



PREVENTION of MOSQUITOES IN IRRIGATED PASTURES

General Information

Those irrigation practices which are advantageous to mosquito control are also beneficial to the production of crops. At least 3 days in water are required for mosquitoes to reach the adult stage. With the exception of rice, water which is left standing for more than 24 hours after irrigation is of no benefit to the field in which it remains and usually becomes detrimental to the crop. In most cases, less than 1/2 inch of standing water in a field is removed by means of evaporation, this does not remove the water rapidly enough to promote mosquito control. The extent to which water infiltrates soil varies according to its texture and condition. Soils that are either fine textured, compacted, or excessively tilled, particularly when they are wet, may become almost impervious to water infiltration after a few hours. In this type of situation, the field must be graded with a slope to promote surface drainage for the excess water. Livestock should be kept out of wet fields to reduce compaction. The proper grading of a field will help promote mosquito control as well as higher crop yield at reduced cost for both water and irrigation labor.

Design Criteria For Irrigated Pastures

All fields subject to irrigation should be leveled according to a designed grade with a minimum of soil movement (cutting and filling) and with a minimum down slope fall of 0.2 percent. After leveling, the "strip check" or border method of irrigation should be established and utilized on the fields planted to pasture and field crops. The widths of borders should be no greater than 50 feet. Border levees should be constructed in such a way that no borrow pits will be left on their sides to collect and hold water. The length of runs should be no greater than 1,320 feet. When establishing new head ditches, proper turnouts should be installed along with an outlet for draining the ditch. Tailwater drains should be constructed at the ends of all irrigated fields. In all instances, water should be applied in quantities and at frequencies that will meet the needs of the crops grown on the particular soil types and that will provide for proper water penetration without erosion. To reduce mosquito production, water should not be allowed to stand in ditches or in fields longer than three (3) days.

Mosquito Species Associated with Irrigated Pastures

Ochlerotatus nigromaculis (formerly named *Aedes nigromaculis*) is also known as the irrigated pasture mosquito. This species is the primary pest mosquito that occurs due to poor water management practices and poorly designed and maintained pasture fields. Adult females deposit eggs on damp soil and at the bases of grasses and other vegetation. Up to 150 eggs may be laid individually. The eggs remain unhatched until the next irrigation. This species develops very rapidly, with the emergence of adults being possible in less than 4 days during the hottest days of summer. Females of this species are aggressive biters of both livestock and man during the day and near twilight. The presence of large numbers of this mosquito can result in weight loss and reduced milk production. Densities of this mosquito become greatly reduced as fall progresses.

Ochlerotatus melanimon (formerly *Aedes melanimon*). Until the late 1930's, *Ochlerotatus melanimon* was the primary species associated with irrigated pastures. At this point, *Oc. nigromaculis* surpassed *Oc. melanimon* as the primary species. *Oc. melanimon* is found in association with *Oc. nigromaculis* in irrigated pastures during the spring and part of the summer. This species is capable of transmitting Western Equine Encephalitis in a secondary transmission cycle. It has been infected under laboratory conditions with West Nile Virus and was found to have moderate transmission capability.

Culex tarsalis lays clusters of eggs called rafts on the surface of standing water. At least 7 to 10 days are needed to complete the life cycle from egg to adult. Irrigation ditches and tailwater are potential sites for mosquito production if the water is allowed to remain standing for this length of time. *Culex tarsalis* is known as the "encephalitis" mosquito in California because it is the primary carrier (vector) of Western Equine Encephalitis (WEE) and St. Louis Encephalitis (SLE). It has been shown to be an excellent vector of West Nile Virus (WNV) as well. Horses can be vaccinated to prevent them from contracting WEE and WNV, but nothing is available for humans for WEE, WNV or SLE to date.

Eliminating or reducing the potential for larval habitats and subsequent mosquito production is still the best method of mosquito control available. Before creating an irrigated pasture, it is recommended that you consult a farm advisor with the U.C. Extension Service and the Solano County Mosquito Abatement District.

SOLANO COUNTY MOSQUITO ABATEMENT DISTRICT

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