Index No.: AGR010
Contract No.: CSP900113
Eff. Date: 8/1/14

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. 7

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 6 through 16 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 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.

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
birch.15@osu.edu

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

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

CONTRACT NUMBER: CSP 900113

EFFECTIVE DATES: 07/01/12 TO 07/31/14
* Renewal through 07/31/15

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

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

http://www.ohio.gov/procure

*Indicates change 08/01/14.

*MUTUALLY AGREED-UPON PROJECTS FOR FY15

1. Viticulture: Progress on Current Projects and Future Plans for FY 15 {1July 2014- 30 June 2015)

The polar vortex has provided an ideal opportunity to evaluate the impact of the different cultural practices on winter damage. Thus, the information will be valuable to Ohio growers. All varieties from the currently funded projects by OGIC were evaluated for winter damage. Due to the frequent freeze events, the Contractor evaluated some varieties more than once. The Contractor also evaluated cane damage which is not typical. The data collected on bud and cane damage helped determine the type of pruning to use this spring. All vines were pruned according to the extent of damage and pruning weights were recorded on all varieties in both locations. With the exception of Best Viticulture Practices (BVP) project, it is anticipated that all remaining projects will be terminated at the end of the fiscal year.

A. Development and Evaluation of Crown Gall-Free (Agrobacterium vitis) Riesling, Chardonnay, and Cabernet franc Grapevines (Kingsville and Wooster):
Principal Investigators: Imed Dami, Diane Kinney
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

This winter, canes were sampled from each variety in both locations to determine percent bud damage. In March, canes were hedged back to 5-bud spurs. In April, vines were hedged back to the cordon due to high percentage of bud death. The Contractor will also evaluate and record the extent of cordon and trunk damage. Of significant importance, the Contractor will evaluate crown gall incidence during the summer. This trial will answer the question whether clean vines (free from Agrobacterium vitis) have less winter injury than standard nursery vines; and whether clean vines recover quicker than non-clean nursery vines.

B. Evaluation of Different Training Systems for Cabernet Franc (Kingsville):
Principal Investigators: Imed Dami, Diane Kinney
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

Vines were pruned in April down to the cordon. Vines will be maintained and trained according to the specific system. This summer, additional data will be collected to assess trunk damage to evaluate differences among training systems. Even though there will be a significant crop loss, the Contractor will collect yields (if any) to see if there are differences among the training systems.

C. Evaluation of Vinifera Winegrape Varieties (Kingsville and Wooster):
Principal Investigators: Imed Dami, Diane Kinney, Todd Steiner
Collaborators: Shouxin Li, Greg Johns, Yvonne Woodworth, Part-time students

The block in Wooster was pruned back to 5-bud spurs in late March. During spring, vines were hedged back to the cordon due to high bud damage. Varieties that sustained >80% cane damage were further pruned as follows: 2/4 vines per panel, trunks were cut 10" above the graft union. The remaining 2 will be left intact. This includes all but Gamay noir, Kerner, Pinot noir precoce, Regent, and Siegerrebe in Kingsville. Varieties that were pruned back in Wooster include Arneis, Dolcetto, Durif, Malbec, Merlot, SB7 and SB14. The Contractor will also evaluate and record the extent of cordon and trunk damage. Of significant importance, the Contractor will evaluate crown gall incidence during the summer.

D. ClonalEvaluation of Cabernet Franc (Kingsville):
Principal Investigators: Imed Dami, Diane Kinney
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

Vines were pruned back to the cordon in April. Since this plot is located at AARS in Kingsville, Greg Johns, Yvonne Woodworth,and part-time staff will maintain this plot. The Contractor will evaluate and record the extent of cordon and trunk damage. Of significant importance, the Contractor will evaluate crown gall incidence during the summer. After this freeze, we may identify one or more clones that are more cold-hardy than the industry standard clone #1.

