



The Grape Communicator

A Newsletter for the Illinois Grape & Wine Industry

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Notes on Multicolored Asian Lady Beetle

*Rick Weinzierl, Entomologist,
University of Illinois*



Multicolored Asian lady beetle in grapes (E.C. Burkness, University of Minnesota).

In preparation for the late August and September time period during which multicolored Asian lady beetle (MALB), *Harmonia axyridis*, congregates on grapes and poses a threat as a contaminant in clusters at harvest, now is a good time to review recent findings that may help in understanding and managing this pest. Dr. Bill Hutchison and the graduate students and research associates in his program in the

Notes on Multicolored Asian Lady Beetle (cont. from page 1)

Department of Entomology at the University of Minnesota have conducted research on this insect over the past few years, and their results include several useful findings.

Before summarizing results of the research done in recent years in Minnesota, a quick overview of the biology and pest status of the MALB may be useful. This insect, native to Asia as its common name implies, is a predator of aphids, and as such, it was a candidate for importation to the U.S. to control aphid pests that had been introduced accidentally on imported plant materials. Efforts to release the MALB and establish populations in North America for biological control of aphids date back to 1916. The first detection of an established population in North America dates back to the late 1980s, and since then the species has spread rapidly across the continent. It is one of approximately 475 species of lady beetles in North America north of Mexico. Larvae and adults feed on aphids, and fall population densities in at least some portions of Illinois seem to be related to summer densities of the soybean aphid; when soybean aphid infestations are heavy in mid summer, they provide abundant food for the MALB, and consequently MALB populations increase. Adults are the overwintering stage, and two behaviors common among the adult beetles cause them to be viewed as

pests: (1) they aggregate and feed on certain fruits, including grapes, raspberries, and apples, and (2) they invade homes in large numbers in search of overwintering sites. Their direct feeding damage to grapes is usually not cause for concern, as they infest clusters already damaged by fungal diseases or other insects. Instead, they pose a problem to wine makers when they remain in fruit clusters at harvest and are crushed with the berries; alkaloids in their body fluids taint the wine, giving it an “off” flavor and smell. For more details on the background information presented here, see the paper referenced below by Koch (2003) (available at http://insectscience.org/3.32/Koch_JIS_3_32_2003.pdf).

Grape growers in Illinois annually face questions about whether or not MALB populations in a given vineyard warrant control and what to do or what to spray to try to achieve control. Researchers in Minnesota have reported the following findings and recommendations:

- MALB infestations are highly correlated with previous damage – splitting, fungal disease, or grape berry moth feeding damage. Preventing these problems reduces the attractiveness and suitability of grape clusters to MALB.
- Early detection of movement of populations into vineyards can be accomplished by using 6-inch by 6-inch square yellow

Notes on Multicolored Asian Lady Beetle

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stick traps, beginning about 4 weeks before harvest is anticipated. A new University of Minnesota fact sheet recommends using 2 to 6 cards per acre, and I would add that placing at least some the cards near the edges of vineyards is a good idea. Sticky cards catch beetles before visual inspection of clusters provides evidence of their presence. Yellow sticky cards are available from Great Lakes IPM, Vestaburg, MI (<http://www.greatlakesipm.com/>), or from Olsen Products, Medina, OH (<http://www.olsonproducts.com/index2.html>).

- To determine the need for insecticide application, examining 25-30 clusters per block or variety is recommended. Early assessments of research data from Minnesota suggest that control clearly is warranted if 2 to 5 percent of the clusters are infested with 1 or more beetles per cluster.
- Insecticides that provide some degree of effective control of MALB include Danitol, Sevin, Baythroid, Malathion, and Provado. Danitol, a pyrethroid, may be used until 21 days before harvest, but not later, so its role is limited to early reductions in beetle

numbers. Sevin may be used until 7 days before harvest, and Minnesota researchers have found it to be effective as well. Baythroid, also a pyrethroid, recently was labeled for use in grapes with a 3-day preharvest interval (PHI), and although data on its performance are sparse so far, related data suggest that it will work very well. Baythroid is a Restricted-Use pesticide; a Pesticide Applicator's license is required for its purchase and use. Malathion also has a 3-day PHI in grapes, but it provides less residual effectiveness. Provado may be used on grapes up to the day of harvest (but with a 12-hour re-entry interval for pickers); it "knocks down" MALB, resulting in the beetles dropping from the clusters. Many may recover and not die, but it effectively reduces contamination of clusters at harvest. None of these insecticides is labeled specifically for control of multicolored Asian lady beetle, but their labels for use on grapes allow application against this insect in Illinois (though not in all states). For growers who do not possess a Pesticide Applicator's license, using Sevin at 7 days before harvest and Provado 1 day before harvest is a good management plan. For

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growers who are licensed to apply Restricted-Use pesticides, applying Baythroid 3 days before harvest should be effective.

