

VEGETABLE CROPS HOTLINE

*A newsletter for commercial vegetable growers prepared by the
Purdue University Cooperative Extension Service*

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VEGETABLE CROPS AND WATER STRESS - (Bill Shoemaker)

- In a normal season one can expect to encounter conditions in vegetable fields that could lead to moisture shortages to the crop, resulting in stress to the plant. This can be exacerbated by the high temperatures that are normal during the middle of summer. Managing this problem can be a headache, even when the grower has a well-designed, efficient irrigation system. To manage the problem well takes a thorough understanding of the relationship between plants, soils, and the influence of the weather on demand by crops for moisture.

Every farmer becomes well acquainted with the soils on the farm because they are critical to the farming enterprise. Not only do they serve as a physical medium for growing the crop, they provide essential nutrients to the crop, serve as a heat basin for stimulating and moderating plant growth, and deliver moisture to the root system while holding moisture reserves for future use. Each soil type differs in its capacity for providing these services. In the case of moisture, sandy soils are weak in soil-moisture holding capacity and can be depleted quickly. Often they hold less than 0.75" water per foot of soil. Loamy soils tend to have higher soil-moisture holding capacity, often up to 1.25" per foot of soil. In addition, loamy soils tend to release moisture well, giving the crops a better opportunity to utilize total moisture reserves. Soils with high clay content often hold even higher levels of moisture but cannot release the moisture as freely as loamy soils. So even though they may have higher moisture content, they may have lower levels of moisture that plants can actually use. The fine clay particles hold some moisture too tightly for the roots to retrieve it. Soils that are high in organic matter often

have very high moisture reserves and can release most of that moisture to crops. In addition, organic soils tend to develop in moist areas so often have high reserves to begin with.

As soils begin to be depleted of moisture, shallow-rooted crops such as greens, beets, carrots and onions show the first signs of stress. Leafy vegetables will begin wilting during the heat of the day. At first, this may signal stress but not lack of moisture reserves, particularly as temperatures begin to climb into the 90's F. Demand induced by temperature, strong sunlight, and wind may be greater than the plants ability to retrieve moisture, resulting in temporary wilting. But as moisture reserves continue to be depleted without replacement, either by rain or irrigation, the plants recover more slowly and later in the day. Short, temporary stress may not result in any loss to the grower. But as the duration of stress grows, the plant uses its resources for survival, failing to grow and develop the fruit or plant tissue the grower harvests for market.

As dry conditions continue and moisture reserves are further depleted, crops with deeper root systems, such as peppers, tomatoes, cabbage and cucumbers, begin to be affected. In the fruiting vegetables such as cucumbers, peppers and tomatoes, fruit deformities begin to occur. As the situation deteriorates, fruit set fails and the number of fruit that develop properly decreases. This is often when serious problems with blossom-end rot occur, not only in tomatoes but in peppers and other fruiting crops as well. Leafy heading crops such as cabbage may develop tip-burn, with interior leaf-edges drying up. The deepest rooting vegetables such as sweet corn, watermelon, and pumpkins, may be the last to show signs of stress, but the rapidly growing tissue characteristic of such crops can be quick to develop problems, such as blossom-end rot in watermelon.

Some old-timers may remember seasons that were this short of moisture this early in the season, but not many. This is a critical point because at this point in the season, demand for moisture is at its peak and will probably continue to be at its peak. Soil moisture reserves may not be adequate to supply the moisture needed by crops, particularly shallow-rooted crops, very much longer as crops pull out reserves quickly. Unless generous rainfalls occur soon, growers will need to depend on irrigation to maintain optimum moisture availability.

And there is plenty of season to go yet. Next issue I'll discuss some of the key points in managing irrigation for optimizing production of vegetable crops.

Bill Shoemaker is a Senior Research Specialist in the Department of Natural Resources and Environmental Sciences at the University of Illinois. This article was reprinted from an article that first appeared in *Illinois Fruit and Vegetable News*: Volume 11: Issue 10 June 24, 2005. Questions can be directed to Bill at (630) 584-7254; wshoemak@inil.com.

A GROWERS SELF-ASSESSMENT OF FOOD SAFETY RISKS

- (John Wargowsky) - This publication is one of a series of Good Agricultural Practices (GAPs) tools available for on-farm use by commercial fruit and vegetable producers. The self-assessment walks farmers through GAPs and helps them to identify the practices requiring attention. These practices include the areas of record keeping, worker hygiene, toilets and hand washing, water use, pesticide use, manure use, compost use, herd health, wild animals, harvest sanitation, postharvest handling, juice and cider, direct marketing, u-pick operations, petting zoos, farm biosecurity and crisis management.

