

impregnated with 240 parts per million of streptomycin base. Successful control of many bacterial leaf spotting diseases depends upon proper timing of the applications. Since dusts may be applied quickly and economically by airplane, this method of control was investigated. Tests were conducted at Ft. Pierce in the fall of 1953 comparing dusts containing 250 and 1000 p.p.m. of streptomycin, calculated as a free base, with copper dust for the control of bacterial spot. The plants were dusted seven times between September 1 and October 13. A total of 35.58 inches of rain was recorded between September 1 and October 20, 1953. There were no differences between the treatments at any time during the test. The streptomycin dusts as well as the copper dust failed to control bacterial spot.

RECOMMENDED SPRAY SCHEDULE

The suggested fungicide program for un-staked tomatoes grown on sandy soils of southern Florida is as follows: Begin applications on a weekly schedule with either 2 pounds of zineb or 1½ to 2 pounds of Manzate per 100 gallons of water. After the young plants have reached six to eight inches in height, 2 quarts of nabam plus ¾ pound of 36 per cent zinc sulfate (or its equivalent) may be substituted or used as an alternate with zineb or Manzate. If bacterial spot becomes a threat, a suitable form of copper (Copozim, Tribasic Copper Sulfate, Copper A etc.), used at a rate to include 1½

pounds of metallic copper per 100 gallons of spray, may be alternated with one of the above materials if late blight is not in the area.

The first application of Phygon for the control of gray mold should be made just before "laying by" the tomatoes. Another application of Phygon should be made immediately after "laying by." For the next four to six weeks a program alternating nabam plus zinc sulfate and Phygon on a five-day schedule should be followed. The total number of Phygon applications necessary for good control of gray mold has not been determined, but indications are that a minimum of six is necessary. After this period, if late blight or gray leaf spot are not in the area, intervals between sprays may be lengthened to one week. A thorough coverage of all foliage is very important. On mature plants a minimum of 250 to 300 gallons of spray per acre is necessary to adequately cover the foliage.

The program outlined above should result in better control of all diseases and consequently higher yields should be obtained than if a single fungicide were applied on a straight schedule.

LITERATURE CITED

1. Ainsworth, G. D., Enid Oyler and W. H. Read. Observations on the spotting of tomato fruits by *Botrytis cinerea* Pers. *Ann. Appl. Biol.* 25:308-321. 1938.
2. Ark, P. A. Use of streptomycin dust to control fire blight. *Plant Disease Reporter* 37:404-406. 1953.

PERFORMANCE OF NEW TOMATO TYPES IN THE GULF COAST AREA

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It is the object of this paper to report our evaluations of several tomato varieties that have been introduced in recent years. These new varieties have been compared with established standard varieties such as Grothen's Globe and Rutgers in numerous trials involving replicated plots. It is our intention to point out the salient features, desirable as well as undesirable, of these varieties as observed during these trials. Some of the observations and conclusions, of course, are dependent upon information furnished by other Experiment Station workers, growers, and shippers.

The new varieties considered in this report include Manahill, Manasota, W. R. Grothen Globe, Jefferson, Homestead, Manalucie and Queens.

The first of the wilt-resistant varieties to be tried by commercial growers was Pan America, which was bred by tomato specialists in the United States Department of Agriculture laboratories at Beltsville. The second release in the series from the United States Department of Agriculture was Southland, which was developed at the Southeastern Regional Vegetable Breeding Laboratory at Charleston, South Carolina. Those of you who are tomato-growers will remember that, after one or two trials, both Pan America and Southland were aban-

done because of poor yields, due mainly to roughness and poor quality of the fruits.

Manahill met the same fate as Pan America and Southland. Manahill was released by the Gulf Coast Experiment Station without prior trial by commercial growers. It is resistant to Fusarium wilt, early blight, and gray leaf spot. It responded to the cultural practices of the large majority of the growers who tried it by making excessive vegetative growth, and it also proved very susceptible to catfacing. For these reasons Manahill has been discarded except by a few growers who make use of its special advantages on a small scale.

Manasota, another Gulf Coast Experiment Station product, was released at the same time as Manahill. It is resistant to Fusarium wilt only and is an early, smooth-fruited, open-ined type. Despite its earliness and prolific bearing, it was slow to find favor with the growers because its fruits, though very attractive, are not large enough. However, during the past three years the demand for Manasota seed has increased rapidly. This is due in large part to the fact that it has proven very productive under the conditions of the Immokalee area. A number of growers who produce on an extensive scale in the Immokalee and Ft. Pierce areas now consider Manasota the best variety available for their purposes. Its advantageous characteristics are earliness, high yield, and excellent quality and smoothness of fruits. However, Manasota has certain faults that were not recognized prior to its release. These are susceptibility to blossom-end rot, sensitivity to chilly weather (which may mean that it ceases to size fruits), and high susceptibility to cuticle damage by nabam. The latter is a superficial blemish of the fruit surface and is not well understood. Growers producing Manasota should use zineb instead of nabam after fruits begin to set, for by so doing they will avoid the hazard of cuticle damage.

W. R. Grothen Globe, introduced by Associated Seed Growers, is the result of a cross between Pan America and standard Grothen's Globe. It is resistant to Fusarium wilt and is slightly earlier and more vigorous than Grothen's Globe. Reported yields of this variety have been consistently higher, and average fruit size larger, than those of Grothen's Globe, but our records show that much of the fruit is rough and susceptible to catfacing. In addition the fruits are subject to radial cracking.

