

STATE OF OHIO  
DEPARTMENT OF ADMINISTRATIVE SERVICES  
GENERAL SERVICES DIVISION  
OFFICE OF PROCUREMENT SERVICES  
4200 SURFACE ROAD, COLUMBUS, OH 43228-1395

AMENDMENT FOR CHANGE  
AMENDMENT NO. 9

TO: LIMITED DISTRIBUTION - OHIO DEPARTMENT OF AGRICULTURE  
FROM: ROBERT BLAIR, DIRECTOR, DEPARTMENT OF ADMINISTRATIVE SERVICES  
SUBJECT: CONTRACT FOR OHIO GRAPE INDUSTRIES EXTENSION AND RESEARCH PROGRAM

Attached are pages 1, and 10 through 24 to this contract. Remove these pages from the existing contract and replace with the attached pages on the effective and/or revision date.

As a result of mutual agreement between the state of Ohio and the contractor, this amendment is issued to renew the subject contract an additional twelve (12) months, effective July 1, 2015 through June 30, 2016.

Projects for FY16 have been added and information for the Administrative/Fiscal Contact has been updated.

All other prices, terms and conditions remain unchanged.

Questions regarding this Amendment and/or the Requirements Contract may be directed to:

Therese Gallego, CPPB  
therese.gallego@das.ohio.gov

This Amendment, the Contract and any additional Amendments thereto are available from the DAS Web site at the following address:

<http://www.ohio.gov/procure>

Affected Contractor(s):

678 (address 48)  
The Ohio State University  
Office of Sponsored Programs  
1960 Kenny Road  
Columbus, OH 43210-1063  
dickens.54@osu.edu



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MANDATORY USE CONTRACT FOR: OHIO GRAPE INDUSTRIES EXTENSION AND RESEARCH PROGRAM

CONTRACT NUMBER: CSP900113

EFFECTIVE DATES: 07/01/12 TO 07/31/14

\* Renewal through 06/30/16

The Department of Administrative Services has accepted Proposals submitted in response to Request for Proposal (RFP) No. CSP900113 that opened on March 2, 2012. The evaluation of the Proposal responses has been completed. The Offeror listed herein has been determined to be the highest ranking Offeror and has been awarded a Contract for the services listed. The respective Proposal response including, Contract Terms & Conditions, any Proposal amendment, special Contract Terms & Conditions, specifications, pricing schedules and any attachments incorporated by reference and accepted by DAS become a part of this Services Contract.

This Requirements Contract is effective beginning and ending on the dates noted above unless, prior to the expiration date, the Contract is renewed, terminated, or cancelled in accordance with the Contract Terms and Conditions.

This Requirements Contract is available to the Ohio Department of Agriculture as applicable.

The agency is eligible to make purchases of the contracted services in any amount and at any time as determined by the agency. The State makes no representation or guarantee that department will purchase the volume of services as advertised in the Request for Proposal.

Questions regarding this and/or the Services Contract may be directed to:

Therese Gallego, CPPB  
therese.gallego@das.ohio.gov

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\*Indicates renewal effective 07/01/15.

1. Enology Production: Status of Dissolved Oxygen in Ohio Table Wines at Various Stages of Vinification with an Emphasis on Bottling

Although dissolved oxygen is favorable at the beginning of fermentation, further aeration produces several adverse effects. Thus, the quality of table wines improves when air exposure is limited. Oxygen levels are especially critical at bottling with importance on shelf life stability and aging potential. Contractor has accomplished both written and preliminary bottling surveys of the industry indicating this as a problem in FY 14. Contractor will continue to place a significant effort on surveying a greater amount of Ohio commercial wineries in regards to oxygen absorption at bottling. Based on individual winery results, bottling line audits and oxygen pickup in the cellar will be performed.

MUTUALLY AGREED UPON PROVISION

It is agreed that any equipment valued over \$500 purchased by the Contractor for use on the specified projects in the Contract is the property of the Ohio Grape Industries Committee.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16

VITICULTURE

1. Managing Grapevines after Successive Winter Injuries

- A. Developing a Training System for Winter-Damaged Grapevines (New). Almost all cold tender varieties sustained die-back (trunk damage) or died in 2014. Recovering vines that produced new growth (canes) were damaged again after the freezing events in February 2015. The responses of vines to back-to-back cold stress events are unknown and dealing with "re-damaged" vines requires special practices in the vineyard. Many vinifera growers are faced with this situation during the 2015 season. The central dilemma is what is good for the vine is not necessarily good for the grower's bottom line and vice versa. It is the purpose of this study to answer the question "how can the grower strike a balance between producing a healthy vine while generating some revenue?" The goal is to provide growers with objective and research-based information that outlines the pros and cons of the different training scenarios.
- B. Trunk Renewal and Sucker Management (Ongoing). In 2014, almost all vinifera grapevines and some hybrids sustained trunk damage or even death across Ohio. Trials of trunk renewal and sucker management were conducted and several of the questions posed in last year's proposal were answered. Results showed the following: 1) "active" sucker training (laying shoots down the fruit wire) is better than "minimum" training (keeping shoots straight and bundled), 2) train as many suckers as the vine produces in order to devigorate the vines and produce less bull growth; 3) bull canes are not desirable for trunk renewal and should be removed when pruning. In 2015, we propose to observe how vines will recover from the different trunk renewal treatments and record yields in year 2. The goal is to identify the best sucker management strategy with the quickest vine recovery and optimum yield and fruit quality. This trial will be conducted on the same vines treated in 2014.
- C. Evaluation of Crown Gall Sensitivity in Grape Varieties and Preventative Management Methods against *Agrobacterium vitis* (Ongoing). In 2014, many growers indicated that they had extensive incidence of crown gall in their vineyards. This disease, caused by a bacterium, *Agrobacterium vitis* (AV), can be deadly and thus causes the highest economic losses among all grape diseases and pests in the vineyard. Unfortunately, there is no "silver" bullet to cure vines from this disease. At the Winter Grape School held in March 2015, we invited the world leader on crown gall research, Dr. Tom Burr, and he indicated that the current best protection methods against this disease involve vineyard practices and biological control using non-tumorigenic strain. There is currently an "on-going" trial on crown gall that compares *Agrobacterium vitis*-free vines with vines treated with non-tumorigenic strain. Both treatments were compared to the "control" consisting of vines purchased from the nursery (note that vines from nurseries are not free from AV). The results are promising thus far, since we found a reduction on crown gall incidence on crown-gall free vines and those treated with F2/5 strain. Contrary to the Kingsville location, vines in Wooster did not sustain trunk damage and all regrew in 2014. Therefore, we plan to evaluate crown gall incidence during the summer of 2015 in Wooster only. In addition to the on-going study, we plan to evaluate crown gall incidence in all varieties used in our trials.
- D. Managing Winter Damage in Commercial Vineyards (On-going): In 2014, Dami initiated multiple trials in nine (9) commercial vineyards representing all grape growing regions in Ohio. Many of the trials provided useful data and served as demonstration plots for growers and FSA representatives at workshops conducted in 2014. However, there were a few challenges encountered while conducting such a large-scale project: 1) some trials were interrupted because some growers stopped tending for their vineyards (e.g. spraying against diseases/insects/weeds) or interfered with the research plots unintentionally; 2) costly travel and labor. Many of the trials required 100+ miles trips bi-weekly to train vines and Dami and his group spent a large portion of last summer on the road; 3) irregular communication which resulted in loss of data (yield, fruit, and pruning data). For those reasons, Dami proposes to scale down and will continue the trials that started last year with fewer growers. The new training system trial (described above) will be established at a new commercial vineyard once a collaborating grower is identified.

