



Pepper News

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California Pepper Industry Report

Chairman, California Pepper Commission

Glen Fischer, Saticoy Foods

The California Pepper Commission continues to focus its efforts on improving the chemical, disease and pest issues that concern the pepper industry. The Commission met earlier this year with the purpose of discussing any current and future issues and discussing research projects that can improve the California pepper industry.

Our annual newsletter contains summaries of the research projects completed during the 2012-13 year. Each of these projects was considered by the Commission's Research Committee and then recommended to the Commission for approval. Most of our projects have been ongoing, focusing on the more practical issues of farming peppers, while some focus on more basic research that the Commission feels deserves attention.

The Commission has continued to be a proactive partner to the industry, aggressively seeking to maintain the best possible representation to the industry's growers, handlers, and shippers. It is in the Commission's best interest that the industry continues to progress during a time when farming has taken more than its share of negative exposure. My experience with the Commission has reassured me that there are possibilities to continue to improve the Commission's value to the industry and overcome some of the obstacles we all face. The Commission is the only avenue the Pepper industry has to confront new issues in a changing world.

You will be receiving in the next few months a ballot for a referendum vote of the industry. This referendum for the continuation of the Commission is required every five years by law. I am asking you to vote and return

your ballot. If you have any questions feel free to call me at (805) 340-0078 or you can speak with Nathan Sano, Commission Manager, or Kim Sakamoto, Assistant Manager at the Commission office.

The Commission worked with Valent and the Department of Pesticide Regulation on obtaining a Special Local Need (SLN) 24C on Chateau. Chateau is available to growers for a pre-transplanting application for weed control on mallow in the furrow bed. The Label can be found on the Valent website www.valent.com. Dual Magnum continues to be available as a 24C label from Syngenta through their website www.farmassist.com. Without the assistance of the Pepper Commission herbicides such as Chateau and Dual Magnum as well as the registered fungicide Rally would not be available to the industry.

You can also find a pepper-related pesticide list, which is provided to the industry by the California League of Food Processors at their website www.clfp.com. You can sign in to view this list on the Pesticide Program page with the ID: nathan@tabcomp.com and password **nathan93618**.

For the past several years the Commission has been a member and active participant with the California Specialty Crops Council (CSCC). The CSCC provides the Commission the opportunity to work with similar groups to focus on research, education, and regulatory activities, which may affect California agriculture. By representing a variety of groups, the CSCC is well supported when communicating industry issues with state and federal agencies. The CSCC also acts as a conduit of information between its members and various entities. For more information you can visit the CSCC website at www.specialtycrops.org.

With the increasing demand for agricultural sustainability from the retailers, buyers and consumers, several commodity groups worked to put together a strategic plan growers and industry members can use to determine if

their industry practices fall in line with the sustainability standards being set by those demanding them. Being a part of that process the pepper industry now has a strategic plan available on the Commission website or you can request a copy from the Commission office.

Among Commission activities, the agricultural sustainability strategic plan, research reports and this newsletter can be found on the website www.calpeppers.com. You will also find links to the SLN Labels for Chateau and dual magnum along with a link to the CLFP site.

The Commission and staff are always available to answer questions or assist in any way they can. Nathan Sano (nathan@tabcomp.com) is the Board Manager, and Kim Sakamoto (kim@tabcomp.com) is the Assistant Manager, and they can be contacted via email or at 559/591-3925.

2012 Project Reports

Pepper Preemergence Weed Control Trials

Richard Smith, UCCE Monterey County and Michelle LeStrange, UCCE Tulare County

CENTRAL COAST: Field trials were conducted to evaluate potential new herbicides for use on peppers. Zeus, Nortron and Outlook were compared with the standard herbicides, Dual Magnum and Prowl H₂O. In addition, a new low VOC formulation of Prefar was compared with the standard EC formulation of Prefar.

Two trials were conducted in commercial bell pepper fields with cooperating growers. **Trial No. 1** was conducted to evaluate pre-transplant applications and **Trial No. 2** was conducted to evaluate layby applications. There was a high population of hairy nightshade at trial No. 1, but the population was spotty which made determining statistical differences among the treatments difficult. However, a trend indicated that Zeus and Outlook had greater weed control. Zeus at 3.0 fl oz was safer than 6.0 fl oz on the soil type at the trial site (silty clay). The Nortron and Prefar treatments had the highest yields in this trial.

