

EVALUATION OF OFFTARGET EFFECTS OF VARIOUS PESTICIDES  
ON TOMATO PHYSIOLOGY, GROWTH, AND FRUIT PRODUCTION

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Studies on the effects of insecticides on fresh market tomatoes were conducted in the laboratory and field during 1982-83. Initial laboratory experiments were designed to screen most of the registered pesticides used in California on tomatoes for possible roles in suppressing tomato leaf photosynthesis and stomatal conductance. These studies were conducted with the use of a dual isotope porometer. Reductions in photosynthesis following one application of insecticidal material appeared to be correlated with the use of permethrin. Presently, additional laboratory data are being collected and analyzed.

Field studies on staked fresh market tomatoes were conducted during the summer of 1982. Five registered insecticides (methomyl, oxamyl, permethrin, fenvalerate, and azinphos-methyl) were evaluated for their effects on plant photosynthesis, fruit growth rates, fruit size, and fruit weight (at harvest) within the context of a scheduled multi-application treatment program. Eight harvests of fruit in the greenish-yellow stage (post mature green) were conducted. Presently, no conclusive statements can be made upon the effects of the materials examined upon tomato plant physiology and fruit yield. During the study tomato pinworm and leafminer densities were extremely low. Lepidopterous larval damage caused by Heliothis spp., Manduca sexta, and Spodoptera exigua remained below 3% of the fruit harvested in all treatments except oxamyl and the check. Percent injury in the oxamyl treatment ranged from ca. 8% early in the season to ca. 2% at the termination of the study. Percent injury in the check was consistently about 7% higher than that in the oxamyl treatment.