Much of the information for this article was provided by Dr. Bill Hutchison and his students and research associates in the Department of Entomology at the University of Minnesota.

References:

Galvan, T.L., E.C. Burkness, and W.D. Hutchison. 2006. *Wine grapes in the Midwest: Reducing the risk of the multicolored Asian lady beetle. Integrated Pest Management Fact Sheet, Publ. 08232, University of Minnesota, St. Paul. 2pp. (In press, further information on access to this fact sheet will be provided in a future issue of this newsletter.)*

Galvan, T.C., E.C. Burkness, and W.D. Hutchison. 2006. *Influence of berry injury on infestations of the multicolored Asian lady beetle in wine grapes. Plant Health Progress, Plant Management Network: <http://plantmanagementnetwork.org/sub/php/brief/2006/wine/AsianLadyBeetle.pdf>.*

Koch, R.L. 2003. *The multicolored Asian lady beetle, Harmonia axyridis: A review of its biology, uses in biological control, and non-target impacts. Journal of Insect Science* 3:32. 16 pp.

Koch, R.L., E.C. Burkness, S.J. Wold-Burkness, and W.D. Hutchison. 2004. *Phytophagous preferences of the multicolored Asian lady beetle (Coleoptera: Coccinellidae) for autumn-ripening fruit. Journal of Economic Entomology* 97: 539-544.



Issues with Glyphosate

Elizabeth Wahle, UI Extension Specialist, Fruits and Vegetables

I have received several comments recently that glyphosate just isn't controlling weeds as expected, which leads to the following discussion about some potential problems when using glyphosate. First, not all glyphosate formulations are created equal. Take a look at your glyphosate label, whether it is generic or Roundup, and you will notice the active ingredient is listed in two forms—as the active ingredient glyphosate in its salt form and also as the acid equivalent of glyphosate. The active ingredient is the component of a pesticide formulation responsible for a pesticide's ability to control the target pest. Sometimes, however, the numbers preceding the formulation designation (EC, DF, WP etc.) do not indicate pounds active ingredient per gallon or pound, but rather the acid

Issues with Glyphosate

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equivalent per gallon or pound. Acid equivalent is defined as that portion of a formulation that can be converted back to the corresponding parent acid. The distinction between the two formulation names is important when dealing with many formulations of glyphosate. The parent acid of glyphosate can be formulated as different salts. For example, Roundup Original is formulated as an isopropylamine salt (41%) and Roundup Original Max is formulated as a potassium salt (48.7%). In comparing the two, Roundup Original has a 3 pound acid equivalent and Roundup Original Max has a 4.5 pound acid equivalent. This means that a higher rate of Roundup Original would have to be applied compared to Roundup Original Max to get the same weed control because it has a lower acid equivalent formulation. Many growers are now using generic glyphosate, which is usually a 3 pound acid equivalent. If you were using a higher acid equivalent before and did not make an adjustment to your rate after switching to generic glyphosate, you could be experiencing weed control failure.

Another consideration is whether you have hard water. Labels of various glyphosate formulations state that ammonium sulfate may be added to increase the herbicide's performance under stressful conditions. One of these situations is when hard water is used as the spray carrier. Hard water is the description of water with

high concentrations of minerals like calcium, magnesium, sodium, and iron. These minerals have a positive charge and are called "salts". High concentrations of these salts can antagonize or interfere with the activity of glyphosate. The positive charge of these salts is attracted to the negative charge of the glyphosate molecule and results in glyphosate-salt complexes. Unfortunately, some glyphosate-salt complexes are not absorbed as easily into leaves as others. A glyphosate-calcium complex may be less readily absorbed than a glyphosate-ammonium or glyphosate-isopropylamine complex. Adding ammonium sulfate to spray water increases the ammonium salt concentration to out compete the unfavorable glyphosate-salt complexes. Have your water tested for hardness. Anything over 3.5 grain (60 ppm) is considered moderately hard, and could be causing a weed control failure when applying glyphosate.

