

Determining the Difficulties of Ornamental Horticulture Programs

A Senior Project  
presented to  
the Faculty of the Agricultural Education and Communication Department  
California Polytechnic State University, San Luis Obispo

In Partial Fulfillment  
of the Requirements for the Degree  
Bachelor of Agriculture Science

by  
Elizabeth Basham  
May, 2012

© 2012 Elizabeth Basham

## **Abstract**

The purpose of this senior project was to develop a survey to determine the difficulties that high school ornamental horticulture instructors were facing with their programs. Many schools throughout California have faced difficulties with their programs and have had to limit the offerings of the courses that would have been available to their students. Based upon the results from the survey it was determined that many of the instructors felt that their programs had been declining in success due to budget limitations, student involvement, standardized testing requirements and community support. The results of the survey can be utilized to aid the instructors so that their programs could be able to thrive with limited resources.

## Table of Contents

Abstract.....	1
List of Tables.....	4
List of Graphs.....	4
Chapter One- Introduction.....	5
Statement of the Problem.....	7
The Importance of the Project.....	7
Purpose of the Project.....	8
Objectives of the Project.....	8
Definitions of Important Terms.....	8
Summary.....	9
Chapter Two- Review of Literature.....	11
California State Teaching Requirements for Horticulture.....	11
Advantages of Having a High School Horticulture Program.....	15
Career Preparation for Students.....	16
Difficulties with Horticulture in the High School Setting.....	18
California Budget Issues for High Schools.....	19
Fundraising and Money Saving Techniques.....	20
Chapter Three- Methods and Materials.....	23
Population.....	24
Instrumentation.....	24
Data Collection.....	28

Data Analysis.....	29
Chapter Four- Results and Discussion.....	30
Results.....	31
Tables and Figures.....	31
Summary of Results.....	36
Discussion.....	36
Chapter Five- Conclusions and Recommendations.....	37
Conclusions.....	37
Recommendations.....	37
References.....	38
Appendices.....	40
Appendix A- Regional Supervisor Email.....	40
Appendix B- Instructor Email.....	41
Appendix C- Survey.....	42
Appendix D- CLFs.....	46

## **List of Tables**

Table 1- Response to survey question 8

## **List of Graphs**

Graph 1- Response to Survey Question 1

Graph 2- Response to Survey Question 2

Graph 3- Response to Survey Question 3

Graph 4- Response to Survey Question 4

Graph 5- Response to Survey Question 5

Graph 6- Response to Survey Question 6

Graph 7- Response to Survey Question 7

## **Chapter One**

### **Introduction**

Agriculture is a vital program to have in a high school setting since many students are not ever exposed to the types of things that they learn from that program. “Agricultural Education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems,” (“Agricultural education”). By having horticulture in the high school students are able to see their work grow before their eyes and learn how to be successful. Agriculture programs have different components in the school to help prepare students for their futures. A typical agriculture program may have horticulture, animal science, agricultural mechanics, science and agricultural business components.

Horticulture programs in high schools are utilized to provide students the introduction to the horticulture industry. Typically a horticulture program is a part of the agriculture department at a high school. The agriculture department at the high school level is then linked to the Future Farmers of America (FFA) program through its leadership and agriculture education components. For all agriculture programs to be successful they must incorporate the three circles of FFA. Those three circles must be equally used and they include: SAE (Supervised Agricultural Experience), leadership and classroom/ laboratory work. The three circles is an educational model used to balance the learning in an agriculture program. Horticulture is a great way to fulfill each of those three circles. By having a horticulture program established in the agriculture program a school will meet the classroom/ laboratory work with ease. Horticulture

has many hands on elements to gain the interests of students so that all types of learners can learn with it. Teachers are able to guide their students with many different instructional aides such as PowerPoint and video to show how techniques are done and to learn more about the topic that is addressed even when a field trip is not available due to lack of funds. The second circle that horticulture fulfills is that of the leadership circle. Students that are involved with the horticulture program area are able to develop their leadership skills through presentations, FFA activities and even plant sales. Leadership is an important skill that students need to build so that they can become successful in their future careers with or without horticulture. The third circle that horticulture fulfills is that of the SAE circle. Horticulture provides students with many individual activities that they can work on. By having a SAE horticulture project students can watch their work grow and practice those skills that they learned within the classroom. Horticulture SAE projects are typically much more affordable for students compared to that of a livestock project. This introduction to horticulture allows students the opportunities to become engaged in agriculture and make an interest in having it as a career.

After seeing the potential benefits of having a horticulture instructional cluster at a high school it should become clear that agriculture programs need to have them. Horticulture program areas are all unique and they are programs that can be custom fitted to fulfill the needs of each school. Sadly though even with the benefits many schools are cutting out their horticulture programs and many students are losing out on the learning opportunities that horticulture has to offer.