\*Indicates change 07/01/15.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

2. Evaluation of Performance and Cultural Practices of Promising Winegrape Varieties. Per the recommendation and support by the OGIC and the Ohio grape and wine industry, the OSU Viticulture-Enology Program has evaluated more than 40 varieties in the past 10 years. The majority of recent variety planting in Ohio results from recommendation by the OSU viticulture and enology program. Examples include: Cabernet franc, Pinot gris, Chambourcin, Traminette, Noiret, Marquette, LaCrescent, and Frontenac to list a few. Variety evaluation consisted of recording the viticultural and enological performances and identifying the pros and cons of these varieties grown under Ohio climates. From this project, we identified more than 10 varieties that performed well and thus have been recommended.

In 2014, the evaluation trial in the Wooster site sustained 70% vine loss vs. 20% in Kingsville. So far, we have 3-years' worth of data from the Wooster trial, but only 2 years from Kingsville. The Kingsville plot has many varieties that were planted later than in Wooster thus vines are young and don't have sufficient data to make any recommendations. Furthermore, at recent meetings (Tri-county growers association and AARS advisory committee) in northeast Ohio, most growers ranked variety evaluation as a high research priority. For those reasons, Dami proposes to continue the trial in Kingsville by replacing dead/missing vines (20%). Due to extensive loss (70% dead vines) at the Wooster site, all vines were removed except for one row. Dami proposes to initiate new trials at the Wooster site with the most promising varieties (4 to 6) by planting larger number of vines per variety to conduct research on best practices to grow these varieties in Ohio. For example, Regent is recommended and now grown commercially, but growers do not have information on the best vineyard practices to grow it (e.g. optimum pruning method, optimum crop load, optimum fruit maturity, etc). Additionally, we plan to continue testing new varieties and clones but a smaller scale (~6 varieties instead of 20+).

ENOLOGY

1. Varietal Wine Evaluation (OARDC, AARS and OSU South Center). Vineyards were set up at Wooster, Kingsville (AARS) and OSU South Centers as part of the original NE1020 variety trial collaborative project. Varieties at both Wooster and Kingsville have reached maturity for winemaking trials with a number of varieties being made from the 2011 through 2013 vintage. Varieties from OSU South Centers are considered to comprise more of an extension display vineyard that the OARDC Enology Program may also choose to vinify for the Southern region of the state. Although funding is not available through VCE and NE1020 anymore for this program, the enology program has also been working with Dr. Imed Dami including supplemental funding from SCRI. Unfortunately, similar to after the "Polar Vortex" in not having enough grapes for wine production from the 2014 vintage, the past cold winter conditions received will not yield much in regards to wine production once again for the 2015 vintage. There may only a few varieties that might yield enough grapes for wine production such as those from Regent.

We are expecting to produce wines from the New York and Minnesota selections to observe wine quality coming out two years of less than ideal winter conditions. There will be several other hybrid varieties produced at Wooster, AARS or OSU South Centers that may be produced into wine as well under this section of research. It will be important to keep track of wine quality from these varieties in tasting with members of our industry who may be considering a few of these varieties to replant some Vinifera or hybrid vines that did not make it through the past two winters. It is extremely valuable to have these wines available for use in educational formats in having winemakers taste any observed differences that the treatments may have in these practical studies.

2. Best Viticulture Practices. This project is working in collaboration with Dr. Imed Dami on different cultural practices being implemented in the vineyard involving both Pinot Gris from AARS and Cabernet Franc from Wooster. Treatments consist of applying various cultural practices as follows: 1) Good Quality (commercial standard): five practices are conducted based on commercial practices; 2) Premium quality (best practices): similar to 1) but with more vine management; 3) Fair quality (for bulk wine): fair to poor practices. We have made wine from the 2013 vintage from these varieties in addition to performing some chemical analysis of must and wine with preliminary taste panel results from both a professional and a consumer perspective. Unfortunately, due to the "Polar Vortex" we were not able to produce wine from this study for the 2014 vintage in addition to the 2014/2015 winter conditions being too harsh.
3. Effects of Hyper-oxidation on Terpene and Ester Levels in Riesling. Approximately 75% of Ohio wineries produce white wines from cultivars with fruity or floral varietal characteristics (e.g., 'Vidal', 'Traminette', 'Riesling' and others). The quality of these wines is highly dependent on vintner practices that control the level of oxygen that the wine receives during the winemaking and aging processes. After primary fermentation, exposure to oxygen at any point in these processes is generally considered to have a negative impact on wine, color, aroma, flavor and shelf-life. There is perhaps, one exception to this generality being a process known as hyperoxidation. Using this procedure, the winemaker purposefully introduces high levels of oxygen to recently pressed must/juice in order to initiate enzymatically controlled oxidation cascades' of common phenolic constituents leading to the formation and precipitation of yellow quinones. When these compounds are removed prior to vinification, they are excluded from the finished wine, leading to a product that is arguably more shelf-stable and less harsh or bitter in flavor.

