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TOMATO INFO

Fusarium Wilt Variety Evaluation
Potassium Fertilization
Grafted Rootstocks
Tomato Production Meeting, Thursday, 12 January 2017

FIELD NOTES (2016 SEASON)

Reflecting over the last 5 years, our local agricultural landscape has changed substantially. In Yolo County, orchard crops have increased by 25,000 acres from 2010 to 2015 to nearly 57,000 acres, dominated by almonds and walnuts. The planting of permanent crops has diminished the ground available for rotation to tomatoes and water available for irrigation in dry years.

Buried-drip irrigation systems are now common for processing tomato production in our region. The investment has been rewarded with higher yields and irrigation efficiency. The value of drip is further evident as rodent-damaged tape in aging systems is replaced with new drip tape, rather than a return to conventional furrow irrigation. Tomato fields with furrow and sprinkler irrigation can be highly productive, and this conventional irrigation remains in use on perhaps 25% of the tomato acreage in our region.

Bed-width management is another evolving practice. Field tests were initiated at a UC experiment station in Five Points for a couple of years to compared beds centered from 60” to 80”. The comparisons were challenging with equipment and especially irrigation management in an experimental setting. In commercial fields, an individual grower is challenged as the comparisons are not simple to pair within a field. At the landscape level, it appears there is not a clearly superior bed width. The influence of several factors (variation of soil types, tomato varieties and constant variety switching, and various rotational crops) complicates the analysis. Conversion to wide beds appears to have slowed.

There is interest in narrowing the furrow width, including elimination, to increase fruit recovery on a wider, flat surface for the harvester. Beyond the need of an autosteer mechanism on harvesters, in-season tractor traffic creates its own furrow-like depression; and the benefit of channeling drip tape leaks down the furrow and eventually off the field can be compelling reasons to not abandon the raised-bed system.

Fusarium wilt race 3 continues to spread to new fields and increase in infested fields when susceptible varieties are grown. Limiting the spread, especially by cleaning harvest equipment before moving to clean fields, is wise. Root knot nematode is slowly showing up in new fields, overcoming the *Mi* genetics of our resistant cultivars.

FUSARIUM WILT RACE 3 VARIETY EVALUATIONS

In response to increased incidence of Fusarium wilt, race 3, a team of 5, UC Farm Advisors conducted tests in commercial fields with a history of the race 3 pathogen of *Fusarium oxysporum f. sp. lycopersici*. A uniform set of 15 varieties included a susceptible (H 8504) and two tolerant cultivars (HM 3887 and DRI 319). Incidence of Fusarium with H 8504 averaged 24%, 20% and 29% in the 3 northern sites (Robbins, Woodland and Stockton, respectively) and with low (2%) or no Fusarium detected in the southern sites (Dos Palos and Huron). Only the 3 northern locations are included in this discussion. In the combined analysis of the 3 sites with moderately high Fusarium incidence, the top yielding varieties were HM 3887 and N 6428 (Table 1). H 8504 was in the lowest yielding group. Brix performance varied across locations.

Woodland: In the Yolo test, HM 3887 and N 6428 were in the highest yielding variety group (Table 2). Average yield spanned almost 20 tons between highest and lowest yields. Sunburn level was over 20% in both BQ 142 and SVS 2793. Overall, vine growth was good at the site.

Robbins: Plant growth season-long was exceptional in the Sutter field. Cull level including sunburn was modest (Table 3) and vine necrosis was moderate despite an Ethrel® application.

Interestingly, overall yields were high with an average of 57 tons/acre, while blossom end rot was prevalent, but especially high with BQ 406 and H 1310, both around 6%. The high yielding group was led by HM 3887 with 64.8 tons/acre and included SVS 2493, HM 58801 and N 6428. DRI 319 had the highest Brix with 6.28, but was also among the lowest yielding, although at 50 tons/acre.

Stockton: In the Jones Tract site in western San Joaquin County, yield separation was modest, partly because highest and lowest yielding varieties averaged 10 tons/acre (Table not shown). Highest yielding varieties, led by N 6428, appeared to have a higher percent of immature fruit. H 1310 had over 8% blossom end rot.

