EFFECT OF "SUNGARD" AS A DORMANT APPLIED WHITENING AGENT ON BARK TEMPERATURE OF MATURE FRENCH PRUNES

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INTRODUCTION

Limb and small branch sunburn is a serious problem of French prune as trees are at their full bearing potential. Heavy crop loads result in limbs "laying out" predisposing their upper surfaces to sunburn. In addition to direct injury of bark and cambial tissue, the resulting wound is readily infected by the Cytospora fungus. Cytospora continues to invade healthy tissue resulting in limb death and gradually unproductive trees.

Growers attempt to mitigate potential for sunburn injury through judicious pruning programs. However, in the dormant season, growers have difficulty envisioning extent to which subsequent cropping will result in sunburn potential. Thus, pruning programs, although well intended, are often not sufficient to eliminate sunburn. Here is a report of the effect of a whitening agent topically applied during two dormant seasons on bark temperatures, and thus sunburn potential, of French prune.

OBJECTIVE

1. Determine the effect of a dormant applied topical whitener on mid-summer bark temperatures of French prune.

PROCEDURE

1997

A mature, highly productive French prune orchard in Farmersville, CA with a developing sunburn problem was selected for the experiment. Ten pairs of trees were configured into a randomized complete block design where one tree of the pair was randomly selected for treatment. The tree designated for treatment was sprayed with the material "Sungard" (a proprietary material of the Sungard Chemical Co., Fresno, CA). The trees were sprayed 21 February 1997 with a solution of 60 LB Sungard and 2 LB of Sungard spreader per 100 gallons of water (the recommended mix to prevent sunburn of English walnut fruits) with a high pressure hand gun sprayer. Exposed bark temperatures were determined by inserting penetrating thermometer approximately 1/8" below the bark surface on each sprayed and unsprayed tree on 24 July, a hot day, at 1000, 1200, 1400 and 1600 hours. Ambient temperature was determined at each measurement period.

1998

The same 10 pairs of mature French prune trees were used to repeat the treatments of 1997. The individual designated for spraying in 1997 was again treated in 1998. Exposed bark temperatures

on whitened and non-whitened trees were recorded on 6 August on 2 trees per treatment using Hobo-Stowaway data logger for a 24 hour period. In each case, thermisters were inserted approximately 1/16" under the bark and secured. Ambient air temperature was recorded with a similar data logger during bark temperature measurement.

RESULTS AND DISCUSSION

1997

Exposed whitened and non-whitened bark temperatures, throughout a hot summer day in the Southern San Joaquin Valley, are numerically presented in Table 1 respectively. Ambient temperature is correspondingly presented.

Sungard, applied in the late dormant period significantly (P=.01) reduced exposed bark temperatures from 6°F (100 hours) - 12.8°F (1600 hours) 5 months following treatment, 24 July, the only day of measurement. From this preliminary work, it appears that a proper whitening agent applied in the late dormant season may, by reducing exposed bark temperature during mid-summer, have potential for reducing coincident sunburn. Additional testing is needed to fully evaluate this type of treatment and its effect on ultimate sunburn injury. The latter was not measured in this experiment.

Table 1. Effect of a topically applied whitening agent on exposed bark temperatures in mid-summer. French Prune, Visalia, CA 1997

	Exposed Bark Temperatures °F[1/]			
	Hours			
	1000	1200	1400	1600
Ambient Temperature	88.7	94.1	98.0	99.1
Treatment				
Unwhitened	95.8a	103.2a	106.8a	109.5a
Whitened	89.8b	94.0b	97.1b	96.8b
	P.01=4.1	P.01=8.6	P.01=5.9	P.01=5.9

[1/]10 single tree replicates

1998

In 1998, no substantial difference in exposed bark temperature was recorded between whitened and unwhitened trees. Unlike 1997 (a modest rainfall year) where treated trees retained the whitening agent, the 1998 spring was unusually wet (El Nino) and washed much of the Sungard off by mid-summer resulting in little protective benefit (see Table 2).

Table 2. Effect of a topically applied whitening agent on exposed bark temperatures in mid-summer. French Prune, Visalia, CA 1998.

Exposed Bark Temperatures °F[1/]

	Hours			
	1000	1200	1400	1600
Ambient Temperature	87.8	95.1	99.5	100.2
Treatment				
Unwhitened	98.8	113.8	120.1	121.2
Whitened	104.5	119.5	122.6	118.9

[1/] Averages of 2 readings per treatment

CONCLUSION

Late dormant applications of a whitening material to mature prune trees can reduce bark temperatures which may sunburn. Degree of benefit will depend on amount of rainfall following treatment; if excessive, no benefit may be realized. In any case, the material used should have a high degree of whitening and sticking ability and must be applied to thoroughly coat exposed surface.