3. No well established criteria for harvesting the fruit have been established but it has been observed that picking the purple colored fruit when \( \frac{1}{2} \) to \( \frac{1}{2} \) of the surface fruit is colored and ripening at about 70°F results in good quality and minimal anthracnose.

4. There is a good possibility that other superior cold-hardy types will be found but evaluation takes a number of years.

5. Cold-damaged trees should not be pruned until late summer. Recovery from freeze damage is rapid and major replacement of damaged parts can occur within one season.

**LITERATURE CITED**


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**EFFECTIVENESS OF COPPER WHEN COMBINED WITH NU FILM 17 FOR CONTROL OF AVOCADO SCAB**

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**ABSTRACT**

Nu Film 17 (poly-l-p Menthen-8,9-diyI) and Triton B 1956 in combination with tribasic copper and Kocide 101 sprays were evaluated for control of avocado scab (Sphaceloma perseae Jenkins). Nu Film 17 had a significant effect on the copper fungicidal sprays enhancing disease control and increasing marketable fruit yields.

**INTRODUCTION**

Florida avocado production costs continue to rise relentlessly. It is increasingly important for the avocado grower to make every tree produce its utmost. Production costs must be reduced whenever possible without sacrificing quality and yield.

One of the most persistent expenses to the grower is disease control. Avocado diseases such as Cercospora spot (Cercospora purpurea Cke), Anthracnose (Colletotrichum gloeosporioides Penz.) and Avocado scab (Sphaceloma perseae Jenkins) can cause sizable losses to Florida avocado growers. Most of these diseases are adequately controlled by various rates of some form of copper (2). Unfortunately complete disease control is never obtained with the fungicide since coverage is never complete and unsprayed tissue is exposed during growth of the leaves and fruit. Disease control is further reduced through loss of fungicide due to wind and rain.

Blazquez and McGrew (1) have shown that tomato plants sprayed with fungicide and Nu Film 17 combinations had better foliage with less cucumber target spot than the plants sprayed with fungicides alone.

The purpose of this experiment was to evaluate two copper fungicides for the control of avocado scab and to determine the effect of two spreader stickers, Triton B 1956 and Nu Film 17, on the efficacy of the copper fungicides tested.

**MATERIALS AND METHODS**

The commercial avocado variety 'Lula' was used because it is very susceptible to avocado scab.
The fungicides tested were Kocide 101 (Cupric hydroxide) and Tribasic copper sulfate. The surfactants used in combination with the fungicides were Nu Film 17 (poly-l-p Menthen-8,9-diyl) and Triton B 1956 (Modified phthalic glycerol alkyd resin). Nu Film 17 is an organic sticker which forms a soft, pliable film over the leaf surface greatly reducing fungicidal erosion by rain. The fungicides were applied as a dilute spray at the rate of approximately 15 gallons per tree. The sprays were applied with a Myers grove sprayer operated at 300 psi and equipped with hose and two hand operated spray guns. Applications were started in March 1969 and continued on a monthly schedule until the final spray in September 1969. The treatments were applied to plots of 5 trees replicated 4 times. The fruit was harvested in December 1969 and rated in one of three groups: scab free, mild scab, and severe scab. The severe scab category was defined as the amount of scab which would cause a reduction in fruit grade. Commercial grove production practices were followed throughout the experiment.

Table 1. Percent of scab free, severe scab and marketable fruit from fungicide test for control of avocado scab on 'Lula'.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dosage per 100 gallon</th>
<th>Yield No. fruit per plot</th>
<th>Percent Fruit 1/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Scab free</td>
</tr>
<tr>
<td>Tribasic copper</td>
<td>3 lbs 2 oz</td>
<td>364</td>
<td>65.0 b</td>
</tr>
<tr>
<td>Triton B 1956</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kocide 101</td>
<td>2 lbs 2 oz</td>
<td>359</td>
<td>85.0 a</td>
</tr>
<tr>
<td>Triton B 1956</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tribasic copper</td>
<td>3 lbs 1 pt</td>
<td>397</td>
<td>87.1 a</td>
</tr>
<tr>
<td>Nu Film 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kocide 101</td>
<td>2 lbs 1 pt</td>
<td>412</td>
<td>90.0 a</td>
</tr>
<tr>
<td>Nu Film 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check (No fungicide)</td>
<td></td>
<td>385</td>
<td>0.0 c</td>
</tr>
</tbody>
</table>

1/ Differences between figures followed by the same letter are not statistically significant at the 5% level according to Duncan's Multiple Range Test.
Nu Film than with Triton B 1956. In December, leaves and fruit from plots sprayed with copper in combination with Nu Film 17 showed obvious residues, whereas residues were difficult to detect on plots sprayed with copper plus Triton B 1956.

**DISCUSSION**

Nu Film 17 shows a great deal of promise for the avocado grower. It has a significant effect on the copper fungicidal sprays enhancing disease control (percent scab free) and increasing marketable fruit yields. The chemical Nu Film 17 mixed well with the two coppers and there were no problems with dispersion. The tenacity of Nu Film 17 is quite good and extends the residual effect of copper fungicides which have little sticking quality of their own.

Tests are now under way to determine if the amount of copper spray can be reduced without affecting the level of disease control. If this can be done the amount of copper accumulating in the root zone could be reduced. Thus the development of copper toxicity in avocado trees could be prevented or at least postponed.

**LITERATURE CITED**


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**RESPONSE OF ‘STOVER’ GRAPE TO SOIL APPLICATIONS OF MAGNESIUM**

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**ABSTRACT**

Emjeo (26.8-27.5% MgO) was applied to the soil at rates of 600 pounds per acre from 1964 to 1969 (1000 pounds per acre in 1968). Emjeo corrected deficiency symptoms of leaves and increased the Mg content of petioles and soils, and the soluble solids of berries. Vines in Emjeo-treated plots had lower fruit yields and weights of prunings in 1967, 1968, and 1969 but differences were not significant.

The petiolar Mg content of vines in some untreated plots was within the deficiency range. Mn, Fe, and Cu contents of petioles were below normal but not within the deficiency range. High Mg in petioles was associated with much lower Ca and slightly lower K levels. Failure to increase yields with Mg applications may be due to an interaction between Mg and other elements.

Magnesium deficiency of grapes has been reported by several workers (2,4,5). In Florida, Mg deficiency is common in citrus planted in both calcareous (3), and acid soils (6). Symptoms of Mg deficiency were observed in several vines throughout the Station’s vineyard and in a block of 120 ‘Lake Emerald’ vines planted in 1963 to be used as rootstock for ‘Stover’ variety. A test to correct the deficiency was made and results are reported here.

**INTRODUCTION**

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**MATERIALS AND METHODS**

Treatments with Emjeo (80-82% MgSO₄, equivalent to 26.8-27.5% MgO) were begun in 1964. Since rootstock growth was poor, grafting to ‘Stover’ was not done until 1965. The entire planting consisted of 120 plants, with four rows on 10-foot spacing and 30 vines per row spaced 6 feet apart. Plots consisted of 20 vines, four rows wide by five vines long but records were taken from only the 12 inner vines in each plot. There were three replications. Treatments were: the untreated check and Emjeo at 600 pounds per acre from 1964 to 1969 (1000 pounds per acre in 1968) applied in split applications in March and May. Data were taken on fruit and