

Proc. Fla. State Hort. Soc. 83:386-388. 1970.

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

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ABSTRACT

Nu Film 17 (poly-1-p Menthen-8,9-diyl) 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-1-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, in the experiment.

RESULTS

All fungicidal treatments gave significantly better scab control than the check (Table 1). Kocide 101 plus Triton B 1956 provided a higher percent of scab free fruit and a lower percent of severe scab fruit than Tribasic copper plus Triton B 1956. There was no significant difference between the copper fungicides in combination with Nu Film 17 in number of scab free or severe scab fruit. There were no significant differences between Kocid 101 with Triton B 1956, Kocid 101 with Nu Film 17, and Tribasic copper with Nu film 17 in controlling avocado scab. None of the treatments had a significant effect on total yield however, Kocide 101 in combination with Nu Film 17 and Triton B 1956 and Tribasic copper with Nu Film 17 provided approximately 5 percent more marketable fruit than tribasic copper with Triton B 1956 (Table D-

Visual observation indicated that the amounts of residues on foliage and fruit were considerably better when fungicides were combined with 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.

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

Treatment	Dosage per 100 gallon	Yield No. fruit per plot	Percent Fruit ^{1/}		
			Scab free	Severe scab	Marketable
Tribasic copper Triton B 1956	3 lbs 2 oz	364	65.0 b	7.5 b	92.5 b
Kocide 101 Triton B 1956	2 lbs 2 oz	359	85.0 a	2.8 a	97.2 a
Tribasic copper Nu Film 17	3 lbs 1 pt	397	87.1 a	2.3 a	97.7 a
Kocide 101 Nu Film 17	2 lbs 1 pt	412	90.0 a	2.1 a	97.9 a
Check (No fungicide)		385	00.0 c	63.7 c	36.3 c

^{1/} Differences between figures followed by the same letter are not statistically significant at the 5% level according to Duncan's Multiple Range Test.

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

1. Blazquez, C. H. and G. T. McGrew. 1969. Effect of Nu Film 17 on fungicides evaluated for control of cucumber target spot. Fla. State Hort. Soc. Proc. 81: 141-143.
2. Ruehl, George D. 1963. The Florida avocado industry. Fla. Agr. Exp. Sta. Bull. 602.