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What Influences Sweetness in Cantaloupe?

*This article by James E. Motes appeared in **Horticulture . . . Tips**, published by the Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources, Oklahoma State University*

High sugars are promoted by temperatures above 80-85 degrees F. and full sun, good leaf condition (no disease) to increase photosynthesis, cool nights into the 70s but not below 60, selection of cultivars bred for high sugar, good fertilization and irrigation programs, and no excessive irrigation or rainfall during fruit maturation -- but also no drought stress.

Cantaloupes should be harvested at one-half to full slip. 'Full slip' means the entire stem separates from the cantaloupe when picked. Melons are at the peak of flavor at full slip and can be harvested for local sales and home use. However, they will soften too rapidly for marketing off the farm, so off-the-farm marketing may require harvesting at one-half to three-quarters slip.

Cantaloupes are hand harvested, brushed free of soil, and graded for uniformity of size and appearance. For wholesale markets, 9-27 melons are packed in 40-pound crates or cardboard boxes -- hence size references to 12-count or 16- and 18-count melons. The 16- to 18-count melons (about 2.5 pounds each) are in greatest demand for supermarket sales. Some markets prefer 12- to 14-count melons. Roadside sales favor the 9- to 12-count melons (about 4.5 pounds each). There is little demand for 22-count or smaller.

Harvested melons should be kept shaded to prevent sun scald and rapid deterioration of quality, as the internal temperatures can escalate rapidly in the sun. Field heat should be removed by hydro-cooling, refrigerating, or icing. The sugar content of less than full-slip melons can increase slightly after harvest, but will never reach that of a full-slip melon. The aromatic flavors also are diminished in melons that are not full-slip.

Information extracted from an article in "From Farm to Market" by Laurie Hodges, July 1995.

Appearing Within . . .

Drip Irrigation Controls Soil Salinity Under Row Crops

By Blaine R. Hanson and Warren E. Bendixen

Drip irrigation of crops is increasing. In some areas, the salinity of the irrigation water used for irrigation exceeds 1 decisiemen per meter (dS/m). With salt-sensitive and moderately salt-sensitive crops such as lettuce, broccoli, cauliflower, tomatoes, onions, celery, and garlic, salinity management is necessary to prevent yield reductions. Keeping soil salinity low in the root zone is crucial to growers of salt-sensitive crops. This study investigated patterns of soil salinity under surface and subsurface drip irrigation.

Salinity control requires the application of sufficient water during irrigations to leach salts below the root zone. Under subsurface drip irrigation of row crops, wetting patterns during irrigation allow leaching of salts near the drip tape. During irrigation, little leaching occurs midway between laterals, and no leaching occurs above the drip tape. Thus, salinity control under drip irrigation requires leaching by rainfall or with another irrigation method, such as sprinkler irrigation, if rainfall is insufficient. The leaching water must leach the salts below the drip tape. Once those salts are carried below the drip tape, irrigations with the drip system continue to move the salts downward. Salts not initially carried below the drip tape accumulate above the drip tape.

Prior to planting, some growers control the salinity above the drip tape by building up the bed and then operating the drip system to carry the accumulated salts up into the built-up bed. The built-up bed is then pushed into the furrow before planting. This approach is justified because most of the very high soil salinity is concentrated in the top 2 to 3 inches (5 to 8 cm) of the soil profile.

The saline soil displaced into the furrow should cause little problem because operation of the drip system prevents those salts from moving laterally toward the drip tape. Little root development of shallow-rooted crops should occur near the edge of the bed and beneath the furrow. Studies of root distribution suggest that little root development may occur beyond 6 to 8 inches (15 to 20 cm) from the drip tape.

One concern is that small amounts of rainfall during the cropping season may move the accumulated salts near the surface down into the part of the root zone with the highest root density. This highly saline soil water could affect crop growth; however, little or no information is available on any potential effect. Some growers operate the drip system during rainfall in an attempt to prevent the downward movement and to dilute the highly saline soil water.

The results of a study conducted in California led to the following conclusions and recommendations for salinity management under drip irrigation of row crops.

1. Zones of high soil salinity occur midway between laterals under both surface and subsurface drip irrigation. This could also be a problem along the lateral between emitters, although no such pattern was found at these sites, where the emitter spacing along the lateral was 12 inches (30 cm). Zones of low salinity occur near the drip emitter for both types of drip irrigation. This suggests that salt-sensitive and moderately salt-sensitive crops should be planted as close as possible to the drip lateral to provide a low-salinity environment for the roots. The larger the leaching fraction, the larger the zone of low-salinity soil.

The depth of the drip tape may also be a factor in controlling soil salinity under subsurface drip irrigation. The shallower the tape, the smaller the amount of rainfall or sprinkler-applied water needed to carry the salts below the drip tape. Salts leached below the drip tape continue to be leached by the drip system. Also, the shallower the tape, the more root zone of shallow-rooted crops in the low-salinity soil.

2. Under subsurface drip irrigation, a zone of very high salinity can occur above the drip tape. This is caused by salt accumulation from the evapotranspiration of water flowing upward from the drip tape. This zone of high salinity must be removed for stand establishment of salt-sensitive crops. One method of salinity control includes leaching with rainfall or sprinkler irrigation to move the salts downward below the drip tape. Another method consists of building up the bed, operating the drip system to carry the accumulated salts into the built-up bed, and then removing the built-up soil before planting.

