

Texas Gulf Coast Vineyard Update October 2008

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Quiet after the storm

The past 6 weeks have been quiet in the extension office, since the passing of Hurricane Ike. With the exception of a few isolated incidences, both vineyards and wineries in the Texas Gulf Coast Region managed to evade major losses. For those who experienced damage in the vineyard, please keep in mind that Texas AgriLife Extension is available to help answer any of your questions regarding retraining, replanting, and general risk management for your vineyard operation.

Being as quiet as it has been, I have chosen to use this opportunity to present some of the results from preliminary research in your vineyards in 2008, including a study on canopy division of 'Favorite' winegrapes and a demonstration of nutrient mobility in Black Spanish grapes. There are also many extension updates and upcoming educational events to mark in the calendar.

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Preliminary investigation of vertical canopy division of 'Favorite' winegrapes

Canopy division is not a new concept to grape growers in the Texas Gulf Coast. Several growers are already using horizontally divided training systems, such as Geneva Double Curtain (GDC) or what I refer to as the "quasi-divided" training systems, such as the High Munson.

I have observed these systems working nicely with both Black Spanish and Blanc Du Bois winegrapes and have noted the increased yield over the standard, non-divided systems, such as Vertical Shoot Positioning (VSP).

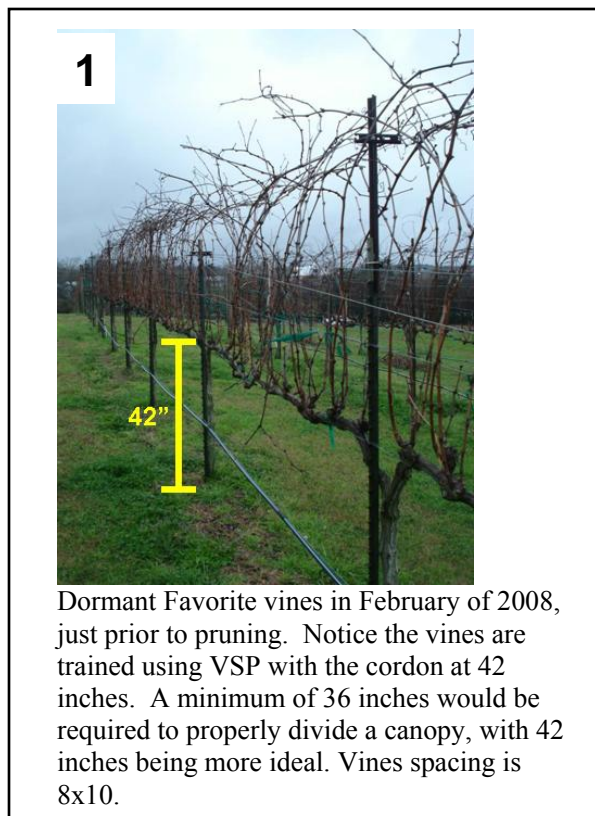
Currently, VSP is the primary training system used by Gulf Coast growers. The purpose of the preliminary study in 2008 was to evaluate the conversion of a VSP training system to a vertically divided system. According to the vineyard manager, vines in the test vineyard have historically

shown “high vigor” and it was presumed that the vines had the capacity to produce more fruit than the current VSP training system, which limits shoot density to 5 buds per linear foot of trellis.

Pruning data from 2008 showed that just half of the vertically divided vines in this study had above average cane vigor (> 40 grams), thus only half of the vines warranted canopy division. Pruning weights of the test vines will be measured this coming winter to determine the capacity of the vines to hang the extra crop produced by canopy division. All data will then be statistically analyzed. The methods and some preliminary results of this study are discussed below.

What is a Preliminary Study?

Preliminary studies or investigations, otherwise known as *pilot studies*, are a common practice in research. In general, a preliminary study is a small scale version of a normal research project that is intended to test the feasibility of a larger study, before large resources are devoted to that effort. It is designed to allow visual observations as well as some small scale data collection. The preliminary observation and data can then be used to determine if a full scale research project is warranted.



