COMPARISON OF MATERIALS APPLIED AS SPRAYS OR BY PAINT BRUSH FOR PREVENTION OF FLATHEADED BORER ATTACKS ON YOUNG PRUNE TREES IN YUBA CITY, SUTTER COUNTY, 1968.

Treatments and dosages*	Total borers in 10 trees	Condition of trees at sampling time		
		No. infested	No. alive	No. dead
Untreated check	51	10	6	4
SPRAYS				
Diazinon E.C., 15 ml/gallon water	32	9	5	5
Ethion 25% W.P. 10 gm/gallon water	29	8	4	6
Sevin 50% W.P. 10 gm/gallon water	22	7	6	4
Dieldrin E.C., 15 ml/gallon water	6	5	6	4
PAINTS				
Exterior white latex paint, 1 qt. plus Sevin 50% W.P., 25 gms.	3	2	8	2
Exterior white latex paint, 1 qt. plus Ethion 25% W.P., 25 gms.	1	1	8	2
Exterior white latex paint, 1 qt. plus dieldrin E.C., 5 ml.	1	1	9	1
Exterior white latex paint, 1 qt. plus diazinon E.C., 5 ml.	0	0	9	1
Exterior white latex paint	0	0	8	2

* Sprays were applied with a 2 gal. Hudson sprayer. Exterior white latex paint and exterior white latex paint plus insecticide treatments were applied by paint brush. All treatments applied on May 2, 1968, as preventatives. Trees sampled on August 29, 1968. All dead trees were not killed by borers; some killed by sunburn and/or drought.

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PROTECTING YOUNG FROM ATTACK PACIFIC FLATHEADED

Exterior white latex paint applied to trunks of young trees before flatheaded borer eggs were deposited, but after bud break, prevented sunburn and reduced borer attacks—and was as effective as any other material tested in these studies.

THE PACIFIC FLATHEADED BORER, *Chrysobothris* mali Horn., is one of the worst pests of newly planted trees. The borer will attack trees while they are in the nurseries, and after they have been planted in the orchard. If trees lose vigor, they are likely to be seriously damaged by the Pacific flatheaded borer. Young transplanted trees are particularly subject to attack, since there is a period during their establishment when their condition is somewhat weakened. This is especially true when young trees have been subjected to sunburn, drought, bark injury, or when planted too late in the spring. The severity of attack also may be associated with the number of beetles present in nearby mature orchards. Tests described here were conducted to evaluate effectiveness of prevention methods.

The damage caused by this insect results from the mining of the cambium layer by the larvae. The shallow winding mines in the inner bark may extend into the outer wood. A symptom of injury is the flow of sap in the affected areas which appears as a wet spot on the bark. Later, these areas may crack and expose the borings.

The feeding larvae may cause a portion of the bark to die or, if the infestation is extensive, the tree may be girdled and killed. The beetles may attack any portion of a mature tree, but on young trees their attack is usually confined to the main trunk near the bud union.

The borer has a single generation a year. Transformation into the adult stage occurs from the first of April through July. The adults are sun-loving and quick in flight. The eggs are usually laid singly in cracks and crevices in the bark. The hatching larva bites a hole in the bottom of the eggshell and mines directly into the outer portions of the bark. After feeding in the bark a short period, it works its way into the cambium or wood and packs the waste and excrement in the mine behind it.

Almost all the feeding and mining are done in the cambium until the larva is nearly full-grown, when it bores into the wood and forms a slightly enlarged oval cell. The larva then enters the prepupal stage to pass the winter. In the spring it pupates and transforms into the adult.

Valley outbreaks

In the California Central Valley during 1967 both young and mature deciduous fruit orchards suffered from severe outbreaks of the flatheaded borer. Many trees were treated with dieldrin sprays in early spring which prevented borer attack but did not prevent sunburn. Burning pruned infested wood was a standard practice of many orchardists to destroy overwintering larvae. This was a very effective method to kill the pest, but it did not prevent attack from borers flying in from other infested orchards. Burning wood also contributed to air pollution. In 1968, noncombustive methods to prevent attack were studied.

Prune trees

In early spring four hundred prune trees with double grafts were planted in an experimental plot at 1-ft intervals in rows 6 ft apart. To make the trees more attractive to borer attack, the trees were weakened by subjecting them to drought and sunburn. On May 2, 1968, some trees were sprayed with insecticides, some were brushed with exterior white latex paint, and others were treated with a mixture of exterior white latex paint and insecticides. Before treatments were applied, the soil was removed from the trunk area to a depth of 2 inches.