\*Indicates change 07/01/15.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

Several research studies indicate hyperoxidation procedures are found to substantially decrease the fruity and floral aromas that white wines typically contain and promote the formation of new, unwanted compounds that are detrimental to wine quality. In contrast, some researchers report white wine stabilization by hyperoxidation of must before alcoholic fermentation to be associated with improved aroma quality in the resulting product. Storage can affect final sensory quality of white wine, by modifying or decreasing characteristic terpenes or ester content and by forming new detrimental flavor constituents leading to reduced quality. The rate of phenolic oxidation seems to increase within wines stored at higher temperatures. Therefore, wines with lower concentrations of phenolic substrates through the process of hyper-oxidation may be able to retain these positive aromatic and flavor constituents ultimately leading to longer shelf life stability and aging potential.

Determining the identity and relative concentration aroma compounds via gas chromatography-mass spectroscopy (GC-MS) is essential when evaluating wine flavor characteristics; the analyses are useful to quantify the effects of altered vinification parameters and provide a mechanism to relate vinification techniques to sensory evaluation of flavor quality. Terpenoid and volatile ester compounds play a key role in white wine flavor and scent. However, the effects of unintentional oxygen on the levels of these compounds are poorly documented.

4. Research Studies and Varietal Wine Production for Extension Purposes. Effect of Harvest Temperature and Time on Traminette Wine Quality. Determining the exact time to harvest a specific variety is extremely important and should be based off of factors such as grape chemistry, taste and weather conditions. In light of this important decision, it is also important to consider the temperature at harvest as it relates to the time it takes until processing the grapes in the cellar. Some studies would indicate that the longer the grapes are held prior to processing the more detrimental it is on wine quality attributes. Within the Ohio commercial wine industry, it is common to have a limited staff in the vineyard that might extend holding times after harvest. It is also common that a winery might not have the appropriate funding or facilities to cool the grapes immediately after harvest.

PLANT PATHOLOGY-VIROLOGY

1. Sustain Ohio Grapevine Productivity by Surveying Virus and Phytoplasma Disease Damages to Vineyards across the State. It is vitally important to ensure the health of Ohio grape industry as it contributes an annual output of at least \$580 million to the state economy and supports over 4,000 full time jobs. Viruses and phytoplasmas are among the most damaging pathogens of grapevines, and their prevalence has been documented in other grape-producing states and countries. However, the scope of virus and phytoplasma problems in Ohio has not been systematically assessed. Our preliminary survey of seven (7) Southern Ohio vineyards during 2012-2014 suggests that viruses are indeed present in some vineyards. We propose to continue the survey in 2015 to discover all disease-causing viruses and phytoplasmas in Ohio vineyards using state-of-art technologies including RNA-Seq and RT-PCR. Results of the survey will offer the much needed guidance for improved intervention aimed at minimizing the losses to Ohio grapevine industry caused by viruses and phytoplasmas.

ENTOMOLOGY

1. Integrated Pest Management System for Insect Pests in Ohio Vineyards. In Ohio we have several species of insects that attack the fruit, shoots, roots, and leaves of cultivated grapes. Many of these pests are indigenous to all vineyards while some are present in specific regions of the state and still others are sporadic pests triggered by varying environmental factors. There are also new invasive species of insects that could pose serious threats to the grape industry in Ohio. The goal of our pest management program is to provide a commercially acceptable level of pest control with minimal economic and environmental impacts. Through these efforts, Ohio growers stand to benefit directly by improving the quality of their fruit and reducing the use of pesticides, resulting in a more environmentally sound program with fewer health concerns for the grower and consumer and reduced costs and improved profitability for their operations.

WEED SCIENCE

1. Improved Weed Control for Winter-Hilled Vines. We continue a grower-driven program conducted at OARDC in Wooster to identify better approaches to weed control. Winter-hilling and removal of the hill in spring complicates weed control because of repeated mixing of soil that degrades herbicide activity while at the same time stimulating weed growth. In addition growers are concerned that removal of the hill in the spring exposes crop roots that may be directly exposed to spring herbicide applications.

\*Indicates change 07/01/15.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

HERBICIDE DETECTION

1. Beta-testing of a mobile, field-deployable 2,4-D/dicamba detection system. The release of 2,4-D and dicamba tolerant corn, soybean, and cotton is imminent, beginning with 2,4-D tolerant corn. Grain farmers will embrace these crops because they provide a new method to kill a growing range of glyphosate-resistant weeds. Employment of novel 2,4-D/dicamba resistant crops as a pest-management strategy, however, brings with it a concomitant set of risks that must be ameliorated for this strategy to be employed successfully. Even modest adoption of this technology on 30% of the corn and soybean acreage in the Midwest will result in an increase in potential 2,4-D and dicamba use to six times the current usage. Because these crops will cause a shift in where 2,4-D and dicamba are primarily used from western rangeland and wheat production to the corn belt, the actual increased usage in the Midwest could be much more than a 6X increase. Even with advanced drift reduction technology in place, the increased use of these herbicides adjacent to sensitive crops will be such that crop injury resulting from off-site movement is almost inevitable and has a high probability of exceeding current levels (estimated at 300 incidents/ year in Ohio).