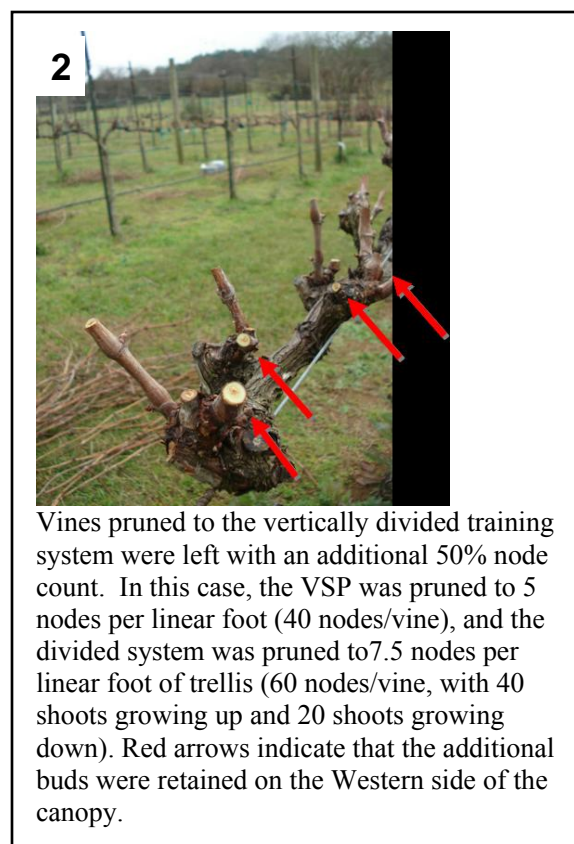
As a rule, it is not deemed as appropriate to make extension recommendations based on the results of a preliminary trial. Therefore, information from this preliminary study is presented for your information only, and no recommendations for canopy division will be prescribed until this data can be validated by a full scale research trial.

Naming a training system

Many grapevine training systems exist worldwide, as do the many names for them. There are also slight variants of those systems, which often take on another name. The training system used in this study is a combination of Smart Dyson Ballerina and Western Sprawl. I herein refer to this system generically as a vertically divided training system, with division only on the Western side of the canopy.

The division

The following photographs and captions illustrate the methods of canopy division from VSP to the vertically divided training system used in this study. A total of 18 vines in a commercial Gulf Coast vineyard were converted to the vertically divided system.

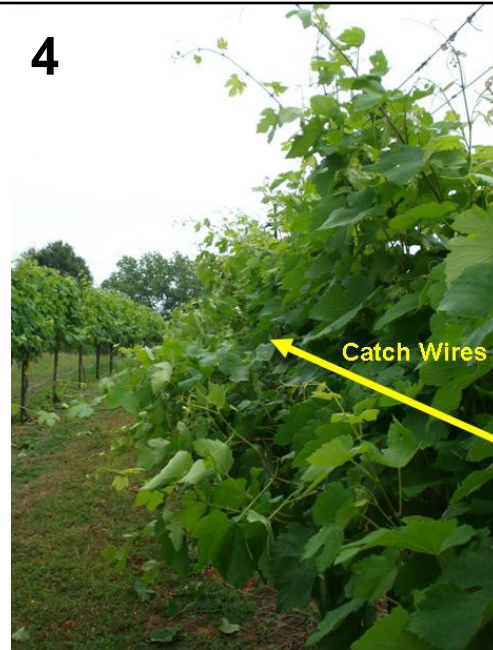


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In the Spring of 2008, shoots were thinned to ensure that the actual shoot number was 40 per vine on the VSP system and 60 per vine on the vertically divided system.

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The shoots emerging from the additional nodes on the vertically divided system were ‘brushed’ out into the isle at the same time that the vertically growing shoots were ‘tucked’ into the upward portion of the canopy. The division is not clear at this growth stage.

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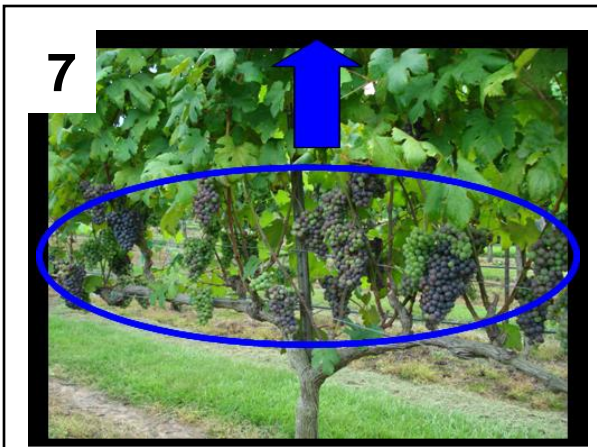


