

Stephen J. Vasquez,
Viticulture Farm Advisor

Activator Spray Adjuvant Selection: Crop Spraying

Franz Niederholzer and Rhonda Smith

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Agricultural spray adjuvants are materials added to the spray tank when loading the sprayer. They include products classified as activator adjuvants and marketed as wetters/spreaders, stickers, humectants, and/or penetrators. Activator adjuvants are marketed to improve the performance of pesticides and foliar fertilizers.

Activator adjuvants can have a place in vineyard chemical appli-

cations, but matching the material to the job can be challenging. A bad match can lead to minor or major losses to the grower. Minor losses can result from excess spreading and pesticide runoff from the target plant. Phytotoxicity—foliar burning or defoliation—could be considered major damage.

This article describes ingredients and functions of activator spray adjuvants commonly

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Additional Web News



QR Codes, a New Extension Tool

A quick response (QR) code (Fig. 1) is a type of barcode. Unlike the familiar UPC codes found on many retail products, such as bottles of wine or boxes of raisins (Fig. 2), QR codes store data horizontally and vertically, which enables them to store a greater amount of information than UPC codes. Thus QR codes may be used to encode a wider variety of information, including contact cards, text, or hyperlinks. Moreover, QR codes can be printed or displayed on almost any surface or location, and are

quickly and easily decoded by smart phones or other devices equipped with a camera and one of a number of different code scanner applications, most of which are freely distributed.

Because of their special features, QR codes are used to help bridge print and electronic forms of communication. In fact, many organizations, especially retailers, are increasingly using QR codes in print media to share diverse content including online coupons, product surveys, and videos.

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Crop Spraying

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sprayed on tree and vine crops. Suggestions regarding activator adjuvant selection are offered. Growers should make their own activator adjuvant use decisions based on experience, particular needs, and risk tolerance.

Do I need to add an activator adjuvant?

Read and follow the specific instructions on the label. If the pesticide or foliar fertilizer label indicates the product should be used with certain types or brand of adjuvant(s), that's what you need to use.

Do I want to add an activator adjuvant?

If the label includes phrases such as "use of an adjuvant may improve results" or "complete coverage is needed for best results" then you might consider selecting and using an effective activator adjuvant based on your situation.

Before proceeding with use of an activator adjuvant, first evaluate your existing spray program. Are you already doing the best spray job you can? Good spray coverage begins with proper sprayer calibration and set up. Is your sprayer calibration dialed-in for different stages of canopy development? Optimum sprayer set up—gallons per acre, ground speed, fan output, and nozzle selection/arrangement—changes from dormant to bloom to early

growing season to preharvest sprays. Adjusting your sprayer to best match orchard and vineyard conditions at each general stage in canopy development is the foundation of an effective, efficient spray program. An activator adjuvant will not make up for excessive tractor speed, poor nozzle arrangement and/or worn nozzles. Your money is best spent first dialing-in your sprayer(s) for the whole season, before considering an extra material in the tank (that is not required on the label).

If you have your sprayer(s) calibrated for each vineyard (block) and stage of growth, now is the time to say "OK, I want to think about a little extra boost to my spray job".

Which activator adjuvant properties do I want?

First, know the properties of the pesticide you will use. Does it work on the plant surface or inside the plant? This is a key point in selecting adjuvants. Here is a quick review of the main classifications and characteristics of activator adjuvants as they currently appear in the field. **NOTE:** Certain products can provide more than one adjuvant property—that can be a benefit to the grower—when used in the field. For example, non-ionic surfactants can work as surfactants and penetrators, depending on use rate.

Wetters/spreaders: These materials contain surfactants that decrease the contact angle and in-

crease the spreading of the spray droplet on the target. High rates of wetters/spreaders may also increase penetration of pesticide into the target tissue (leaves or fruit), potentially causing phytotoxicity. Excessive spreading of pesticide spray solution and runoff from the target may result when using a new or higher rate of spreader—especially when using silicon "super-spreaders". Test new combinations of spreader material(s) and spray volume before regular use. Spray volume per acre or adjuvant use rate will probably have to be reduced if a labeled rate of adjuvant provides excessive spreading.

