University of California
Agriculture and Natural Resources
Making a Difference for California

# Vegetable Crops Facts

UC CE Merced & Madera Counties Vol. 2, Dec, 2010

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**IN THIS ISSUE:**



***Special Note:***

The processing tomato statewide variety trial report is posted on our website

CA processing tomato production in 2010 was 12.3 million tons.

December 2010
Happy New Year

## Upcoming Tomato Meetings:

- 12-Jan-2011 (Wed) - S. Sacramento Valley Processing Tomato Production Meeting, Woodland Community & Senior Center, 2001 East Street, Woodland, 95776. 8:00 am to 12:00 noon. Banquet room on north side of building. For more information see http://ceyolo.ucdavis.edu.
- 26-Jan-2011 (Wed) - N. San Joaquin Valley processing tomato production meeting in conjunction with CA Tomato Growers Association meeting 64th Annual Membership Meeting, DoubleTree Hotel, 1150 9th St, Modesto. 8:00 am to 11:00 am. Registration required for CTGA luncheon.
- 1-2 Feb-2011 (Tues-Wed) - CA League of Food Processors Showcase, Sacramento Convention Center, 1400 J Street, Sacramento. Registration required.

## General Notes:

**Powdery mildew** pressure was low this year, not only in Merced County by throughout the state. It did finally show up on some very late fresh market fields, but even then defoliation and sunburn were minimal. This puzzled our powdery mildew research team, as the 2010 season weather was very mild, and in theory should have been good for the development of this disease. I again conducted a fungicide program evaluation trial in a commercial field with SUN 6368 with no disease incidence. One potentially mitigating factor was the extensive use of dusting sulfur used this year by the industry. So far, the main conclusion that the powdery mildew project has shown is that dusting sulfur is a very effective way of controlling powdery mildew in tomatoes, provided that the timing of application occurs before the onset of disease. Sulfur has little to no curative capabilities and will not stop the disease once it has started. While we are still trying to work out the details on the timing and frequency of applications, at least two (2) applications of dusting S at 6 and 10 weeks after transplanting provides very economical suppression.

**Drip irrigation** use continues to expand, especially for processing tomatoes. Irrigation via drip for California processing tomato production may currently exceed 2/3rds of the acres by some estimates (~ 200,000 acres) (*Source*: Gene Miyao, Tomato Information Newsletter, 14-Dec-2010). This is a dramatic expansion in the last 5 years. Around Dos Palos and heading south on Fairfax into Fresno County, expansion into drip is occurring concurrently with transitioning into 80" beds as well.

Growing **2-rows of tomatoes on 80" beds** offers many potential benefits: reduced drip tape; reduced number of passes through a field for transplanting, cultivation, and harvest; increased rotation possibilities and less time adjusting equipment spacing on farms where both 30" and 40" crops are grown (e.g., cotton and tomatoes versus melons and onions). On the other hand, 80" beds slow down both transplanting and harvesting speed, potentially offsetting the speed gains from reducing the number of passes, transplanters and harvesters need to be modified to fit the new spacing, and cost savings from the reduced amount of tape are a small part of the overall cost of installing a drip system. Additionally, research done by myself and Tom Turini (Farm Advisor, Fresno County) shows that 80" beds require about 10% more transplants per acre for optimal yields as compared to 66" beds.

And of course, there needs to be the potential improvement in yield. In this regard, the system looks very promising: for two years, our research project has shown significantly more yield from the 80" beds (from plots with either 1 or 2 drip lines) as compared to the 66" beds. Why? We don't have the answer for that yet, but I suspect it may have to do with the number of plants per acre. The 80" beds may be utilizing soil and sunshine more efficiently. Additionally, there are more plants to compensate for stand losses. Where the trial is being conducted at the West Side Research and Extension Center near 5-Points, TSWV pressure was substantial in 2010, and powder mildew in 2009.

