

diagnosis of malaria reached a high level of proficiency. Numerous military and civilian technicians received intensive training in special courses given by Miss Aimee Wilcox, CDC, and other governmental and private institutions. Recently, practically every major community in this country has had competent technicians capable of diagnosing malaria from thick blood films. It will be difficult to maintain a high level of proficiency, but every effort should be made to do so. Laboratories in the United States currently have the unique opportunity of taking part in eradicating one of the worst scourges mankind has ever known, but if the program is to succeed,

laboratories must do everything within their power to assure correct diagnoses.

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## A Review of Existing Insect Abatement Legislation

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While the Communicable Disease Center and the various State health departments have been conducting extensive malaria-control programs in the Southern States, it frequently has been indicated that there was a definite need for a means whereby the control of mosquitoes and, possibly, also flies, other arthropods, and domestic rodents could be provided in afflicted areas. This problem is being met satisfactorily in several States by the creation of abatement districts which permit local financing of adequate control measures.

Copies of all existing State laws which establish the procedure for creating mosquito abatement districts within States therefore were secured, reviewed, and analyzed. An attempt has been made to enumerate the better features of all existing State laws.

A brief summary of certain features of the various State laws is presented in table 1. It will be noted that 20 States have mosquito abatement laws, and approximately one hundred permanent mosquito-control districts operate under these laws in various parts of the country. It also will be noted that New Jersey and California were the first States to promulgate State-wide laws pertain-

ing to mosquito abatement (1906 and 1915) while Minnesota and Texas passed such laws during the past year.

**District Unit.** The majority of abatement districts embrace county-wide areas throughout the State, but there are several exceptions: in Alabama, the law pertains only to one county; Massachusetts limits greenhead-fly control projects to localities along the seacoast; the Texas law concerns only counties bordering the Gulf of Mexico; and the Virginia law pertains to counties and towns in the tidewater section of the State. The Minnesota law is unusual in that abatement districts cannot be set up on a county basis, the "governmental unit" being defined as "any city, village, borough, or town."

There is unanimity of opinion among those who have had considerable experience with the operation of insect control districts that all laws should allow any community or county within a State to create an abatement district if there is a problem of sufficient importance. The limiting of abatement districts to municipalities is an undesirable provision because many of the more troublesome

TABLE 1

Features of State Laws Pertaining to Mosquito Abatement and  
Number of Mosquito Districts in Existence Under Such Laws

State	Year Laws Approved	District Unit	Pest Empowered to Control	Mosquito Control Board	Abatement Plans Approved by	No. of Districts in State (1949)
Ala.	1939	Colbert County	Malaria mosquitoes	No special board	County Court and County Health Dept.	1
Calif.	1915	Territory in 1 or more counties with pop. of 100 or more	Mosquitoes, flies, other insects, & rats	At least 5 members	State Health Dept. approves if State aid is received	41
Conn.	1915	Any locality	Mosquitoes	State Board (5 members)	State Board of Mosquito Control	-
Del.	1933	Any locality	Mosquitoes	No special board	State Highway Dept.	-
Fla.	1929	Any county	Mosquitoes	County Commissioners in counties over 65,000; or 4 members (3 appointed & State health officer in smaller counties)	State Health Dept.	13
Ill.	1927	Territory in 1 or more counties with pop. of 300 or more	Mosquitoes, flies, & other insects	5 members	-	6
Maine	1933	Any locality	Mosquitoes	No special board	State Dept. of Health	-
Mass.	1929	Greenhead fly control limited to localities along sea-coast	Mosquitoes & greenhead flies	Data not available	State Reclamation Board	3
Minn.	1949	Any city, town, or village	Mosquitoes, other insects, & arachnids (ticks, mites, & spiders)	4 members (3 appointed & State Commissioner of Agric.)	State Dept. of Agric. & State Dept. of Conservation	0
Miss.	1928	One or more counties	Mosquitoes	4 members (3 appointed & State health officer)	County Board of Supervisors & State Health Dept.	0
N. J.	1906	Any county	Mosquitoes	8 members (6 appointed & Director of State Exp. Sta. & State Dir. of Health)	State Agric. Exp. Sta.	14

(Table 1 continued on next page.)