In the layby trial, the treatments were applied between and to the sides of the seedlines. The sprays were directed, but inevitably some material contacted the foliage of the plants. Where Zeus and Nortron contacted the foliage they caused phytotoxicity on the leaves: burned lesions with the use of Zeus and distortion of the foliage with Nortron. All materials reduced the number of hairy nightshade plants on two evaluation dates and there were no differences in yield among the treatments.

CENTRAL VALLEY: Three field trials evaluated 5 preemergence herbicides: Zeus, Nortron and Outlook were compared with the standard herbicides, Dual Magnum and Prowl H₂O. All were applied at 1x and 2x rates, and a 4x rate of Outlook was also applied, and all were compared to an untreated check. The treatment list was the same for each trial. In two trials the herbicides were applied one day before transplanting the peppers and the difference between the trials was that one was completely grown using subsurface drip irrigation and the other was grown using sprinkler irrigation followed by furrow irrigation.

In the pre-transplant furrow application all herbicide applications resulted in some crop phytotoxicity, but crop damage by Outlook (4x) and Zeus (2x) was significantly higher than the rest. A third trial applied the herbicides at layby and the trial was grown using furrow irrigation, however sprinkler irrigation was used to incorporate the layby herbicides.

As in the Central Coast layby trial, where Zeus and Nortron contacted the foliage they cause initial phytotoxicity on the leaves: burned lesions with the use of Zeus and distortion of the foliage with Nortron, however these symptoms were greatly reduced with time. A 4x application of Outlook resulted in less phytotoxicity to pepper leaves than a 2x rate of Nortron or a 1x rate of Zeus. An application of a 2x rate of Outlook showed the same pepper phytotoxicity as a 1x application of Prowl H₂O, both of which diminished as the peppers grew. In all trials Dual Magnum, Prowl H₂O, and Outlook provided excellent results in broadleaf and grass weed control.

Insect Pest Management on Peppers

John T. Trumble, Sean Prager, William Carson, and Greg Kund, UC Riverside

Pepper field trials were conducted at the University of California South Coast Research and Extension Center (SCREC). The project included both a chemical screening trial and an IPM trial. The chemical screening trial was used to identify new compounds that can potentially be used in a commercial IPM program. The IPM program was conducted using a large scale commercial field design and was used to evaluate treatment rotations against a complex group of insects for efficacy as well as economic benefits for pepper growers.

Chemical trials examined GF 2860, Radiant, Intrepid plus Warrior, Entrust, Torac, Grandevo, Grandevo with and without Radiant, and MBI 206. All of these materials were applied on a weekly basis.

The IPM trials examined a rotational treatment and a chemical standard. The IPM treatment consisted of Rimon, Actara plus Lannate, Actara, Agrimek, and

Ecotrol. The other treatment representing a chemical standard was Lannate 2.4 LV, combined with Pounce 3.2 EC. The materials used in the IPM trial were applied according to rotational strategies that would support a commercial grower operation. The low input treatment had Rimon, Actara plus Lannate, and Actara only, applied once. Agrimek and Ecotrol were applied twice. The chemical standard of Lannate and Pounce were applied four times. The fruit from the chemical and IPM trials were harvested and assessed for insect damage. The chemical screening trial focused primarily on insect damage and the IPM trial included insect damage and a harvest yield component.

Worm pressure populations were moderate this field season. Pepper weevil numbers were high this season with the control sustaining 19% damage. Several treatments reduced pepper weevil damage significantly. Whitefly and leafminer pressure were low in the chemical and IPM trials. We did see some differences between the treatments for psyllid (*Bactericera cockerelli*) numbers. Peppers treated with Lannate plus Pounce and Intrepid plus Warrior had higher psyllid numbers at harvest. These insecticides either stimulated the psyllids to oviposit or negatively affected beneficial populations which help control the psyllids. The use of these types of materials, carbamates and pyrethrins, has been shown to actually increase populations of psyllids in the field in other locations. For a complete copy of the report contact the California Pepper Commission.

Additional behavior and developmental studies on potato psyllids are being conducted using different host plants simulating agricultural field conditions. We developed a binomial sampling plan for potato psyllids on bell pepper which was published. Studies were continued to research the repellency of essential oils against psyllids. Longevity, mobility, and resistance studies were done comparing imidacloprid and thiamethoxam.

Funds from UC ANR, the USDA Pesticide Management Alternatives Program, and USDA RAMP also supported our pepper research.

