South African Avocado Growers' Association Yearbook. 2002. 25:9-10

Sunburn control on 'Hass' fruit

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ABSTRACT

Shadow, a wettable powder used for sunburn control, was applied as a double and a multiple application treatment to 'Hass' trees in a commercial orchard. Shadow treatment reduced the incidence of sunburn by 20% when compared to the untreated control. However, due to high residue levels and / or scale insect infestation on Shadow treated fruit, the percentage of export grade fruit was only increased by 2% (double treatment) and 4% (multiple treatment). Shadow treatment is therefore impractical for 'Hass' avocado, but may hold promise for smooth-skinned cultivars such as 'Fuerte'.

INTRODUCTION

'Hass' fruit that set from determinate inflorescences are exposed to the sun and are prone to severe sunburn. Poor tree condition and leaf loss caused by root rot aggravate the problem. The amount of exportable fruit may be considerably reduced as a result of sunburn, which may affect up to 10% of the crop. Methods of sunburn control on various fruit and vegetable crops include the use of shade-cloth structures, fruit bagging, the use of protective heeds and treatment with reflective substances. The aim of this trial was to test Shadow, a wettable powder, as a sunburn control agent on 'Hass' avocados.

MATERIALS AND METHODS

The trial consisted of 30 'Hass' trees, selected to have a large number of fruit exposed to the sun. Shadow at 100g/L (Partner™ 650 at 1ml/L added as a sticker) was applied as a double application treatment (December 2000 + January 2001) and a multiple application treatment (2 ´ December 2000 + January 2001 + February 2001 + March 2001 + April 2001) using a motorized knapsack sprayer. As Shadow was washed off by heavy rain, re-application was done according to the degree of cover on the fruit. Control trees were left untreated.

At harvest (early July), fruit from each treatment were sent to the packhouse where they were subjected to the normal packhouse procedures. Data on the proportion of export, local and factory grade fruit were obtained from the packhouse. One sample each of the local and factory grade fruit was evaluated for Shadow residues after packhouse treatment, sunburn damage and insect infestation on the fruit. The evaluation was done on a scale of 0-3, where 0 depicted a clean fruit and 3 a fruit with a severe symptom. A sample of the export grade fruit was stored for an evaluation of fruit quality after simulated shipment (28 days at 5.5 °C).

RESULTS AND DISCUSSION

The incidence of sunburn on fruit from the control trees was low, with only a small portion of the factory grade fruit having sunburn at a rating of two (Fig. 1). Shadow treated trees (both treatments) had 20% more fruit free

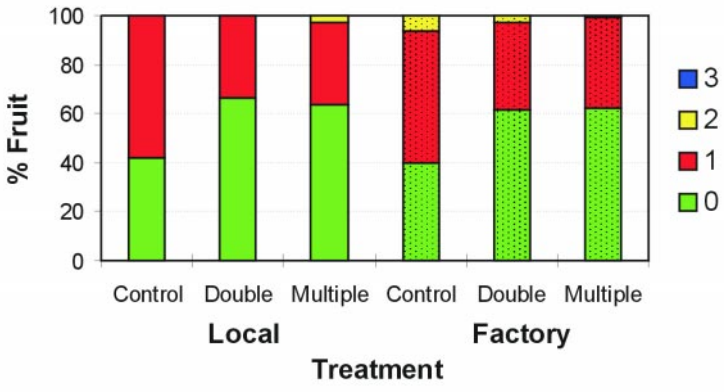

Figure 1. The effect of Shadow treatments on sunburn damage on 'Hass' fruit (local and factory grade), compared to an untreated control. Evaluation was done on a scale of 0-3 (0= no symptom, 3= severe symptom).

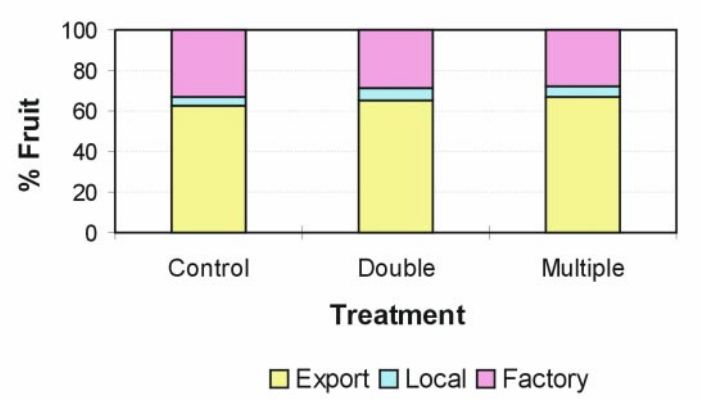

Figure 2. The effect of Shadow treatments on the proportion of export, local and factory grade 'Hass' fruit, compared to an untreated control.

