurred in rain water which filled these

depressions. As far as we know, no salt-marsh mosquitoes had ever been observed in this area before. This development, and the establishment of *Aedes sollicitans* breeding in a mining region of Kentucky have led to some speculation as to the possibility of further inland invasions in Alabama.

There is no legislation designed to facilitate the organization of abatement districts or to provide financial assistance. It is obvious, however, that as the coastal areas develop there will be an increasingly strong demand for mosquito control in these areas. There is a need for additional study to determine the most effective and economical means of controlling the mosquitoes prevalent near the coast to avoid costly mistakes when financial and administrative means for control become available.

Inland, the vast majority of our towns and cities have mosquito problems of varying intensity due largely to the breeding of *Culex quinquefasciatus* in ditches, especially polluted ones, and in artificial containers. *Aedes aegypti* are also frequently found breeding in artificial containers along with *Culex*. *Aedes aegypti* appears to be confined to urban areas in the central and northern part of the state, but may be found both in towns and in rural areas in the extreme south. A survey conducted in Birmingham, Montgomery and Mobile in 1952 showed significant *Aedes aegypti* breeding in all three cities, with the highest premises index (20%) in Mobile. Most cities are making progress toward the elimination of sewage-polluted water in open ditches, but wherever this condition still exists, it assures heavy and concentrated breeding of *Culex* mosquitoes. During the late summer of 1954 (one of the driest seasons on record) a number of towns experienced unusually large numbers of *Culex* mosquitoes, emerging from very small areas of highly polluted water. In such situations we recommend larviciding and as soon as possible the elimination of breeding waters.

Approximately 30 cities in the state

carry on seasonal larviciding routinely. Fourteen do adulticiding by means of mist or fog machines. Fogging has a strong popular appeal and in a number of instances has been employed in situations where better results could have been achieved at much less cost by larviciding.

Other mosquito problems, usually of short duration and limited extent, deserve mention. It is normal to have fairly heavy broods of several species of *Aedes* and *Psorophora* mosquitoes in early spring in the swamps along the major streams. Subsequent broods may emerge if heavy rains or floods occur during the summer, although the latter condition has not arisen for the past several dry years. Occasionally there seems to occur an unusually heavy breeding season for these woodland pool and flood-water mosquitoes. Such a season was the early part of 1955. Along the lower Tombigbee and Alabama Rivers, a tremendous brood of *Aedes sticticus* appeared in March. A record-breaking late freeze occurred in April, reducing the *sticticus* population considerably. About two weeks after the freeze there emerged great numbers of *Aedes vexans*, *Aedes infirmatus*, *Psorophora cyanescens*, and smaller numbers of other species. For a period of several weeks this situation caused severe complaints from farmers in the vicinity, after which the mosquitoes gradually died out. We have no practical solution for such problems as they affect rural areas. In the few instances where municipalities are affected, adulticiding by fogging, as was done by the City of Demopolis, is economically feasible and reasonably effective.

Broods of *Psorophora* also emerge following heavy spring or summer rains in other parts of the State, particularly through the "Black Belt," and in the lime-sink areas of the Tennessee Valley. The southern suburbs of Montgomery, for instance, frequently have short-term scourges. Where communities of sufficient financial resources are affected, fogging is the only recourse. Fortunately these broods usually dissipate within a week or so.