To check for excessive spreading, place a length of black plastic sheeting under several vines in a row. Secure the plastic with spikes, wire staples, and/or weights. Spray the new adjuvant and pesticide combination using your current sprayer set up. Reenter the field shortly after spraying, wearing appropriate PPE, and evaluate coverage. If material is pooling at the lower portion of leaves and/or fruit, excessive spreading is occurring. Check to see if pooling is occurring only in a certain area(s) of the canopy or throughout the canopy. If more spray solution is landing on the black plastic tarp under the trees/vines than between them,

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QR Codes

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Figure 1. Two types of barcodes; a QR code, on the left, and a UPC code on the right. If you scan the QR code shown, your device's browser will be directed to a website (<http://kimtag.com/viticulture>) with links to some mobile-friendly UC viticulture extension resources for growers in the San Joaquin Valley.

Providing useful, timely information is always our goal in extension, so we too our planning to make more use of QR codes at field days and meetings, beginning with Grape Day, 16 August 2011, 8 am to 12 noon, at the Kearney Agricultural Center. Bring your smart phone or similar mobile device and keep an eye out for QR codes.

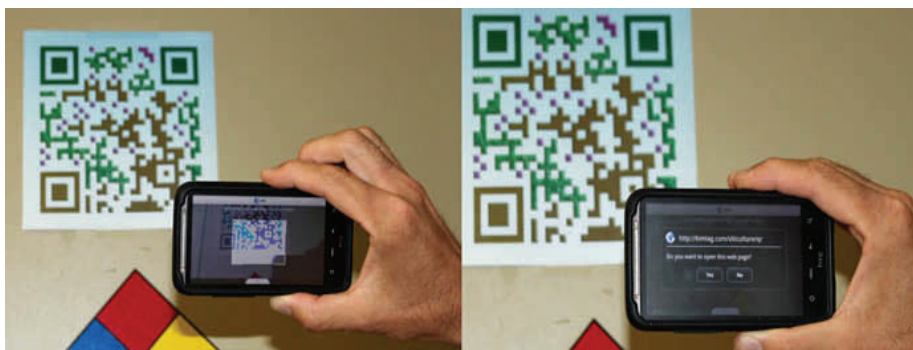


Figure 2. To scan a code, open the code scanning application on your smart phone and then use your phone's camera to scan the code (left). The code is immediately scanned, and the phone may then make use of the content; in this case the code directs the browser to a web site.

California Ag Summit Slated for January at UC Davis

Global food trends, energy and social media will be featured topics at the second annual California Ag Summit, to be held Jan. 27 at UC Davis.

John Hofmeister, retired president of Shell Oil Company, founder and chief executive of Citizens for Affordable Energy, and an expert on energy and climate, will be the keynote speaker for the event, with comedian Jack Gallagher as lunchtime speaker.

Topics

- Global Food Trends: From production to consumption. How does California agriculture match up?
- Energy and Agriculture: From oil to alternative energy. What is the future of energy production in the U.S. and the world, and how will it impact California agriculture?
- Social Media: From marketing to consumer education to crisis management. Its growing role and importance for agriculture.

More information about the summit is available online at: <http://calagsummit.org/>

Crop Spraying

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then runoff is occurring. [Some ground deposit should be expected from standard airblast sprayer use.].

Compare the results of your adjuvant test with a similar application of your current pesticide/adjuvant combination on another portion of the row. If there is no pooling or runoff with the new adjuvant in the tank, you can use the adjuvant with confidence. [NOTE: You might be using insufficient spray volume with your current program.] If the test with the new adjuvant showed pooling on leaves and/or runoff on the ground, you have several choices.

1) You can reduce spray volume per acre by replacing some or all nozzle with smaller nozzle sizes on the sprayer in an effort to reduce overspreading. If you saw overspreading on some portions of the canopy, but not others, reduce nozzle size only on the part of the spray boom that targets the over-sprayed part of the canopy. Recheck spray coverage if nozzle changes were made.

2) You can reduce the adjuvant rate and recheck coverage/spreading.

3) You can just go back to your established program without the new adjuvant.

What's the "best" course of action? That depends on your farming operation. Reducing spray volume per acre means more ground covered per full spray tank—a potential time and cost savings. If

spraying is done during the heat of the day in hot, dry climate, spray water evaporation is a major issue and it may be best to keep the higher spray volume and reduce the spreader rate or eliminate it entirely. Checking coverage and overspreading allows you to make the best decision possible; avoid damage and, hopefully, save money. All farming operations are different. Make the choice that best fits your farm.

Stickers can increase the retention time of the pesticide on the leaf and reduce rain wash off. These adjuvants may limit movement of systemic pesticides into the plant, and are probably most beneficial when used with protectant materials (cover sprays). Do you use overhead irrigation? Is there rain forecasted? If you answer yes to either one of these questions, you may benefit from using a sticker.