Later in the season, the shoots on the lower portion of the canopy begin to fall downward with their own weight. The control vines on the VSP system can be seen in two vines in the foreground. It is at this time that the downward shoots were ‘combed’ downward. Combing involves the untangling of the downward shoots to avoid shoot-to-shoot overlap, while giving a slight tug to aid downward growth. The last non-systemic contact herbicide (e.g. Rely) was applied just prior to combing, to reduce chemical burning of downward shoots.

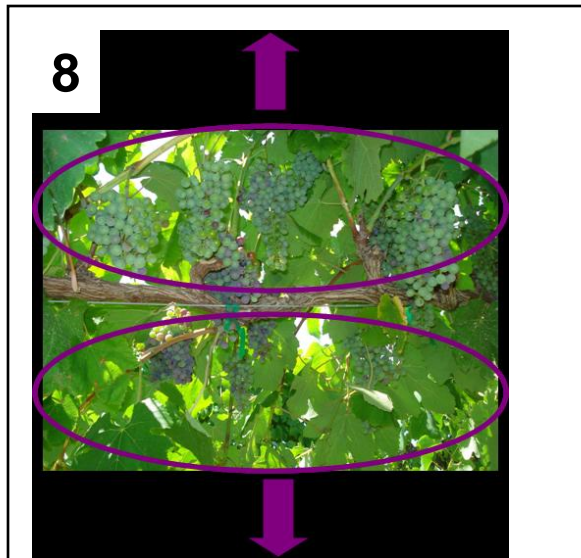
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Close to veraison, the downward shoots were in need of trimming to prevent contact with the vineyard floor. It is about this time that the upward shoots also needed trimming. Although the vineyard was regularly irrigated, the 2008 season was very dry, which likely reduced the frequency of shoot trimming and herbicide application. It would be interesting to test this system in a ‘wet’ growing season, in order to determine if adequate control of *weeds* and *downy mildew* could be achieved.



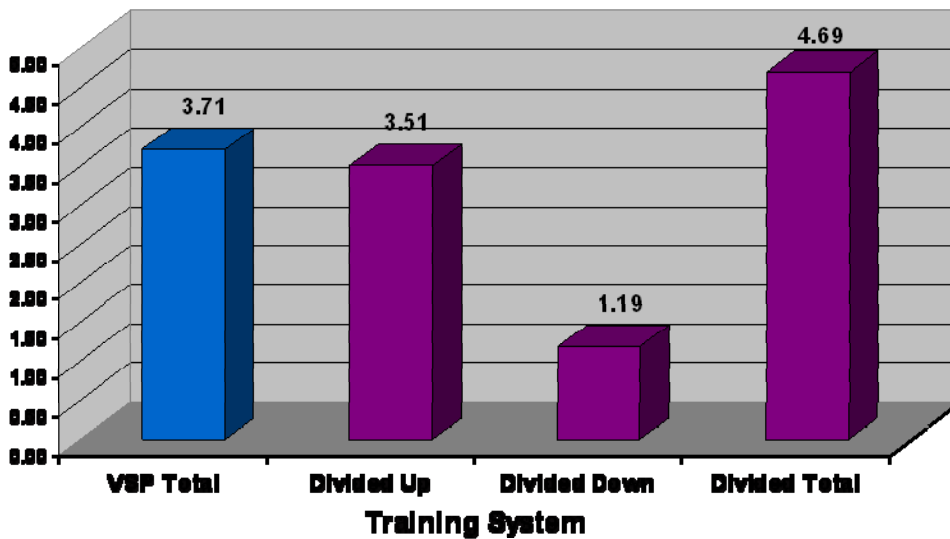
The above photo shows the Eastern side of a VSP canopy at 50% veraison showing fruit clusters exposed and upward growing shoots only. Additional leaves were removed to show clusters for the above photograph.



At 25% veraison, the vertically divided system has fruit exposure on the Eastern side of the canopy, which is regulated by leaf pulling immediately after fruit set. The clusters of the upward growing shoots are shown in the top circle above the cordon and those of the downward growing shoots are shown in the circle just below the cordon.