Discussion: The performance of HM 3887 under our moderately high incidence of race 3 was impressive. In a successive-year, repeated test in the same site, I suspect a tolerant variety might be overrun. Under higher disease pressure, risk of catastrophic disease impact escalates when relying on a tolerant compared to a resistant cultivar. Thus, from a management perspective, a tolerant variety might be a candidate for fields with historically moderately low Fusarium incidence combined with rotation out of tomatoes for a few years prior. Without a reliable soil sampling system to directly measure Fusarium wilt pathogen populations, risk assessment relies on monitoring disease level in the recent tomato crop to guide subsequent varietal decisions. Several Fusarium wilt, race 3 resistant varieties are available that provide high yield performance. The resistant varieties are the better choice where race 3 is problematic.

We especially thank all our grower cooperators. In some cases, harvest was by the Morning Star Company. Ag Seeds and T, S & L provided variety consultation, collection of seed and greenhouse support, particularly from Lance Stevens. The Processing Tomato Advisory Board analyzed our fruit quality. Advisor Brenna Aegerter compiled the data and ran the combined and many individual statistical analysis of variance tests. Finally, we are thankful for the funding support from the California Tomato Research Institute and its contributing growers.

Table 1. Yield and fruit quality from high Fusarium wilt incidence trials, **combined Sutter, Yolo and San Joaquin counties** with Brix from 5 locations, 2016.

			Marketable		PTAB			°Brix			°Brix	
	Variety	disease resistance	yield tons/A		color	pH	°Brix	Sutter	Yolo	SJ	Merced	Fresno
1	HM 3887	**VFF** Nsw	57.6	a	24.9	4.42	5.09	5.20	4.93	5.15	5.2	4.63
2	N 6428	VFFF3Nsw	55.0	ab	23.3	4.41	4.96	5.40	4.73	4.75	5.0	4.78
3	BP 2	VFFF3NPsw	52.8	bc	22.5	4.53	4.98	5.43	4.73	4.80	5.2	4.70
4	HM 58801	VFFF3Nsw	52.5	bc	23.9	4.42	5.45	5.73	5.38	5.25	5.2	4.38
5	BQ 141	VFFF3NPsw	52.5	bc	21.8	4.43	4.80	5.05	4.58	4.78	5.2	4.88
6	N 6429	VFFF3NswLv	51.4	bcd	23.4	4.47	4.99	5.55	4.58	4.85	5.2	4.58
7	SVS 8232	VFFF3NPsw	51.0	bcd	21.5	4.39	5.28	5.50	5.25	5.08	5.4	4.53
8	SVS 2493	VFFF3NPsW	50.8	bcd	22.4	4.47	4.89	5.10	4.78	4.80	5.4	4.65
9	H 1310	VFFF3NPsw	50.3	cde	22.7	4.43	4.93	5.38	4.58	4.83	5.0	4.95
10	DRI 319	**VFF** NPsw	48.7	cde	23.1	4.39	5.58	6.28	5.35	5.13	5.8	4.40
11	H 1539	VFFF3Nsw	47.8	de	21.0	4.45	4.87	5.03	4.78	4.80	5.3	4.48
12	BP 16	VFFF3NPsw	47.6	de	23.3	4.42	5.17	5.68	4.83	5.00	5.2	4.83
13	BQ 406	VFFF3NPsw	47.4	de	21.9	4.47	5.23	5.50	5.00	5.18	5.6	4.73
14	H 8504	**VFF** NP	46.0	ef	23.4	4.36	4.70	5.03	4.53	4.55	5.0	4.50
15	BQ 142	VFFF3NPsw	42.7	f	22.3	4.46	5.09	5.68	4.88	4.73	5.3	4.45
	LCD 5%		4.39		0.77	0.04		0.45	0.22	0.33	0.34	0.30
	% CV		11		4	1	5	6	3	5	4.5	5
	*Location x variety interaction						*					

Table 2. Evaluation of yield, fruit quality and culls, processing tomato variety trial,
Don Beeman Farms, Woodland, 2016.