E. Winter Protection of Grapes Using Abscisic Acid (ABA): Principal
Investigator: Imed Dami, Shouxin Li
Collaborators: Greg Johns, Yvonne Woodworth, and Matt Meineke (M Cellars)

Vines were pruned back to the cordon in Pinot gris at AARS in Kingsville. Of the chardonnay grown at M Cellars in Geneva, 2 of the 4 vines/panel were pruned to 5-bud spurs and the remaining 2 vines/panel were pruned completely down to the cordon. Despite the extensive damage to buds, the Contractor will evaluate the cordon and trunk damage and see if ABA improved trunk hardiness. The Contractor will evaluate whole vine damage this summer. This is Shouxin Li"s project and she will complete it this fall. If ABA proves effective it would provide growers owning small to medium size vineyards with a cost-effective alternative to protect their vines from cold injury vs. installing expensive wind machines.

*Indicates change 08/01/14.

F. Best Viticulture Practices (Kingsville and Wooster):
Principal Investigators: lmed Dami, Thomas Todaro
Collaborators: Greg Johns, Yvonne Woodworth, Todd Steiner

Vines were pruned back to the cordon in Pinot gris at AARS in Kingsville and in Cabernet franc in Wooster research vineyards during April. Thomas Todaro, graduate student, is working on this project. The first- year findings were presented by Dami at the Winter Grape School in March. Part of this project will be to develop video clips for educational purposes. Dami and Todaro will produce new videos in 2014. Thomas will also analyze the 2013 berry samples (currently frozen) for flavor compounds. He will also be involved with the sensory evaluation of the different treatments from the 2013 wines made by Steiner. A cost analysis of the different treatments will be developed. Due to vine damage and crop loss, the Contractor will not be able to repeat the experiment in 2014.

2. Viticulture: New Projects for FY 15 {July 1, 2014 – June 30, 2015)

A. Cordon and Trunk Management Trial:
Principal Investigators: lmed Dami, Diane Kinney, Thomas Todaro
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

Since most vinifera varieties sustained nearly 100% bud damage, it is likely many also sustained cordon and trunk damage. However, the Contractor will not know until spring when growth resumes. Managing damaged trunks is one of the most difficult decisions growers face with many questions: is the trunk dead? Is it alive? Is it only injured and if so will it recover? When to cut it and how much? Do I do double prune trunks, etc? The Contractor proposes to set up a trial that will address all those questions. The goal is to have answers to those questions at the end of the trial. Findings will be useful to growers during the season and will be utilized in the future in case this event occurs again.

Trunk management: The trial will be set up at the OSU research vineyards and collaborating commercial vineyards. Trunks will be cut (or left intact as control) at different heights and different times (before budbreak and after growth resumption in the spring). Vines will be evaluated for winter damage during spring and summer including cordon and trunk damage. Assessment of crown gall will also be recorded. Multiple trips to sites will be required to conduct these tasks. These visits will also provide opportunities to interact with growers and provide them with recommendations as the season progresses. Thus, these trials will serve an outreach purpose as well.

B. Rootstock and Clonal Evaluation Trial:
Principal Investigators: lmed Dami, Diane Kinney, Thomas Todaro
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

The effect of rootstock on scion cold hardiness has been debated for years. Research in the 1980's showed no difference among rootstocks when buds were tested in the lab. However, field observations "anecdotally" showed a rootstock effect. The Contractor will take this opportunity (first since 1994) to assess rootstock effect in our research vineyards as well as some commercial vineyards that have multiple rootstocks for the same variety. Vines will be evaluated for winter damage during spring and summer including cordon and trunk damage. Growth resumption and any yield will be recorded for each rootstock.

C. Pruning Decisions in Hybrids Trial:
Principal Investigators: lmed Dami, Diane Kinney, Thomas Todaro
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

The OSU Viticulture Program developed and shared new pruning strategies for most grape varieties from research conducted after the 2009 freeze event. The strategies were developed for most varieties that have non-fruitful base buds including vinifera and American varieties. However, many hybrids have fruitful base buds and pruning strategies should be different to account for that. Unlike in 2009, most hybrids have been damaged in 2014. Applying the best pruning method is critical to restore crop production at a minimum cost. The Contractor proposes to conduct pruning methods of the most damaged hybrid varieties as follows: adjusted spur pruning, hedging, and complete cane pruning back to the cordon. The latter would be the most straightforward and easiest to manage and cheapest, but may not be the most appropriate for that specific variety. Pruning methods will be applied this spring. Winter damage will be assessed during spring and summer including cordon and trunk damage. Growth will also be evaluated and yield will be recorded for each pruning type.

