AVITROL-TREATED BAIT FOR PROTECTION OF GRAPES FROM HOUSE FINCH DAMAGE

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INTRODUCTION

Damage to grapes by house finches (Carpodacus mexicanus) is widespread and well documented in California. DeHaven (1974) estimated that damage in nine counties exceeded 0.75 million dollars while Clark (1976) indicates a probable loss of 3.7 million dollars throughout the entire state. Crase et al. (1976) indicated that house finches undoubtedly are the principal depredating species. Various protection measures are described by Piper & Neff (1937), Boudreau (1972), and Clark (1975, 1976). Current protection programs are explained by Crabb and Martin (1977).

The use of wooden V-shaped feeding troughs containing strychnine-treated (0.43% a.i.) rape and canary grass seed is a common practice in California for reducing local populations of house finches (linnets) (Palmer 1970, Clark 1976). This paper reports on the efficacy of Avitrol-treated rape and canary grass seed in protecting grapes from house finch damage when using feeding troughs supported one to three feet above the vines.

Preliminary trials were undertaken (June and July, 1977) using early maturing grape varieties with a history of prior house finch damage. These trials suggested: 1.) House finches did not distinguish between Avitrol-treated or untreated seed in cage trials. 2.) In the field, they repeatedly fed on treated bait. 3.) A ratio of two untreated seeds per one treated seed (0.75% a.i. by weight) more consistently induced an aversion reaction to the test site than a 5:1 dilution ratio. 4.) A blend of three parts canary grass to one part rape seed was used but occasionally was altered if a preference developed.

METHODS

Rape and canary grass seed was soaked four hours in a hydrochloric acid and 4-aminopyridine solution. This procedure was conducted by Avitrol Corporation. Laboratory analysis indicated that the treated seeds carried 0.98% active ingredient by weight per seed. Red wine grape (Pinot Noir and Pinot Chardonnay) varieties were used in the study. One 17-acre plot (Pinot Noir) at the Brown vineyard and one 20-acre plot (Pinot Chardonnay) at the Southdown vineyard were selected. The vineyards were 50 miles apart. These particular treatment and control plots were selected based upon the abundance of house finches in the areas and the high degree of damage over the last two years. Control plots were located adjacent to treatment plots with highly visible boundaries between them.

Prebaiting with clean (untreated) bait Dwarf Essex variety rape seed and canary grass seed (Phalaris sp.) was begun as soon as 50 house finches or more began feeding in either vineyard. The clean seed in each V-shaped trough was replaced with four ounces of treated seed when the troughs were receiving estimated maximum house finch visitation (Clark 1976). Treated bait remained exposed until the house finches stopped feeding from the troughs. The exposure varied from one to four days. Thereafter, treated bait was replaced with clean bait in each trough and remained until feeding activity approached maximum, then treated bait was put out in place of clean bait. The cycle was repeated as often as necessary until harvest (Tables1 and 2).

Bird counts were recorded by the same man between 0600 - 0900 on each day listed in Tables 1 and 2. The greatest feeding pressure occurred between 0700 - 0830 with a noticeable increase on clear mornings. Counts were estimated (Arbib 1972) over fixed time intervals as described by Martin and Jackson (1975). The minimum and maximum number of birds visiting each trough was recorded. The number of birds in the vineyards fluctuated greatly. Bird counts were made only in treated plots. Damage assessment was conducted throughout the plots (Fig. 1 and 2) using the technique described by Martin and Crabb (1978).

DISCUSSION AND RESULTS

Tables 1 and 2 describe the relationship between the baiting exposure periods relative to the number of house finches in the treatment plot and the number of house finches actually feeding from the bait troughs.

Brown Vineyard - Within the first few weeks of initiating the trial, bird depredation was evenly distributed over both plots. After August 9, the first day of treatment, few house finches were observed in the treated and control plots. Damage to the treated plot was assessed at 3.0%. A preliminary check of the control plot revealed an immeasurable amount of damage so a detailed assessment was not conducted. It is not known why the birds departed the test plot area. It would be too presumptuous to think that one day of treatment resulted in the birds abandoning the test site.

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Table 1. Data on finch control from the Brown vineyard containing 17 acres of Pinot Noir grapes.

