

University of California

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Cooperative Extension, Stanislaus County

VEGETABLE VIEWS



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May Vegetable Walk

For many vegetable growers, particularly for those growing fruiting vegetables, field situations in May can be the most diverse with the following stages happening simultaneously: 1) fields already with plants transitioning from vegetative to reproductive phase, 2) fields with new plants (either from directly-seeding or transplanting) at early growth phase, 3) fields just ready for seeding or transplanting, and 4) fields being prepared, including shaping beds, laying plastic, and installing irrigation. In many

cases, these four stages occur and co-exist on one farm and for a single crop. Plants with different growth stages presenting at the same time can heighten grower's awareness and anxiety about plant health in different ways.

The Vegetable Walk, starting in May 2018 and happening monthly, involves local farm visits to identify and capture issues of concern related to vegetable health, growth disorders, and water and nutrient management throughout the season. The first Vegetable Walk for this year conducted on May 15 covered six vegetable farms from small to large scale, open field to hoop house production, leafy to fruiting commodities, and organic to

conventional practices.

Currently, no major growth disorders, insect, or disease outbreaks have been reported from vegetable growers in Stanislaus County. Scouting fields more frequently, paying attention to insects and any abnormal plant growth, and sharing your suspicions with me are helpful. Also, the Veg Views newsletter will provide updates from monthly Crop Walks. Visit <http://ucanr.edu/nlchange> to subscribe to the Veg Views newsletter. The newsletter can be mailed or a link emailed according to your preference.

I look forward to working with you for a productive season. Please contact me at (209) 525-6822 or zzwwang@ucanr.edu with comments and questions.

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Tomatoes in the hoop house are either under harvest or close to harvest. Photo permissions given by the grower.



Growth stages for melons are diverse. Images taken on May 15, 2018, by Dr. Zheng Wang showed different growth stages of watermelons for one grower ranging from transplanting to setting fruit (A to C). Photo permissions given by the grower.



In May, growth disorders of some newly transplanted seedlings start to emerge. The young watermelon plants on the left are suspected to suffer from pre-emergence herbicide residue. Images were taken on May 15, 2018, by Dr. Zheng Wang. Photo permissions given by the grower.

Where Should a Beginning Grower Start?

Recently, I have been contacted by a number of potential new vegetable growers. They either just retired to enjoy life and started “decorating” their long-term unused grounds or were planning to continue farming as the next generation in their family. They asked many questions, showed their concerns, and had a high need for information on crop selection, timing, and available resources. It seems that a summary describing key points of starting to grow vegetables is needed for these beginning growers.

Your time, capability, and budget matter. As a commercial grower, you need think about how to be lucrative. Devoting an appropriate amount of time, choosing crops that are easy to

grow, and wisely implementing a budget are all important to ensure a return on investment. Typically, start **SMALL** for the first few seasons. Maintaining the farming size within your manageable range at the beginning will help with troubleshooting, time and labor usage, and produce quality enhancements more efficiently. Starting with a relatively small acreage and ending with high quality produce is undoubtedly better than farming on a larger scale but ending with low quality produce due to lack of experience in field management, budget strategy, and plant health.

Choose easy to grow vegetables. There are nine families of vegetables with dramatically different growth habits. Lettuce, salad mix greens, and other leafy

vegetables are usually the easiest species to grow for beginning growers. They can be planted and harvested almost at any time of the year in the Central Valley. In addition, they have short growth cycles, usually less than 30 days for baby leaves and 50 days for mature heads or leaves from seeding to harvest. Moreover, growers can stagger seeding/transplanting to maintain consistent harvests and stay in the market throughout the year. Other possible choices include tomato, root vegetables (e.g., carrots), legumes (e.g., beans), and zucchini.