	variety	disease resistance	Marketable Yield tons/A		infected Fol Plants (%)	% vine necrosis	PTAB Brix	PTAB color	PTAB pH	% pink	% green	% sun burn	% mold	% BER
1	HM 3887	VFFNsw	64.2	A	13.0	46	4.93	26.5	4.46	4	1	9	1	0.0
2	N 6428	VFFF3Nsw	59.8	AB	0.0	35	4.73	24.3	4.47	4	2	6	0	0.3
3	BQ 141	VFFF3NPsw	58.7	BC	0.0	35	4.58	22.3	4.52	1	1	12	0	0.0
4	DRI 319	VFFNPsw	56.8	BCD	7.3	35	5.35	23.3	4.44	1	1	11	0	0.0
5	BP 2	VFFF3NPsw	56.6	BCD	0.0	54	4.73	22.8	4.63	1	1	10	1	0.0
6	HM 58801	VFFF3Nsw	54.8	CD	0.0	21	5.38	24.3	4.49	2	1	7	0	0.1
7	N 6429	VFFF3NswLv	54.3	CD	0.0	76	4.58	24.3	4.58	1	1	15	1	0.2
8	SVS 8232	VFFF3NPsw	54.2	CD	0.0	61	5.25	22.0	4.48	2	1	12	1	0.1
9	BP 16	VFFF3NPsw	52.8	DE	0.0	43	4.83	24.0	4.51	3	3	7	2	0.0
10	SVS 2493	VFFF3NPsW	52.8	DE	0.0	72	4.78	22.8	4.54	1	1	23	0	0.0
11	BQ 406	VFFF3NPsw	52.7	DE	0.3	43	5.00	22.5	4.55	2	1	11	0	0.3
12	H 1310	VFFF3NPsw	51.9	DE	0.0	65	4.58	24.0	4.50	5	1	8	1	1.6
13	H 1539	VFFF3Nsw	48.6	EF	0.2	75	4.78	21.8	4.55	2	2	11	0	0.2
14	H 8504	VFFNP	46.5	F	19.7	87	4.53	24.8	4.42	6	1	15	1	0.3
15	BQ 142	VFFF3NPsw	44.8	F	1.3	61	4.88	22.3	4.55	3	2	27	1	0.4
	LSD 5%		5.0				0.22	1.3	0.07	2.0	1.8	5.3	NS	0.5
	% CV		6				3	4	1	56	97	30	112	139
	Average		54.0				4.86	23.4	4.51	3	1	12	1	0.2
	^ significant non-additivity issue										^	^		^

Table 3. Fusarium wilt, race 3 resistant processing tomato variety trial results,
Richter Bros., Knights Landing, Sutter County, 2016.

	Variety	Disease Resistance	Yield Tons/A		% Fol plants	% vine necrosis 7-Sep	% vine necrosis 16-Sep	PTAB Brix	PTAB Color	PTAB pH	% pink	% green	% sun burn	% mold	% BER
1	HM 3887	VFFNsw	64.8	A	16.3	32	43	5.20	23.5	4.42	0	1	4	2	1.1
2	SVS 2493	VFFF3NPsw	62.2	AB	0.9	25	72	5.10	21.5	4.44	0	0	8	2	1.3
3	HM 58801	VFFF3Nsw	61.8	ABC	0.3	16	35	5.73	23.8	4.37	0	0	3	2	1.7
4	N 6428	VFFF3Nsw	60.3	ABCD	0.3	22	54	5.40	22.0	4.34	1	0	2	1	3.1
5	BQ 141	VFFF3NPsw	59.2	BCD	0.3	14	57	5.05	21.3	4.38	0	0	4	1	1.1
6	N 6429	VFFF3NswLv	58.8	BCD	0.0	18	65	5.55	22.5	4.39	0	0	2	2	2.9
8	H 1310	VFFF3NPsw	57.9	BCDE	0.3	8	35	5.38	21.3	4.40	1	1	3	1	5.8
7	BP 2	VFFF3NPsw	57.3	BCDE	0.0	16	57	5.43	21.0	4.47	0	0	3	2	1.0
9	H 8504	VFFNP	56.9	CDE	23.7	50	61	5.03	22.0	4.28	1	0	4	1	1.5
11	H 1539	VFFF3Nsw	55.9	DEF	0.3	19	43	5.03	20.5	4.41	0	0	1	0	1.0
10	SVS 8232	VFFF3NPsw	55.5	DEF	0.0	21	61	5.50	20.5	4.33	0	0	5	4	1.8
12	BQ 406	VFFF3NPsw	52.9	EFG	0.0	18	54	5.50	20.8	4.44	0	0	3	1	6.3
13	BP 16	VFFF3NPsw	51.3	FG	3.2	25	65	5.68	22.8	4.33	1	0	2	2	1.6
14	DRI 319	VFFNPsw	50.4	G	23.7	35	72	6.28	22.8	4.35	1	0	8	3	0.7
15	BQ 142	VFFF3NPsw	49.1	G	0.0	22	50	5.68	21.3	4.40	0	0	5	2	2.2
	LSD 5%		5.05		6.3	10.9	13.6	0.45	0.88	0.07	NS	0.4	3.0	1.3	1.9
	% CV		6		95.5	33.8	17.4	5.8	2.8	1.2	110.7	96.2	56.0	57.8	60.6
	Average		57.0		4.6	22.6	54.9	5.4	21.8	4.4	0.5	0.3	3.7	1.6	2.2
	^significant non-additivity issue				^								^		