Preliminary Results

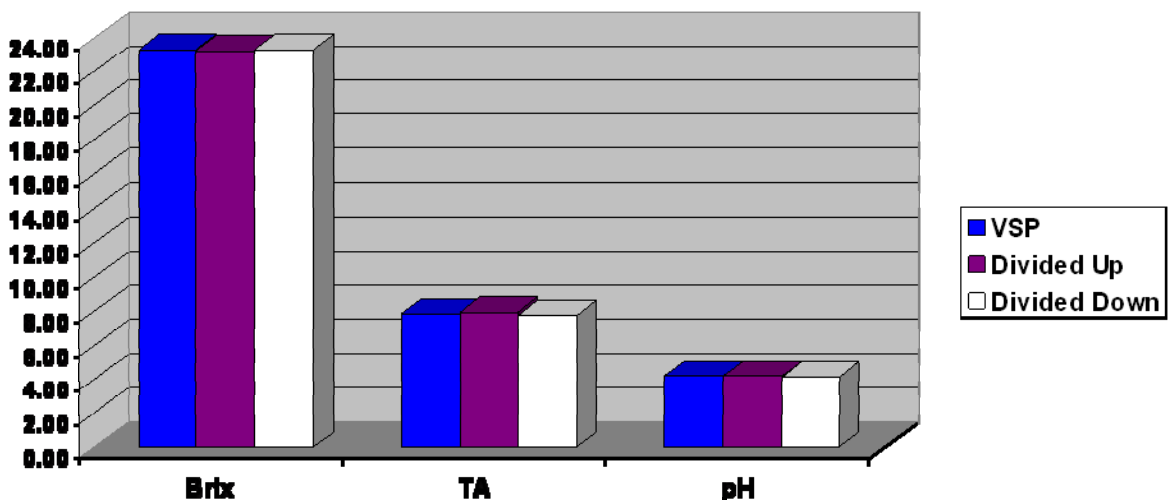
Tons per Acre "Favorite"



The above graph shows that the upward growing shoots of the divided canopy had a yield similar to the VSP trained vines. The additional shoots growing downward produced the equivalent of 1.19 tons/acre. The gross yield from the 18 vertically divided vines in this study suggests a 26.4% yield increase without creating any additional shoot “crowding” in the canopy. The total increase in cluster number was 35.5%, however, the clusters on the downward shoots had lower average cluster weights than those on upward shoots (data not shown). The economic input required to achieve the extra yield was not quantitatively analyzed in this preliminary study, thus the monetary value of the above yield increase remains unknown. It should come as no surprise that a vine with a higher bud number/shoot number will produce more fruit. The question to answer

with future research is whether or not this higher bud number is economically sustainable with regard to long term vine health *and* given the economic input to maintain the extra canopy. The results from the fruit chemistry are below.

Fruit Chemistry at Harvest 'Favorite' 100 berry sample averages



The above graph shows that the Brix, total acidity, and pH from fruit grown on upward shoots and downward shoots was similar to that of the upward shoots of the VSP training system. Until the post harvest pruning data is taken, it will not be determined if vines were cropped at their maximum capacity, therefore I consider this fruit chemistry to be inconclusive at this time.

What are the perceived challenges with vertical canopy division in the Gulf Coast?

When asked why they had not decided to use a vertically divided training system, growers cited reasons such as reduced airflow in the vineyard, challenges with weed and disease control (if shoots grow close to the ground), and additional labor requirements, as the major deterrents. I hope to address those concerns in future work. As with any other training systems (and as its growth habit might suggest), vertical canopy division certainly does have its 'ups' and its 'downs.' ☺

A Note on Yields

The Gulf Coast is indeed a challenging region to grow winegrapes, and some of the limitations with regard to diversity of marketable grape varieties and their returns may actually be compensated for by taking advantage of opportunities that growers in other

parts of the state might not be able capitalize on.

For example, growers of Viognier in other parts of the state might be required to achieve brix levels of 24-26° in order to produce characteristic wines for that variety, whereas Blanc Du Bois has the reputation to make a very pleasant, aromatic wine at brix levels of 16-18°.

