45% yield increase. The relatively low yields and moderately severe foliage symptoms of plants grown in the absence of fertilizer Cu, indicate that available soil Cu was quite low. This large yield increase is not unusual when available soil Cu is low enough to cause visual symptoms of Cu deficiency on the foliage (7). Even in the absence of Cu deficiency symptoms, yield increases of 25 to 30% due to fertilizer Cu have been reported (4,7).

Results of the above experiments indicate that CuO is as efficient as $CuSO_4$ in supplying Cu to watermelon plants for optimum production of melons grown on virgin flatwood soils.

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POST-HARVEST CONTROL OF *Sclerotinia sclerotiorum* OF POLE BEANS

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ABSTRACT

Three post-harvest chemical treatments were evaluated for watery soft rot control on pole beans. Botran gave superior control of *Sclerotinia*. Benlate and Thiabendazole did not provide sufficient control.

INTRODUCTION

White mold, caused by the fungus *Sclerotinia sclerotiorum* (Lib.) de Bary, is at present the most important disease problem of pole bean production and marketing in Dade County, Florida. Such practices as continuous culture on the same tract of land, heavy seeding rates, fertilizer programs which promote luxuriant vine growth and packing hampers for shipment in the field without grading, have undoubtedly contributed to the white mold problem. Continuous bean culture favors the fungus by allowing the development of increasing populations in the soil with each succeeding planting. High density populations and consequent dense shading of the soil provides an excellent environment for the fungus. Cool damp conditions under the plant canopy favors the distribution of inoculum to the vines and the pods and rapid development of the mold.

Foliage fungicides and soil treatments recommended for Dade County have not been consistently satisfactory in control of white mold. Air craft application of foliage fungicides is quite inadequate since the chemical in either liquid or dust form rarely reaches that portion of the plant exposed to the fungus inoculum. Soil fumigation in Rockdale soil, in Dade County is less than completely effective.

Because field control of white mold is limited at best, and since beans are packed in the field without grading, infected pods are included in market shipments. The disease continues to develop during transit, resulting in the condition

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known as "nesting," and considerable losses to growers. Since a post-harvest treatment to control nesting is greatly needed, this study was initiated to test the efficacy of selected fungicides as a post-harvest control of white mold.

METHODS

The fungicides tested were Botran, (2, 6-Dichloro-4-nitroaniline), Benlate, (Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate), and Mertect, (2-(4-Thiazolyl)benzimidazole). These chemicals were selected because they had been reported to control white mold (1, 2). None are approved by Federal or Florida agencies for post-harvest application on pole beans.

The experiment containing 14 treatments with ten replications was repeated several times with only minor variations in results which were not considered statistically significant. The sample size for each treatment was a hamper of pole beans obtained from commercial fields throughout Dade County. Each hamper was poured slowly into a wire basket at which time fiev *Sclerotinia*-infected bean pods were introduced evenly throughout. The samples were completely submerged in the chemical solution, and agitated for 10 seconds, allowed to drain, then poured back into the hampers and stored under high humidity at 58°F. The number of infected pods was counted after 10 days of storage.

RESULTS AND DISCUSSION

The post-harvest dip of Botran at a rate of 2 pounds per 100 gallon afforded excellent control of nesting (Table 1). Botran not only prevented nesting but also eradicated the fungus organism. The results substantiated the findings of Pegg (2). Benlate and Mertect at a rate of 2 pounds per 100 gallon were approximately 14 and 20 times, respectively, better than the dry check. However, at the present time the market will not tolerate any nesting in bean shipments.

The utilization of Botran is affected because of discoloration of the bean pod by the yellow color of Botran. This discoloration was pointed out in Pegg's (2) work which he attributed to poor drainage of pods treated in bags. Although the beans were well drained before packing in my experiments some coloring was noted where two pods intersected allowing the Botran to pool and dry. Drying the beans thoroughly before packing may reduce the number of unsightly yellow pods. Lower rates of Botran caused less discoloration, but control of nesting at these rates was reduced (Table 1).

Table 1. Control of nesting of pole beans by post-harvest treatments after 10 days storage at 58°F.

Treatment (lb/100 gal)		Avg. No. of infected Pods/hamper 1/, 2/	
Water control (dipped)		371.4	l
Dry control (not dipped)		288.6	k
Botran	2	0.0	a
	1	65.4	g
	½	112.6	i
	¼	150.3	j
Mertect	2	14.4	b
	1	30.3	cd
	½	45.4	ef
	¼	96.2	h
Benlate	2	20.1	bc
	1	35.7	de
	½	50.4	f
	¼	112.6	i

1/ Treatments within a range are not significantly different at 5% level of p.

2/ The experiment was repeated several times with only minor variations in results which were not considered statistically significant.

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