Conclusions

Specific gravity ranged from 1.0824 to 1.0642 due to varietal differences. Rutledge and Leon fine sand produced tubers of higher specific gravity than Bladen fine sand. Lower specific gravity values were usually associated with high rates of potash, chloride as the source of potash, band application of fertilizer and higher levels of soil moisture.

Acknowledgement

The author expresses appreciation to the following for their assistance. Drs. R. A. Denison and C. B. Hall, Main Station, Gainesville, for specific gravity measurements presented in Table 4; Dr. G. M. Volk, Main Station, Gainesville, for data given in Table 2 and specific gravity measurements in 1954 and 1955 in Table 3; Mr. James Watts, Wise Potato Chip Company, Berwick, Pennsylvania for specific gravity measurements given in Table 1 for 1956-59; Dr. E. N. McCubbin for supplying tuber samples of potato varieties and seedlings.

Literature Cited


Use of Combinations of Maneb and Dyrene for Control of Tomato Diseases

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Use of the ethylene bisdithiocarbamate fungicides, particularly manebo, by Florida growers has resulted in a marked improvement in control of fungus diseases of tomato in recent years. When properly applied manebo gives excellent control of late blight (Phytophthora infestans (Mont.) DBy) and adequate control of gray leaf spot (Stemphylium solani Weber) under most conditions. The major shortcoming of manebo as an all-purpose tomato fungicide is that it does not control Botrytis gray mold (Botrytis cinerea Fr.). Ferbam, thiram and dichlone have been suggested for control of Botrytis gray mold (2,5) but all have major

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shortcomings as an all-purpose tomato fungicide.

The results of research clearly indicate that the fungus diseases of tomato can be controlled by proper use of the right fungicides. However, in actual practice growers frequently have difficulty in attaining this and at times experience severe losses. Part of the difficulty stems from the complexity of the problem. Not only can more than one disease occur simultaneously, but the combination of diseases may differ from area to area and season to season. This has led to differing recommendations for disease control from area to area and season to season, and also during a given season. Research over the past two years indicates that a combination of maneb and Dyrene is effective against all the major fungus diseases of tomato foliage. This paper presents some of the evidence supporting this program, and suggests ways that it might be applied in the various disease situations that occur in the tomato-growing areas of the state.

### Methods and Results

Results reported herein were obtained from fungicidal tests conducted at the Sub-tropical Experiment Station and the Indian River Field Laboratory during the 1957-58 and 1958-59 tomato-growing seasons. Fungicides were applied as sprays with a power sprayer in sufficient volume to wet the foliage thoroughly. In each experiment 1.5 lbs. of 70% maneb (weights refer to amount per hundred gallons of water) and 2 lbs. of Dyrene were used alone, and were compared with a combination of one lb. each of the materials. In the experiments at the Indian River Field Laboratory, 0.75 lb. of 50% dichlone was included as a “standard” of comparison for control of Botrytis gray mold.

**Control of gray leaf spot.** Three experiments were conducted for the control of gray leaf spot. In each test check plots and non-sprayed buffers were severely damaged by the disease. Fungicides were applied at weekly intervals in one test. In this test the mixture of maneb

<table>
<thead>
<tr>
<th>Fungicide and amount/100 gals.</th>
<th>Gray leaf spot lesions/leaflet</th>
<th>Late blight lesions/plot</th>
<th>Botrytis gray mold index*</th>
</tr>
</thead>
<tbody>
<tr>
<td>maneb (70 %), 1.5 lbs.</td>
<td>4.3</td>
<td>0.8</td>
<td>5.0</td>
</tr>
<tr>
<td>Dyrene, 2 lbs.</td>
<td>2.2</td>
<td>57.3</td>
<td>1.0</td>
</tr>
<tr>
<td>maneb (70 %) + Dyrene 1 lb. of each</td>
<td>1.1</td>
<td>3.3</td>
<td>1.3</td>
</tr>
<tr>
<td>dichlone (50 %), 0.75 lb.</td>
<td>---</td>
<td>3.8</td>
<td>2.5</td>
</tr>
</tbody>
</table>

| L. S. D. at 5% level of significance | 0.9 | 16.8 | 0.7 |
| L. S. D. at 1% level of significance | 1.3 | 22.6 | 0.9 |

* Index based on a 1 to 6 scale where 1= no Botrytis gray mold found in 5 random locations per plot, and 6= gray mold at each location.
and Dyrene was slightly superior to Dyrene alone, and both treatments were significantly superior to maneb alone (Table 1). In the other two experiments, where applications were made at four to five day intervals, all three treatments gave equal control of gray leaf spot.

