

Effects of sulfur on Tufts strawberry

N. C. WELCH · A. GREATHEAD

U NDESIRABLE SEEDINESS in strawberry fruit of the Tufts variety has been observed under various growing conditions throughout the fruiting season. This periodic occurrence of seediness has limited the acceptance of this new variety. The seedy appearance was thought to be caused by adverse climatic conditions, heat, powdery mildew, growing methods, or chemical phytotoxicity.

In an experiment conducted in 1972, Tufts strawberries were planted at different times of the year; some were exposed to the sun and some were shaded. The harvested fruit showed little variance, suggesting that temperature, growing conditions, and climate do not affect seediness.

During the 1973 and 1974 growing seasons, two trials were conducted to determine the effects of Benlate and sulfur on the seedy appearance of the Tufts variety. Benlate at 1 pound per acre and wettable sulfur at 3 pounds per acre were applied at 14-day intervals in 200 gpa of water, beginning at the opening of the first flower buds in the spring.

Fruit was harvested weekly and graded according to the severity of seediness. Category 1 represents normal fruit; category 2 represents increasing degrees of seediness; category 3 represents fruit unacceptable to the market because skin burning occurred and seed was fully exposed (see photo). Triton B1956 at 4 ounces per 100 gallons was added to one-half of each treatment.

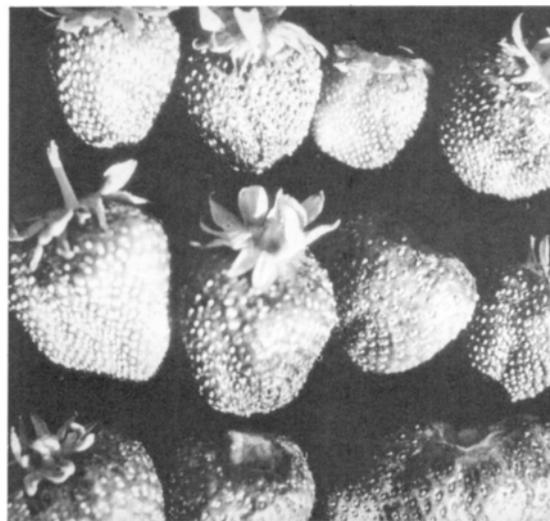
Tufts fruit was considerably affected when maturing fruit was sprayed with wettable sulfur. This damage occurred on both the shaded and exposed fruit, but was more pronounced on the exposed berries. Fifty-two percent of the berries were unmarketable and 37 percent showed partially exposed seed. Addition of a wetting agent to the spray treatments did not significantly affect the results. Of the fruit sprayed with Ben-

late, 96% was normal. In 1974, the Tioga variety was added to the experiments, but Tioga fruit was not affected by any of the treatments, whether the plants were shaded or exposed to direct sunlight.

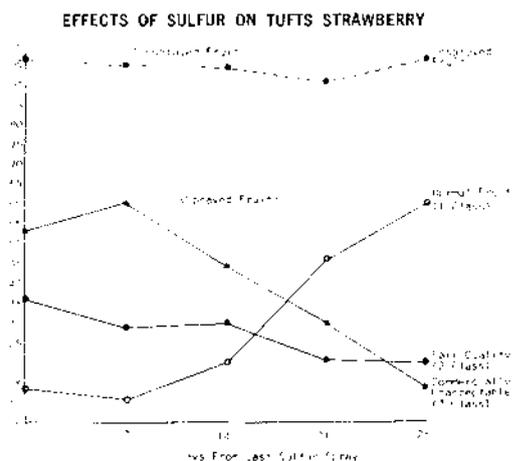
An additional experiment was conducted in 1974 in which wettable sulfur at 3 pounds per acre was sprayed on Tufts fruit. Tags were placed on a number of just opened flowers. No further treatments were applied. Two days later, fruit of market maturity was harvested and graded as described above; 93% of the fruit was normal (only 2% less than the 95% normal harvest of unsprayed fruit). Forty-two days later, fruit of market maturity resulting from the tagged flowers was harvested and graded. Ninety-one percent of the fruit was normal; 9% was slightly seedy. These data indicate that no damage occurs when either young flowers or mature fruit are treated with wettable sulfur and suggest that only developing fruit is damaged by sulfur spraying.

In the 1974 experiment, spraying was discontinued on a portion of the trial midway through the growing season of the Tufts variety. Grading and harvesting of the fruit was continued at weekly intervals up to 28 days from the last application of wettable sulfur. The graph indicates that sulfur spraying early in fruit development can cause seedy-appearing fruit at harvest. The degree of seediness and percent of fruit damaged decreased gradually as time from last spray increased. However, some damaged fruit appeared 28 days after the last spray application.

Sulfur applied to Tufts fruit caused a shrinking of the skin, exposing the seed more than normal. The side of the fruit exposed to the sun showed greater damage than the shaded side. No damage to other parts of the plant was observed at the amounts and frequency of sulfur applied. Developing fruits of the Tufts vari-



Tufts strawberries showing normal fruit (top), increasing seediness due to sulfur spraying (middle), and severe seediness (bottom).



ety should not be treated with sulfur during the fruiting season.

Norman C. Welch is farm advisor, Santa Cruz County, and Art Greathead is farm advisor, Monterey County. Dr. Royce Bringham and Larry Fulton furnished land and guidance in the study.