The treatments were applied to the trunks from the scaffold limbs to 2 inches below the soil surface. No materials were applied to the foliage. The soil was replaced around the trunks after treatments. Each treatment was applied to 10 trees. The spray treatments were applied with a 2 gallon Hudson sprayer. These treatments and dosage per gallon of water were: diazinon E.C., 15 ml; 25 per cent Ethion W.P., 10 gms; 50 per cent Sevin W.P., 10 gms; dieldrin E.C., 15 ml. The brush treatments and dosage of insecticide per undiluted quart of exterior white latex paint were: 25 gms 50 per cent Sevin W.P.; 25 gms 25 per cent Ethion W.P.; 5 ml dieldrin E.C.; 5 ml diazinon E.C. An undiluted exterior white latex paint treatment also was applied without an insecticide. All treatments were compared with an untreated check (see table).

TREES BY THE BORER

Some of the trees were killed by extreme drought conditions and severe sunburning before borer infestations occurred. All treatments were better than the untreated check; however, the dieldrin spray was much better than the other sprayed treatments. Exterior white latex paint either with or without insecticides was better than either the sprayed or untreated trees. Exterior white latex paint plus insecticides was no better than exterior white latex paint used alone.

A single application of exterior white latex paint applied to trunks of young trees before flatheaded borer egg deposition, but after bud break, prevented sunburn and subsequent borer attack. An application of this material made before bud break may delay bud development; an application to the foliage may cause leaf damage.

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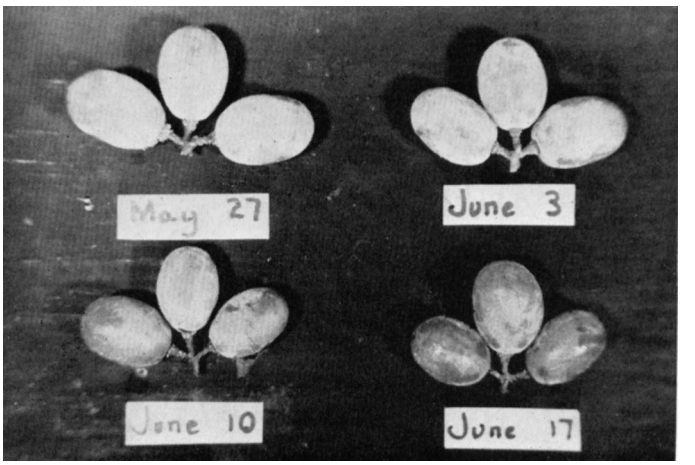

Typical Thompson seedless grapes from these tests show no effects on maturity from spray applications timing on dates indicated.

F. L. JENSEN

Effects of TIMING gibberellin sprays for berry sizing on maturity of table Thompson Seedless

The maturity of table Thompson Seedless was not affected in these tests by the time of application of berry-enlarging sprays of gibberellin, whether the sprays were applied when the grapes were at the shatter stage or at one, two, or three weeks after shatter. The shatter and shatter-plus-one-week treatments did produce larger berries than did the two later spray treatments.

THE USE OF GIBBERELLIN to enlarge the size of Thompson Seedless berries has been a standard commercial practice of table grape producers for several years. The sprays are applied after the normal shatter following bloom has occurred, usually in early June. Previous work has shown that the greatest size increases are obtained from sprays applied shortly after shatter has occurred. The effect of spray timing on maturity has been less extensively studied, especially of sprays applied within the period shortly after shatter.

The effects of timing on fruit maturity were tested in a trial established in cooperation with D'Arrigo Bros., whose vineyard was located in northern Tulare County, south of Reedley. A 40-part-per-million concentration of gibberellin was used for the berry enlarging sprays with 3 ounces of Triton B 1956 per 100 gallons of water used as a spreader-sticker. Approximately 235 gallons of spray were applied per acre. A randomized complete block design was employed with three replications of each treatment. Each plot consisted of a row through two blocks, or about 160 vines.

First Treatment

The first treatment was applied on May 27, when shatter had been completed on about 95 per cent of the clusters. Weekly applications followed on June 3, 10, and 17.