Fungicide Evaluations in 2012 for Pepper Powdery Mildew Control

Aziz Baameur, UCCE Santa Clara County, Steve Koiki, UCCE Monterey County, Brenna Aegerter, UCCE San Joaquin County

Powdery mildew (PM) infects the leaves of peppers, resulting in a whitish powdery cast and curling of leaves that eventually turn yellow and brown. The most significant impact of powdery mildew is leaf loss that reduces potential photosynthesis and exposes fruit to sun

scalding leading to lower marketable fruit production. The disease can occur wherever peppers are grown. California Central Coast pepper fields often experience severe cases. Though the disease is not severe every season in San Benito and Santa Clara counties, it is a persistent issue that continues to affect crops and forces growers to make several spray applications. Field reports indicate possible resistance or shift in the fungus tolerance to certain fungicides like Rally or Cabrio.

Two field trials were conducted to compare the efficacy of six fungicides (Quintec, Quadris Top, Kumulus DF (micronized sulfur), Rally, Taegro, Indar 2F) applied at the upper end of label rates and compared to an untreated control.

Evaluation of foliar disease was done after the final spray and four weeks before harvest. The severity rating was done on 3-foot sections of the bed. The visual rating scale ranged from 1 (no visible PM presence) to 6 (75-100% of the leaf surface affected by mildew). Where visual rating of leaves was not possible, we collected and counted fallen leaves. Based on the leaf evaluation, Quintec offered the best protection, with no visible PM on the majority of leaves in both the upper (99%) and lower (90%) canopy. In addition, both sulfur and Quadris Top provided good disease control.

With the exception of Quintec, all other treatments provided less control in lower foliage than in the upper canopy. This difference in control between upper and lower canopies appears to be related to poor penetration of the spray into the canopy and thus poor coverage of the lower leaves.

Sulfur, Quadris Top, and Quintec treated plots had the lowest number of leaf drop. All fungicides reduced leaf drop when compared to the non-treated control.

Sunburned fruit weight far exceeded marketable fruit weight for all treatments in both fields. Field 1 showed no statistical differences in yield among treatments. In field 2, sulfur and Rally treated plots had higher marketable yield.

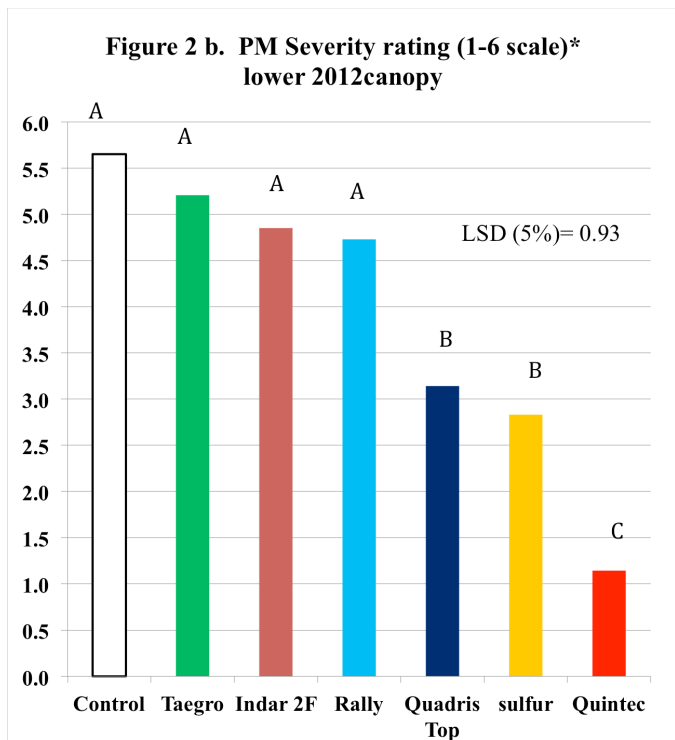
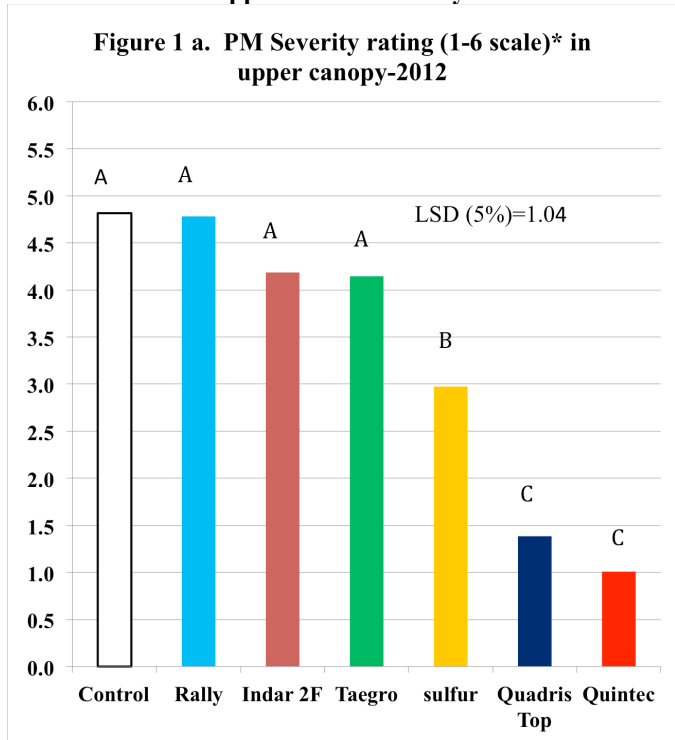
Conclusions

