



VEGETABLE VIEWS

2019 Research Projects

Greetings! It is likely that your planting has been delayed by the abundant precipitation this spring. I have been visiting a few farms and was told that processing tomatoes in Stanislaus County have been delayed for about two weeks compared to normal years. A wet spring offers some benefits, but obviously problems do pop up. Growers have found the emergence of garden symphylans (also called garden centipedes) and damage to their young processing tomato transplants due to damp conditions. In addition,

lower-than-average temperatures force growers to apply more coverage on their young plants to accumulate heat for quick establishment (see picture on page two). The grower explained that all the work on his 30-acre watermelon field was done by hand, and admitted this is very labor intensive, causing a tremendous labor cost. Although we have seen difficulties in the early stage so far this year, I still hope you will have a wonderful season.

infection in resistant tomato varieties from Stanislaus County last year, but this may not be the case. Continuous and timely scouting of suspicious fields and varieties is still important for effective management. As we know, the western flower thrips is the major vector of the virus, and the virus can attack plants at almost every stage. As the season progresses, effective monitoring and projections of thrips and TSWV levels are critical to prevent the occurrence and further expansion of the disease. The TSWV and Thrips Management website (<https://ucanr.edu/sites/TSWVfieldriskindex/>) provides tools to help with TSWV risk management and thrips population projection for tomatoes across the Central Valley. Information from these tools may offer a quick estimate on the pest threat level near your field.

The 2019 UCCE Stanislaus County vegetable crop research program aims to provide science-based information on a number of high priority topics regarding **pest and disease management**, **new production practice evaluation**, **crop and soil nitrogen management**, and **vegetable weed control**. The projects are listed below, categorized by crop.

Additionally, I will be monitoring the tomato varietal responses to TSWV in our county, especially responses from TSWV resistant varieties. Tom Turini, Vegetable Crops Advisor in Fresno County, and Dr. Bob Gilbertson, professor of plant pathology at UC Davis, are the project leaders. The purpose is to get plant samples from suspicious fields for further tests and summarize the diagnostic data at the end of the season to assess the severity and expansion

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Processing tomato:
Monitoring tomato varietal responses to resistance-breaking tomato spotted wilt virus

In 2018, I posted two newsletter articles concerning the detection of tomato spotted wilt virus (TSWV) resistance-breaking strains in the Central Valley. This virus may cause high incidence of disease even in “resistant” varieties. There were no reports of

Continued...Fall Cover Crops



Watermelon plants in Patterson covered by cups for heat accumulation, with holes on the top to ensure air ventilation. (Photo credit: Z. Wang)

of the resistance-breaking strains. If you suspect virus symptoms in your field, please give me a call. Collaborators on this project are other central valley vegetable crops farm advisors working on processing tomato. This study is funded by the California Tomato Research Institute.

Influence of compost application rates on nitrogen management and processing tomato productivity and quality

This project will evaluate the nitrogen management considerations growers should anticipate when applying compost prior to transplanting processing tomatoes. The goal is to develop a better understanding on how fall-applied compost rates influence nitrogen use efficiency of the following year's processing tomato. From Fall 2019 to 2020, I will work with Dr. Anthony Fulford, our new Soil Nutrient Advisor in the UCCE Stanislaus County office, and Dr. Costanza Zavalloni, agriculture studies professor of CSU Stanislaus, to evaluate three compost application rates (5, 10, and 15 tons/acre) on processing tomato production and plant/soil

nutrient status. This research trial is supported by Maring Farms Inc. in Patterson, Calif. The California Tomato Research Institute provides funding to this project.

Evaluation of rootstock-scion combinations on processing tomato yield and quality

In 2018, I joined the ANR tomato grafting team with Dr. Brenna Aegerter, Vegetable Crops Advisor in San Joaquin County, and Gene Miyao, retired Vegetable Crops Advisor in Yolo, Solano & Sacramento Counties, to assess the viability of grafting as a cost-effective tool to enhance processing tomato productivity. Results from 2018 indicated that grafting increased tomato yield by an average of 39%. However, when looking over past years' data (2017-2018), yield increase ranged from

8% - 19%. In addition to yield increase variation by year and site, major challenges for limited adoption of grafting include the high cost for transplant establishment, more greenhouse space required, extended growth period that may delay harvest, and reduced soil-borne disease resistance due to the possibility of planting the grafted union belowground.

In 2019, we will continue the evaluation in the northern San Joaquin Valley. We hope to identify promising and consistent yield-enhanced rootstock-scion combinations. This project is funded by the USDA-NIFA Specialty Crop Research Initiative.

Watermelon:

How in-row spacing of grafted seedless watermelon impacts yield, quality, and economic matrix

As with processing tomatoes, watermelon grafting has its merits, but the increased cost and the additional needs of field management remain the major adoption obstacles. Are there any practices which maintain the advantages of grafting while making it more cost-effective? To answer the question, I will be



Tomato spotted wilt virus infects plants at different stages (Photo credit: Z. Wang).

Continued...Fall Cover Crops



Difference in leaf coverage of grafted vs. non-grafted processing tomato. Extended vegetative growth of grafted plants may delay harvest (Photo credit: Z. Wang).

working with our watermelon grower, Dan Avilla, a vegetable grafting company in North Carolina, Tri-Hishtil, and a number of seed suppliers to evaluate the impacts of three in-row plant spacing (3, 4, and 6 feet apart) on the yield, fruit quality, and economic indices of different rootstock-scion combinations.

In 2019, we will be screening four watermelon rootstocks grafted onto two commonly-used seedless scions transplanted with the three

aforementioned in-row spacings. The project will be conducted in Turlock, Calif. I hope to find the optimal spacing (plant population) to make the watermelon grafting more economically sound.

Leafy greens:

Testing the efficacy of a potential basil herbicide

The limited number of herbicides for leafy greens and culinary herbs, like basil, forces growers to rely on

mechanical cultivation and manual weed removal for weed control. Herbicides are typically not recommended after plant emergence, particularly for herbs; screening existing pre-emergent herbicides for their applicability on herb field weed suppression can help with their registration, providing California leafy growers more choices for chemical weed control and reducing the labor cost for manual weeding.

I will be collaborating with Brandon Narron from Ratto Bros Inc. to test the efficacy of a Sulfentrazone herbicide on basil weed control in Modesto, Calif. Sulfentrazone, with the trade name of Zeus XC, is a selective pre-emergent, soil-applied herbicide for broadleaf, grass, and sedge weed control. The trials will compare different application rates with grower standard practices on crop injury, weed elimination, and leaf fresh weight. The herbicide-free field will serve as the control. Western IR-4 provides products and funds for this project.

Stay tuned to the program website and subscribe to the newsletter (http://cestanislaus.ucanr.edu/Agriculture/Vegetable_Crops/) for updates.

Please feel free to contact me by phone at 209.525.6822 or by email at zzwwang@ucanr.edu with any vegetable crop questions or comments. **In 2019, tomato spotted wilt virus, vegetable grafting, and crop nutrient management are of particular interest.**



Grafted watermelon seedlings in the greenhouse (Photo credit: Benjamin Hinson, Tri-Hishtil)

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.

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Stanislaus County

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Tree & Vine IPM Update Breakfast Meetings

1st & 3rd Wednesdays

March-June

7:00 - 8:00 a.m.