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Tips on Aphid Control

This article by Bill Chaney and Larry Godfrey,
entitled "Aphid Control in 1995 Vegetable Crops," appeared in ***The Grower****, February 1995*

Aphids continue to be a major pest in vegetable crops throughout much of the vegetable-growing regions. Control in many of these crops may be more difficult than usual in the coming season due to the loss of one of the major insecticidal tools -- Phosdrin -- that growers have depended on to help manage this pest. What will this loss mean to vegetable growers? Alternative materials are available in all crops, but the efficacy of these, especially those that can be used in the period closest to harvest, may be less than growers are used to from Phosdrin.

Many aphid species exist, although most crops have only a few species that are of economic concern. Some of the most important aphids in vegetables are the green peach aphid, the cabbage aphid, the black bean aphid, and the cotton/melon aphid. Some of these species have become resistant to many of the insecticides applied for control. The green peach aphid is one species that is noted to have resistance to many common insecticides.

Aphids can damage crops in several ways. Growers are most concerned about contamination of vegetables which have a low tolerance for insect contamination at harvest. This factor, combined with consumer concern for residue-free produce, severely limits the use of insecticides close to harvest. Aphids also can transmit viruses to many vegetables. Insecticides do not directly reduce transmission, since an aphid can transmit a virus to the plant before succumbing to most chemicals. But insecticides may keep aphid populations at lower numbers, which helps reduce the spread of viral diseases.

Beneficial insects, such as lady beetles, lacewing larvae, syrphid fly larvae, and smaller predators, such as minute pirate bugs and big-eyed bugs, also control aphid populations. Growers should learn to recognize beneficial insects in their immature stages as well as adults.

Parasites are another group of beneficial insects. The adult parasite, usually a small wasp, may kill many aphids in her lifetime by laying her eggs in the aphids. You can spot parasitized aphids by their characteristic bloated appearance, their lack of movement, and usually by their tan or black color.

Insecticides applied to crops may kill beneficial insects, making the aphid population even worse. Therefore, growers should use these materials only when pests reach accepted threshold levels.

Not all natural control factors are insects, however. Some fungi invade aphids, killing them and converting them into a mass of spores to infect other aphids. You can see these aphids, dead, immobile, and 'fuzzy' from the fungus, clinging to leaves. Most of the fungi need relatively high humidity and temperature to be effective in wiping out aphid populations.

New options for aphid control may become available in the near future. Several new selective insecticides that target aphids are being tested. Researchers also are looking at the possibility of using antifeedants, alarm pheromones, and stylet oil to help manage aphid populations.

POST-PHOSDRIN TIPS

Scout fields frequently, taking note of both the aphids and any beneficial insects in the field. Because Phosdrin was the material most often used close to harvest to clean up aphid problems, it will be more important than ever not to let aphids get out of control early in the crop cycle.

- **Remember to scout your fields carefully during the cool weather, which favors aphid populations, and when other fields are being harvested nearby, especially upwind.**

- **Pay special attention to the removal of weeds and crop residue that may be producing the aphids that will become a problem in vegetables later.**

- **Consider the potential impact on aphids of the materials applied to control other pests in the field, and use all insecticides judiciously. When insecticides are applied for aphid control, coverage should be optimized, as most aphid species colonize on the underside of leaves and other protected areas.**

DRIP-IRRIGATED MELONS

As the use of drip irrigation in melon production has increased, so has the debate over the effects of this practice on fruit-quality factors such as soluble solids content, firmness, and post-harvest life. To explore this controversy, Timothy Hartz, vegetable extension specialist at the University of California, Davis, conducted his own experiments, evaluating the effects of various drip-irrigation treatments on cantaloupe yield and fruit quality. Hartz said the results from his test plots were surprising: irrigation regimen had marginal effect on yield, fruit-size distribution, percent soluble solids, fruit firmness, or storability. Based on his experiments and on his observations of commercial drip-irrigated fields, Hartz made the following recommendations for melon production:

- **Start the season with a full soil profile, and water judiciously in the early season to encourage deep root development**
- **Minimize moisture stress through the bloom- and fruit-set period, and keep the top foot of soil at 80 percent to 100 percent of available moisture (10-25 cb tension in most melon soils), CIMIS Eto x % canopy coverage works well as a scheduling system.**
- **Cut back on irrigation 14 to 21 days before harvest, making the plant use residual soil moisture.**
- **Evaluate field and crop conditions as harvest approaches. For a confined harvest period (less than or equal to 2 weeks) on a soil with substantial available water reserve, you probably can cut off water altogether 7 to 10 days before harvest. For lighter soils or prolonged harvest, daily application of 25 - 50 percent of CIMIS Eto should keep the vines up without compromising fruit quality.**

This article appeared in The Grower, September 1995

Drip irrigation . . . (Continued from page 2)

3. Rainfall during the crop season can carry salts accumulated near the soil surface downward into the soil profile. These salts move as a zone of highly concentrated soil water. This zone of salinity may not be a problem under surface drip if the plant row is close to the lateral, since most of the root growth is near the lateral and the high-salinity water is midway between laterals. However, this zone could be a problem under subsurface drip irritation, where salt accumulation occurs above the drip tape.

4. Leaching fractions of 14 to 26% may be needed under drip irrigation to prevent yield reductions of vegetable crops for an irrigation water with electrical conductivity equal to 2 dS/m. Minimum leaching fractions are less with lower-salinity irrigation water.

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