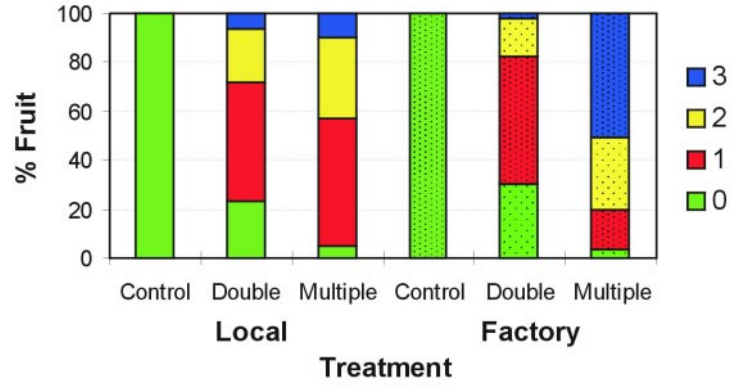

Figure 3. The effect of Shadow treatments on Shadow residues after packhouse treatment on 'Hass' fruit (local and factory grade), compared to an untreated control. Evaluation was done on a scale of 0-3 (0= no symptom, 3= severe symptom).

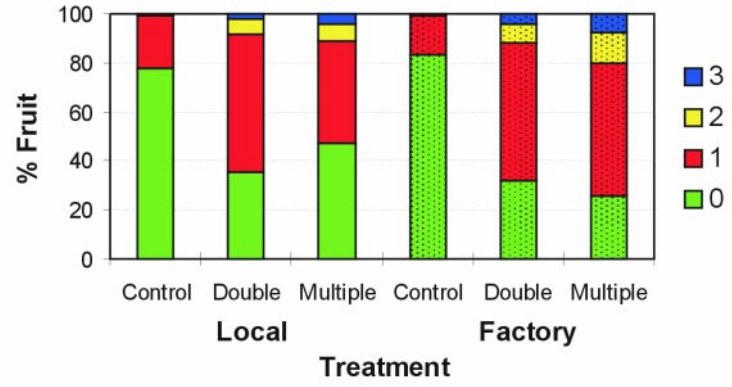

Figure 4. The effect of Shadow treatments on scale insect infestation on 'Hass' fruit (local and factory grade), compared to an untreated control. Evaluation was done on a scale of 0-3 (0= no symptom, 3= severe symptom).

from sunburn (rating 0) when compared to the untreated control trees. However, the proportion of export grade fruit was only increased by 2% (double treatment) and 4% (multiple treatment) when compared to the untreated control (Fig. 2).

After undergoing the normal packhouse procedures, Shadow-treated fruit still had high levels of visible residues, especially on fruit from the multiple application treatment (Fig. 3). Scale insect infestation on control fruit was minimal with 78% (local grade) and 82% (factory grade) of the fruit free of scales (Fig. 4). However, scale insect infestation increased dramatically on fruit from Shadow treated trees. The severity of the infestation was higher on fruit which received the multiple application treatment, especially for the factory grade fruit. Fruit quality after simulated shipment was good and no differences between treatments were observed.

CONCLUSIONS

Shadow treatment of 'Hass' fruit reduced the incidence of sunburn by 20% when compared to the untreated control treatment. However, due to high residue levels and / or scale insect infestation on Shadow treated fruit, the percentage of export grade fruit was only increased by 2% (double treatment) and 4% (multiple treatment). Therefore, Shadow treatment is impractical for 'Hass' avocado but may hold promise for smooth-skinned cultivars such as 'Fuerte'.

ACKNOWLEDGEMENTS

The financial support of SAAGA is gratefully acknowledged. Westfalia Estate is thanked for supplying a trial orchard and handling the fruit in the packhouse. A. Ratshili and V. Ramolefo are thanked for their technical assistance.