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State	Year Laws Approved	District Unit	Pest Empowered to Control	Mosquito Control Board	Abatement Plans Approved by	No. of Districts in State (1949)
N. Y.	1916	Any county (not including N.Y.City)	Mosquitoes, flies, ticks, & other "hominous" arthropods	6 members (4 appointed & chairman of Board of Supervisors & 1 member appointed by State health officer)	County Board of Supervisors	1
Ohio	1945	Any county or portion of	Mosquitoes, flies, & other insects	Data not available	State Dept. of Health	1
Oreg.	1939	Any county or portion of with pop. of 100,000 or more	Mosquitoes	6 members (5 appointed & Director of State Exp. Sta.)	State Exp. Sta.	0
Pa.	1935	Any county or portion of	Mosquitoes	5 members	County Commissioners	1
R. I.	1934	Any city or town	Mosquitoes	No special board	State Dept. of Agric. & Conservation	-
Tex.	1949	Counties bordering Gulf of Mexico	Mosquitoes	Advisory Commission of 5 members makes recommendations	County Court	1
Utah	1923	Any city, county, or portion of with pop. of 100 or more	Mosquitoes, flies, & other insects	At least 5 members	-	4
Vt.	1947	Any locality	Mosquitoes	State Mosquito Control Advisory Committee (4 members)	State Commissioner of Agric.	-
Va.	1928	Counties, cities, & towns in tidewater section of State	Mosquitoes	3 members (2 appointed & State health officer or his deputy)	State Health Dept.	12

insect pests breed in very extensive areas, such as salt marshes and flood plains, and frequently these areas lie outside the city limits.

**Pest Which a District Is Empowered to Control.** Most of the laws authorize the control of all species of mosquitoes; however, Alabama limits control to malaria mosquitoes. Seven of the State laws permit the districts to engage in the control of mosquitoes and other insects, particularly flies. The Minnesota and New York laws provide for the

abatement of arachnids (ticks), and in California several districts are empowered to control rats.

It is highly desirable that districts be granted authority to control all species of insects, arachnids, and rodents which affect public health. This provision would permit the smaller districts to maintain a better year-round program since the abatement of certain pests, such as rodents, could be done during the nonmosquito-breeding months. Furthermore, in many sections of the country

annoyance caused by gnats, sand flies, stable flies, and house flies is just as great as, or even greater than, that caused by mosquitoes. In such areas the public demands control of these pests.

**Mosquito Control Board.** The administrative body for a district is frequently designated as a "Board of Trustees" or "Mosquito Control (Extermination) Commission." Most of the laws limit the board membership to three, four, five, six, or eight members. In California and Utah the board consists of at least five members, but may be larger if incorporated municipalities are included, since one member is appointed from each city---e.g. the board of trustees for the Alameda County Abatement District in California consists of nine members. The State health officer is ex officio member of the board in Florida, in Mississippi, and in New Jersey, and is ex officio chairman of each commission in Virginia. The Director of the Agricultural Experiment Station is ex officio member of the board in New Jersey and Oregon, while the Commissioner of Agriculture serves in this capacity in Minnesota.

The Florida law authorizes the Board of County Commissioners to serve as the governing body for antimosquito districts in counties having more than 65,000 population.

It is believed that more public interest in the district's abatement program would be aroused if the governing board consisted of more than three members. On the other hand a large board tends to be unwieldy. It is our opinion that the board should consist of five or six members.

**Duties and Powers of the Board.** By the powers conferred under various State laws, the district board may:

1. Take all steps necessary to abate pests within the district.
2. Purchase necessary supplies, equipment, and material needed to control or abate pests.
3. When necessary and proper in furtherance of the objectives of the act, the board may build, construct, maintain, and repair: dikes, levees, cuts, canals, or ditches upon any land within the district.
4. Enter without hindrance any lands within the district for the purpose of inspection to ascertain whether pests are breeding thereon.
5. Sell or lease any land, right-of-way, ease-

ment, property, or material acquired by the district.