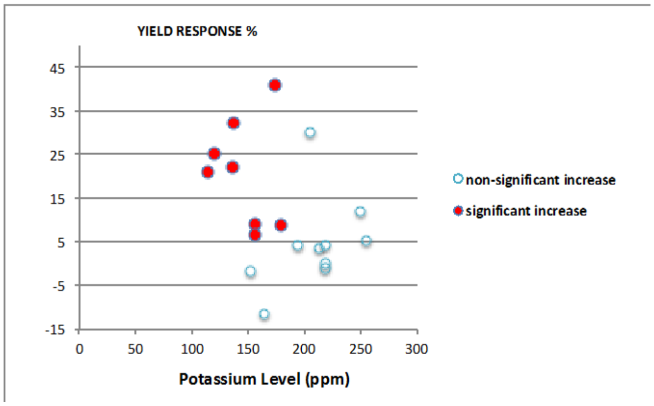
POTASSIUM- DO YOU NEED IT?

Tomatoes may benefit from potassium applications.

From supplemental applications of composted poultry manure, UC Plant Pathologists Mike Davis and Johan Leveau, doctoral student Nilesh Maharaj and I measured tomato yield responses up to 40%. The field tests initiated in 2011 focused on soilborne disease management to sustain tomato plant health. In that first season, a supplemental application of composted poultry manure increased yield by 30%, while conventional fungicides and microbial mixes had little effect. While not demonstrably reducing disease level, yield responses to composted manure continued.

As we gathered and processed more data, potassium applications were included to compare to compost as we began focusing on soil K levels. After several years of additional tests and expanded treatments, we saw clear evidence that potassium applications also increased yield when associated with a soil K threshold level below 200 ppm (Table 4). The lab extraction method was using ammonium acetate.

Table 4. Influence of soil K level (in ppm) on processing tomato yield response to composted poultry manure, Yolo-Solano, 2011-2015.



Local Nutrient Tests, 2016

From 2 local field tests conducted in 2016 with low soil K levels, we were disappointed when tomatoes did not respond to supplemental application of composted poultry manure or potassium. We still believe the K threshold level is around 200 ppm. The test fields in the Woodland-Knights Landing area had soil K levels at 95 to 120 ppm. A substantial yield response was expected.

One of the sites was afflicted by a high disease level of Fusarium wilt (exceeding 50% in many plots). The other test had exceptionally high yields. Both growers fertigated with K through their drip system, which included shut off valves which were used during the grower's K injection. Composted poultry manure applications at 5 or 10 tons per acre nor potassium at rates up to 400 lbs/A of K_2O as KCl or sulfate source did not significantly increase yield in either of our 2016 tests (Table 5).

In the Delta, UC Advisor Brenna Aegerter evaluated potassium muriate applications at rates from 50 to 800 lbs/A of K_2O as a preplant sidedress in a commercial field. Tomato yields increased linearly by about 9%. Soil levels were ~150 ppm K (with 1.5% K on the soil cation exchange) in this single-row planting on 60-inch centered beds with an Egbert clay and variety HM 4909. Irrigation was initially via sprinklers and thereafter by furrow.

