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**FOR
EARLIER
TOMATOES**

Virginia Polytechnic Institute and the United States Department
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FRUIT-SET HORMONES FOR EARLIER TOMATOES

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Market gardeners know that a bushel of tomatoes sold during the first part of the tomato harvest may bring at least five times as much money as a bushel sold later. Alert home gardeners also are eager to harvest those first ripe tomatoes.

The reason for low yields early in the season is frequently a poor fruit set. Little is known about the causes of a poor fruit set. However, we do know that some of the causes are low night temperature (below 60 degrees), poor soil moisture conditions, faulty nutrition, and insect and disease injury.

Experiments have shown that certain growth-regulating substances, popularly called "hormones," when sprayed on flower clusters, may be a profitable practice in the production of early tomatoes. When a poor fruit set is due to low temperature, a hormone spray may increase the yield. This is not necessarily true when a poor fruit set is due to other disorders or when a normal set occurs.

Hazards in Using Fruit-Set Hormones

Before treating with the material, growers should be fully aware of the hazards involved in the use of fruit-set hormones on field-grown tomatoes. We suggest that only a small part of the tomato field be treated with hormone spray. By doing this, the grower will have an opportunity to observe results under the particular conditions of that field.

Tomato plants are sensitive to most hormone materials when used at strength enough to set fruit. New leaves are smaller and may be deformed. However, when minimum spray strengths are used and the spray

Influence of Fruit-Set Hormone (Sure-Set) on E

Variety	Treatment	Number First
Valient	No Hormone	
	Hormone	
Burpeeana Early Hybrid (1183)	No Hormone	
	Hormone	
Rutgers	No Hormone	
	Hormone	

* Three harvests of Valient and Burpeeana; one harvest of Rutgers

is confined mostly to the flower cluster, injury is slight.

Hormone treatments generally do not increase the total yielding capacity of tomatoes but favor an earlier yield. Therefore, hormone treatment would be of little use except where early tomatoes are desired.

Excessively rough fruit may be increased by deformed flowers which develop usually on early clusters and do not form fruit unless treated. Puffiness and blossom-end rot may also increase if these defects are occurring in the field. The percentage of fruits with a green color in the seed cavities may be increased. Based on limited information, there is some indication that fruit will soften more quickly after full maturity. Many of the tomato fruits set by hormones are seedless, which in some respects may be a desirable characteristic. The tomatoes are usually normal in texture and flavor.

Experiments with Fruit-Set Hormones

Experiments have shown that hormone sprays can be expected to help when a poor set of tomatoes is due to low night temperature. In a series of experiments in New York counties, it was found, in most cases, that the value of the earlier tomatoes far exceeded the cost of buying and applying the materials.

An experiment was conducted at Blacksburg in 1950 by Dr. John R. Havis, associate horticulturist, Virginia Agricultural Experiment Station, to study the value of a fruit-set hormone for increasing the early yield of tomatoes. Three varieties of tomatoes were used. Half of the plants of each variety were treated with a fruit-set hormone and half were untreated. The material used as a hormone was para chlorophenoxyacetic acid (PCPA) supplied under various trade names. Ask your dealer for a good hormone spray. The following table was supplied by Dr. Havis:

Early Tomato Yield at Blacksburg During 1950 Season

Fruit Set on Two Clusters	Average Size of Fruit Harvested by July 20* (Ounces)	Bushels per Acre of MARKETABLE Fruit Harvested by July 20*
13.8	5.0	65.2
13.1	6.5	129.0
15.2	3.9	109.5
13.5	5.7	195.5
9.6	6.0	5.5
8.4	8.8	29.9

There was no increase in the number of fruits set on plants treated with the hormone. The good set of fruit on the untreated plants was probably due to relatively warm weather during blossoming. Under such conditions, the hormone cannot be expected to increase the number of fruits that set. There was, however, a considerable increase in the early yield measured in bushels of marketable fruits per acre. The treated plants bore earlier-ripening and larger fruits. All three of the varieties tested had increased early yield. Thus, a possible advantage from the use of hormones under conditions favorable for fruit set was indicated by the increased early yield, even though there was no increase in number of fruit sets.

These results are from one year's trial. In other seasons with warmer or cooler weather conditions, and at other locations, results may be much different.

Using Fruit-Set Hormones

Treat only a small portion of the tomato field with fruit-set hormones so that the grower will not take too much risk. There is still a lot to be learned about fruit-set of tomatoes.

For best results use a spray solution of 30 parts hormone per million parts of water. Follow the manufacturers' directions in preparing the hormone for use. The estimated cost of chemicals for spraying one acre is \$5 or less.

How to Spray

Apply the first spray after the plants have been set in the field and when 2 or 3 flowers are open on the first cluster. All plants in a planting do not flower at the same time. The grower must decide when most of the plants have 2 or 3 open flowers. A second spray may be applied about one week later, when additional flowers have opened. Ordinarily not more than 2 or 3 sprays are needed, since temperatures will be getting progressively more favorable for natural fruit set.

Do not spray the whole plant with the hormone solution. Confine the spray to the flowers. Use sprayers with nozzles that make a cone-shaped fine mist. Hold the sprayer nozzle fairly close to the cluster and keep the spray off the leaves as much as possible. Wetting the foliage, especially near the growing tip, results in distorted and stunted leaves. It is not necessary to get the solution into the open flowers. Spraying from the back or side is satisfactory.