Weed control in processing tomatoes

High yields in processing tomatoes depend on a great many factors, not the least of which is good weed control. Weeds compete severely with the tomato, primarily for water and light, and interfere with mechanical harvest. The arsenal of herbicides available for annual weed control in tomatoes is relatively large compared to those for other vegetable crops. However, because tomatoes are planted over a large range of soil types and weather conditions, it is difficult to make accurate general recommendations.

If some fields are to be planted early, the safest herbicide available should be used to control early spring weeds with the minimum setback to the young germinating tomato. Diphenamid (Enide) is often the candidate for the winter weeds. However, diphenamid is somewhat short-lived, particularly in the heavier soils of the Sacramento Valley, and the addition of a lay-by type of herbicide, such as trifluralin (Treflan) will often be useful to control late spring and summer weeds.

If planting is delayed until soils warm up somewhat, when pigweed and lambsquarters are the main weeds, followed by summer grasses, napropamide (Devrinol), or pebulate (Tillam), or both are usually the choice, particularly in the light soils of the San Joaquin Valley. Napropamide has also been outstanding in the Imperial Valley.

If the plantings are somewhat late, the diphenamid-trifluralin mixture (Trefmid) does an excellent job in most soils with little or no setback to young tomato plants.

Most tomato herbicides give adequate control of weeds, such as the pigweeds, lambsquarters, Russian thistle, purslane, and annual grasses, but are weak on weeds in the tomato family, such as the nightshades, groundcherries, and jimsonweed. For control of weeds in the thistle family, including sowthistle, prickly lettuce, groundsel, and pineapple weed, napropamide is somewhat more effective than diphenamid and trifluralin.

The answer is harder to find when weeds in the tomato family are the main problem. California scientists have been working on this problem for years, and recently the Processing Tomato Advisory Board elected to support increased research on selectively controlling weed species of the tomato-potato family (Solanaceae) in processing-tomato crops. Field and greenhouse experiments have been conducted throughout the state. Several of the new herbicides, applied preemergence, preplant incorporated, or postemergence, have shown more safety on the weeds than on tomatoes. One new herbicide, RH 6201, has shown a degree of selectivity in a limited number of trials.

In a number of trials, pebulate, one of the older, registered herbicides, has selectively controlled nightshade species, including the most widespread—hairy nightshade. Although extensively used in tomatoes, pebulate has not always been as effective or as safe in all soil types as have some of the newer herbicides, and it often has a narrow margin of safety. It generally controls nightshade at 4 to 6 pounds per acre, shallow incorporated and followed by sprinkler irrigation. But, at 6 to 8 pounds, it occasionally injures tomatoes in some light sandy soils or under other marginal growing conditions. In some trials, pebulate, applied to dry soils at 6 pounds per acre and sprinkled in, has given selective control of hairy nightshade in VF 65 tomatoes. Additional studies are under way to find the maximum selectivity of this herbicide for tomatoes.

Another older herbicide used widely for weed control in soybeans and tomatoes in other areas is chloramben (Amiben). Applied preplant and incorporated it has not been effective. However, when applied after direct seeding and sprinkled in, it has given outstanding nightshade control.

Unfortunately, when chloramben is used at planting time, the margin of safety in many soils is not adequate. A
and were replicated four times. Fungicide gallon Hudson CO, sprayer at 30 psi. Spray applications were made with a 2-

Plots consisted of 12 strawberry plants and ethylene mulch was used in all plots.

In a 1976 trial, the fungicide dichlofluanid gave the best control of Botrytis cinerea in strawberries.

Fungicide controls Botrytis in strawberry

Albert O. Paulus  
Victor Voth  
Jerry Nelson  
Howard Bowen

Botrytis fruit rot, commonly known as gray mold rot, is the major fruit rot of southern California strawberries. It is caused by the fungus, Botrytis cinerea, which thrives in wet conditions and cool temperatures. Because tolerance to benomyl by this fungus has been noted in the past several years, trials were initiated to test several other fungicides, alone and in combination with benomyl against B. cinerea.

1976 trial

The 1976 trial, using Tioga and Tufts strawberries, was conducted at the University of California South Coast Field Station near Santa Ana. Poly-ethylene mulch was used in all plots. Plots consisted of 12 strawberry plants and were replicated four times. Fungicide spray applications were made with a 2-gallon Hudson CO2 sprayer at 30 psi.

Sprays were applied on March 4, 15, and 26 and on April 2, 12, and 22. Yield and counts of rotted fruit were taken on April 14, 20, 24, and May 4 for both Tufts and Tioga. An additional pick

<table>
<thead>
<tr>
<th>Treatment*</th>
<th>Tioga Yield</th>
<th>Tioga Number of rot-</th>
<th>Tufts Yield</th>
<th>Tufts Number of rot-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluroxane (thichlofluanid) 50W, 2 lb</td>
<td>22.40 a</td>
<td>13.66 a</td>
<td>317 a</td>
<td>14 a</td>
</tr>
<tr>
<td>Benlate (benomyl) 50W, 8 oz, plus Thylate (thiram) 65W, 2 lbs</td>
<td>16.68 b</td>
<td>10.87 c</td>
<td>396 ab</td>
<td>47 b</td>
</tr>
<tr>
<td>Thylate 65%W, 2 lb</td>
<td>15.00 b</td>
<td>11.87 b</td>
<td>436 bc</td>
<td>28 ab</td>
</tr>
<tr>
<td>Benlate 50W, 8 oz</td>
<td>13.32 c</td>
<td>10.87 c</td>
<td>545 c</td>
<td>80 c</td>
</tr>
<tr>
<td>Control (no treatment)</td>
<td>10.75 c</td>
<td>10.30 c</td>
<td>558 c</td>
<td>89 c</td>
</tr>
</tbody>
</table>

* Fungicide rates are per 100 gallons of water, and the fungicidal mixtures were applied at 200 gallons per acre.
† Significant at 5 percent level.
‡ Yield data represent production up to test picking dates, not to end of season.

Benomyl was not significantly different from the controls in its effect on yield or fruit rot. Further, Botrytis isolates collected from the benomyl plot grew well on culture media containing 400 ppm benomyl, indicating tolerance to this fungicide.

Arthur H. Lange is Weed Scientist, San Joaquin Valley Agricultural Research and Extension Center, Parlier; Warren E. Bendixen is Farm Advisor, Santa Barbara County; Royce Goertzen is Staff Research Associate, Parlier; Bill B. Fischer, Harold M. Kempen, Harry S. Agamalian, Eugene E. Stevenson, Robert A. Brendler, Jack P. Orr, and Robert J. Mullen are Farm Advisors in Fresno, Kern, Monterey, Stanislaus, Ventura, Sacramento, and San Joaquin counties, respectively; and Floyd M. Ashton is Professor of Botany, University of California, Davis.

CALIFORNIA AGRICULTURE, FEBRUARY 1977 15