**Control of Botrytis gray mold.** Two experiments were made on the control of Botrytis gray mold. The disease was moderately severe in one test but only moderate in the other. Under the more severe conditions, control of Botrytis gray mold with the combination of maneb and Dyrene was equal to Dyrene alone and both were significantly superior to dichlone (Table 1). In the other test, under moderate disease conditions, these three treatments gave equal control of Botrytis gray mold. Maneb was significantly inferior to the other treatments in both tests.

**Control of late blight.** The two experiments on control of Botrytis gray mold also provided information on the control of late blight under mild disease conditions. Since the results of the two tests were very similar, the results of only one test are presented in Table 1. The combination of maneb and Dyrene was slightly inferior to maneb, but equal to dichlone; none of these differences were statistically significant. Dyrene alone was much inferior to maneb alone, or to the combination of maneb and Dyrene.

**Effect on yield.** In all of the tests reported herein, yields from plots sprayed with maneb, Dyrene and maneb + Dyrene were approximately equal. It is doubtful that the differences in disease control in most of the tests were of sufficient magnitude to affect yields, or in cases where control differed, the diseases appeared too late to depress yields. For these reasons the similarity in yields is interpreted to mean that none of the treatments had an adverse effect on yield. This view is supported by the results of other tests with Dyrene and by observations of its use in commercial fields.

**DISCUSSION**

In suggesting the combination of maneb and Dyrene as the "core" of a tomato fungicidal program, the writers believe that this program combines the best features of each

<table>
<thead>
<tr>
<th>Disease Situation</th>
<th>Fungicide to use</th>
<th>Amt./100 gal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Routine' conditions, none active but might appear</td>
<td>maneb + Dyrene</td>
<td>1 lb. + 1 lb.</td>
</tr>
<tr>
<td>Gray leaf spot and/or Botrytis gray mold active, late blight a threat</td>
<td>maneb + Dyrene</td>
<td>1 lb. + 2 lbs.</td>
</tr>
<tr>
<td>Gray leaf spot and/or Botrytis gray mold active, late blight not a threat</td>
<td>Dyrene</td>
<td>2 lbs.</td>
</tr>
<tr>
<td>Late blight active, gray leaf spot and/or Botrytis gray mold a threat</td>
<td>maneb + Dyrene</td>
<td>1.5 lb. + 1 lb.</td>
</tr>
<tr>
<td>Late blight and Botrytis gray mold active</td>
<td>maneb + Dyrene</td>
<td>1.5 lb. + 2 lbs.</td>
</tr>
<tr>
<td>Late blight active, gray leaf spot and/or Botrytis gray mold not a threat</td>
<td>maneb</td>
<td>1.5 lbs.</td>
</tr>
</tbody>
</table>
fungicide and largely avoids their weaknesses. Better control of gray leaf spot and Botrytis gray mold (including the ghost spot phase of Botrytis infection) should result, without jeopardizing control of late blight or causing plant injury and reducing yields. The combination of maneb and Dyrene is expected to control all the fungus diseases of tomato foliage under most conditions except those favoring severe disease development. In the event of an epidemic of a given disease, the fungicide most effective against it should be increased to the amount normally used and the interval between applications shortened. Suggestions for adjusting the program according to different disease situations are presented in Table 2. It is believed this program will be applicable in all the tomato-growing areas of the state.

There are certain situations where the combination of maneb and Dyrene would not be advantageous. For example, on the marl soils of Dade County where late blight is the main disease affecting tomatoes and gray leaf spot occurs sporadically, only maneb should be used. Use of the combination of maneb and Dyrene would not be beneficial on gray leaf spot resistant varieties except if Botrytis gray mold threatened the crop.

The success of any fungicidal program depends on the thoroughness of coverage and timeliness of application. This is also true for the program we suggest. For best results, applications should be started before diseases appear and continued regularly. This is particularly important in the control of Botrytis gray mold and gray leaf spot because good control depends on the build-up of a fungicidal deposit on the lower leaves before the vines "fall-over."

**LITERATURE CITED**


**INHERITANCE OF RADIAL FRUIT CRACKING IN A TOMATO CROSS**

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Quincy

Fruit cracking is one of the primary causes of reduced quality and market value in tomato crops. Even though a considerable reduction in both incidence and degree of cracking can be obtained by the use of improved cultural methods, it would be desirable to breed a tomato variety that would exhibit fruit cracking resistance under many environmental conditions. Previous research indicated that cracking resistance, as found in some breeding lines, might be inherited. Reynard's (1) work presented genetic information of some practical use to the breeder.

Because fruit cracking is sometimes serious