While new formulations of 2,4-D and dicamba can dramatically reduce drift, drift events can still occur and these events often lead to lawsuits. Depending on the concentration of 2,4-D or dicamba in drift that impinges on a crop, effects vary from occasional yield increases, to initial injury with complete recovery, to greatly reduced yield or death. Crops vary in sensitivity, and sensitivity varies with stage of development; drift at or near the time of flowering is often particularly damaging. Detection of drift compounds in the damaged crop is increasingly a deciding factor in such cases. In the case of 2,4-D and of dicamba, herbicides which mimic the plant hormone auxin, it is very difficult to detect residues with reliability and reproducibility using current analytical techniques if above-ground tissues are not collected within two to three days (48-72 h) of the drift event. Unfortunately, evidence of drift damage is usually not visible until the end of this period.

EXTENSION

1. Viticulture
  - A. On-Going Extension and Outreach Activities. Dami and the OSU Winegrape Extension Team will continue to provide extension deliverables to the Ohio grape and wine industry. The "core" program deliverables include: 1) Ohio Grape & Wine Conference, 2) Grape School and hands-on workshops with relevant topics, and 3) technical information in the Team newsletter, OGEN.
  - B. New Extension and Outreach Activities. Dami proposes to continue the following new Extension activities for FY16. Dami and his group in collaboration will deliver these activities with the OSU Winegrape Team.
    - 1) Fact sheets on new varieties: Dami and Kinney in collaboration with Todd Steiner will write and produce several fact sheets to profile varieties that are recommended by the Viticulture-Enology Program.
    - 2) Midwest Grape Production Guide: This book is the number one resource recommended to grape growers in Ohio. Since its publication in 2005, more than 5,000 copies have been sold. However, the book is due for revision after 10 years. Dami will devote time and effort to revise this extremely valuable source for Ohio grape and wine producers. New authors have contributed new chapters and new information. Due to the unplanned freeze events and subsequent re-prioritization of extension activities, the completion of the guide will be postponed to a later date.
    - 3) Program Website: Dami and Kinney in collaboration with the winegrape team completed the new website which was rolled-out at the OGWC last February. Diane Kinney will be the primary person working on maintaining and updating the website content. Among the new additions, Dami plans to create a U-tube channel to post educational video clips.
  - C. Vineyard Site Visits. Plan of Action-Visit as many vineyards across Ohio to increase grape and vineyard quality.
  - D. Promote Grape Quality.-Plan of Action is to hold workshops to promote grape quality at different stages of grape development held at grower's vineyards or when appropriate the research sites at Kingsville, Wooster and Piketon will be used.
  - E. Additions to Grape Quality Viticulture Outreach. Provide consultation to growers selected by Dr. Dami to plant Winter Hardy New York and Minnesota grape varieties in 9 commercial vineyards that have wineries across the state. This is collaboration with Dr. Imed Dami and it is dependent on additional funding to purchase vines that are being phased in over 3 seasons. Some vines have been purchased/propagated for this. My responsibility is to help in the grafting process and visit these sites in conjunction with my outreach site visits which will not include additional funding.
  - F. Vineyard Site Identification, Best Grape Varieties for Specific Site Recommendation and Best Vineyard Practices Continue Vineyard Site Evaluations for FY15 for new sites being planned-with the increase in clients wanting to establish vineyards I did request an increase in the travel budget.

\*Indicates change 07/01/15.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

- G. Site preparation A Plan of Action is recommended for Site Prep to be done a year in advance of planting to properly take care of any issues such as cover crops, drainage, nutrients or weeds. This will be done for both new and established growers. It is strongly recommended to have any noxious or perennial weeds under control before planting vines to avoid competition.
- H. Early Diagnosis of Problems and Solutions and Control of Diseases. Plan of Action is to scout private vineyards with the grower to detect disease, weeds, nutritional, chemical or insect problems and recommend course of action in collaboration with Dr. Mike Ellis on disease problems even though Dr. Ellis has retired, he is still available for advice and potential on-site visits. Insects was not on the list of priorities in the Strategic Plan but with the occurrence of the 4 new invasive insects (SWD, MALB, BMSB, Spotted lantern fly and old continual pests such as the Grape Berry Moth, Phylloxera, trapping and identification and control of these insects will also be a part of any on sight vineyard visit for early detection and control with recommendations.

2. Viticulture Extension from OSU South Centers.

Comprehensive training of new and existing grapes is of vital importance to the success of wine grape growing in southern Ohio and beyond. Testing of cold hardy grape cultivars for premium wine production, development and demonstration of effective vineyard management practices and improvement of basic understanding of grape and wine quality are also critical to a growing wine grape industry. OSU South Centers is uniquely positioned to conduct both basic and applied research on grape production and deliver a comprehensive grape grower outreach program.

3. Enology

- A. The 2016 Ohio Grape and Wine Conference. The past number of Ohio Grape and Wine Conferences has been viewed as a huge success with record attendance occurring each year. We have once again worked closely with Christy Eckstein at OGIC in Co-coordinating the conference. A very good technical program has been established highlighting excellent out of state featured speakers in addition to OSU/OARDC in state specialists in each grape and wine discipline.

Therefore, we will once again plan to help coordinate 2016 Ohio Grape and Wine Conference. We have already started the process in searching for a potential host site for next year's conference. The enology program will again develop the technical sessions in enology and co-organize the general sessions with key members of the viticulture program being Dave Scurlock, Imed Dami and Dr. Gary Gao. We will also work with the conference organizing committee to help develop the conference format, special events and logistics. With the increased attendance and interest from the Ohio grape and wine industry we are excited to have an opportunity to once again work together in performing the proposed conference.