Despite these faults, the variety has been grown in considerable volume on old land for the past three years, and the market has accepted the fruits on a par with those of standard Grothen's Globe, the accepted standard of market quality for some time.

Jefferson is another wilt-resistant variety introduced by Associated Seed Growers. It is extremely vigorous and makes densely-leaved, tall vines. It is somewhat later than Rutgers, but produces well under favorable conditions. It is best suited to the spring-crop season and to production on stakes. The fruits of Jefferson are flat and rough, especially under unfavorable growing conditions that do not allow the best possible filling of the shoulders, which are naturally creased. However, the fruits are resistant to catfacing and cracking. The early fruits on Jefferson plants are usually of good size, but those produced on later clusters may be too small. The average size of No. 1 fruits is often less than for either Grothen's Globe or W. R. Grothen Globe. It is difficult to determine the proper time to harvest fruits of the Jefferson variety. The immature fruits are firm and uniformly dark green; and they give no clear indication of stage of maturity by obvious change in color or texture as do the fruits of most other varieties. Because of this, the grower must be very careful to avoid harvesting a large percentage of the fruits in a too immature stage. Most growers who have had experience with Jefferson now consider it best to delay the first harvesting from it for another week after they first think the fruits are approaching the proper stage. The fruits ripen uniformly but usually are soft. Thus, they do not compare favorably with those of standard Grothen's Globe in quality. Reception of Jefferson by growers and buyers has not been altogether favorable, and it is difficult to evaluate the variety because of conflicting opinions expressed by members of both groups. It is the case, however, that acreage of Jefferson is still increasing, especially for staked spring crops, and also that several growers who have grown it during the fall crop season have reported satisfactory results. The variety is not suited to culture on the ground in the Immokalee area because the vine growth becomes so dense that it seriously hinders the control of diseases. Since Jefferson possesses characteristics of first-order importance to growers, namely high-yielding capacity, wilt resistance, and plant vigor, it will be grown

to some extent for some time to come unless the market strenuously objects to the quality of the fruits after the volume of the variety has become noticeable.

Homestead is a wilt-resistant variety released in 1952 after it had been tested for three years under the designation STEP 89. It was bred by Dr. C. F. Andrus, of the Southeastern Vegetable Breeding Laboratory, who recognizes that it is not a fixed type but thinks that the variation from plant to plant may possibly prove advantageous. Most of the plants are semi-determinate with stem and leaf characters resembling those of Rutgers, but the variation in any given seed lot at present may be considerable. Most of the plants are prolific, and the fruits in general resemble Rutgers in size, shape, and appearance. In some cases, however, the fruits have averaged much rougher than those of Rutgers grown under the same conditions, and some plants produce fruits of uniformly pale-green color. Reactions of sand-land growers who have tried Homestead range from very favorable to unsatisfactory, with the majority expressing doubt. In our trials Homestead has never been outstanding, but neither has it been poor. Thus, it is evident that not enough time has elapsed to permit accurate evaluation of this variety; for the present it appears advisable for growers operating on sandy land to try Homestead on only limited acreages. Homestead is obviously more susceptible than Rutgers and Grothen's Globe to gray leaf spot, early blight, black spot, and leafmold.

Manalucie, a variety with combined resistances, was released this year by the Gulf Coast Experiment Station. It is resistant to Fusarium wilt, gray leaf spot, early blight, and leafmold. Its vine grows about nine inches taller than desirable but the stems are large and strong, so the vine habit is semi-erect for unstaked culture. The fruits are late but are large, with depth, firmness, fleshiness, and

slow-ripening quality. This stock has yielded well in our trials and in preliminary trials by growers, especially in the Ft. Pierce area. It appears resistant to cold, blossom-end rot, and crease stem. Evidence to date indicates that the new features of Manalucie may be very important to our tomato growers; but there has not yet been time to determine how the large, heavy fruits will stand modern methods of handling, so the utility of the variety remains to be finally evaluated by growers during the next few months.

Queens is a new variety developed by Dr. L. G. Schermerhorn of the New Jersey Experiment Station, the originator of the Rutgers variety. Queens is the result of a cross of Rutgers x Valiant. Its vine growth is indeterminate and the internodes are long, the plant resembling very much the old variety Livingston Globe, which was a favorite with growers 15 years ago. It is especially well adapted to staking and it is assumed that it will perform well on ground culture. Under favorable conditions it is extremely prolific, with production of high quality fruit surpassing that of all other commercial varieties in tests during the past season. Fruits are deep with smooth and full shoulders and skin texture equal to Rutgers. Average fruit size is satisfactory. Maturity is several days earlier than Rutgers and Jefferson. It should be noted that this variety carries no resistance to any of the diseases common to tomatoes, therefore plantings should be restricted to soils known to be free of Fusarium wilt. While general horticultural characters of this variety indicate that it would be ideal for fall planting, results during the fall season have been disappointing, due probably to the inability of the variety to recover from adverse weather conditions. These observations on Queens are based on tests of a single season, and our present recommendations are that it be considered for only limited trials by growers.

FLORIDA NINETY STRAWBERRY AFTER ONE YEAR IN COMMERCIAL PRODUCTION

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Florida Ninety, a new strawberry variety developed at the Strawberry Laboratory and released by the Experiment Station in March 1952 has had one winter of commercial fruit production and two summers of commercial