This self-assessment is available to Ohio and Indiana fruit and vegetable producers free of charge while supplies last through the Ohio and Indiana Specialty Crop Food Safety Initiative. Other GAPs tools for farm use include a basic GAPs brochure (Spanish and English), a grower's guide, worker training video (Spanish and English), and laminated posters addressing hand washing, toilet use and toilet paper disposal (Spanish and English). Producers in other states may order these materials and more by visiting <www.gaps.cornell.edu/>.

Contact Mid American Ag and Hort Services by phone at (614) 246-8286, fax at (614) 246-8686, or email at maahs@ofbf.org. More information about the Ohio and Indiana Specialty Crop Food Safety Initiative may be found at www.midamservices.org by clicking on "Projects." The Initiative is conducted in partnership with the USDA Risk Management Agency and numerous other organizations.

JAPANESE BEETLES IN SOUTHERN INDIANA - (Frankie Lam)

- Japanese beetles were observed in southern Indiana in mid-June. The number of beetles scouted in fields was not high however; the population may increase in size during July. Japanese beetle (Fig. 1), green June beetle

Fig. 1. A Japanese beetle, which has six pairs of white tufts along each side of the dorsal abdomen, is feeding on cucumber leaf. (Photo by Frankie Lam)



(Fig. 2), May (or June) beetle (Fig. 3), chafer (Fig.4), and dung beetle (Fig. 5) belong to the same family of scarab beetles. The larvae of these beetles are commonly known as white grubs (Fig. 6) and might cause severe damage on lawn and turfgrass.



Fig. 2. Green June beetle has dull velvety green color and yellow margins. (Photo by Frankie Lam)



Fig. 3. A May (or June) beetle. (Photo by Frankie Lam)



Fig. 4. A rose Chafer on grape. (Photo by Frankie Lam)



Fig. 5. A dung beetle. (Photo by Frankie Lam)



Fig 6. White grub has a white, C-shaped body. (Photo by Frankie Lam)

The Japanese beetle is shiny metallic green, oval-shaped, with dark-tan wing covers, and about half-inch long. The adult has six pairs of white tufts along each side of the dorsal abdomen (Fig. 1). The beetle can feed on more than 300 species of plants, including soybeans (Fig. 7), grapes (Fig. 8), roses, shrubs, fruit and deciduous trees, corn silks, and flowers of all kinds. Usually the adult feeds on the upper surface of foliage and chew-

ing out tissue between veins (skeletonizing the leaves) (Fig. 7). The Japanese beetle has one generation per year. Although Japanese beetles also feed on the leaves of cucurbits, the beetles seldom have been reported to cause severe damage to foliage and fruits of melons. Danitol, Malathion, and Sevin are recommended for the control of the Japanese beetle. Please read the label carefully before applying insecticides.

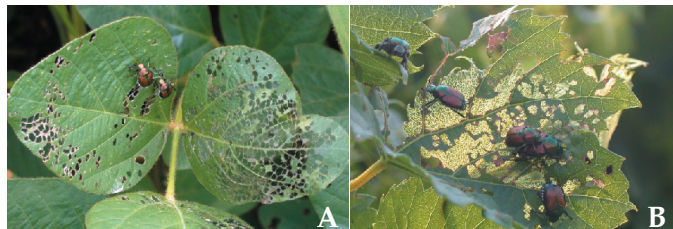


Fig. 7. Japanese beetles skeletonizing a soybean leaf (A) and a grape leaf (B). (Photos by Frankie Lam)

LEAF YELLOWING IN CANTALOUPE - (Chris Gunter) - I have seen the yellow leaf edges in cantaloupe commonly called salt burn (Fig. 1). This is a noninfectious disorder that affects muskmelon more than watermelon. The edges of the older leaves and the middle of the row show these symptoms most frequently. Young leaves are not affected (Fig. 1 inset). Salt burn is often associated with foliar nutrient or pesticide sprays, copper for example. Soil applied urea or ammonium nitrate may contribute as well.



Fig. 1. An older cantaloupe leaf showing salt burn, inset is a healthy younger leaf, from the same plant, with no salt burn. (Photo by Chris Gunter)

SPIDER MITES ON WATERMELONS - (Frankie Lam) - Spider mite infestations were found in some watermelon fields during mid-June in southern Indiana. Although the number observed in fields was not very high, if the weather in early July continues to be hot and dry the populations might build up to damaging levels. Infestations of mites usually occur at the edge and slowly move into the field. Colonies of mites tend to establish on the crown leaves of melon plants. Close inspection of affected crown leaves shows an interveinal yellowing on the upper surface. Heavy infestation of mites may reduce the marketable value of fruits and kill the plants.