	Date	No. of Troughs	No. of House Finches Observed in Treatment Plot*	No. of House Finches Observed Feeding in Troughs*
UNTREATED	July 20-27	14	75-150	0
	July 28	14	75-150	25-50
	July 29-Aug. 8	18	150-200	50-150
TREATED	Aug. 9	18	150-200	50-150
	Aug. 10	18	10-35	0
	Aug. 11	18	0	0
UNTREATED	Aug. 12	18	10	0
	Aug. 13-15	18	30-40	0
	Aug. 16-19	18	40-75	0-40
	Aug. 20-28	18	50-75	40-60
TREATED	Aug. 29	18	50-75	40-60
	Aug. 30	18	0	0
UNTREATED	Aug. 31-Sept. 2	18	20-25	0-10**
	Sept. 3-7	18	20-25	0-10**
	Sept. 8	Vineyard assessed for bird damage		
	Sept. 9-20	18	20-25	0-10
	Sept. 21	Grapes were harvested***		

*These figures represent the range between the minimum and maximum numbers of house finches observed from 0600 - 0900.
**Sugar content of grapes between 16 -- 19% soluble solids.
***Harvesting was originally scheduled for Sept. 12 but was postponed to allow sugar content to increase.

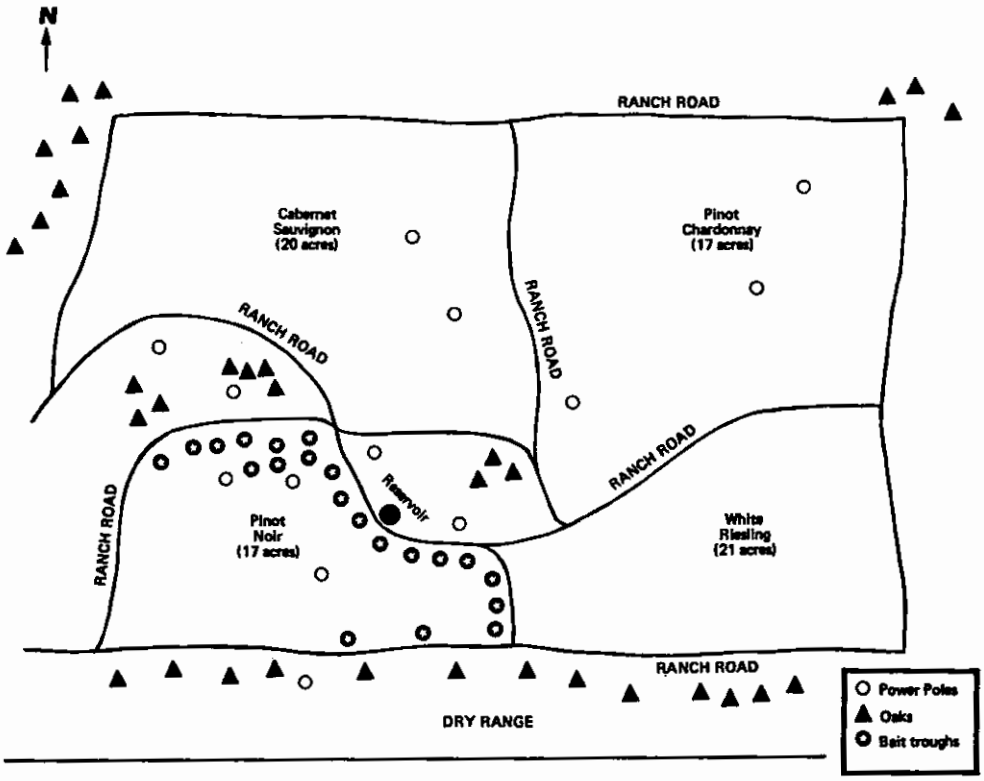

Fig. 1. Brown Vineyard

Table 2. Data on finch control from the Southdown vineyard containing 20 acres of Pinot Chardonnay.