D. Sucker Management Trial:
Principal Investigators: lmed Dami, Diane Kinney, Thomas Todaro
Collaborators: Greg Johns, Yvonne Woodworth, Part-time students

Trunk damage will be more apparent when growth resumes in the spring. One of the signs of trunk damage is vine suckering. Basically, vines throw many suckers at the base of trunks. What is the best way to manage suckers? Do we retain two or more suckers per vine? Do we sucker young vines the same way as older vines? Do we remove more suckers later in the season? Is it economical to train suckers the same year? The Contractor proposes to set up a trial that will address all those questions and the findings will be utilized by growers during the same season and in the future in case this event occurs again. The Contractor will retain different numbers of suckers for young and older vines and will apply different training methods by removing the excess of suckers during the summer and actively train them or not throughout the growing season. In year 2, the Contractor will observe and record how vines recovered from the different treatment and identify the best sucker management method. This trial will be conducted on vinifera since they sustained the most damage.

E. Commercial Vineyards Trials:
Principal Investigators: lmed Dami, Diane Kinney, Thomas Todaro
Collaborators: Greg Johns, Yvonne Woodworth, Gary Gao, Part-time students, and grape growers

In collaboration with commercial vineyards, the Contractor will try to answer all management practices in one trial working with the most important varieties across different regions in Ohio, including hybrid varieties: Vidal Blanc (VL Chambourcin (CHBL Traminette (TRL Valvin Muscat (VML and Frontenac (FR); and vinifera varieties: Riesling (RSL Chardonnay (CH), Cabernet franc (CFL Pinot Noir (PNL Pinot Gris (PGL Cabernet Sauvignon (CSL and Gewurztraminer (GW).

3. Viticulture: Extension Proposal

A. On-Going Extension and Outreach Activities:

Weed Science Extension Plan A. This project addresses the major new 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. The first step that will occur in 2013/2014 will be to develop a plan to link findings relative to spray drift risk to major educational programs that train grain farmers and custom applicators. Curriculum development will be in concert with agronomic team members who are a part of this proposal. Program delivery will begin in the winter training season of 2013/2014. Outreach materials will include PowerPoint slide presentations and script, narrative for inclusion in bulletins used by farmers and custom applicators. A fact sheet relative to grape growers will be prepared, as will one specific to custom applicators and private applicators spraying grain.

The Contractor will continue to provide extension deliverables to the Ohio grape and wine industry. The core program deliverables include:
1) Ohio Grape & Wine Conference,
2) Hands-on workshops with relevant topics,
3) OGEN, and
4) Extension publications (e.g. Factsheets).

B. New Extension and Outreach Activities:

1) Workshops on managing winter-damaged vines: The OSU Grape Team will organize and present workshops at the growers' and research sites during the 2014 growing season and next year.

2) Grape and Wine Field Day on August 13, 2014 at the AARS. Dami is co-organizing the event with Greg Johns and will present as well. As a result of the winter damage, the focus of the field day will be to demonstrate vineyard equipment for hilling-up. Dami will present an update on winter damage and demonstrate different ways of managing damaged vines in the research vineyards at AARS.

3) 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.

4) 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 almost 10 years. Dami will devote time and effort to revise this extremely valuable source for Ohio grape and wine producers. All chapters will be revised and new chapters will be added.

5) Program Website: Dami has been working on the content of the new website with the CFAES CommTech Office. Due to the unplanned freeze events and subsequent re-prioritization of research and extension activities since January, the website roll-out has been postponed to a later date this year.

4. Viticulture: Production Proposal

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. 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, the Contractor identified more than two dozen varieties that performed well and thus have been recommended. Several educational programs (conferences, workshops, and field days) were presented to discuss these varieties with wine tasting. In order to further promote these varieties, maximize their exposure to growers and wine makers, and encourage their expansion, the Viticulture Program proposes to engage in a partnership with OGIC to promote planting varieties new to Ohio through a cost-share program.