Spider mites are small (1/80 - 1/60 inch) relatives of spiders. The adult mites are eight-legged, ranging in color from pale yellow to brown (Fig. 1). The immatures look similar to the adults, but are six-legged and smaller

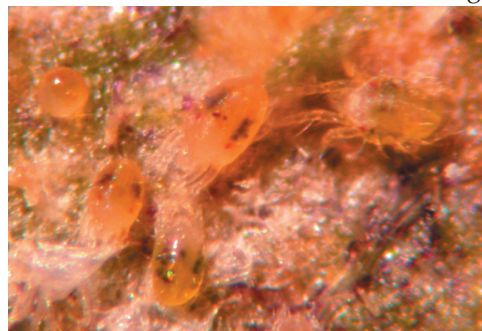


Fig. 1. Spider mites feeding on the underside of a watermelon leaf. (Photo by Frankie Lam)

Fig. 2. Watermelon leaf with spider mite infestation has speckled and yellow appearance. (Photo by Frankie Lam)

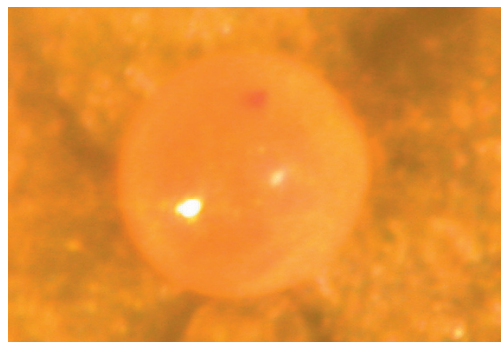


Fig. 3. A spider mite egg. (Photo by Frankie Lam)

in size. Both adult and immature mites feed from the underside of the leaves and give the foliage a speckled appearance (Fig. 2). They produce protective webbing around the area where they feed and lay their eggs. Their eggs are very small, spherical, straw-colored, and shiny (Fig. 3). Under optimum conditions (>80°F and <50% RH) the mites can complete their life cycle within

five to seven days. However, heavy rains that increase relative humidity in the field produce favorable conditions for the development of fungal diseases in the mites and may also wash the pests off of the leaves.

Scouting of mites should focus on the borders of fields. At least 10 plants in 10 locations along the field edge should be checked. Crown leaves that are yellow or speckled should be examined carefully for mites by using a 10x-hand lens. If mites are found on plants along the field edges, the rest of the field should also be checked. Mark the infested plants with flags and recheck the plants in two to three days. If heavy mite infestation is found during a hot, dry period, miticide application is justified. However, if infestation is not spreading, spot spraying may be effective. For spot spraying, spray the infested area of the field and 100 feet beyond the infested area. Furthermore, the first miticide application should be followed by a second application within 5 days (Except for Acramite, only one application per season). The first application will kill all mite stages except the eggs, whereas the second application will kill the mites hatched from those eggs escaped from the first application.

Miticides should be used only where and when the application is justified. This is because many of these chemicals also kill beneficial organisms, including predatory thrips, minute pirate bugs, and predatory mites that feed on the pests. Acramite, Agri-mek, Capture, Kelthane, and Danitol are labeled for the control of mites on melons. Read the labels carefully before applying any pesticides.

2ND ANNUAL AGRITOURISM MEETING AND WORKSHOP
- (*Announcement*) - If you want to increase the number of tourists and the amount of tourist dollars coming

to your community, or if you've been selling products at your farm or at a farmer's market and you want to expand your on-farm income potential, this full day workshop is for you!

The Agriculture and Tourism Partners of Illinois will be having their 2nd Annual Meeting and Workshop, July 13th in Springfield, Illinois. This year's conference will play host to well known agritourism consultant, Jane Eckert, Eckert AgriMarketing.

Eckert is a marketing professional with a lifetime of farm experience.

Also speaking at this year's event, attorney Rich Schell will discuss agritourism legalities and liabilities. Schell is an attorney, author and small farm owner. He is the author of "A Guide to Illinois Laws Governing Direct Marketing of Food for Farmers and Other Food Entrepreneurs." He also frequently writes for Hobby Farms, The NonGMO Report and the American Bee Journal. Rich is the President of the Chicago Farmers-a Chicago based agricultural business group and is on the board of the Illinois Initiative to Develop Entrepreneurs in Agriculture.

The cost of the workshop is \$25 for ATPI members and \$40 for non-members (includes 6 month membership). For more information or to register please contact the Central Illinois Tourism Development Office at (217) 525-7980.

The Agriculture and Tourism Partnership of Illinois (ATPI) was developed as a result of an Illinois AgriFirst Grant awarded to the Central Illinois Tourism Development Office. ATPI's mission is to promote agritourism and related direct marketing activities in Illinois to the benefit of farm operators and the travel industry.

Agriculture and Tourism Partners of Illinois, c/o CITDO, 700 East Adams, Springfield IL 62701, (217) 525-7980.

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