

IMPORTANCE OF MOSQUITO CONTROL IN THE LOS ANGELES METROPOLITAN AREA

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The Los Angeles Metropolitan Area is typically semi-arid with a Mediterranean-like climate. It has a normal rainfall of around 13 inches with a range from about 3 inches to 30 inches per year with all major rainfall occurring during the winter months from October to March.

Water importation in 1965 from the Colorado River and Owens Valley plus local rainfall amounted to about 1,352,000 acre feet. This abundance of water results in mosquito breeding, and with approximately 7,000,000 people in Los Angeles County at the present time, this necessitates control programs. For the uninitiated, one acre foot of water is 325,900 gallons.

A number of mosquito control agencies have been formed to cope with the problems. Mosquito Abatement Districts that are in operation include the Southeast Mosquito Abatement District, Orange County Mosquito Abatement District, Ballona Creek Mosquito Abatement District, Compton Creek Mosquito Abate-

ment District and Antelope Valley Mosquito Abatement District. A certain amount of limited control is provided by other governmental agencies in areas of low mosquito incidence.

Mosquito problems in the Los Angeles area include a variety of situations such as the following:

1. *Water spreading basins:* Much of the imported water as well as local precipitation is directed to water spreading basins for percolation into underground storage. Over 1,800 acres of these basins are located in Los Angeles County. Intermittent usage not only causes mosquito problems but chironomid (midge) problems as well.
2. *Drainage structures:* The heavily built-up areas require a vast drainage network of underground and open storm drainage channels, together with the associated structures of catch basins, cross drains and siphons. These structures are kept continuously supplied with water from cooler waste waters and garden and lawn waste waters.

3. *Gutters*: Due to the shallow slopes of the area, water from lawn drainage stands in hundreds of miles of gutters during the summer months, providing an ideal environment for *Culex quinquefasciatus* and *Culex tarsalis*. Since the summers are dry and warm, lawns must be watered several times weekly so that the runoff maintains water in the gutters.
4. *Inadequately drained areas*: Due to the shallow slope of the land many areas are not adequately drained, particularly below developed subdivisions. Water from these subdivisions ponds over extended periods.
5. *Cemetery vases*: There are several million flower vases in a number of cemeteries, several of which are quite large (Forest Lawn, Rose Hills, Inglewood) which provide an ideal environment for several species of mosquitoes.
6. *Agriculture*: In addition to several thousand acres of permanent pasture, there are 310 dairies using approximately 1,800,000 gallons of water daily for cow washing and cleanup. Much of this water, heavily loaded with organic matter, must be disposed of on the surface of the ground that is in large part impervious. There are many other mosquito breeding sources from agriculture including crop operations, horse and cow water troughs, poultry watering facilities and Tubifex worm farm culture.
7. *Industrial wastes*: Involved are the usual sources such as pits, sumps, water towers, vegetable and fruit washing operations and yard flushing.
8. *Recreation*: Sources such as water hazards of golf courses and pools of various sorts.
9. *Wild life refuges*: Areas provided for waterfowl protection.
10. *Salt marshes*.
11. *Backyard sources*: Thousands of these sources cause trouble intermittently and include swimming pools, plastic pools, various containers, and ornamental pools and cesspools.

Mosquitoes that cause the principal problems are in order of importance:

1. *Culex quinquefasciatus*—common house mosquito

2. *Culex tarsalis*—encephalitis carrying mosquito
3. *Culiseta inornata*—winter mosquito
4. *Aedes nigromaculis*—pasture mosquito
5. *Aedes squamiger*—salt marsh mosquito
6. *Aedes taeniorhynchus*—salt marsh mosquito

Other mosquitoes that are bothersome at times include *Aedes sierrensis*, *Anopheles franciscanus*, *Anopheles freeborni*, *Culex erythrothorax*, and *Culiseta incidens*.

The program of control must be as close to perfection as is possible because of the large population in close proximity to the sources of mosquitoes. Emergence of mosquitoes will be the source of hundreds of complaints from citizens who will not be averse to making their needs for relief known to agencies or groups such as city councilmen, county supervisors, health departments, chambers of commerce, improvement associations, women's clubs and similar groups.

I will illustrate the control necessary by describing the operations of the Southeast Mosquito Abatement District. To achieve adequate control, the District maintains a permanent staff of 12 employees including a Manager, Entomologist, General Foreman, Foreman, Stenographer, and 7 Senior Inspector-Operators supplemented, as needed, by up to 26 recurrent Inspector-Operators. Equipment used by the District includes 3 staff cars, one pickup truck, and 27 operational field vehicles. The operational field vehicles are all right-hand drive and mostly equipped with automatic transmissions. These features are most effective from a labor standpoint for the treatment of gutters and roadside ditches. Spray equipment includes pressure tanks with pressure provided by compressors mounted on motor vehicle engines. Our granule program is handled with granule guns, air operated, and by hand driven granule spreaders.

Great care must be exercised in selection and use of pesticides due to the close proximity of people, pets and other animals to the areas where spray or granule work is required.

Need for programs in the Los Angeles Metropolitan area is illustrated by the growth of the Southeast Mosquito Abatement District in 12 years from the original 155 square miles, 400,000 people, and 3 cities to the current 458 square mile area, 2,000,000 people and 22 cities which include half of the City of Los Angeles. As a matter of interest the current assessed valuation of the Southeast Mosquito Abatement is \$3,840,000,000 with a tax rise of 8.1 mills per \$100 of assessed valuation. The other 4 Districts in the metro-

politan area total approximately 1000 square miles with a population of approximately 1,400,000 and assessed valuation of \$2,530,700,000.

I can say in final analysis that people of communities of our type need a comprehensive mosquito control program which will insure freedom from mosquito borne disease and nuisance. It is the opinion of those most qualified in this field of vector control that the agencies most suited to carry out mosquito control are Mosquito Abatement Districts.