

CANTALOUPE VIRUS DISEASES IN YUMA COUNTY

 Merritt R. Nelson

Yuma County is the largest producer of spring cantaloups in the southwest United States. Fourteen thousand acres of cantaloups are grown annually in the Yuma, North Gila, Dome and Parker Valleys, an industry worth \$7,500,000 a year to the economy of Yuma County.

Extensive surveys and research on the effect of mosaic virus diseases on cantaloups during the past two years have shown that the average annual yield of cantaloups is at least 60 crates per acre lower than it would be in the absence of mosaic virus diseases. A conservative estimate would place this loss at \$3,000,000

Dr. Nelson is an Associate Plant Pathologist who has been working, at the Yuma Branch Experiment Station, on diseases of commercial vegetable crops.

(Continued from Page 14)

Many nest sites are provided by woodpecker excavations in old umbrella, elm, cottonwood, and other trees, and starlings are now rearing their young in saguaro cactus cavities as well. Palm trees, especially if untrimmed, also offer many breeding locations. Rearing of two broods annually is common. Thus one pair of parent birds may add eight or more new members to the starling population annually. Because the natural death rate among most small land bird species is believed to be very high, it is important to recognize those conditions which favor the reproduction of depredating species such as the starling.

Many people mistake starlings for blackbirds. Although frequently associating with flocks of redwings, yellowheads, and cowbirds, starlings belong to a group of 110 bird species native to the Old World. Our blackbirds belong to a bird family restricted to the Western Hemisphere. Starlings (also called "Star" by the Germans) have a distinctive four-pointed star-like silhouette in flight.

Their perching position is more upright than a blackbird's, and they have a long, straight bill that turns yellow in the spring. As starlings moult and lose the tan plumage of youth, they acquire a dark blackish coat of green and purple sheen speckled with white. A starling, espe-

annually, about 28 per cent of the potential crop. While these losses were formerly attributed to the "crown blight disease complex," it is apparent now that the major diseases of this complex are mosaic virus diseases.

WMV and CMV

There are two main virus diseases of cantaloups in Yuma County. The most widespread disease is watermelon mosaic (WMV). It is found in all the cantaloupe areas. The amount of infection varies, however, from 75 to 100 per cent in the Yuma Valley to less than 50 per cent in North Gila and Dome Valleys. Cucumber mosaic (CMV), though much more severe in its effects on cantaloupe, is more restricted in distribution, being found regularly only in northern and central Yuma Valley.

This difference in mosaic distribution correlates exactly with declining cantaloupe fields and poor yields. Those fields that are infected early and heavily by mosaic

especially in spring, whistles, buzzes and gurgles in a very distinctive fashion.

California Study Available

In 1959, Walter E. Howard thoroughly reviewed the literature on the starling and analyzed its build-up and potential threat to California agriculture in a California Department of Agriculture Bulletin. The information contained in this paper covering the bird's identification, life history, habitat requirements, economic status, potential hazard, and control is of equal value to Arizona's agriculture. "The European Starling in California" is available by writing to Walter E. Howard, Specialist, Field Station Administration, University of California, Davis, Calif.

Starling problems in the Southwest may be expected to intensify and possibly spread to new crops and new localities in the future. Consequently, in this region as in others, the Bureau of Sport Fisheries and Wildlife of the U. S. Fish and Wildlife Service is giving special attention to research on starling damage control. It is clear that this will require as much money, time, hard work and cooperation as is required for research on specific insect pests, weeds, or plant and animal diseases.

If we are to cope with this aggressive, adaptive and troublesome bird species, it will require detailed knowledge of the relationship between environment and the starling in each problem area, we need more effective methods of crop protection, and development of acceptable methods for large-scale starling population reduction.

In Summary . . .

Yuma County, with a \$7½ million spring cantaloupe industry, loses \$3 million annually from that crop because of mosaic virus diseases, chiefly watermelon mosaic and cucumber mosaic. They come under the general heading of "crown blight complex."

The vector, which carries the virus to the crop plants, is the aphid. Control measures so far available consist of

1. Mowing or burning fence rows and field edges which harbor the aphids and the virus.

2. Planting the cantaloupe in fields well isolated from such crops as safflower and sugar beets which are excellent aphid hosts.

3. Attempting, through early planting, to get the cantaloupe plants well along before virus infection occurs.

Probably a combination of these methods is best. Meanwhile, University of Arizona plant pathologists, at Tucson and at Yuma, are continuing research on this crown blight problem. Three million dollars a year is worth saving.

viruses are the fields that yield the fewest fruit. For example, in 1960, average yield in the North Gila Valley was 250 crates of cantaloups per acre, while several fields in the east central Yuma Valley yielded fewer than 100 crates. During that year mosaic symptoms appeared in early June in the North Gila Valley and reached a maximum infection of 7.5 per cent. In the east central Yuma Valley, however, mosaic symptoms first appeared in early April and reached a maximum of 95 per cent by mid-May. The following year, 1961, mosaic symptoms appeared earlier and reached a higher maximum infection in both of these areas.

Escape by Earliness

Even though 65 per cent of the cantaloups in the North Gila Valley became infected during 1961, yields were still over 200 crates per acre. This was possible because infection, though higher than 1960, was still late enough to cause relatively little damage. The story was different in the east central part of Yuma Valley, however, because here most plants were infected while still in the flower and early fruit set stage and few if any melons were harvested.

In addition to earlier and heavier virus infection in central Yuma Valley, a third factor also contributed to the greater damage sustained there. Cucumber mosaic, the more severe of the two viruses, was present in great abundance during

(Continued on Page 16)