1. Quintec, Quadris Top, and sulfur provided excellent to good control of powdery mildew.
2. Rally, a commonly used fungicide to manage PM, provided poor control in this trial.
3. PM control is contingent on coverage and canopy penetration. For example, sulfur showed a dramatic contrast in providing excellent control of PM in the top canopy but worse control than the untreated plots in the lower canopy.

4. All treatments provided reduction in leaf drop when compared to untreated check. Sulfur, Quadris Top, and Quintec significantly reduced leaf drop as compared to the control.

5. Marketable yield in both fields were low because of the high sunburned fruit count.

Figure. Powdery Mildew Leaf Severity (1-6) of two Pepper Varieties in two Pepper Fields in Gilroy area 2012



*Severity of scale indicating percent of leaf covered with MP—1=0%; 2=1-10%; 3=11-25%; 4=26-50%; 5=51-75%; 6=76-100%; Bars with the same letter are not statistically

different from each other

Effect of Foliar Applied Potassium Nitrate on Yield and Quality of Capsicum spp.

Bill L. Weir, UCCE Merced County

It has been demonstrated in numerous field experiments that increased yields can be realized by foliar applications of potassium nitrate during fruit initiation and development. Both cotton and tomato benefit from timely foliar applications from first bloom until approximately two weeks later. This study evaluates the effects of foliar potassium nitrate applied to bell peppers (*Capsicum spp.*) at a rate of five pounds per acre at two week intervals from bloom to harvest.

Foliar applications were made at bloom, 2 weeks later, 4 weeks later and 6 weeks later. Another treatment received applications at all four times, and an untreated check received no potassium nitrate.

The test was conducted as a randomized complete block and replicated five times. Three harvests were made at ten day intervals. Total yields were highest in the treatment that received potassium nitrate every 2 weeks for eight weeks. The untreated check produced lowest yields.

Root-Knot Nematode Damage to Bell Pepper in Coachella Valley

Antoon Ploeg, UC Riverside, Jose Aguiar, UCCE Riverside County, Oli Bachi, UCCE Imperial County

Nematodes have not been reported as a major problem in bell pepper production in California. However, in the Coachella Valley in Riverside County, California, bell pepper growers are suspecting nematodes of causing widespread damage. However, research data on damage thresholds and tolerance limits for desert growing conditions are not available.

This research project assessed the damage potential of the nematodes to bell pepper in the Coachella Valley, characterized root-knot nematode populations occurring in bell pepper fields, and evaluated damage thresholds and tolerance limits of bell pepper for a locally occurring root-knot nematode population compared to the resistant varieties.

Under field conditions, nematode infested bell pepper plants appeared to show typical nematode damage and heavy chlorosis of leaves. Samples from the grower's fields confirmed presence of high nematode levels in soil and roots. Further analysis revealed that the problem was caused by *Meloidogyne incognita* (Southern root-knot nematode). In a greenhouse trial using nematodes isolated from a Coachella bell-pepper field, the nematodes did not significantly affect total fruit yield (g per plant) in the two

resistant cultivars ‘Carolina Wonder’ and ‘Charleston Belle’, while that of susceptible ‘Baron’ and ‘MiniBells’ (variety grown by Coachella valley growers) was severely affected. The yield from ‘MiniBells’ inoculated with nematodes were reduced by approximately 50% compared to the no-nematode control. Nematode reproduction and nematode-induced root symptoms were significantly lower on the two resistant cultivars.

Note: A project being conducted by Jim Prince of California State University, Fresno titled “Bio-control of Powdery Mildew” has been extended to the 2013-14 fiscal year at the researcher’s request.