While glitches and surprises occur, the breadth of results support that yield responses to potassium applications likely occur in soils with K levels below 200 ppm using an ammonium acetate extraction method and secondarily, in combination with K levels not exceeding 2% of the cation exchange capacity (CEC). Remain attentive to soil K levels as a guide; and use simple comparative strip tests within specific fields that include untreated vs K application to determine the responsiveness within fields. An application rate of 100 to 200 lbs of K_2O per acre may be reasonable. Soil K levels will continue to be depleted and the rate of extraction will accelerate as higher yields are achieved through better genetics and other improvements.

Our last few compost tests were aimed at comparing application placement depth. The test results have been weak, but without clear advantage of trenching vs. a surface placement.

Table 5. Evaluation of supplemental composted poultry manure and K on tomato yield and Brix, Woodland-Knights Landing, 2016.

	Treatment	Grower 1 tons/A	Grower 1 Brix	Grower 2 tons/A	Grower 2 Brix
1	non treated	81.8	4.35	50.9	4.98
2	compost 5 tons (trench)	83.3	4.68	47.6	5.10
3	compost 5 tons (shallow)	83.2	4.50	54.8	4.95
4	compost 10 tons (trench)	82.8	4.48	47.9	5.13
5	compost 10 tons (shallow)	83.1	4.40	53.8	4.95
6	KCl @ 50 lbs K20 sidedress	79.9	4.45	46.1	4.88
7	KCl @ 100 lbs K20 sidedress	81.2	4.48	50.0	5.05
8	KCl @ 200 lbs K20 sidedress	79.1	4.35	45.1	5.20
9	KCl @ 400 lbs K20 sidedress	81.8	4.38	50.8	4.85
10	K2SO4 @ 50 lbs K20 sidedress	79.1	4.63	39.2	4.88
11	K2SO4 @ 100 lbs K20 sidedress	79.6	4.43	51.5	4.93
12	K2SO4 @ 200 lbs K20 sidedress	81.8	4.65	46.0	5.15
13	K2SO4 @ 400 lbs K20 sidedress	81.3	4.55	52.2	4.78
	LSD 5%	NS	NS	7.1	NS
	% CV	3	5	10	6
	compost: trench vs surface *(probability)*	NS	NS	0.01	NS

PROGRESS REPORT ON GRAFTED ROOTSTOCKS, 2016:

A local field test was conducted to evaluate the benefit of grafted rootstocks for canning tomato production. The test was initiated in response to a grower-voiced interest to increase plant vigor and thus boost yield through a vision of grafting onto hardy rootstocks. Fresh market tomatoes in sophisticated, controlled-environment glasshouses have used rootstocks to provide vigor and longevity for 8-month runs of fruit production. Beyond vigor enhancements, rootstocks have also provided genetic resistance to some pests.

In cooperation with grower Blake Harlan and seedling producer Growers Transplanting, Inc., a field test was conducted as a late-season planting. We compared 3, non-grafted varieties (H 8504, DRI 319 and HM 3887) against the grafted combination of those 3 variety's shoots and 3 rootstocks (MaxiFort, MultiFort and DRO 138TX). GTI provided seedlings for our 0.5 acre-sized test which was mechanically transplanted on single row, 5-foot-centered beds and mechanically harvested. The field was exclusively buried-drip irrigated. Our planting date was delayed with pre-irrigation activity and then by high temperatures at planting in our silt loam soil. With the high temperatures, we lost many plants but maintained a full stand by hand transplanting to replace the heat-damaged seedlings. Once established, plants grew well.

Summary of results: Yields were increased on average by ~10% from 55 to 60 tons per acre when compared to the non-grafted varietal counterpart (Table 6). The yield gain appeared to be associated with prolonged fruit set with a slight delay in vine decline during early fruit ripening. The yield gains ranged from 2 to 15% and included a slightly elevated level of green fruit which increased from 6% to 10%, on average. Differences in cultivar performance occurred as expected, while the 3 rootstocks performed similar to each other regardless of scion.

Bottom line: The economic attractiveness of grafting for canning tomato production falls far short. The current cost of grafted transplants is more than $650 per 1,000 plants. At $72.50 per ton for tomatoes, grafting would need to produce more than 100 tons per acre.