Timing is everything. Early in May, some beginning growers asked if they should grow tomato crops this year. During these conversations, they indicated they

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had not completed field preparation, installed irrigation, or purchased transplants. In this case, growing tomatoes this summer is unlikely possible simply because it is too late. It is a big decision to start commercial vegetable production. However, once the decision is made, each step has to be done within its proper time frame. For example, it takes about six weeks for fruiting vegetable seedlings to reach their readiness of leaving the nursery greenhouse and transplanting into fields. An appropriate

A: Transplanted on April 2



Stagger transplanting (A, B ,C) allows growers to harvest at different times and keep them in the market longer. The images taken on May 15, 2018, by Dr. Zheng Wang showed that organic cucumbers were transplanted at staggered schedules. Produce from the same farm will enter the market at different times to elongate supply. Photo permissions given by the grower.

B: Transplanted on mid-April



C: Transplanted on May 4



D: Swiss chard in open fields



amount of time must be considered in order to transplant successfully. In fact, during these six weeks and earlier, fields need to be prepared accordingly (plowing, disking, weeding, etc.) and irrigation has to be set up prior to the arrival of these transplants. Timing is also critical for in-season crop development as each vegetable has its own demand for water and nutrients. Failure to supply these resources can result in various growth disorders. For instance, stages of peak water

E: Lettuce in raised beds



Leafy vegetables are the easiest species to start with as they can be grown in different settings. Images were taken by Dr. Zheng Wang. Photo permissions given by the grower (D) and The Ohio State University-Vegetable Production Systems Laboratory (The OSU-VPSL, E and F).

F: Spinach in high tunnels



requirements for tomatoes are vegetative growth, flower set, and fruit formation as plants grow rapidly during these periods. Nutrients such as calcium are critical when fruit are setting, since calcium deficiency and imbalance will cause unmarketable fruit.

Look for help. There are various excellent sources available. Perhaps the easiest access is your parents, friends, or neighbors. Your issues may have been previously encountered by them, and if you are lucky enough, they already know the solutions. Additionally, there are numerous resources from federal and state authorities: 1) USDA-New Farmers (<https://newfarmers.usda.gov/>), 2) USDA-National Institute of Food and Agriculture Farm Answers (<https://farmanswers.org/>), and 3) California Farm Academy-Center for Land-Based Learning (<http://landbasedlearning.org/farm-academy>).

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You may also seek help from the UC-based Cooperative Extension community (e.g., Guides for Beginning Specialty Crop

Growers: <https://casfs.ucsc.edu/about/publications/grower-guides/grower-guides-pdfs.html>). Please feel free to contact me

with more questions and details via (209) 525-6822 or zzwwang@ucanr.edu

Watch for Cucumber Beetles on Your Cucurbits

Cucumber beetle is one of the most detrimental insects for cucurbit vegetables, especially during their early growth stage. Currently, most cucurbit vegetables have been already seeded or transplanted and are at their early growth phase in the Central Valley area. Keeping an eye on this insect that may show up on young melon and squash leaves or crawl out of the soil is critical to ensure plant health and a satisfied yield.

Type and Identification. There are two species of cucumber beetles known in California (Western Striped and Spotted) and both are major threats to cucurbits. Adults overwinter under leaves, debris, and structures, and become active in



Spotted (A) and striped (B) cucumber beetles. Jeff Hahn, University of Minn.



spring when cucurbits are planted. They lay eggs in the soil, and once the eggs hatch, larvae feed on stems and roots of young plants. Adults emerge from the soil and start feeding on young leaves.

As described in the UC Pest Management Guidelines (<http://ipm.ucanr.edu/PMG/r116300511.html>), cucumber beetles are about 0.36 inch long and 0.1–0.2 inches wide, with a greenish yellow background with black spots (spotted cucumber beetle, figure A) or black-yellow stripes (striped cucumber beetle, figure B). They fly and migrate from one area to the other within cucurbit fields. In some cases, field edges (side rows, start or the end of a row) are the places where cucumber beetles can be found first as plants at the edges are relatively closer to the fields of other crops that can serve as the habitats of cucumber beetles, such as alfalfa, grain crops, or some uncultivated grounds.

Damage. Striped cucumber beetles are considered more detrimental than spotted species because they feed exclusively on cucurbit vegetables while the spotted species has a broader host range. Young, tender, succulent portions of plant tissues (leaves and flowers) are their favorites. Feeding damage can kill young seedlings especially those before the third true-leaf stage. Although mature plants can be resistant to feeding damage to a certain extent, yield reduction and decline of fruit quality due to cosmetic damage to the skin of young fruit happen in some cases.