Also, the time of application and the concentration of glyphosate in the tank are critical. Use the least amount of water while still maintaining good coverage. This is a systemic product, and your goal is to get a lethal dose into the weed, not into the surrounding area. Using too much water only reduces your concentration and can lead to runoff. Time of day can be important as well. Avoid spraying glyphosate in the evening. It is believed that a plant is less likely to absorb a lethal dose of glyphosate during the

Issues with Glyphosate

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evening hours after it has switched from daytime photosynthetic processes to evening respiration processes.

And finally, there is a definite possibility that after 25+ years of using the active ingredient glyphosate for weed control, that certain plant species have developed a higher tolerance to glyphosate. For this reason the maximum labeled concentration should be used in order to achieve a lethal dose the first time around.



HARDY SEEDLESS TABLE GRAPES FOR ILLINOIS

Bill Shoemaker, University of Illinois

While the Illinois grape industry is largely dedicated to the production of wine grapes, the potential of a market for seedless table grapes seems quite real. The grapes currently shipped into markets come from the West Coast, Chile and South America. While these grapes do well, they are not as fresh as locally grown grapes and are rarely as sweet as grapes grown to full maturation locally.

Another consideration is the distinctive flavors of the hardy seedless grape varieties suited for production in Illinois. Largely derived from the species *Vitis labrusca*, these varieties have the flavors associated with this species found in varieties such as Concord, Delaware and Catawba. These are the flavors Americans grow up with. These hardy varieties of seedless table grapes have these flavors, distinguishing them from the vinifera seedless table grapes consumers typically encounter in the markets.

Last season I sent fruit from one of the varieties in our trial to a local market to gauge consumer reaction. 50 lb of 'Vanessa' grapes were delivered to Duck Soup Coop in DeKalb, IL. They sold the fruit in exchange for comments on quality from the customers who purchased them. Almost 20 customers offered written comments. All were positive, with positive comments on sweetness, texture and juiciness. Most acknowledged the flavors reminiscent of Concord but were pleased by them. Only one offered a negative comment, referring to the slipskin character of the grape.

These positive responses lead me to believe that seedless table grapes for the fresh market are an opportunity for Illinois growers. My discussions with the few growers who are marketing seedless table grapes in Illinois reinforce that belief. They find that direct-marketing the grapes from their vineyard quickly builds a loyal clientele.

HARDY SEEDLESS TABLE GRAPES FOR ILLINOIS

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We have had several seedless table grapes in trial the St Charles Horticulture Research Center in St Charles, IL since 1998. In general, they have been easy to grow and productive. These varieties include 4 reds, Reliance, Canadice, Einset and Vanessa, one white, Marquis and one blue, Glenora. Other varieties have been successfully trialed in more southern locations in Illinois. Some of the Arkansas seedless table grapes, such as Mars, Neptune and Venus, have shown great promise for horticultural and culinary quality in those trials.



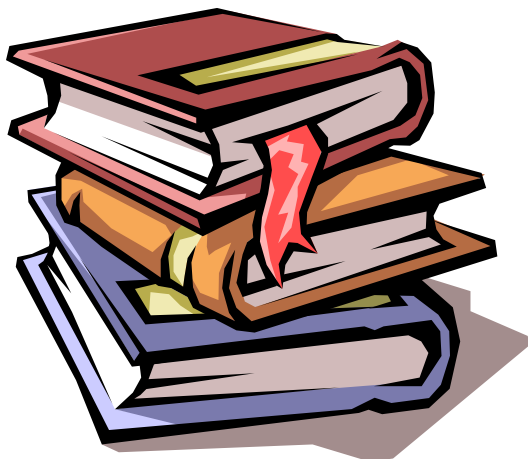
Glenora

The foremost problem growing them has been hardiness. During the life of our trial, the early years tended toward cold winters, while latter years had mild winters. During those

early years the varieties Reliance, Canadice and Einset seemed to avoid cold injury. Marquis and Vanessa suffered variable injury but tended to endure and became productive. Glenora on the other hand suffered injury routinely, and only became productive in the last season. It still has not cropped heavily.

