

RICE MOSQUITO CONTROL UPDATE

Rice is largely concentrated in the south east portion of the county where water is abundant and comparatively less expensive. Last year there were 4,838 acres of rice planted, with a 10% increase expected in this years rice crop.

We have two types of rice in the Escalon area, white rice which most of us are familiar with, and wild rice. Wild rice is planted in February and harvested in June, while it is still in standing water. It grows to around 6'-8' tall.

Rice is unique among the irrigated agricultural crops in California in that its culture requires continuous standing water 2 to 6 inches deep during growing season, creating an ecological habitat potentially suitable for mosquito breeding. In other irrigated crops, water management practices are recommended to eliminate or reduce standing water on the fields, which benefits mosquito control and crop production. In rice, however, mosquito control measures are not compatible with the requirements for rice culture thus excluding most drainage and other water management practices, which are essential to mosquito control in other situations. Rice field mosquito control in California has thus adopted a strategy of pesticide application and biological control. The principal rice field mosquitoes are *Culex tarsalis* and *Anopheles Freeborni*, vectors of mosquito-borne encephalitis and malaria respectively. Both species prefer clear, unpolluted, fresh water habitats similar to most rice fields and surrounding drainage water and seepage. In addition, there is usually a one generation brood of *Aedes Melanimon* mosquitoes following the initial flooding of fields in the spring. After a short delay, *Culex* and *Anopheles* infestations appear, associated with the emergence of rice plants. *Culex tarsalis* populations peak in mid summer and *Anopheles freeborni* in late summer. The observed flight range has been shown to be approximately 20 miles from release

points which accounts for other wide spread distribution in urban as well as rural areas. In Escalon the nearest rice field to town is 1 1/2 miles north and furthestmost is 6 - 7 miles northwest. *Anopheles freeborni* continues its biting activity well into November, hibernating in December and January. In February it resumes biting and oviposition activity.

Our program begins in early spring with contacts with growers to gather data.

We no longer have one operator assigned to rice, all rice is checked by the zone operator which have this type of source in his zone.

Material used by the District will be VectoBac, Altosid Larvicide Liquid and a combination of Vectobac and Crop Spray. In our cold foggers we use pyrenone Crop Spray or MGK.

We treated 39,000 acres of rice by aircraft and ground treated approximately the same acres in 1991.

Although insecticides have been reasonably successful in rice field mosquito control, the necessity for repeated treatments on large rice acreage has been economically infeasible for all but a few mosquito abatement districts. As a result, biological control has become an alternative. Mosquito fish are being implemented for the rice field mosquito by all districts.

Our fish sources consists of drains and small ponds located in the county, but our major source is six vineyard frost control ponds, owned by local winery. They keep ponds full of water if we control the brush on the inside slopes. We feed the fish all year.

We begin by planting the fish in the wild rice at the end of March. Then we plant the fields nearest to town and work outwards at a rate 1/4 pd to the acre.

In conclusion the rice field mosquito presents the most difficult

challenge of all mosquito problems associated with irrigated agriculture in California. Biological control seems to be the most economical approach to mosquito control, along with employing water management and cultural practices.

Rice field mosquito control requires more than just the mosquito abatement districts alone to take on this responsibility. We must have the cooperation and help from the grower, rice specialists, farm advisor and the researcher.