**2010 MID MATURITY REPLICATED TOMATO PROCESSING VARIETY TRIAL MERCED COUNTY**

| Variety | Yield tons/acre | | | | | | Brix % | Color | pH |
|---|---|---|---|---|---|---|---|---|---|
| H5508 | 83.6 (01) | A | | | | | 4.2 (16) | 24.8 (08) | 4.41 (01) |
| H5608 | 80.4 (02) | A | | | | | 4.3 (15) | 23.3 (03) | 4.52 (07) |
| N 6385 | 77.9 (03) | A | B | | | | 4.5 (12) | 22.8 (01) | 4.55 (12) |
| H9780 (STD) | 74.5 (04) | | B | C | | | 4.5 (10) | 26.3 (14) | 4.50 (05) |
| HM 7885 | 74.3 (05) | | B | C | | | 4.3 (14) | 27.8 (15) | 4.66 (15) |
| CXD 255 | 74.3 (06) | | B | C | | | 4.5 (11) | 24.8 (08) | 4.53 (09) |
| H8504 | 74.0 (07) | | B | C | | | 4.6 (09) | 25.3 (12) | 4.46 (03) |
| UG 19406 | 73.1 (08) | | B | C | | | 5.1 (06) | 27.8 (15) | 4.41 (01) |
| SUN 6366 (STD) | 72.7 (09) | | B | C | | | 5.2 (02) | 23.3 (03) | 4.58 (13) |
| BQ163 | 72.4 (10) | | B | C | | | 5.1 (05) | 22.8 (01) | 4.54 (10) |
| N 6394 | 71.8 (11) | | | C | D | | 5.3 (01) | 25.0 (10) | 4.68 (16) |
| BQ 205 | 66.3 (12) | | | | D | E | 5.1 (03) | 25.8 (13) | 4.47 (04) |
| AB3 (DRI0303) | 63.9 (13) | | | | | E | 5.1 (03) | 25.0 (10) | 4.52 (08) |
| AB 2 (STD) | 63.8 (14) | | | | | E | F 5.0 (07) | 24.0 (05) | 4.51 (06) |
| H 4007 | 63.7 (15) | | | | | E | F 4.4 (13) | 24.5 (06) | 4.55 (11) |
| CXD 282 | 58.1 (16) | | | | | | F 4.6 (08) | 24.5 (06) | 4.62 (14) |
| Mean | 71.5 | | | | | | 4.7 | 24.8 | 4.53 |
| CV= | 5.7 | | | | | | 6.6 | 8.1 | 1.4 |
| LSD @ 0.05= | 5.83 | | | | | | 0.44 | 2.88 | 0.088 |

LSD 0.05 = Least significant difference at the 95% confidence level.
Means within a column less than this amount are not significantly different.
CV = coefficient of variation
Numbers in parentheses indicate relative ranking within each category.

Regarding **nutrient management**: in fields with a history of buried drip, annual soil sampling for nutrient levels becomes more important. UC Extension Specialist Tim Hartz has noted that since nutrient extraction is primarily confined to the smaller wetted area within the bed, nutrient depletion can be accelerated, especially for soil P and K, compared to a conventional furrow-irrigated system. Given this limited rooting zone, and the higher yield usually achieved with drip, higher rates of fertilization may be necessary as dictated by soil nutrient levels. Note: to more accurately determine the nutrient status of the soil, soil samples should be taken, as well as fertilizer applications made, in the wetted area of the drip tape.

**Research Results:**

Mid-Maturity Variety Trial, local results

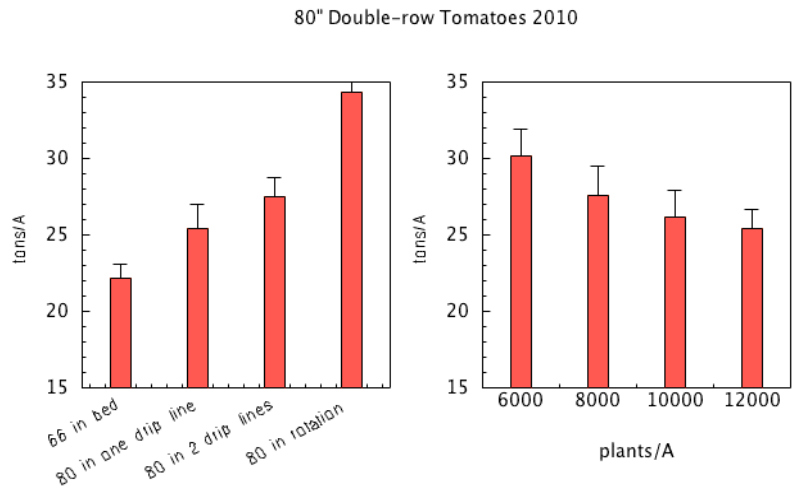
| 2010 MID MATURITY OBSERVATION TOMATO PROCESSING VARIETY TRIAL MERCED COUNT | | | | |
|---|---|---|---|---|
| Variety | Yield tons/acre | Brix % | Color | pH |
| HMX 9905 | 85.920 | 4.5 | 24 | 4.47 |
| H 7709 | 79.185 | 4.8 | 26 | 4.56 |
| UG 19006 | 77.600 | 5.0 | 24 | 4.55 |
| N 6398 | 75.872 | 4.0 | 25 | 4.52 |
| N 6400 | 74.911 | 4.6 | 24 | 4.55 |
| HMX 9906 | 72.952 | 4.9 | 26 | 4.55 |
| CXD 280 | 68.573 | 4.6 | 24 | 4.48 |
| H 6809 | 68.369 | 4.8 | 24 | 4.53 |
| HMX 9903 | 66.940 | 4.7 | 23 | 4.63 |
| BQ 198 | 61.389 | 4.7 | 26 | 4.72 |
| UG 19306 | 60.152 | 5.3 | 24 | 4.45 |
| BQ 187 | 48.654 | 5.3 | 26 | 4.59 |
| BOS 7210246 | 43.429 | 5.4 | 22 | 4.50 |