Besides feeding damage, a major concern with the striped

cucumber beetle is the transmission of a bacterial disease, called bacterial wilt, to cucurbits. Cucumber and many melon crops (e.g., muskmelon and cantaloupe) are most susceptible to bacterial wilt. Winter squash and pumpkin are less susceptible, and watermelon is typically unaffected by the disease. Infected plants typically show leaf and vine wilting, while the wilting recovers overnight for some species of cucurbits. However, when symptoms spread rapidly, the entire plant shows infection very soon and dies within a few days. A handy way to determine plant infection follows these three steps: 1) cut a stem section from infected area and then cut it further in half, 2) take the two cut edges and reattach to each other for about 10-15 seconds, and 3) slowly separate them apart and check for whitish, creamy, mucus-like strings between the two cut edges. If present, the plant is likely infected by bacterial wilt. However, further diagnosis may be still needed for final



Mucus-like string present when separating the two cut edges apart indicates a high incidence of bacterial wilt. Source: University of Minn. Extension.

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verification for the presence of the disease.

Monitor and Control. Start monitoring your plants as early as possible, especially between transplanting and the third true-leaf stage because seedlings during these stages are the most vulnerable to feeding damage and defoliation. Inspection is also necessary when plants are setting flowers and fruit start to form, although many cucurbits at these stages can tolerate feeding damage. Cucumber beetles can feed on flowers and scar the surface skins of young fruit, thereby affecting pollination and reducing yield.

Cucumber beetles are difficult to control, and when bacterial wilt spreads, treatments are hardly effective. Therefore, most controls focus on preventing outbreaks of cucumber beetle



Kaolin clay was sprayed to butternut squash to confuse cucumber beetles. Images were taken by Dr. Zheng Wang, photo permissions given by The OSU-VPSL.

population. Several practices attempt to manage cucumber beetles. 1) Delay planting to avoid the peak of beetle activity. However, please note that fruit maturity may be delayed as well. 2) Block the contact between beetles and cucurbits with the use of row covers. It is applied more widely, especially by organic growers. However, row covers must be removed before setting flowers for pollination purpose. 3) There are numerous insecticides* labeled for use on cucurbits to control cucumber beetles and there are also some that can be used organically. However, caution must be given as these chemicals may also kill or expel beneficial insects and pollinators. Therefore, when possible, choose a low-toxicity insecticide, apply at the right time (e.g., early morning or before flowers open for pollination), and use it in the right way. 4) Some chemicals are used to confuse the insects, such as Kaolin Clay. After spraying, the whitish leaves can confuse cucumber beetles and keep them away from feeding and transmitting bacterial wilt. However, pollinators and other beneficial critters, such as bees and spiders, may also be confused, thereby not recognizing their target plants. Hence, the kaolin clay and similar products should be applied early or late in the day when the activities of these critters are minimal. To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.

If you have questions, need more details, or have concern about your plants, please contact me (zzwwang@ucanr.edu; (209) 525-



Adults typically come out of soil (A) and cause leaf feeding damage (B). Images were taken by Dr. Zheng Wang, photo permissions given by The OSU-VPSL.

6822) or Dr. Jhalendra Rijal (IPM Advisor, jrjal@ucanr.edu; (209) 525-6811).

***CAUTION: Read the labels of insecticides and other related chemical products carefully before buying and using. Make sure the product you are going to use is labeled for the type of insects and crops being treated and is allowed to use in the State of California. The product label is the final authority to ensure you use legally.**

Use these links below for more information.

1. UC Pest Management Guidelines: <http://ipm.ucanr.edu/PMG/r116300511.html>.
2. Vegetable MD Online – Cornell University: http://vegetablemdonline.ppath.cornell.edu/factsheets/Cucurbit_Beetles.htm.
3. Cucumber beetles in vegetable gardens – University of Minnesota Extension: <http://www.extension.umn.edu/garden/insects/find/cucumber-beetles-in-vegetable-gardens/>.

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