Humectants: Under low humidity conditions humectants can help reduce spray droplet evaporation before and after deposit on the plant. This is especially valuable when small droplets and/or materials that must be absorbed into the plant (systemic pesticides, PGRs, nutrients, etc.) are used in the summer under high temperature and low relative humidity conditions.

Penetrators: Frequently used with herbicides, these products include oils (petroleum, vegetable, or modified vegetable oils) and non-ionic surfactants used at

higher rates. In crop sprays, penetrators can be used to increase absorption of systemic pesticides (for example, oil with Agri-Mek). Penetrator adjuvants should be used with caution or avoided entirely when surface active pesticides—cover sprays, not systemic or translaminar materials—are used. Phyto may result. Finally, some penetrators can increase the rain-fastness of some pesticides.

Which adjuvant material should I select?

Use a product intended for crop spraying. Many activator adjuvants were developed and intended for use with herbicides. Products that are advertised for use with plant growth regulators should have a higher chance of crop safety compared with those that don't. This is still no guarantee of a phyto-free application.

Ask for help from your PCA or the adjuvant manufacturer's sales rep. How much do they know about the particular activator adjuvant in the spray mix you are planning? Can they show you the kind of information on a single product similar to what you can find at: <http://www.ast-us.com>? (This website is intended as an example, not an endorsement of the web pages it contains including specific adjuvants.)

Will the adjuvant I selected work in the spray I'm planning?

If you choose to use an adjuvant

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Herbicide-Resistant Weeds in Calif. Vineyards Survey

Brad Hanson

Purpose of the Survey:

The goal of this survey is to determine grower, applicator, and pest control advisor perceptions and experiences related to herbicide-resistant weeds in perennial **cropping systems**. This research is being conducted as a part of a larger project (Evolution and Management of Herbicide Resistant Weeds) which involves several UC Davis, UC Cooperative Extension, and Fresno State University faculty.

Methods:

We will conduct a survey of at least 1,000 weed managers who work in California orchards and vineyards. In late 2010 and early 2011 we used a series of in-person surveys at grower meetings. To expand upon that technique, we developed this web-based survey which has a similar format and will be open from June 2011 through February 2012. Participation is voluntary, all data will be collected anonymously, and no personally identifying information will be kept or shared.

The survey, which should only take a few minutes to complete, includes a series of simple questions to gauge:

1. Demographics (respondent farming system, approximate acreage, and region)
2. Weed control practices used
3. Experience and concerns with herbicide resistant weeds

Impact on Weed Management:

Once complete, the results of

the survey will be presented to scientific and extension audiences and will be used to help develop future research directions and extension education programs to benefit growers and pest managers. Compared to annual cropping systems in other parts of the country, there has been very little research on understanding the production impacts, economic consequences, or management changes imposed by herbicide resistant weeds in the unique perennial cropping systems in California.

Drawing for Weed and Crop Production Books

After the survey is completed in February 2012, we will draw the names of 15 participants to receive their choice of several UC Publications related to weeds, integrated pest management, or tree and vine crop production. These high quality publications are 150-250 pages and usually sell for \$20-80 each.

To participate in the drawing after completing the survey, you will have the option to go to another webpage where you can enter your name and contact information for the drawing as well as your preferred UC book. This information will not be directly associated with the survey responses to preserve anonymity.

Survey link:

<http://ucanr.org/hrwsurvey>

Brad Hanson is a UC Cooperative Extension Weed Specialist based at UC Davis.

Crop Spraying

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that is not specifically listed on the pesticide or foliar fertilizer label, jar test the planned spray solution first. Use the same spray water source. Include all leaf feeds, other adjuvants, and pesticide(s) that you plan to put in the spray tank. Do this before tank mixing these materials.

A lot of time and money rides on effective pesticide application. Do your homework before the spray tank is filled and you will be well on your way to solid results.

Franz Niederholzer and Rhonda Smith are UC Cooperative Extension Farm Advisor in Sutter/Yuba and Sonoma Counties, respectively.

San Joaquin Valley Grape Symposium

January 4, 2012

C.P.D.E.S. Hall
172 W. Jefferson Avenue
Easton, CA

7:30 a.m.— 1:00 p.m.