The Merced County processing tomato variety trial is part of the coordinated UCCE statewide variety testing program. This year, the trial was conducted with Aric Barcellos of A-Bar Ranch in Dos Palos, CA, in a field located off Russell Ave just south of Dos Palos. The trial was transplanted on April 30 using Chechi Maggli cone planters and harvested on Sept 26 (145 days) by Morningstar. The field had double lines on 80" beds, and was irrigated with one buried drip tape running down the center of the bed.

Yields were extremely high, ranging from 84 to 58 tons per acre. The best performing varieties were H5508, H5608, and N6385, which produced on average 84, 80, and 78 tons. One of the non-replicated experimental lines produced 86 tons/A. Brix was a little on the low side, however, at about 4.7%. These yields were the best I've ever recorded, and were also the highest for all the test locations in the state. There was very little disease pressure for this field – both TSWV and powdery mildew were not an issue.

Drip Irrigated, 80" beds

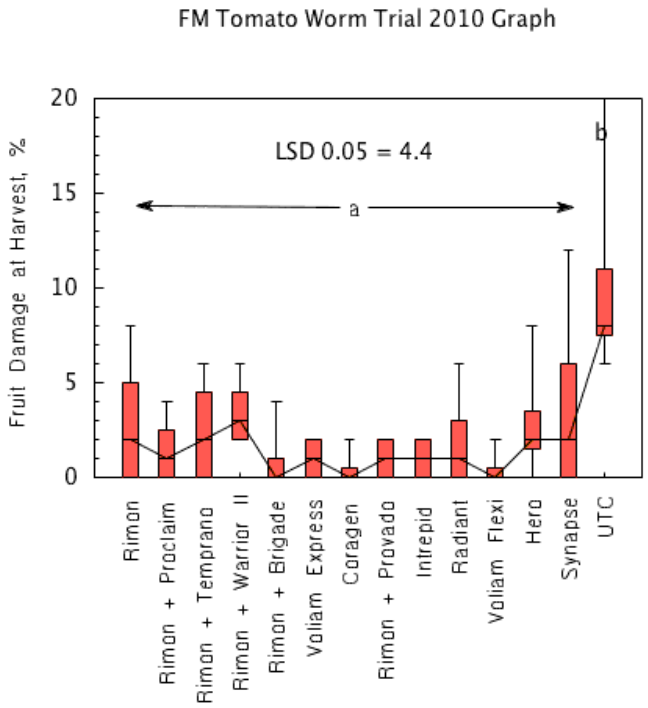
This was the second year of a study designed to provide information regarding costs of production, yield and quality, and optimal plant population of processing tomatoes under alternative drip/bed configurations. Main plot treatments included 1) standard 66-inch bed with buried drip tape and one row of transplants in the center of the bed; 2) 80-inch bed with one buried drip tape in the center of the bed and two rows of transplants on top of the bed; 3) 80-inch bed with two buried drip lines and two rows of transplants; 4) 80-inch bed with one buried drip line and two rows of transplants following fallow-bed rotation. Additionally, plant population was also evaluated, using spacing to achieve 6000, 8000, 10,000, and 12,000 plants per acre. The trial was impacted by TSWV, which averaged 12.6% and ranged from 1 – 38%. Chronic difficulties with leaks in the irrigation system may have contributed to the overall low yields and high variability in the data. Nonetheless, fruit yield was significantly better in the 80" single line treatment after fallow as compared to the 66" bed system. Yields were highest at 6000 plants per acre and declined with higher plant densities. Fruit color, soluble solids, and pH were unaffected by the treatments. Green fruit were more prevalent in the 66" standard treatment at time of harvest. As in 2009, the trial provided good preliminary data on the potential of the 80-inch, double-row system. Effects of plant spacing, if any, still need to be determined.