Given the generalized effects of yield on fruit maturation (i.e. high yields require more time to ripen than average yields), it can be presumed that one could ripen a higher yield per vine with Blanc Du Bois than with Viognier, within the same time frame, and still please the winemaker. Divided training systems may offer one method to achieve such yield increases provided that the vines have the capacity to warrant the canopy division. I feel that this preliminary study shows that further testing of vertical canopy division is one

possible direction to explore for achieving higher grape yields in the Gulf Coast Region.

Take home message

The results of this small scale preliminary study show that vertical canopy division of VSP trained vines may be one option for allowing extra buds (thus extra yield) in the vineyard, without violating the standard viticulture recommendation of leaving no more than 5 buds per linear foot of canopy. Because this study was of small scale, and was carried out only in one season, it is not recommended that growers adopt this practice based on these results. We will consider a larger evaluation with statistical analysis of the results prior to making any extension recommendations.

*Special thanks to Louise & Ed Rice for the use of their 'Favorite' vineyard in New Ulm, Texas, and to Raymond Haak & Nadia Hetzel of Haak Winery for the use of their laboratory for fruit chemistry analysis.

Nutrient mobility in grapevines

Some degree of discoloration and senescence of older leaves is normal this time of the season. An understanding of nutrient mobility in leaves will help one to understand why leaves are discolored and dropping, even when the vine is receiving seemingly adequate water.

Nutrients in grapevines vary in their mobility in the phloem. Nitrogen (N), Potassium (K), Magnesium (Mg), Sodium (Na), Phosphorus (P), Chlorine (Cl), and Sulfur (S) are all mobile in the phloem; that is, those nutrients are able to move from one 'source' location (older leaf) to a 'sink' location (ripening fruit, shoot tip). Other nutrients, such as Zinc (Zn), Copper (Cu), Manganese (Mn), Iron (Fe), Boron (B), and Molybdenum (Mo) are only partially

mobile in the phloem. Calcium (Ca) is an example of an immobile nutrient.

The figure below (page 7) illustrates the link between what we sometimes see in the vines this time of season and the nutrient status of the vines. The figure shows old and new leaf tissue of a single Black Spanish vine. Notice how the phloem mobile nutrients (N,P,K,S) are all in greater quantity in the shoot tips (sink), whereas the difference between partially mobile nutrients (Zn, Cu, B, Mn, Fe) may be in greater or lesser quantity.

So why weren't Mg and Na levels higher in the new leaves if they are mobile in the phloem?

As with many other Gulf Coast vineyards, irrigation water was the sole source of water available to these vines in 2008. Incidentally I also sampled the water for this vineyard and results showed elevated alkalinity (275ppm), bicarbonate (335ppm), and total dissolved salts (471ppm), which likely contributed to the higher Mg and Na in the old leaf tissue. Calcium, being non mobile, would typically be higher in old leaf tissue, but the elevated Ca in the irrigation water likely contributed to the elevated levels in both old leaves and shoot tips.

High Ca levels sometimes result in decreased K uptake. The old leaves in the photo below show K deficiency symptoms, including yellowing of leaf edges, which spreads between the main leaf veins

Although this demonstration was not replicated throughout the vineyard, I think it suffices to show that combining data from tissue and water analyses can give greater insight than either analysis alone. The same concept would apply for combining soil analysis data with that of plant and water data.



Grape Sample Location	N	P	K %	Ca	Mg	Na	Zn	Fe	Cu ppm	Mn	S	B
Old leaf	1.63	0.18	0.93	4.04	0.35	1674	40	79	9	339	2059	52
Shoot tip	2.45	0.25	1.18	3.05	0.33	1333	31	81	10	172	2260	48

Viticulture Extension Updates

Blanc Du Bois wine needed for research.

Our own extension enologist, Mike Sipowicz has recently submitted a request for commercial and non-commercial Blanc Du Bois wines for a research project in collaboration with Dr. Charles Sims of the University of Florida, Department of Food Science and Human Nutrition.

The submitted wines will be put through a sensory descriptive analysis via a trained panel to characterize the different sensory attributes. The wines will then be submitted to the wine judges at the Florida State Fair for an evaluation by the "experts." They also plan to do gas chromatography analysis of the flavor volatiles to identify the impact volatiles, plus the more routine analyses, with hopes to find meaningful correlations between all of the above data.

