ceptible to strains of recent occurrence and can be severely damaged by them. Losses in grain yield as high as 27 per cent have resulted from severe infections of powdery mildew. Atlas 68 possesses the same resistance to *Rhyncosporium* scald as Atlas 57, which is effective against most of the pathogenic races present in California.

Atlas 68 is recommended for production in areas where Atlas 57 has been grown successfully and in areas where its resistance to powdery mildew and yellow dwarf may prove to be advantageous. Table 2 compares yields of the two varieties at seven locations. The average difference (6 per cent), in favor of Atlas 68 reflects differences in yellow dwarf reaction. Powdery mildew infection was not a factor in these tests. This difference, less striking than that between CM 67 and California Mariout, reflects the lower prevalence of yellow dwarf in the Sacramento Valley where most of the tests were conducted.

Comparisons

Table 2 compares yields of Atlas 68 and four additional varieties with similar areas of adaptation to Atlas 57. The number, duration, and distribution of the tests are not sufficient to establish local recommendations, but they do provide some information about the relative performance of the varieties over an extensive area. In general, the earlier-maturing short stiff-strawed varieties, such as Briggs and Arivat, gave the best performance on the medium-textured fertile soil types, with Briggs having a 5 to 17 per cent advantage over Arivat. The differences between these two varieties are in line with previous findings. Types maturing at midseason and later have consistently given favorable performance on heavy soil types and in dry-farmed foothill regions. In such areas, Atlas 68 compared favorably with the other varieties. Atlas 68, like Atlas 57, may find a limited use in the malting and brewing industry.

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ETHREL SPRAYS IN

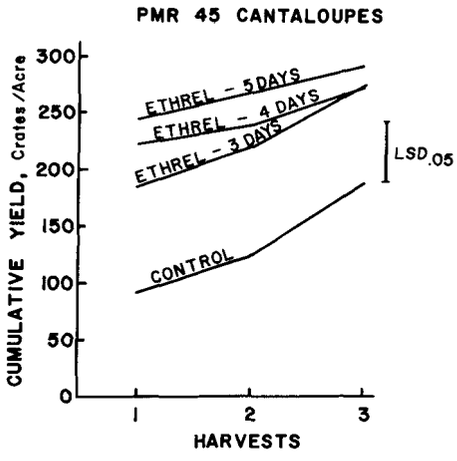
MUCH OF OUR PRESENT RESEARCH effort is directed towards mechanizing the harvesting of our California vegetable crops. This is as true for cantaloupes as it is for asparagus, lettuce, and fresh market tomatoes. Agricultural engineers and plant scientists generally agree that mechanical harvesting of cantaloupes on a commercial scale is still several years in the future. The principal obstacle to machine harvesting of cantaloupes has been the absence of a variety which will mature fruit of acceptable quality in a determinate manner so that the crop can be harvested in a single once-over operation much the way canning tomatoes are harvested.

Although selective harvesters have been tried on cantaloupes, they have proven impractical or uneconomical due to the damage they do to the fruit and vine. Researchers working on cantaloupe mechanization in California now are convinced that non-selective or once-over harvest by machine must be the immediate as well as the long-range goal.

Better ways

Since interest has declined appreciably in the selective harvester as a stop-gap measure between conventional handpicking and once-over machine harvest, various possibilities have been considered to develop better ways to hand harvest cantaloupes. One of these is to achieve sufficient concentration of fruit maturity through spacing, cultural practices, and/or chemical sprays to permit the reduction of hand picks from the 10 to 20 now being used to three or four. Work to explore different possibilities of concentrating fruit maturity has been going on and will be enlarged this coming season in field experimentation in the San Joaquin Valley.

GRAPH 1. YIELD OF MARKETABLE CANTALOUPES AS AFFECTED BY ETHREL APPLICATION 3, 4, AND 5 DAYS BEFORE THE FIRST HAND HARVEST. (SIZES 45 & LARGER.



During the past two seasons work with Ethrel, 2 chloroethylphosphoric acid, a growth regulator and ripening agent, has been fairly successful in concentrating cantaloupe maturity for once-over harvest by machine. To test this chemical as an aid to hand-harvesting of cantaloupes, an experiment was conducted in the west Fresno County near Mendota last September. In a well-replicated series of plots of $\frac{1}{100}$-acre size, Ethrel was sprayed on cantaloupe vines three, four, or five days prior to first hand harvest. Then all plots, including the controls, were hand harvested by commercial crews on three successive days. Yields are shown in graph 1.

Increased yields

The application of Ethrel five days before first harvest resulted in 292 crates of marketable fruit per acre or an increase of 104 crates above the control.

REDUCE NUMBER OF PICKINGS HAND-HARVESTED CANTALOUPES

Ethrel sprayed on cantaloupe foliage three and four days before first harvest resulted in 87- and 82-crate increases respectively.

In effect, the Ethrel application raised the production of marketable melons which were harvested in three successive days from unprofitable yields to acceptable and profitable levels. (The state cantaloupe yield average in 1968, according to the California Crop and Livestock Reporting Service, was 160 cwt. per acre or slightly less than 200 crates per acre.)

The proportion of marketable fruit to green and overripe melons, after Ethrel application, is shown in graph 2. The Ethrel sprays reduced the percentage of green fruit plots by hastening the maturation processes. Marketable fruit, accordingly was increased about one and one-half times by the Ethrel as compared with the check treatment.

Concentration of Solids

A major concern in the use of Ethrel as a pre-harvest spray for cantaloupes has been its effect on the concentration of soluble solids. Refractometer readings shown in the table were taken from harvested melons of marketable size to determine the effect of Ethrel on the soluble solids percentage of the fruit. In melons of all three marketable maturities there was a general pattern of reduction in the percentage of soluble solids when Ethrel was applied. Only in the Eastern Choice melons, however, did the decrease prove statistically significant. All averages were above the state and federal minimum, however.

The research being conducted this year should further increase the knowledge of Ethrel application timing, effect of cultural and weather conditions, influence of spacing, and effects on nutritional levels. Ethrel has not yet been registered for use on cantaloupes, and cannot be recommended at this time.

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EFFECT OF PRE-HARVEST ETHREL SPRAY ON SOLUBLE SOLIDS OF HAND-HARVESTED PMR 45 CANTALOUPES.

Ethrel Application*	Hard Ripe	Eastern Choice	Western Choice
	Percent soluble solids		
Check	11.4	11.6	11.1
3 Days before harvest	10.1	10.0	10.0
4 Days before harvest	10.5	10.4	9.7
5 Days before harvest	10.0	9.9	9.8
LSD 5% level	N.S.	0.9	N.S.

* 1000 PPM ethrel in 100 gals. H_2O/Acre.

GRAPH 2. EFFECT OF PRE-HARVEST ETHREL SPRAY ON PERCENTAGE OF GREEN (G), HARDRIPE (H), EASTERN CHOICE (E), WESTERN CHOICE (W), AND OVERRIPE (O) CANTALOUPES.