Procedures

Regions and Varieties: During the first phase of the project, the Contractor proposes to identify interested growers from the three (3) main regions in Ohio: north, central, and south. More growers will be solicited from sub- regions in the subsequent phases. To maximize the success of the program and its impact and benefits, different types of grapes will be utilized, i.e. cold hardy and cold sensitive, red and white varieties, long- and short-growing season). A list of selected varieties (subject to update) includes the following:

Cold hardy varieties (survive -15F or lower): Frontenac (R), Marquette (R),Arandell (NY 9S](R), Frontenac gris (W), laCrescent (W), Aromella [NY 76.0844.24] (W), NY 81.0315.17 (W),NY 84.0101.04 (W).

Cold tender varieties (survive -10F or higher): Gamay noir (R), Regent (R), Syrah (R), Teroldego (R), Arneis (W), Siegerrebe (W),Malvasia (W),Sauvignon blanc (W).

Vine Order and Planting: Once vineyards-wineries are identified, variety selection will be made for each region. Dr. Dami will provide recommendations on the best suited varieties for the region and vineyard. Varieties will be ordered in the fall of 2014 and planting will take place in the spring of 2015. A minimum of 2 varieties (25 vines each) per vineyard will be planted. The number of vines per variety is large enough to produce fruit for small-batch wines. Dave Scurlock will assist with vine delivery to growers and follow- up recommendations on vine establishment and care.

Outcomes and Benefits

A. Some varieties may perform better in growers' vineyards than in the original research site
B. Develop niche market of locally-grown and well-adapted varieties
C. Promote new varieties and wines in sub-regions of existing grape growing regions
D. Expand grape planting and production by improving variety-site matching
E. Develop new AVAs in Ohio.
F. Diversify variety planting to minimize the risks of biological (diseases, insects) and environmental (e.g. winter damage) threats.

5. Weed Science: Improved Weed Control for Winter-Hilled Vines

For vinifera grapes the winter-hilling and removal of the hill in spring complicates weed control. This occurs because of repeater mixing of soil that on one hand degrades herbicide activity and on the other increases weed growth. Further removal of the hill in the spring exposes crop roots that may be directly exposed to spring herbicide applications. Selection of herbicides along with the rates and timing of application are critical considerations within the hilling system.

This project, located at OARDC in Wooster was started in the fall of 2013. Vines were hilled prior to herbicide application. Herbicides applied after hilling were Alion, Chateau, Karmex, Princep, Casoron,and Matrix. Weed control and crop vigor were rated in these plots in spring of 2014. Hills will be removed and one-half of each plot will sprayed again with identical herbicides to determine if applications that come in direct contact with exposed roots result in crop injury. A second set of "spring-herbicide only" plots (not treated with herbicide in the fall) will be sprayed with the same herbicides once the hill is removed. This will allow a three-way comparison of herbicide applied in the fall, to herbicide application in both fall and spring, to herbicide application in spring only. Yield and pruning weights will be recorded in addition to visual assessments of weed control and crop injury. This experiment will be repeated in 2014/ 2015.

6. Plant Pathology: Sustain Ohio Grapevine Productivity by Surveying Virus and Phytoplasma Disease Damages to Vineyards Across the State.

The goal of the proposed project is to determine for the first time the identities of common viruses and phytoplasmas present in Ohio grapevines, map their distributions across Ohio, and assess the severity of diseases caused by each of the viruses through a comprehensive field survey. Such a survey is needed in Ohio as virus and phytoplasma problems have already been found to cause serious yield losses to wine grapes in other states and areas, including California, Missouri, New York, Pennsylvania, and Virginia. More importantly, the grapevine leafroll disease, caused by Grapevine leafroll-associated viruses (GLRaVs), was recently confirmed in two Ohio vineyards (Han, Elllis, and Qu, Plant Disease, 2014, in press). In addition, the grapevine yellows disease caused by phytoplasmas was also observed in a number of Ohio vineyards by Dr. Dami (unpublished). Finally, the risk of a new disease caused by Grapevine red blotch-associated virus (GRBaV), recently reported in California and New York, also warrants urgent assessment.

7. 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.

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

*Indicates change 08/01/14.