Tomato Worm Control Trial

There was very little worm pressure in this location this year, and many of the counted larvae were loopers and not armyworm or fruitworm. Prior to the first application, we found about 5.5 larvae per 4 shakes. This was substantially reduced following the Aug 9 application, but overall counts were also low in the untreated plots and no significant treatment effects were seen. No live larvae were observed in subsequent counts at 1 and 2 weeks; the plots were sprayed again on Aug 30 and Sept 17 based on egg laying activity and to match grower practices. At harvest, fruit damage from worms was measured in each plot. All of the insecticide treatments significanlty reduced worm damage as compared to the untreated control, which averaged 10.5% damage. Using arcsin corrected data, only the Rimon + Warrior treatment was found to not be different than the untreated control.

As in previous years, these results show that new worm control products for tomatoes are effective at controlling lepidopterous pests under commercial field production. In 2010, the addition of Warror to the Rimon did not provide additional control as compared to Rimon alone.




Thrips and TSWV Monitoring

Overall, Merced County had low levels of TSWV in 2010, usually less than 3%. We continue to search for potential TSWV (and thrips) inoculum sources. To date, there is no indication of TSWV coming from greenhouses. Almond orchards were monitored for thrips and flowers were sampled. Low thrips populations were found and TSWV was not detected in thrips from almond flowers. Early season weed surveys in Fresno/Kings and Colusa/Yolo again failed to reveal TSWV infection, consistent with our previous results indicating low rates of TSWV infection in weeds. Spring lettuce fields in Fresno had very low incidences of TSWV, and no potential winter bridge hosts were found in Colusa/Yolo; however, there has been elevated incidence of TSWV in fall lettuce in Fresno County. Fall and spring-planted radicchio fields in Merced had little or no TSWV infection and relatively low thrips populations. Effective management of thrips, together with the continued prompt removal of harvested crops, has reduced the role of radicchio as a TSWV bridge crop in Merced. Finally, PCR detection of TSWV in thrips continues to show very low levels of TSWV in thrips, especially early in the growing season. Overall, our results continue to show that TSWV overwinters at low levels in winter weed, bridge crops, or some unfound source, and is then amplified in susceptible crop hosts during the growing season. Based on comments from growers who have seen infections near adjacent fallow fields, this coming season we will be monitoring thrips emergence from soil as a source of the virus.

**Scott Stoddard**
**Farm Advisor**

# NORTHERN SAN JOAQUIN VALLEY
# PROCESSING TOMATO PRODUCTION MEETING

*UC Cooperative Extension San Joaquin, Stanislaus, and Merced Counties,*
*In conjunction with the California Tomato Growers Association 64th Annual Membership Meeting*

**Wednesday, January 26, 2011 8:00 am - 11:00 am**
**Doubletree Hotel, 1150 9th St., Modesto, CA 95354**

7:30 Registration, Continuing Education sign-in

8:05 *Weed control update including bindweed*
Tom Lanini, Weed Management Specialist, UC Davis

8:25 *Fusarium: two old diseases and one new one*
Mike Davis, Plant Pathology Specialist, UC Davis

8:45 *Update on tomato powdery mildew control*
Brenna Aegerter, Farm Advisor, San Joaquin County

9:05 *Tomato transplant field studies: age, root-ball orientation, doubles*
Gene Miyao, Farm Advisor, Yolo/Solano/Sacramento counties

9:25 break

9:40 *Evaluation of double-row tomatoes on 80-inch beds:- A progress report*
Scott Stoddard, Farm Advisor, Merced & Madera counties

10:00 *Tomato spotted wilt virus: Thrips control and variety susceptibility update*
Tom Turini, Farm Advisor, Fresno County

10:30 *Extended field storage varieties: Field and lab evaluations*
Michelle Le Strange, Farm Advisor, Tulare & Kings counties, and
Diane Barrett, Fruit and Vegetable Products Specialist, UC Davis

11:00 adjourn

**Continuing education hours have been requested from**
**DPR (1.5 hrs) and California CCA (2.7 hours)**

*This Cooperative Extension sponsored meeting is free and open to the public. The meeting room and refreshments are generously provided by the California Tomato Growers Association, Inc.*
*For information about the California Tomato Growers Association Annual Meeting,*
*please contact CTGA at (916) 925-0225*