More information
to follow

GRAPE DAY 2011

2011 represents 60 years that University of California (UC) researchers have extended viticulture information to the grape industry. The first Grape Day was held in 1951 at UC Davis with H.B. Richardson, Extension Specialist, and A.J. Winkler, Chair, Department of Viticulture and Enology. In the 1960s, A. Kasimatis, Extension Specialist established several regional Grape Days at off campus facilities, including the first Grape Day at the Kearney Agricultural Center (KAC) in 1967, two years after the center was opened. Since 2005, Matthew Fidelibus, Extension Specialist and Stephen Vasquez, Viticulture Farm Advisor have organized Grape Day at the KAC. This year, Grape Day offers a program covering a variety of topics relevant to grape production. We hope you find this year's program to be interesting and enjoyable, and look forward to seeing you on August 16th.

University of California Kearney Research and Extension Center

Parlier, CA

August 16, 2011

7:30 am – 12:00 pm

\$10/person includes: refreshments, meeting and proceeding

Registration: 7:30 am-8:00 am

Program: 8:00 am-12:00 pm

Field tours: 8:00-9:30 am

New wine grape varieties for the San Joaquin Valley, James Wolpert, UC Davis

The development of new grape rootstocks for the San Joaquin Valley, Peter Cousins, USDA-ARS

Using the 'Paso Panel' to aid in irrigation scheduling, Mark Battany, UCCE, San Luis Obispo County

BREAK (9:30 am till 10:00 am)

Classroom presentations: 10:00 am-12:00 pm

Understanding water use of grapevines, Andrew McElrone, USDA-ARS, Davis CA

Trapping and baiting for gopher control in vineyards, Roger Baldwin, UC IPM Advisor, Parlier, CA

Critical weed free periods in vineyard development, Kurt Hembree, UCCE, Fresno County

Fruitfulness of DOV raisin cultivars, Matthew Fidelibus, UC Davis and UC Kearney Ag Center

ONLINE REGISTRATION: <http://ucanr.org/grape-day>

Contact: Matthew Fidelibus at (559) 646-6500

CALENDAR OF EVENTS

Local Meetings and Events

Kearney Grape Day

August 16, 2011
 7:30 a.m. — 12:00 p.m.
 Kearney Agricultural Center
 9240 S. Riverbend Avenue
 Parlier, CA 93648
 Contact: Matthew Fidelibus
 (559) 646-6500
 Cost: \$10/person

U.C. Davis University Extension Meetings (800) 752-0881

Advanced Tasting Seminar

August 6, 2011
 9:00 a.m. — 4:00 p.m.
 1632 Da Vinci Ct.
 Davis, CA
 Section: 111VIT216

Winery Accounting and Finance for Executives

August 12, 2011
 8:30 a.m. — 4:30 p.m.
 Wine Business Center
 899 Adams St. Saint Helena, CA
 Section: 111VIT214

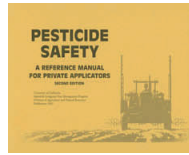
Rootstock Workshop: Identification and Use

August 15, 2011
 8:30 a.m. — 4:00 p.m.
 UC Davis Plum Room, DANR Building
 1 Hopkins Road
 Section: 111VIT219

Successful Home Winemaking

September 10, 2011
 8:30 a.m. — 3:30 p.m.
 1632 Da Vinci Ct., Da Vinci Building
 Davis, CA
 Section: 111VIT212

Publications from the University of California



Pesticide Safety: A Reference Manual for Private Applicators
 ANR Publication 3383
 Price - \$7.00 + tax and shipping

Updated in 2006, this manual covers information essential for anyone using pesticides on California farms, including growers, managers and employees. The manual covers pesticide labels, worker safety (handlers and fieldworkers), how to mix and apply pesticides, calibration, the hazards of pesticide use including heat related illness, and pesticide emergencies.



Agricultural Salinity and Drainage
 ANR Publication 3375
 Price - \$25.00 + tax and shipping

A user-friendly resource for agricultural consultants and advisors, as well as for local, state and federal agricultural and water agency management staff. Includes thirty-eight chapters covering a broad spectrum of salinity and drainage topics. Illustrated with 27 tables and 44 figures.

Order Form

Publication	Qty.	Price	Subtotal
Pesticide Safety		\$ 7.00	
Ag Salinity and Drainage		\$ 25.00	

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\$1—29.99	\$6	Shipping Based on Merchandise Total:	
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\$50—79.99	\$10		
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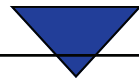


Vine Lines

Produced by UC Cooperative Extension Farm Advisor Stephen J. Vasquez. Contact me for further article information, or to be added to the mailing list.

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