Challenges facing anyone who decides to produce these grapes commercially will be similar to wine grape production. However, maximizing productivity and quality will require different horticultural practices. Growers will want to push irrigation and fertility. Cane pruning may be more effective for some of these varieties. Pest challenges will be similar to wine grapes. Marketing will be the most unique challenge as bulk sales will be less likely than personal sales. However, they could be a new venue for reaching consumers who are unfamiliar with Illinois wines.

The emergence of hardy wine grapes for wine production in Illinois has led to the development of a successful new industry. Seedless table grapes are leading products in produce markets. Perhaps seedless table grapes will open a new dimension for Illinois young grape industry.



*A NEW & VALUABLE BOOK
FOR THE WINERY*

WINE ANALYSIS & PRODUCTION 2007

*Barry H. Gump, Ph.D.
Department of Viticulture & Enology
California State University, Fresno*

My colleagues, Bruce Zoecklein (Virginia Tech) and Ken Fugelsang (CSU, Fresno) and I are working on a revision of our textbook, Wine Analysis & Production. In revising the book our focus, again, has been on providing practical information to winemakers. To accomplish this we have added some new chapters, revised and repackaged existing material, added some new methods, updated existing ones, and developed spreadsheets to facilitate the calculation of results from using these methods.

You can help us in this effort by telling us what you wish to see covered, and methods you would like to have included. You can send your

comments/requests to me at barryg@csufresno.edu

The following is an abbreviated version of our working outline. Chapters with "a" or "b" parts will ultimately have separate numbers.

Chapter 1. The Winery Laboratory

In-house vs. commercial testing: economics/ability (skills and equipment), domestic vs. export, and basic lab design. Requirements for the winery laboratory (Equipment /Supplies, Glassware, and Chemicals. Quality management (the QC program), and waste management (what is hazardous waste -- chemical and biological, and physical), its collection and disposal (time limits for holding, volume limits, etc)

Chapter 1b. HACCP- LIKE Plans

What is a HACCP- like plan? What are critical control points in processing and what analyses do you need to run here?

Chapter 2. Reporting and Reliability of Lab Results

Ways to express results (Wt/v, v/v, equivalent weight and N, molarity, mg/L, mg/mL, g/L). Calibration and standard curve generation. Standard curves, dilutions, standard additions, and internal standards.

Basic statistical evaluation of data (mean, standard deviation,

WINE ANALYSIS & PRODUCTION 2007 (cont. from page 8)

confidence Limits, control charts, coefficient of variation). Along with these is record keeping.

Chapter 3. Experimental Design in the Vineyard and Winery

Establishing goals, controls, replications, randomization, analysis of variance, t-tests, F-tests, (viticulture and enology examples).

Chapter 4. Instrumentation Basics

UV and VIS spectrometry, pH and electrochemical methods, dissolved oxygen meters, capillary GC and use of wide-bore capillaries on existing instruments, SPME, conductivity meters, nephelometer, mass spectrometry, near IR, segmented and non-segmented flow injection analysis, bioluminescence methods, black box multi-parameter auto analyzer, ELISA.

Chapter 5. The Sensory Impact of Chemical Components (functional groupings) of Grapes/wines.

Grape components and metabolites, sur lie, micro-ox – structural balance, thermal vinification, processing-derived compounds (fermentation and other than fermentation), impacts of yeast and bacteria in producing these compounds (alcohol, phenols, change in acid compounds, aroma/flavor

compounds) and their changes over time.

Chapter 6. Sensory Analysis; Your Most Valuable Analytical Tool—The Mechanics of Running a Sensory Analysis

The Importance of a winery sensory program and the basic requirements for a sensory facility, panel selection, size, screening and training, performance evaluation. Sensory evaluation methods, discrimination (difference) tests (Triangle test, Pair comparison, Duo-trio), descriptive tests (Quantitative descriptive analysis, Principal component analysis, Free-choice profiling), texture sensory analysis, Suppleness index (Palate Balance Equation), consumer panels (number of panels needed – time factor – when you taste the wine), and the preparation of sensory anchors for training panelists.