*Viticulture Total	$ 60,048.00	$ 71,599.00	$ *62,465.00
h. Plant Pathology	**Year 1 Cost**	**Year 2 Cost**	**Year 3 Cost**
a. Evaluation of currently available and experimental fungicides	$ 3,023.80	$ 3,106.60	$ 0.00
b. Collect infected grape canes and document pycnidia formation and sporulation	$ 3,023.80	$ 3,106.60	$ 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
d. Determine the effects of dormant applications of a potential substitute for Liquid Lime Sulfur (Sulforix) 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
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
*f. Sustain Ohio grapevine productivity by surveying virus and phytoplasma disease damages to vineyards across the state.			$ *23,033.00
*Plant Pathology Total	$ 15,119.00	$ 15,533.00	$ *23,033.00
i. Entomology Section to be awarded after 08/01/12.	**Year 1 Cost**	**Year 2 Cost**	**Year 3 Cost**
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
b. Evaluate Movento for control of grape scale.	$ 4,804.00	$ 2,000.00	$ *2,000.00
c. Evaluate Movento and leverage for annual and long term control of grape phylloxera.	$ 4,804.00	$ 2,000.00	$ *2,000.00
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
*Entomology Total	$ 24,216.00	$ 29,214.00	$ *29,214.00

*Indicates change 08/01/14.

j. Weed Science	Year 1 Cost	Year 2 Cost	Year 3 Cost
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
b. Optimization of mobile detector deployment strategies for 2,4-D and dicamba drift.	$ 0.00	$ 6,500.00	$ *6,500.00
*c. Improved weed control for winter-hilled vines			$ *5,700.00
*Weed Science Total	$ 5,700.00	$ 12,200.00	$ *12,200.00
*Category Total	$ 105,083.00	$ 128,546.00	$ *127,092.00
3. Enology Research			
1. Enology research focused on producing premium quality wine in Ohio:	**Year 1 Cost**	**Year 2 Cost**	**Year 3 Cost**
a. Identify vinification practices in determining optimum procedures of enhancing varietal character.	$ 13,037.00	$ *9,567.40	$ *7,729.00
b. Investigation of new yeast and bacteria strains in producing higher quality and more complex wines.	$ 6,520.00	$ *7,653.40	$ 0.00
c. Emphasis on aromatic volatile research by optimizing the GC/MS.	$ **	$ **	$ 0.00
d. Investigation of new techniques of controlling both chemical and microbial wine stability.	$ 8,691.00	$ *0.00	$ 0.00
e. Effect of tannin addition on Cabernet Franc and Chambourcin wine quality		$ 13,085.40	$ 0.00
f. Effect of hyperoxidation on Riesling and Pinot Gris wine quality.		$ 4,894.40	$ 0.00
g. Effect of oxygen management on terpene and ester levels in white wines		$ 15,810.00	$ *24,734.00
j. Best Viticultural Practices		$ 5,930.00	$ *10,821.00
*Enology Research for Premium Quality Wine	$ 28,248.00	$ 48,874.00	$ *43,284.00
2. Collaborative Enology research focused on enhancing both grape and wine quality for Ohio:	**Year 1 Cost**	**Year 2 Cost**	**Year 3 Cost**
a. Evaluate cultural practices in the vineyard that optimize vine performance and fruit quality for wine quality enhancement.	$ **	$ **	$ 0.00

*Indicates change 08/01/14.

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
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
d. Develop standards of fruit maturity for varietals in Ohio in the production of premium wine.	$ 4,345.00	$ 0.00	$ 0.00
e. Work with other disciplines involving Entomology, Plant Pathology and Weed Ecology on possible studies effecting wine quality	$ ***	$ ***	$ 0.00
Enology Research to Enhance Grape and Wine Quality	$ 10,864.00	$ 0.00	$ 0.00
***Category Total**	**$ 39,112.00**	**$ 64,594.00**	**$ *61,835.00**
*Commercial Expansion of New Varieties to Ohio			$ *1,500.00
***Grand Total**	**$ 316,911.00**	**$ 382,733.00**	**$ *393,854.00**

*Indicates change 08/01/14.

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 (07/31/15)

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 08/01/14.

SUMMARY OF AMENDMENTS

Amendment Number	Revision Date	Description
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.