Adjustments are needed to make grafting economically feasible. Reduction in plant population and a lower price for grafted plants are likely both needed. If planting rate was lowered to 5500 plants per acre with a cost of $0.50 per plant, then a yield target of 80 tons/acre with a price of

$72.50 per ton approaches a breakeven point. In the future, the price of grafting could be lowered with volume and mechanization.

Beginning in 2017, our office will participate in a multi-year USDA grant in collaborate with other Universities to evaluate the potential of grafting for vegetable crops in the US. UC Advisor Brenna Aegerter and I are teaming to assess the practice on processing tomatoes. Colleague Margaret Lloyd will be evaluating grafting with heirlooms for fresh market tomato production.

Table 6. Evaluation of grafted rootstocks on processing tomato fruit yield, quality and culls, Harlan Family Farm, Woodland, 2016.

I	**Rootstock**	**Scion**	Marketable yield Tons/A	non-grafted yield (%)	PTAB color	°Brix	pH	% pink	% green	% sun burn
1	-	H 8504	48.6	-	23.5	4.80	4.24	7	7	1
2	MaxiFort	H 8504	52.1	107	22.3	4.60	4.25	8	11	1
3	MultiFort	H 8504	52.3	108	22.5	4.43	4.25	8	12	1
4	DRO 138TX	H 8504	56.0	115	22.5	4.50	4.23	10	10	1
5	-	DRI 319	54.9	-	21.8	5.35	4.25	2	3	2
6	MaxiFort	DRI 319	62.4	114	21.8	5.33	4.30	3	6	2
7	MultiFort	DRI 319	62.6	114	21.5	5.35	4.26	4	8	1
8	DRO 138TX	DRI 319	63.3	115	21.5	5.35	4.26	4	11	1
9	-	HM 3887	62.1	-	22.5	5.05	4.29	8	7	1
10	MaxiFort	HM 3887	63.5	102	23.5	5.15	4.27	9	8	1
11	MultiFort	HM 3887**	65.5	106	23.5	5.29	4.20	10	14	3
12	DRO 138TX	HM 3887	66.0	106	22.5	5.25	4.30	6	11	0
	average		59.1		22.4	5.0	4.3	6.5	9.2	1.2
	LSD 5%		6.0		1.33	0.40	0.05	4.3	5.4	NS
	%CV		7		4	5	1	46	41	91
	non-additivity									
CLASS COMPARISONS:										
	Grafted vs		60.4	110	22.4	5.03	4.26	6.8	10.2	1.2
	non grafted		55.2	100	22.6	5.07	4.26	5.6	6.0	1.4
	Probability		0.001		NS	NS	NS	0.236	0.002	0.30
FACTORS										
A.	*Variety (scion)*									
		H 8504	53.5	110	22.4	4.60	4.24	8.6	11.5	0.7
		DRI 319	62.7	114	21.6	5.34	4.27	4.0	8.2	1.2
		HM 3887**	65.0	105	23.2	5.23	4.26	7.9	11.0	1.3
	Probability		0.000		0.003	0.000	0.15	0.002	0.1196	0.24
	LSD 5%		3.57		0.83	0.25	NS	2.48	NS	NS
B.	*Rootstock*									
		MaxiFort	59.3	108	22.5	5.03	4.27	6.7	8.3	1.2
		MultiFort**	60.2	109	22.5	5.02	4.24	7.2	11.7	1.3
		DRO 138TX	61.8	109	22.2	5.03	4.27	6.6	10.7	0.7
	Probability		NS		NS	NS	0.06	NS	0.12	0.31
	LSD 5%						NS		NS	NS
C.	*Interaction (probability)*									
	Variety x Rootstock		NS		NS	NS	0.03	NS	NS	NS
	% CV		7		4	6	1	43	38	89

** Note: HM 3887 x MultiFort with 3 of 4 missing plots
missing values estimated with statistical analysis program MSTAT

SOUTH SACRAMENTO VALLEY PROCESSING TOMATO PRODUCTION MEETING

University of California Cooperative Extension Farm Advisors
Colusa/Sutter/Yuba and Yolo/Solano/Sacramento Counties