Your participation will help researchers develop an in-depth universal "profile" for Blanc du Bois: something that has never been done for this wine. This is the most extensive Blanc du Bois wine research that has ever been conducted. They have indicated that they will purchase the wine that you provide. Contact Mike Sipowicz to participate: mpsipowicz@ag.tamu.edu

New look for the Texas Winegrape Network website. For those who have recently visited the statewide extension website for winegrapes, you may have noticed a new look and layout for the webpage. Dr. Ed Hellman, site administrator, has recently updated the statewide resource. The same information is still available, with new additions including information for

winemakers and event calendars. Look for more updates and factsheets for grape growers and winemakers in the future. Additionally, you can look at past newsletters from each of the viticulture extension advisor's regions by clicking on the following tabs: *News > Newsletters > Texas Regional Newsletters*.

Visit: winegrapes.tamu.edu

Winegrape Production Guide for Eastern North America – Pre-print discounts.

Please note that the deadline to receive 32-40% discounts off the list price of the Wine Grape Production Guide for Eastern North America has been extended to October 24, 2008. The book will be published in December 2008. Special pre-printing prices are also available for single copies. The book will be a comprehensive resource for novice and experienced growers, as well as crop advisors, service providers, educators, communicators, and students. It is over 300 pages with 16 chapters, 174 color photos, 40 line drawings, 45+ variety descriptions, 42 tables of useful information, a key to insect and mite grape pests, and a glossary. Tony

Wolf from Virginia Tech is the lead author and editor, but 15 other authors (myself included) contributed, and the book was improved after peer-review by 40 experts from 21 states and Canada. I feel that many of our challenges in the Gulf Coast are similar to those in the Eastern US. This would be a great addition to any grower's library. Visit: www.nraes.org/nra_winegrapecontent.html

Water Quality

Vines still need water after harvest and through the winter. Now is an ideal time to test irrigation water. Premature loss of old leaves or whole vines may be a sign of high salt content in irrigation water. This season, having been very dry, one would see such effects more pronounced. Water samples can be sent to the Texas A&M Soil, Water, and Forage testing laboratory. Remember to let the pipes flush for about 10 minutes before taking a sample directly from the pump. I would be glad to have a look at the results with you.

Visit: soiltesting.tamu.edu

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2008 Upcoming Viticulture Events

Grape Camp

November 9-10

The 2008 Grape Camp hosted by the Texas Wine and Grape Growers Association will be held at Fredericksburg Inn & Suites in Fredericksburg, TX on Sunday, November 9 through Monday, November 10. The annual Grape Camp is educational programming designed and delivered by the Texas AgriLife Extension Service for commercial vineyard owners and for anyone interested in learning about grape growing in Texas. For further information visit:

<http://www.txwines.org/grapecamp/default.asp>

Advanced Grower Workshop – Pruning & Training

January 22: 1-4pm

This workshop will be the first of a series of future training workshops for advanced growers. Several requests have come in for advanced educational demonstrations regarding pruning and training. This advanced workshop will cover in detail how to renew older vines, including renewal of dead spaces on cordons, and pruning and training of young vines. The course will be co-instructed by regional Viticulture Extension Associates, Penny Adams (Hill Country) and Fritz Westover (Gulf Coast). Two vineyard locations will be visited for the demonstration (Austin & Colorado Counties). Contact Fritz Westover: fawestover@ag.tamu.edu

Prospective Winegrape Grower Workshop – Houston

January 23: 9am-3pm

This one day workshop is designed for individuals considering planting a commercial vineyard in Texas. Topics will include site considerations, risks, costs, labor requirements, necessary expertise.

Cost: \$125/person, \$200/couple

For further information and registration details please email: fawestover@ag.tamu.edu

17th Annual Gulf Coast Grape Grower Field Day

February 6: 8:30am-4:00pm

This year marks the 17th annual Gulf Coast Grape Grower Field Day. The Field Day will be held once again at the Cat Spring Agriculture Society Building, Cat Spring, TX. Please hold this date in your calendar. Registration information will follow in the new year.

TWGGA Annual Conference

February 19-21

DoubleTree Hotel North

Austin, Texas

<http://www.txwines.org/conference/default.asp>

As always, feel free to contact me if you have any questions or comments.

Best regards,

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