**Complete research reports available
from the Commission office**

Farm Advisors

The following is a list of Farm Advisors by county, who are part of the University of California Pepper working group. Not all counties or farm advisors are listed. For more information go to www.sfp.ucdavis.edu.

Fresno County – 559/241-7529
550 E. Shaw Avenue, Suite 210 93710
Tom Turini, taturini@ucanr.edu

Imperial County – 760/352-9474
1050 East Holton Road, Holtville, 92250
Eric Natwick, etnatwick@ucanr.edu
Sam Wang, samwang@ucanr.edu

Kern County – 661/868-6222
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Joe Nunez, jnunez@ucanr.edu

Kings & Tulare County – 559/684-3320
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Michelle LeStrange, mlestrange@ucdavis.edu

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Aziz Baameur azbaameur@ucanr.edu

Ventura County – 805/645-1454
669 County Square Dr., #100, Ventura, 93003
Oleg Daugovish odaugovish@ucanr.edu

Yolo, Solano & Sacramento County – 530/666-8732
70 Cottonwood St., Woodland, 95695
Gene Miyao emmiyao@ucanr.edu

Listing of 2013-14 Approved Projects

Baameur – Developing IPM Tools for Thrips & TSWV	\$11,000
Baameur/Smith – Utilization of Nitrogen Uptake	11,500
Smith – Pre-emergence of Weed Control	5,000
John Trumble – Insect Management	22,000
Bill Weir – Effect of Nutrients on Yield and Quality	5,000
Bob Gilbertson – Monitoring Thrips/IPM Strategy	15,000

Total \$69,500

2012-13 Financial Report

The accompanying Financial Report shows that the Commission continues to be in excellent financial shape, due partly to exceeding the expected income from marketed peppers. The Commission budgeted on the basis of receiving income from the equivalent of 380,000 tons

of fresh peppers, which would bring in \$133,000 at the \$.35 per ton rate. However, the actual tonnage from the 2012 crop brought in \$139,181. While the surplus carry-over might seem large, the Commission has chosen to keep a substantial reserve to prevent the possibility of needing to fund a project without having the money available. During the 2013 annual meeting the Commission felt the current reserve allowed them to reduce the assessment rate to \$.30 per ton.

The Commission's books are audited annually by an independent Certified Public Accountancy firm, and any pepper industry member wanting a copy of said audit may apply to the Commission office.

California Pepper Commission

Financial Report

Fiscal Year: March 1, 2012 through February 29, 2013

<i>Account Name</i>	<i>Amount</i>
INCOME	
Carry-over from 2011-12	\$199,768
Assessment Income, 2012-13	139,181
Assessments Prior	43
Interest Income	<u>1,060</u>
Total Available Funds	\$340,052
EXPENDITURES	
Management Services	\$40,200
Audits	2,640
Office Supplies	1,003
Telephone	616
Postage	600
Reports & Publications	88
Travel & Mileage	2,207
Meetings	911
Insurance	735
Website	1,050
Marketing Branch, CDFA	11,225
Market Enforcement Branch	2,400
California Specialty Crops Council	7,500
Production Research	54,176
Chemical Research	<u>3,250</u>
Total Expenditures	\$128,601
Carry-over to 2012-13	<u>211,451</u>
Total Expenses & Reserve	\$340,052

Every three years the Commission is required to provide industry members the opportunity to participate in a nomination to represent their district as a member or alternate to the Commission. Prior to the annual 2013 Commission meeting nomination meetings were held throughout the state to set the current roster for the years 2013-16.

California Pepper Commission 2013-16

MEMBERS

ALTERNATES

Producer Representatives

Burt Silva King City	John Hook King City
Ryan Talley Arroyo Grande	William Terry Oxnard
Mike Chuck Gilroy	Dan Fiorio Gilroy
Bob Giampaoli Le Grand	Patrick Cerutti Newman
Richard W. Bradford La Quinta	Adrian Zendejas Coachella

Handler Representatives

Matthew Terra Escalon	Tim Chiala Morgan Hill
Daniel Brotslaw Turlock	Juan Lopez Hanford
Glen A. Fischer Ventura	Jerry Hensley Ventura
Tim Baloian Fresno	Edward Chell Camarillo
Bob Heisey Hollister	Terry Berke Woodland

Public Representative

Dave Nirenberg Camarillo	Peter Iverson King City
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Staff

Nathan Sano/Manager Dinuba	Kim Sakamoto/Ast. Mgr Dinuba
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