three- to four-week delay allows the herbicide to dissipate sufficiently so that a satisfactory tomato stand is established with initial nightshade control.

Often planting schedules do not allow this delay before spring planting. Workers in Monterey, San Benito, Yolo, and Ventura counties found that the phytotoxicity of chloramben to tomatoes was reduced, without the loss of nightshade control, by spraying a small area over the seed hill or seed line with activated carbon. Although this approach is promising and inexpensive, it has not been helpful where herbicides are incorporated before bed planting or under furrow irrigation. Further, it has not always been effective in light sandy soils.

Chloramben plus surfactant has also shown promise as a postemergence application, killing several weed species, including hairy nightshade, without excessive damage to young tomatoes. More work under a wide range of environmental conditions is planned.

Another approach coming out of the increased research has been the deep-injection giant-bed work. The technique includes a large bed listed over a 20- to 24-inch injection of 1,3-D fumigants (Telone and DD) or methyl bromide gel. The single shank per bed delivers a high rate (on a broadcast basis), concentrating the kill in the center of the large high bed, which is knocked off just before planting, leaving the clean heart of the bed on the surface, where the seed row of tomatoes or other crops can be planted. This technique requires more money per acre but offers fewer phytotoxicity problems, control of nematodes and other pests, and control of nutsedge in addition to nightshade and most other weed species. Hard-seeded weed species, such as some pigweeds, filaree, and cheeseweed, may not be controlled with this technique, although some pigweed control has been obtained at the higher rates tested in two field experiments at the Kearney Horticultural Field Station.

Such factors as soil temperature and moisture will have to be carefully evaluated to obtain the most effective movement and activity of the fumigants. The 1,3-D fumigants have broad registrations, but methyl bromide gel currently has greater restrictions. A great deal of additional work with the many soil types in which tomatoes and other row crops are grown is necessary before this new use of fumigants can solve resistant weed problems.

Many of these approaches to controlling resistant weed species in processing tomatoes are promising. Perhaps one method or a combination will stop the increase of botanically related weeds in tomato fields, with nutsedge control as a bonus.

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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. Polyethylene 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 CO_2 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 and counts of rotted fruit were made for Tioga on May 12. The table gives the results.

EFFECT OF VARIOUS FUNGICIDE TREATMENTS ON STRAWBERRY YIELD AND BOTRYTIS FRUIT ROT CONTROL, 1976

Treatment*	Yield (tons per acre)†‡		Number of rot-affected fruit†	
	Tioga	Tufts	Tioga	Tufts
Euparen (dichlofluanid) 50W, 2 lb	22.40 a	13.66 a	317 a	14 a
Benlate (benomyl) 50W, 8 oz, plus Thylate (thiram) 65W, 2 lb	16.68 b	10.97 c	396 ab	47 b
Thylate 65W, 2 lb	15.00 b	11.87 b	436 bc	28 ab
Benlate 50W, 8 oz	12.32 c	10.97 c	545 c	80 c
Control (no treatment)	10.75 c	10.30 c	558 c	89 c

* 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.

Dichlofluanid gave the highest yields and provided the best control of Botrytis fruit rot in both varieties. 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.

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