- B. Participation and Involvement in National and International Meetings. It is extremely vital to both participate and attend professional meetings at national and international venues. These meetings bring exposure to research and extension we are doing in Ohio in addition to collaborating with other researchers in enology on future projects. Attending out of state conferences, also opens eyes to our commercial grape and wine industry in Ohio and the quality wines we are producing today. This is also a good time to learn of new methodology and enology practices. Many contacts can be made at these meetings providing extension opportunities of excellent speakers to present their information at our annual conference, field days or workshops. Although OGIC does not cover out of state travel, they still provide funds allocated toward my salary which I feel compelled to list in this proposal. These opportunities are extremely valuable and will be covered under OARDC enology program funds.
- C. The Ohio Quality Wine Program. The Ohio Quality Wine Program (OQW) has been implemented and running presently since 2007. This program consists of a joint venture involving the Ohio Grape Industries Committee, The Ohio State University/OARDC Viticulture and Enology Program and key members of the commercial grape and wine industry. The OARDC Enology program is pleased with the sensory and chemical evaluation of wines entered into the program. This is an extremely valuable program that was originally created to address 3 objectives being; to provide global respect, consumer recognition regarding wines of distinct quality, planting more grapes in the ground to address the growing number of wineries in Ohio

However, it is important to recognize that the OQW program is realistically still in the early stages and will take some time in continuing to develop this program for the benefit of identifying and marketing the quality wines being produced in Ohio. It is excellent that OGIC has also placed a significant effort on marketing these wines to help in consumer recognition of this important program.

It is our intension to continue working effortlessly with OGIC in the development of this program through coordinating and performing the sensory evaluations and chemical analysis of wines entered into the OQW program for FY 16. Under direction of the OQW subcommittee, we will coordinate four separate OQW sensory evaluations (August, November, March and May) including chemical analysis of wines submitted. In addition, we will continue to provide input on the quality subcommittee as we proceed further into this important program for the Ohio grape and wine industry.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

- D. Post Fermentation Wine Quality Control Workshops. The Post Fermentation Wine Quality Control Workshops have been very successful and greatly appreciated for the past number of years we have performed them for the Ohio wine industry. We have had an average attendance of nearly 20 people at these regional workshops since establishment of this series in 2008. As indicated in the recent FY 14-19 strategic planning meetings, addressing "wine quality" was viewed as the highest priority of all with a score of (4.4) in continuing to be addressed. Therefore, the enology program will continue to offer the Post Fermentation Wine Quality Control Workshops in December and January on a regional setting for the FY 16 proposal period.

The workshops will continue to be done in a relaxed social format with winery personnel participating in discussion of the wines presented with some possible remedies or treatments if required at this stage of vinification. If wines are being analyzed for possible flaws, all possible remedies or treatments will be discussed in a constructive format. These workshops also train winery personnel on sensory evaluation techniques and what to expect in regards to varietal characteristics and blending potential.

- E. Additional Workshops. It is our goal to provide some additional workshops in enology covering several key areas of interest such as but not limited to; laboratory analysis, filtration, new winery setup and a pre-fermentation conference. These types of workshops were included in our "Winemaking Boot camp" series of workshops accomplished in FY 15. The amount of additional workshops will be directly related to the time commitment involved with looking into the possibility of a potential winemaking certificate program initiating in FY 17. It is important to note that a focus of these workshops also are set up to take place at the annual Ohio grape and wine conference taking place in February.

Depending on the content and agenda, implementation of some workshops may be necessary to include a relatively small charge for cost recovery purposes.

- F. Ohio Commercial Tour of the Michigan Grape and Wine Industry. The OARDC enology and viticulture program is excited to offer this unique opportunity once again to the Ohio grape and wine industry. We have offered industry tours to different growing regions both in and out of the country within the past decade. These tours bring great excitement from the tour participants. Michigan is becoming quite known for being a premium wine producing state with a diverse growing regions and varieties. Since they have similar growing conditions and diverse varieties as we have in our industry, there should be much to learn on this trip.

There will be several main objectives of the tour. The first purpose is to provide an educational aspect in regards to both viticulture and cellar practices emphasized in Michigan. A second objective provides a good opportunity to network between the attendees present on the tour in addition to the contacts at each stop. The last objective is to provide some cohesiveness within our growing, grape and wine industry in addition to simply having a good time away from the vineyard or winery.

This tour originally was supposed to take place in FY 15 however due to an additional workshop on sensory evaluation of wines and recognition of wine flaws that was also recommended by OGIC; we postponed this tour to FY 16. This was also accomplished due to some indication from industry members that they may be still working in the vineyard during the first part of June re-planting and trellising from what was lost or being renovated due to the past two severe winters. We desire to make this opportunity available to all even though we are limited on the total number of participants.

The exact locations of the tour have not yet been identified but we are confident that it will provide a wonderful educational and enjoyable experience.

- G. Northeast Ohio Grape Twilight Tour. The enology program is asked each year to present research and extension information at the Northeast Ohio Grape Twilight Tour. This is held in collaboration with Dr. David Morrison in the Northeast region of Ohio where we have a significant number of wineries. It will be especially good to participate in this meeting since Greg Johns will be retired at AARS and desire to show our support from OSU for this event in addition to the vineyards and wineries in the region. In addition to providing research and extension information, we are usually asked to provide an educational tasting of our research projects. This is a good venue to continue providing useful information to the Ohio wine industry which we plan to participate in the August, 2015 Twilight Tour.
- H. Participate in both National and International Wine Competitions. I plan to participate as a judge in several regional, national and international wine competitions throughout FY 16 period. This enables me to stay sharp on sensory evaluation of wines in addition to becoming familiar with new varieties and examining their potential wine quality for the Ohio commercial wine industry. In addition, collaborating with other judges is also beneficial in determining the potential of additional judges to participate as a judge in the Ohio Wine Competition.
- I. Researching a Potential Wine Makers Certification Program. A recent desire from several OGIC research subcommittee members has expressed interest in developing a type of winemaker's certificate program in Ohio. This type of program could vary greatly in the type of certification program being developed and implemented. The overall scope of the program must fit into specifics of the Ohio State University for teaching and certification program ethics. It will take a great effort in looking into what will be the most efficient and optimum type of certification program to develop for the Ohio wine industry.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

Therefore, a significant amount of time will be devoted during FY 16 into evaluating a winemaker's certification program and the best methodology for this to potentially get implemented for FY 17. We will also evaluate other certification programs from institutes of higher education across the country in addition to looking into the staffing of such programs in working efficiently.