Define thresholds and what this means, and perception recognition. Provide and discuss the tannin descriptor wheel and the sparkling wine descriptor wheel

Chapter 7. Viticultural and Environmental Factors Contributing to Aroma, Flavor, Color, Structure and Texture

Application of spray material, deficit irrigation, crop load, micro-climate, clones, canopy management, soil-water management, and heat and light vs. some chemical groups.

**WINE ANALYSIS & PRODUCTION
2007** (cont. from page 9)**Chapter 8. Grape Maturity
Assessment**

Asymmetric ripening, shriveling, weight reduction, hang time, seed, skin, pulp maturity, color, stem maturity, terroir and sampling (cluster vs. berry, targeted vines in vineyard, sugar per berry), skin color measurement, aroma assessment, estimating grape yield, estimating must yield, and Brix/alcohol conversion.

**Chapter 9. Managing PH and
Acidity – do re-write of current
chapter.****Chapter 10. Management of
Alcoholic Fermentation**

Yeast metabolism, carbohydrates utilization, reducing and non-reducing sugars, esters, fusel alcohols, fatty acids, glycerol, other sugar-derived alcohols, polysaccharides.

**Chapter 11. Managing the
Nutritional Status of Juice and
Wine**

Overview of topic, nutrient dessert, nitrogen supplementation, protracted/stuck fermentations, ethyl carbamate regulatory limits, and ATA.

**Chapter 12. Phenolics and Color
Management – (sur lie – microOx)****Chapter 13. Barrels, Adjuncts and
Alternatives**

Flavor/odor active compounds derived from wood, flavor development and controlled oxidation, utilization of wood cooperage – fill frequency, Brett, bungs, size, seasoning, sampling, oak type, coopers, sanitation, TCA, tannin, wood source, tannin additions, utilization of alternatives and adjuncts – cubes, inserts, extracts.

**Chapter 14. The Use of Enzymes
in Production**

Flavor enhancing, color enhancing, pectanases, macerating enzymes, glucanases, ureases, glucosidases, lysozymes, and monitoring sensory impacts.

**Chapter 15. Sulfur Dioxide and
Other Preservatives and Sterilants
in Wine**

Preservative vs. sterilant, and DMDC, sorbic acid, and Lysozyme.

Chapter 16. REDOX

Redox – its importance in juice and wine, enzymatic oxidation, chemical oxidation, coupled oxidation, acetaldehyde bridging in Micro-oxidation, chemical antioxidants, phenols, ascorbic acid, ATA, and sur lie.

**WINE ANALYSIS & PRODUCTION
2007** (cont. from page 10)**Chapter 16b. Use of Gases in the Winery -- Processing Considerations**

The use of gases: Nitrogen for getting O₂ out of wine, carbon dioxide. Argon, and mixed gases. Discuss sensory aspects of gasses and bottling line use of gases. Refer to safety chapter regarding use/presence of CO₂, describe simple meters and measuring devices. Mention OSHA requirements.

Chapter 17a. Sulfides

Reduced sulfur compounds, and remediation (copper/polymer sheets).

Chapter 17b. Other Defect Aromas and Flavors and Remediation

VA, ethyl acetate, acetaldehyde, volatile phenols, nitrogen compounds – non-fermentation derived, TCA, and other aroma/flavor compounds. Quick reference to odor compounds such as methoxy pyrazines. ATA, and process for VA removal and remediation.

Chapter 18. Microbiological Considerations in Production

Grape and wine bacteria, yeast and mold, management of native and inoculated yeast strains, management of native and inoculated lactic acid bacteria.

Selected yeast (un-inoculated yeasts) and bacteria of importance to winemakers, such as Brett, Zygos, Lactobacillus kunkeii, microbes in the air, microbial toxins, mixed culture fermentations, and some of the new yeast strains available.

Chapter 19. Physical Instabilities

Protein and Bitartrate/tartrate stability, oxidative deterioration and color including pinking.

Microbiological polysaccharides, yeast cell walls and stability, phenolics/ color precipitation, metals, electrical dialysis, and Fluoride.

Chapter 20. Fining and Fining Agents

Clays, alginates, carbon, proteinaceous agents, gelatin, gums, chitin, yeast fining, casein, Isinglass, albumen, Gum Arabic, synthetic and proprietary formulations, PVPP, tannins – eno tannins, wheat gluten, resins, and Lysozyme.

Chapter 21. Cellar Operations

Safety and confined space entry, oxygen meters and their use, safety in the cellar and CO₂ monitoring (caves).