	Date	No. of Troughs	No. of House Finches Observed in Treatment Plot*	No. of House Finches Observed Feeding in Troughs*
UNTREATED	July 25	4	150-200	0
	July 28	14	150-200	0
	July 29	14	200-250	50
	July 30	14	200-350	50-100
	Aug. 1	14	200-350	50-100
	Aug. 2	14	200-350	50-100
	Aug. 3	14	250-300	50-100
	Aug. 4	14	250-300	50-100
	Aug. 5	14	350-400	50-100
	Aug. 6	14	350-375	50-100
	Aug. 7	14	400-450	50-100
TREATED	Aug. 8	14	400-450	50-100
	Aug. 9	14	150-250	50-100
	Aug. 10	14	50-75	15
	Aug. 11	14	25-50	0
UNTREATED	Aug. 12	14	50-250	0
	Aug. 13-16	14	150-250	0
	Aug. 17-25	14	150-250	50-150
TREATED	Aug. 26	14	150-300	50-100
	Aug. 27	14	75-150	0
	Aug. 28	14	50-75	0
UNTREATED	Aug. 29	14	50-75	5-25
	Aug. 30	14	50-75	5-25
	Aug. 31	14	50-75	5-25
	Sept. 1-5	14	75-200	25-150
	Sept. 6-11	14	75-200	25-150
TREATED	Sept. 12	14	75-200	25-150
	Sept. 13	14	5-25	0
UNTREATED	Sept. 14	14	5-25	0
	Sept. 15-18	14	25-150	0
	Sept. 19-Oct. 4	14	25-150	0-40
TREATED	Oct. 5-6	14	25-150	30-40**
	Oct. 7	14	5-25	0**
UNTREATED	Oct. 8-19	14	5-25	0
	Oct. 20-21	Vineyard assessed for bird damage		
	Oct. 24-28	Grapes were harvested		

*These figures represent the approximate range between minimum and maximum number of house finches observed between 0600 - 0900.
**Sugar content of grapes between 18 - 22%.

Southdown Vineyard - The treatment plot received an estimated 7.0% damage while damage to the north and south control plots was estimated at 17.0% and 13.0% respectively. The aversion effect at Southdown was principally limited to the treatment plot. House finches continued feeding on the grapes throughout the trial at this location as nomadic flocks continually moved in from the adjacent canyon. This contributed to the rapid buildup of birds following treatment. Approximately 65% of the grapes were damaged along the west side of this vineyard last year (1976). Figure 2 shows that damage was reduced by 50% this year (1977) as a result of the use of Avitrol-treated baits.

The untreated area on the north side of the treated plot received little damage in past years and was not originally included as a part of the study site. Within a few weeks of using treated bait, it became apparent that bird pressure was building up in this area. This suggests that birds normally feeding along the canyon side of the treated area were moving into the six-acre untreated site.

The data collected support the fact that Avitrol-affected house finches may stimulate an avoidance reaction among other flock members. The extent and duration of the avoidance reaction appears to vary, depending upon the degree and stability of bird pressure. For example, the abrupt departure of the birds from the Brown vineyard compared to the gradual departure of the birds from the Southdown vineyard may be explained by the fact that the Brown vineyard contained a limited but stable house finch population whereas the Southdown vineyard population continually fluctuated with the arrival of new flocks because of their movement into the area by way of Dry Creek Canyon.

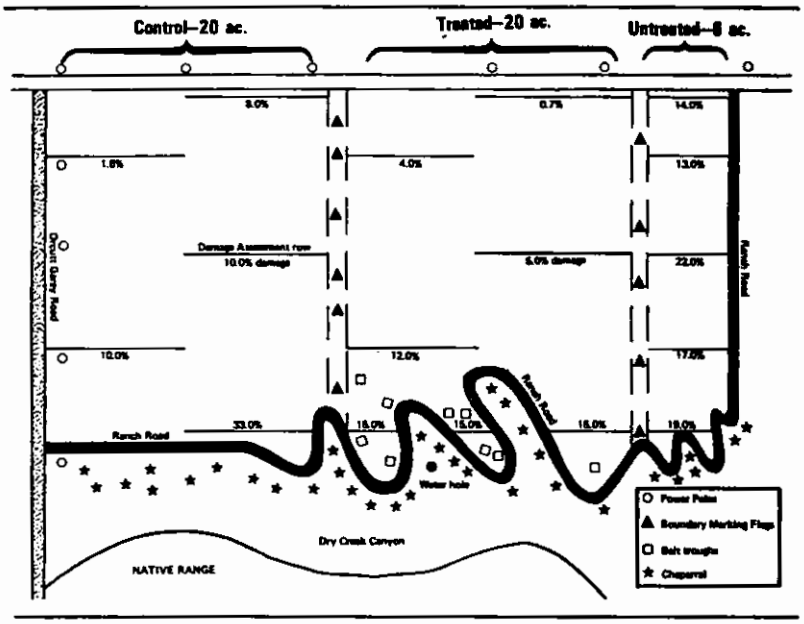

Fig. 2. Southdown Vineyard

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