

# Bud Moth on Prunes

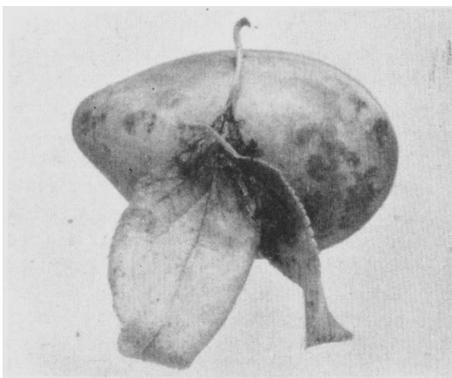
parathion found to be highly toxic to pest of increasing economic importance

Arthur D. Borden and Harold F. Madsen

**Heavy damage** to the prune crops of a number of Santa Clara Valley orchards has been caused by the bud moth—*Spilonota ocellana*—during the past few seasons.

Although the bud moth is of greatest economic importance in the prune orchards of Santa Clara County, it is of economic importance in San Benito, Santa Cruz, Napa and Sonoma counties. Surveys are in progress to determine its importance in other prune-growing counties.

The damage done to fruit by the bud moth is very characteristic. Early in the season the larvae of this moth are primarily leaf feeders, but as the fruit en-



Bud moth damage on young prune. Approximately life-size.

larges and a considerable portion of the leaf is consumed, the larvae tie the leaf to a fruit and feed on the fruit from under this protection.

The larvae do not bore into the fruit but feed on the surface producing small, shallow holes. The fruit produces gum where attacked and this cements the now dry leaf to the fruit.

A portion of this dry leaf remains on the fruit even after the fruit has been processed and causes the fruit to be graded as culls. In heavily infested orchards this loss in grade may run as high as 40% or 50% of the crop.

## Field Investigation Findings

A field investigation of this problem was undertaken by the Division of Entomology and Parasitology at Berkeley during the summer of 1948.

The bud moth overwinters as a par-

tially grown larva in an overwintering cocoon constructed at the base of a fruit spur on last season's growth and emerges when the first blossoms appear in the spring.

The larvae are chocolate brown in color with a black head capsule and prothoracic shield and feed first on the blossoms and later on the young leaves which they tie together with silk. The damaged leaf tissue soon turns black and this dead tissue together with the tied-up leaf terminals is a very easy way to locate the infestation early in the season.

The larvae usually desert the leaves to pupate and construct shelters of dead leaves or blossoms on the twigs. Pupation was noted as early as May 4 the past season and the first moth appeared early in June.

The adult moths are about 5/16 inch in length, carry the wings in a horizontal plane, and are mottled grey in color with a rather wide white band across each fore wing.

The adult female moth may deposit over 200 eggs singly on the foliage. The eggs are disk shaped, transparent, and difficult to locate.

The larvae hatching from the eggs are cream colored and do not attain the characteristic brown color until after the second molt. The young larvae construct shelters of silk and frass along the midrib of the undersurface of the leaves and feed on the leaf from this shelter. The tunnel of silk and frass is extended as the feeding area widens and later on the larvae attack the fruit. Most of the damage to the fruit occurs in the summer when the new generation of larvae are feeding.

There is but one generation of moth a year with the moth in flight over the period from early June to August.

The damage done by the bud moth may be confused with that caused by the attack of the orange tortrix, *Argyrotaenia citrana* which frequently occurs with the bud moth in mixed populations.

The orange tortrix, however, does not construct the characteristic tunnels on the leaves and its damage to the fruit is more extensive.

The larva of the orange tortrix is a straw color and larger than that of the bud moth when full grown. The larvae of the bud moth also may be confused with

Hibernaculum or overwintering cocoon of the bud moth. Arrow indicates cocoon which is shown here at about twice life-size.



The adult bud moth pictured here at about six times life size

the larvae of the peach twig borer, *Anarsia lineatella*, but may be distinguished from it by its characteristic damage and its black head capsule.

The head capsule of the peach twig borer is brownish in color, the body has light brown intersegmental markings.

## Control Experiments

Applications of insecticides for the control of the bud moth were applied as postharvest sprays, in the jacket period and at the time the eggs were hatching in the early summer.

Of the materials used, parathion 15% wettable showed the greatest toxicity to the bud moth. It destroyed the larvae of the bud moth in all stages, even those found in the overwintering hibernaculæ. Of the other materials used, DDD and basic lead arsenate gave the most satisfactory control. Parathion and DDD offer less spray residue hazard than basic lead arsenate or DDT.

As to the timing of the spray applications a postharvest or jacket-period spray and an application at the time the eggs begin to hatch—early June—appears to be advisable in heavy infestations. Such a program the past season gave less than 1% damaged fruit at harvest in an orchard where unsprayed trees showed 31% damaged fruit, at the first picking. If only one application is to be applied, as in the case of light infestations, the jacket-period spray should be the most effective.

Arthur D. Borden is Lecturer in Entomology and Entomologist in the Experiment Station, Berkeley.

Harold F. Madsen is Research Assistant, Division of Entomology, Berkeley.