- J. On-Site Winery Consultations: Continue Extension Technical Support. Many times the best way to learn respect and trust of the owner's and winemaker's in the Ohio commercial wine industry is to provide a personal on-site consultation. This enables conversation in the winery environment providing a more comfortable, relaxed atmosphere. It also provides us with the opportunity to raise any additional comments, questions or troubleshooting advice based on individual winery situation and layout. There has been a special effort placed by the OARDC Enology Program in this area the past several years which has received some grateful comments from reciprocating wineries receiving this valuable service. In addition, on-site visits are performed for startup wineries in determining the best layout options, organization and technical information for producing premium quality wines. Topics covered during these critical site visits deal directly with wine quality, best practices for wineries, consistent wine quality and early flaw detection to name a few of the highest priorities of the recent research and extension strategic planning sessions. An additional effort will be placed on the availability of utilizing a special piece of equipment to be purchased yet in FY 15 in determining winery sanitation utilizing an ATP Luminometer. A special production project may be designed in the future to evaluate our current industry status regarding winery sanitation efficiency utilizing at a larger pool of wineries. Therefore, we will continue to place an increased emphasis in performing winery site visits in FY 16.
- K. Off-Site Winery Consultations. Since the Ohio wine industry has grown over the past decade to over 200 actively producing wineries, the opportunity does not exist to visit each winery as often as desired. Therefore, many consultations are performed over the phone in providing research and extension information in addition to troubleshooting wine problems if necessary by phone, fax or e-mail. It is our goal to spread the word to all wineries in feeling comfortable to contact us at any time for confidential support in answering questions and ultimately helping improve wine quality. In the winery site visits, winery consultation covering critical winemaking topics with the intent on ultimately improving wine quality has collectively been rated one of the highest priorities and will continue to be a focus area of the enology program for improved efficiency in FY 16.
- L. Provide Chemical Analysis of Commercial Wines. Approximately 14 years ago, we implemented a wine analysis program in collaboration with OGIC in which we provide wine analysis and troubleshooting through the enology lab at no charge to our commercial wine industry. This goes hand in hand with the offsite winery consultations listed above. This effort addresses wine quality and consistency throughout the industry as being a vital part in the production of premium quality wines and positive recognition of the Ohio grape and wine industry. Analyses of wines are followed up with suggested recommendations and troubleshooting if necessary, ultimately to increase wine quality. I believe this is an invaluable service to the Ohio wine industry and has helped many wineries continue to improve their wine quality to a point where they are being recognized in Ohio, national and international wine competitions. It is our intent on continuing to provide chemical analysis and feedback to the Ohio commercial wine industry for those wineries taking advantage of this service.

This service will hopefully be benefited by increased chemical analysis ability in the utilization of a recently purchased spectrophotometer by the OARDC enology program.

We hope to utilize some more enzymatic analysis capabilities in performing increased evaluation abilities and faster turnaround times.

4. Weed Science

Extension Outreach for Weed Management in Grapes. Here we continue to address the major risk to the grape industry that will be incumbent with the release of 2,4-D and dicamba tolerant field crops. Outreach will be both to grape growers, but also to commercial pesticide applicators, grain farmers, and their advisors who will be using the new 2,4-D and dicamba tolerant soybean varieties. Outreach materials included Powerpoint slide presentations and script used by County Agents in Pesticide Education sessions, and narrative for inclusion in bulletins used by farmers and custom applicators. We also completed a new factsheet, designed for distribution to grain growers, on the risks of drift faced by grape growers. This fact sheet is currently in internal review within OSUE and we expect release in the next few weeks. Presentations were made in Ohio (NE Ohio Grape School, and Ohio Grape & Wine Conference) and also at the Virginia Grape & Wine Conference in Charlottesville.

\*Indicates change 07/01/15.

\*MUTUALLY AGREED-UPON PROJECTS FOR FY16 (continued)

PRODUCTION

1. Commercial Expansion of Varieties New to Ohio. In order to promote varieties tested at OSU research vineyards, maximize their exposure to growers and wine makers, and encourage their expansion, the Viticulture Program in partnership with OGIC started a new variety expansion initiative through a cost-share program in 2014. Six collaborating vineyards and wineries from the main grape growing regions (northeast, northwest, central, southeast, and southwest) in Ohio have participated in the first year of this project. Four hybrid and vinifera varieties (Aromella, Malvasia, Sauvignon blanc, and Teroldego) and an advanced selection (NY81) are purchased and will be planted this spring by cooperating growers and vintners. Due to shortage of plant materials from nurseries, many varieties were not available. Furthermore, vines were more expensive than originally budgeted. If it were not for multiple requests (begging!) by Dami for donations, it would not have been possible to order 5 varieties (750 vines ordered). The actual cost was more than double (~\$4,000) the amount requested (\$1,500). Dami proposes to continue this project for FY16 with the following adjustment: 1) increase the minimum number of vines per variety provided to cooperators. Many requested 100+vines instead of the minimum 25-50; 2) increase the requested budget due to vine expenses (grafted and rootstocks) and shipping cost; 3) request to purchase a grafting machine to be able to graft specific varieties and clones that are not available from the nurseries. For example, most varieties of interest (e.g. Gamay noir, Siegerrebe, Arneis) were not available in nurseries. Further, some growers suggested varieties to plant in OSU research vineyards that are not available in the nurseries. Thus having the flexibility to graft our own varieties will be highly desired.

\*Indicates change 07/01/15.