6. Borrow money for operation of the district and repay in the same or the next fiscal year.

7. Do any and all things necessary or incident to the powers granted and to carry out the objectives specified in the act.

Powers set forth under the California and Utah acts provide for inspection and performance of control work OUTSIDE the district boundaries when such territory is so situated that mosquitoes therefrom may migrate into the district.

The power to perform work outside district boundaries is an excellent provision because the majority of districts are concerned with the control of migratory mosquitoes -- salt marsh and floodwater species -- and these types are noted for flying long distances from their breeding source.

**Guiding Agency.** Most of the laws provide for State coordination or cooperation. In New Jersey the work of the various commissions is supervised and directed by the Director of the Agricultural Experiment Station. In Florida, Maine, Ohio, and Virginia such supervision is under the State health department. In Massachusetts, mosquito control projects are under the State Reclamation Board (this board of three members includes a representative from the State Department of Public Health and the State Department of Agriculture). In Connecticut, mosquito abatement projects are administered by a Board of Mosquito Control, consisting of: the Director of the State Experiment Station, the Director of the State Water Commission, the Superintendent of the State Board of Fisheries and Game, the Commissioner of Health, and one person appointed by the governor. In Minnesota, Rhode Island, and Vermont mosquito abatement projects are under the State Department of Agriculture. The Delaware law is unique in that mosquito control programs are under the supervision of the State Highway Department. Mosquito abatement districts in Alabama, California, Pennsylvania, Texas, and Utah lack State supervision.

It is believed that each mosquito control district should be under State supervision to provide for coordination of work of the various districts, and in many cases State participation gives tech-

nical advice to districts which they could not otherwise afford.

**State Appropriations.** In Virginia the State Board of Health contributes annually to the mosquito control commission a sum not more than 25 percent of the gross amount obtained from tax levy and not to exceed \$10,000 in any one year. In Delaware, Maine, and Rhode Island, the State Legislature makes an annual appropriation for mosquito abatement. Any town in the last-named State desiring to make use of State funds must match such funds. Legislation passed in Florida in 1949 provides for State aid to organized mosquito control districts and county health units, such funds being administered by the State Board of Health. Districts and county health units must match the State contribution which may not exceed \$15,000 per county per year. During recent years the State Legislature of California has made substantial appropriations to the State health department for assistance to local abatement districts and health departments in the control of disease-bearing mosquitoes (vectors of encephalitis and malaria).

**Suggestions for Inclusion in State Legislation.** Provisions which would be desirable for inclusion in abatement laws are briefly summarized as follows:

1. Each district should be under the technical supervision of an officer of a designated State agency who would approve plans, methods, and cost estimates.

2. The district should have the jurisdiction to control pests other than mosquitoes, such as flies, fleas, ticks, rats, and other vermin which affect the public health.

3. It should be possible to organize any number of adjacent municipal and county governmental units into insect and pest control districts throughout the State.

4. The administrative body (board) for the district should consist of a definite number of members -- such as five or six -- and the board should include at least one member from a local health department. The State health officer should be ex officio member of each board.

5. The board should have the power to make inspections and to perform control work on territory adjacent to the district.

6. The State should render technical assistance by making preliminary surveys, by preparing abatement plans, and by determining cost estimates of same.

7. Provision should be made for the enlargement by annexation or consolidation, and for discontinuance of any insect and pest control district.

It is believed that these provisions would be of considerable help to States without enabling laws for insect and rodent control when they wish to promulgate this type of legislation. Several States have already requested information from the Communicable Disease Center concerning such legislation.

## Some Highlights of the 1949 Residual Spray Program

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### GENERAL

In the spring of 1945, when the residual spray activities were inaugurated on what then was designated as an Extended Malaria Control Program, many problems confronted personnel engaged in those activities. Supplies of insecti-

cidal chemicals were limited, suitable new commercial type vehicles were not available, and spray equipment designed specifically for residual spraying did not exist. Hard and fast policies or rules were not established to unify or standardize program-wide operational procedures and