Tank sample location, timing of sampling, mixing, calibration of tanks (TTB requirements), the concentration of SO₂ needed for sanitation purposes, the use of displacement gases, blending calculations, and some reference

**WINE ANALYSIS & PRODUCTION
2007** (cont. from page 11)

back to stability monitoring. Cross flow filtration vs. sterile filtration, define micro, ultra filtration, and RO. The need for temperature control, and ethanol emissions.

Pre-coating, body feeding, and have a section on calculations (blending, fortification, sugar addition, acidulation, copper, SO₂, etc.). Water utilization, water requirements, waste and what to do with it (waste water management under sanitation).

Chapter 22. Sanitation

Sanitation by conventional methods, ozonation, environmental TCA, and monitoring of sanitation effectiveness. Also discuss peroxy acids, H₂O₂, heat, SO₂, UV, no Chlorine, and per-acetic acid.

Chapter 22b. Safety Covers general safety concerns in winery operations.

Chapter 23. Packaging Quality Control

Discuss closures, bottle QC, alternative closure technology, cork QC, odor and flavor-active metabolites including flavor scalping, glass, labels and glues, capsules, transport/warehousing and temperature/humidity concerns.

Chapter 24. International Wine Regulations and Authentication – provide a summary of these

Chapter 25. Diagnostic, Monitoring, and Rapid Methods

Provided an updated section of rapid, diagnostic methods.

Chapter 26. Laboratory Procedures

Update existing methods and add new ones. Create spreadsheets for simple calculation of results.

**From the Editor:**

If there is a topic you would like to see covered in this newsletter, please submit your suggestions to us.

We are always looking for new material and items of interest so please take the time to send in your suggestions.

Send suggestions to the editor at:
cimmarru@uiuc.edu

UPCOMING WORKSHOPS & EVENTS

Central Region:

- **Grape Harvest Workshop at Bay Creek Vineyard**
Saturday, August 12, 2006
9:00 am

There are three factors, sugar, acid, and pH, which can be tracked weekly after *véraison* that will reach optimum levels when the grapes are ready to harvest for winemaking. Accurately and quickly measuring these three factors is a skill needed by both grape growers and winemakers alike, in order to produce top quality wines. This workshop, sponsored by the Illinois Department of Agriculture, the Illinois Grape Growers and Vintners Association, and University of Illinois Extension, is designed to give participants hands on experience working with special equipment used in measuring and determining grape ripeness. In addition to vineyard sampling of differing grape varieties, winemakers are also invited to bring wine samples for testing as well.

Workshop participants will meet at Bay Creek Vineyard, located three miles south of I-72 (Exit 31) on County Hwy 3 at 9:00am. Bay Creek Vineyard is located on the west side of the road at 26909 County Hwy 3, Pittsfield, IL 62363. Don't forget to dress for the weather, since most of the workshop time will be spent in

the vineyard. This is a hands on workshop, and participants are encouraged to bring their personal gear, including gloves and work boots.

Grape publications will also be available for sale at the workshop, including the 2006 Small Fruit & Grape Spray Guide for \$9.00 and The Midwest Grape Production Guide for \$15.00.

For further information and in order to plan space for the meeting, please contact Elizabeth Wahle at (618) 692-9434 or by email at wahle@uiuc.edu

Northern Region

- **VITICULTURE DAY AT ST CHARLES CANCELED**

Recent developments have led Bill Shoemaker, grape researcher at the St Charles Horticulture Research Center, to cancel the viticulture field day planned for August 19. Serious health issues in his family and no real alternatives for management of the field day have led him to make this decision. He offers his apologies to the grape grower community and pledges to rebound with an event in 2007. This will not affect other viticulture field days in Illinois, including the WIGPAC event on the same date, August 19.

This newsletter welcomes new contributors. If you would like to make a newsletter contribution, please contact Denise Cimmarrusti at cimmarru@uiuc.edu or Bill Shoemaker at wshoemak@inil.com .

If you do not have access to an electronic copy of this newsletter and would like to receive one, please send your name and address to the address below.



The Grape Communicator is an electronic newsletter, free of charge, for those interested in the Illinois Grape and Wine Industry.

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*We hope you have enjoyed reading this edition
As always, we welcome your feedback*