COST SUMMARY

Ohio Grape Industries Extension and Research Program  
 CSP900113

UNSPSC CATEGORY CODE: 93141905, 70141705

OAKS ITEM NUMBER: 11942

Description	Year 1 Cost	Year 2 Cost	Year 3 Cost	Year 4 Cost
<b>1. Extension Services</b>				
Extension Services	\$ 172,716.00	\$ 189,593.00	\$ 203,427.00	\$ *202,779.00
<b>Category Total</b>	<b>\$ 172,716.00</b>	<b>\$ 189,593</b>	<b>\$ 203,427.00</b>	<b>\$ *202,779.00</b>
<b>2. Viticulture Research</b>				
1. Viticulture	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
a. Evaluation of Crown Gall-Free grapevines	\$ 9,012.00	\$ 9,192.00	\$ 3,132.00	\$ 0.00
b. Evaluation of training systems for Cabernet Franc	\$ 10,014.00	\$ 10,215.00	\$ 3,132.00	\$ 0.00
c. Winegrape variety evaluation – Ne 1020 Project	\$ 10,000.00	\$ 12,700.00	\$ 3,132.00	\$ 0.00
d. Winegrape variety selection evaluation with improved cold hardiness	\$ 7,010.00	\$ 0.00	\$ 0.00	\$ 0.00
e. Clonal evaluation of Cabernet Franc.	\$ 9,012.00	\$ 9,192.00	\$ 3,132.00	\$ 0.00
f. Rootstock Evaluation for Traminette and Chardonel	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
g. Winter protection of grapes using ABA	\$ 15,000.00	\$ 15,300.00	\$ 0.00	\$ 0.00
h. Implementing Best Viticulture Practices		\$ 15,000.00	\$ 3,132.00	\$ 0.00
*Managing Vines after Winter Injury	Year 1 Cost	Year 2 Cost	Year 3 Cost	Year 4 Cost
a. Cordon and Trunk Management			\$ 9,397.00	\$ 0.00
b. Rootstock and Clonal Evaluation			\$ 9,397.00	\$ 0.00
c. Pruning Decisions in Hybrids			\$ 9,397.00	\$ 0.00
d. Sucker Management			\$ 9,397.00	\$ 0.00
e. Commercial Vineyards Trials.			\$ 9,397.00	\$ 0.00

\*Indicates change 07/01/15.

*f. Developing a Training System for Winter-Damaged Grapevines				\$ *12,631.00
*g. Trunk Renewal and Sucker Management				\$ *12,631.00
*h. Evaluation of Crown Gall Sensitivity in Grape Varieties				\$ *12,631.00
*i. Managing Winter Damage in Commercial Vineyards				\$ *12,631.00
*j. Evaluation of Performance and Cultural Practices of Promising Winegrapes				\$ *12,631.00
Viticulture Total	\$ 60,048.00	\$ 71,599.00	\$ 62,465.00	\$ *63,155.00
<b>2. Plant Pathology</b>	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
a. Evaluation of currently available and experimental fungicides	\$ 3,023.80	\$ 3,106.60	\$ 0.00	\$ 0.00
b. Collect infected grape canes and document pycnidia formation and sporulation	\$ 3,023.80	\$ 3,106.60	\$ 0.00	\$ 0.00
c. Determine the conditions required for sporulation of P.viticola on infected grape canes and develop a predictive model.	\$ 3,023.80	\$ 3,106.60	\$ 0.00	\$ 0.00
d. Determine the effects of dormant applications of a potential substitute for Liquid Lime Sulfur (Sulfurix) on the development of Phomopsis cane and leaf spot and other grape diseases in Ohio, and the effects of dormant applications of phosphorous acid on control of grape diseases.	\$ 3,023.80	\$ 3,106.60	\$ 0.00	\$ 0.00
e. Determine the efficacy of a new biological control agent and soil amendments of compost for control of grape crown gall.	\$ 3,023.80	\$ 3,106.60	\$ 0.00	\$ 0.00
f. Sustain Ohio grapevine productivity by surveying virus and phytoplasma disease damages to vineyards across the state.			\$ 23,033.00	\$ 0.00
*g Identify Disease-Causing Viruses and Phytoplasmas in Ohio				\$ *12,000.00
*h. Determine Statewide Distribution of Identified Pathogens				\$ *8,000.00

\*Indicates change 07/01/15.

*i. Assess Grape Production Losses Caused by these Pathogens				\$ *3,033.00
Plant Pathology Total	\$ 15,119.00	\$ 15,533.00	\$ 23,033.00	\$ *23,033.00
3. Entomology Section to be awarded after 08/01/12.	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
a. Develop more effective scouting protocols and pest management strategies to control invasive pests in Ohio vineyards, including but not limited to Multi-Colored Lady Asian Beetle, Marmorated Stink Bug, Spotted Wing Drisophila and European Berry Moth.	\$ 14,608.00	\$ 20,214.00	\$ 20,214.00	\$ 0.00
b. Evaluate Movento for control of grape scale.	\$ 4,804.00	\$ 2,000.00	\$ 2,000.00	\$ 0.00
c. Evaluate Movento and leverage for annual and long term control of grape phylloxera.	\$ 4,804.00	\$ 2,000.00	\$ 2,000.00	\$ 0.00
d. Statewide systematic monitoring of Spotted Wing Drosophila (SWD), comprehensive training of growers in SED monitoring and identification, and insecticide efficacy studies of SWD.	\$ 0.00	\$ 5,000.00	\$ 5,000.00	\$ 0.00
*e. Monitoring and Managing Invasive Pests in Ohio Vineyards				\$ *13,000.00
*f. Evaluating Admire Pro, Movento and Leverage for Control of Grape Phylloxera				\$ *6,000.00
*g. Monitoring and Management of Japanese Beetles				\$ *3,000.00
*h. Grower Outreach and Consultation				\$ *1,714.00
*i. Midwest Small Fruit and Spray Guide Development				\$ *500.00
Entomology Total	\$ 24,216.00	\$ 29,214.00	\$ 29,214.00	\$ *24,214.00
4. Weed Science	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
a. Continue development of new and improved herbicides, alternative weed control techniques and weed management systems that will provide more efficient, cost effective and environmentally sound weed control in Ohio vineyards.	\$ 5,700.00	\$ 5,700.00	\$ 0.00	\$ 0.00

\*Indicates change 07/01/15.