Woodland Community Center

2001 East Street, Woodland 95776
(From Highway113, exit on CR 25A, head west to East Street. Right turn on East St. for ~1 mile)

8 am to noon, Thursday, January 12, 2017

7:45	Doors will open — Coffee and refreshments will be ready
8:20	*Evaluation of supplemental composted manure & potassium on plant health; & Progress report on grafting evaluation:* Gene Miyao, UC Farm Advisor, Yolo/Solano/Sacramento counties
8:40	*Calif labor issues:* Ed Taylor, Agricultural & Resource Economics, UC Davis
9:00	*Calif labor issues:* Dan Sumner, UC Agricultural Issues Center and Dept of Agricultural & Resource Economics, UC Davis
9:20	*Research to support irrigation and nutrient management decisions in processing tomatoes:* Daniel Geisseler, Nutrient Management Specialist, UC Davis
9:40	*Local Pesticide Regulation Update:* Dennis Chambers, Deputy Ag Commissioner, Yolo County
10:00	——————— Short Break———————————
10:20	*Fusarium wilt, race 3 variety evaluations:* Amber Vinchesi, UC Farm Advisor, Colusa and Sutter/Yuba counties
10:35	*Fusarium wilt studies:* Hung Doan, doctoral student, Plant Pathology Dept, UC Davis
10:55	*Variety Evaluations:* Scott Picanso and Jonathan Deniz, TS&L Seed Co.
11:15	*Root knot nematode control evaluations; and Characteristics of Mi, resistance-breaking populations in California:* Antoon Ploeg, Dept. of Nematology, UC Riverside
11:35- 11:55	*Tomato spotted wilt virus and Curly top update:* Bob Gilbertson, Plant Pathology Dept., UC Davis

Hall Rental and Refreshments Courtesy of:

Dow AgroSciences (Jill LeVake)
Syngenta (Derrick Hammonds)
Bayer (Bob Austin)
Valent USA (Leanne Becker)
BASF (Dawn Brunmeier)
DuPont (Tim Gallagher)

Gowan (James Brazzle)
Farm Credit West (Anna Fricke)
Morningstar Company (Renee Rianda)
Campbell Soup Company (Ag Operations)
Olam (Zach Bagley)
Pacific Coast Producers (Steve Freeman)

Meeting is open to any interested party. Meeting facility is handicap accessible.

PCA #M-0175-17 with 0.5 hrs. of laws & 1.5 hrs. of other
CCA #CA54663: 0.5 Nutrients, 0.5 IPM, 1.0 Crop Management & 1.0 Professional Dev

UPCOMING TOMATO MEETINGS:

√ 12 January 2017 (Thursday AM) South Sacramento Valley Processing Tomato Production Meeting, Woodland Community & Senior Center, 2001 East Street, Woodland, 95776

√ 25 January 2017 (Wednesday AM) N. San Joaquin Valley Processing Tomato Production Meeting (AM) follows with CA Tomato Growers Association Business Meeting, DoubleTree Hotel, 1150 9th St, Modesto. Registration required for CTGA luncheon (916) 925-0225 ctga@sbcglobal.net

√ 7-8 Feb 2017 (Wed-Thursday)– EXPO, CA League of Food Processors, Sacramento Convention Center, 1400 J Street, Sacramento. Registration required.
https://www.foodprocessingexpo.org/register_now.cfm

We appreciate the support of CTRI and of our cooperating growers in our local 2016 field tests:
Sam and Steve Meek of J.H. Meek and Sons;
Colin and Frank Muller of Muller Ranch.
Blake Harlan, Harlan Family Farm and Josh Chase, Growers Transplanting Inc.
Don Beeman and Salvador Duenas, Don Beeman Farms
Ag Seeds and TS&L
Plant Sciences Dept, UC Davis, Jim Jackson and Fred Stewart
Plant Pathology Dept, Armstrong facility, UC Davis, Bryan Pellissier

Our able field assistant over the last few years, Ben Leacox, has moved on. We will be looking for help for our research projects and educational events. If you know of a qualified applicant, please let us know.

Best wishes for a Happy Holiday Season,

Gene Miyao

Gene Miyao
Farm Advisor, Yolo, Solano & Sacramento counties