b. Optimization of mobile detector deployment strategies for 2,4-D and dicamba drift.	\$ 0.00	\$ 6,500.00	\$ 6,500.00	\$ 0.00
*c. Improved weed control for winter-hilled vines			\$ 5,700.00	\$ *5,800.00
Weed Science Total	\$ 5,700.00	\$ 12,200.00	\$ 12,200.00	\$ *5,800.00
5. *Herbicide Detection	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
*a. Complete Weather Optimization of 2,4-D/dicamba Detection System				\$ *7,700.00
*b. Beta Field Deployment Trials of the 2,4-D Detection System in Vineyards				\$ *9,800.00
Herbicide Detection Total				\$ *17,500.00
Category Total	\$ 105,083.00	\$ 128,546.00	\$ 127,092.00	\$ *133,702.00
<b>3. Enology Research</b>				
1. Enology research focused on producing premium quality wine in Ohio:	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
a. Identify vinification practices in determining optimum procedures of enhancing varietal character.	\$ 13,037.00	\$ 9,567.40	\$ 7,729.00	\$ 0.00
b. Investigation of new yeast and bacteria strains in producing higher quality and more complex wines.	\$ 6,520.00	\$ 7,653.40	\$ 0.00	\$ 0.00
c. Emphasis on aromatic volatile research by optimizing the GC/MS.	\$ **	\$ **	\$ 0.00	\$ 0.00
d. Investigation of new techniques of controlling both chemical and microbial wine stability.	\$ 8,691.00	\$ 0.00	\$ 0.00	\$ 0.00
e. Effect of tannin addition on Cabernet Franc and Chambourcin wine quality		\$ 13,085.40	\$ 0.00	\$ 0.00
f. Effect of hyperoxidation on Riesling and Pinot Gris wine quality.		\$ 4,894.40	\$ 0.00	\$ 0.00
g. Effect of oxygen management on terpene and ester levels in white wines		\$ 15,810.00	\$ 24,734.00	\$ 0.00
*h. Best Viticultural Practices		\$ 5,930.00	\$ 10,821.00	\$ *7,480.00
*i. Varietal Wine Evaluation (OARDC, AARS and OSU South Center)				\$ *10,472.00
*j. Effects of Hyper-oxidation on Terpene and Ester Levels in Riesling				\$ *23,935.00

*k. Research Studies and Varietal Wine Production for Extension Purposes				\$ *17,813.00
Enology Research for Premium Quality Wine	\$ 28,248.00	\$ 48,874.00	\$ 43,284.00	\$ *59,700.00
2. Collaborative Enology research focused on enhancing both grape and wine quality for Ohio:	<b>Year 1 Cost</b>	<b>Year 2 Cost</b>	<b>Year 3 Cost</b>	<b>Year 4 Cost</b>
a. Evaluate cultural practices in the vineyard that optimize vine performance and fruit quality for wine quality enhancement.	\$ **	\$ **	\$ 0.00	\$ 0.00
b. Evaluate clones and rootstocks of existing and newly introduced varieties for enhancing wine quality (e.g. Cabernet franc, Riesling, Gamay noir, etc.)	\$ **	\$ **	\$ 0.00	\$ 0.00
c. Evaluate newly released varieties and advanced selections for grape and wine quality in Ohio. Varietal wine production for extension presentations and functions.	\$ 6,519.00	\$ 7,653.40	\$ 18,551.00	\$ 0.00
d. Develop standards of fruit maturity for varietals in Ohio in the production of premium wine.	\$ 4,345.00	\$ 0.00	\$ 0.00	\$ 0.00
e. Work with other disciplines involving Entomology, Plant Pathology and Weed Ecology on possible studies effecting wine quality	\$ ***	\$ ***	\$ 0.00	\$ 0.00
Enology Research to Enhance Grape and Wine Quality	\$ 10,864.00	\$ 0.00	\$ 0.00	\$ 0.00
<b>Category Total</b>	<b>\$ 39,112.00</b>	<b>\$ 64,594.00</b>	<b>\$ 61,835.00</b>	<b>\$ *59,700.00</b>
*Commercial Expansion of New Varieties to Ohio			\$ 1,500.00	\$ *2,800.00
<b>Grand Total</b>	<b>\$ 316,911.00</b>	<b>\$ 382,733.00</b>	<b>\$ 393,854.00</b>	<b>\$ *398,981.00</b>

All costs must be in U.S. Dollars.  
 The State will not be responsible for any costs not identified.  
 There will be no additional reimbursement for travel or other related expenses.

CONTRACTOR INDEX

CONTRACTOR AND TERMS:

BID CONTRACT NO.: CSP900113-1



678 (address 48)  
The Ohio State University  
Office of Sponsored Programs  
1960 Kenny Road  
Columbus, OH 43210-1063

TERMS: Net 30

CONTRACTOR'S CONTACT:

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\*Indicates change 07/01/15.

SUMMARY OF AMENDMENTS

Amendment Number	Effective Date	Description
9	07/01/15	To renew the contract for an additional twelve (12) months, effective July 1, 2015 through June 30, 2016, change the Administrative/Fiscal Contact and update the Cost Summary for FY16.
8	10/27/14	To change the expiration date of the contract and to add the mutually agreed-upon provision regarding equipment.
7	08/01/14	Issued to renew the contract for an additional twelve (12) months, effective August 1, 2014 through July 31, 2015. In addition, this amendment is issued to include budgeted projects for FY15 for this contract; and, an update to the Contractor's contact.
6	07/01/14	To renew the contract for an additional twelve (12) months, effective July 1, 2014 through June 30, 2015.
5	07/19/13	To add new projects, update the budget amounts with FY14 funding and re-paginate the document.
4	08/24/12	To correct the FY13 totals for Viticulture Research and Grand Total and to correct the OAKS vendor address code.
3	08/08/12	To add the Entomology costs and include these costs in the Grand Total amounts.
2	07/13/12	To correct Weed Science and Grand Total amounts for Years 1 and 2.
1	07/06/12	To correct Grand Total amount in Year 1 and Plant Pathology Total, Viticulture Research Category Total and Grand Total amounts in Year 2.