## **Statement of the Problem**

Because of the California State budgeting problems education is being hit hard and many programs are being cut out of schools. Horticulture is in danger of being removed from curriculums simply because many people in the communities feel that it is too costly and is something that is not included on the standardized testing which is where schools get a great deal of their funding. The problem is that teachers are feeling like they have to get rid of their horticulture programs due to their schools not being able to financially support them since their curriculum is not what is being tested upon for standardized testing and therefore is not eligible for state funding through those funding programs. A study needs to be done to find out how to get the high school agriculture teachers to save their horticulture programs.

## **The Importance of the Project**

This project will determine the challenges that are faced by the Ornamental Horticulture programs. High school agriculture programs will be able to generate an income with their program so that they can offer students more opportunities to learn by saving their horticulture instructional units. Also, by having a horticulture program, students will be able to interact with the community through community beautification projects and plant sales to further enrich the school's agriculture program. This project will be of use to others in the agriculture education field since it will discuss why ornamental horticulture instructors are having difficulties with their programs.

## **Purpose of the Project**

The purpose of this project is to survey high school ornamental horticulture instructors to determine their challenges in conducting an OH program.

## **Objectives of the Project**

1. To develop a list of horticulture instructors worth surveying from the Regional Supervisors.
2. To develop a survey for the ornamental horticulture instructors about their ornamental horticulture programs.
3. To discover what were the common difficulties teachers and their horticulture programs in California face, and provide the results to those who would be interested in the findings.

## **Definition of Important Terms**

- Horticulture: “the science and art of growing fruits, vegetables, flowers, or ornamental plants” (“Merriam Webster dictionary”)
- SAE: Supervised Agricultural Experiences- “project based on one or more SAE categories:
  - Entrepreneurship
  - Own and operate an agricultural business (e.g. a lawn care service, a pay-to-fish operation, holiday poinsettia production and sales.)
  - Placement

- Get a job or internship on a farm or ranch, at an agriculture-based business, or in a school or factory laboratory.
  - Research and Experimentation
  - Plan and conduct a scientific experiment. (e.g. Determine whether the phases of the moon affect plant growth, or test and determine the efficacy of different welding methods.)
  - Exploratory
  - Explore careers in agriculture by attending an agriculture career fair, or creating a report or documentary on the work of a particular agricultural profession,” (“Supervised agricultural experiences”)
- FFA: Future Farmers of America – a youth organization dedicated to building the future leaders in agriculture.
  - Hands on- a style of learning where the instruction is done using a variety of methods to engage the understanding and learning of the students through actually doing the work that has been discussed in the classroom (i.e. Planting herbs or hoof trimming on sheep)

### **Summary**

Horticulture in the high school agriculture program is a great way for students to receive hands on learning. Horticulture allows for students to prepare for future careers, and get involvement with the community. Students benefit greatly from having a horticulture program by getting to watch their work grow before their eyes. Horticulture programs in high schools are declining due to various issues that the instructors are facing.

This project will give teachers the insight to save money, develop opportunities for their students to earn money through their instructional program, and allow their students to thrive by getting to the source of their difficulties. The purpose of this project is to determine from the experts in the field the reasons as to why OH programs are struggling. The final outcome of this project is that there will be results from the survey that can be analyzed to determine the difficulties plaguing ornamental horticulture programs.

## **Chapter Two**

### **Review of Literature**

High school horticulture programs allow students to have the opportunities to learn the horticulture business when they might have never had the opportunity to do so due to their access to horticulture resources. “High school O.H. (ornamental horticulture) courses are focused upon two major objectives. One objective includes the very important task of helping students start to understand basic concepts, principles, practices, and mechanics of O.H. This should include an opportunity for introduction to not only the growing of plants, their processing and distribution, but also a thorough understanding of the business aspect. Some students use this initial preparation as a basis for job entry, while others base future occupational education upon it. The second objective is preparation focused upon direct entry into an occupation- either a specific job, or possibly more appropriately a cluster of jobs”. (Lassanske 1974, p. 74)

### **California State Teaching Requirements for Horticulture**

Instructors of horticulture must adhere by strict standards for their horticulture curriculum. For California they are put into place by the California Department of Education. The standards are broken down into the career pathway of ornamental horticulture. “The Ornamental Horticulture Pathway prepares students for careers in the nursery, landscaping, and floral industries. Topics include plant identification, plant physiology, soil science, plant reproduction, nursery production, and floriculture as well as landscaping design, installation, and maintenance”. (“California career technical,” 2006) The state teaching requirements are:

“F1.0 Students understand plant classification and use principles:

- F1.1 Understand how to classify and identify plants by order, family, genus, and species.
- F1.2 Understand how to identify plants by using a dichotomous key.
- F1.3 Understand how common plant parts are used to classify the plants.
- F1.4 Understand how to classify and identify plants by using botanical growth habits, landscape uses, and cultural requirements.
- F1.5 Understand plant selection and identification for local landscape applications.
- F2.0 Students understand plant physiology and growth principles:
  - F2.1 Understand plant systems, nutrient transportation, structure, and energy storage.
  - F2.2 Understand the seed's essential parts and functions.
  - F2.3 Understand how primary, secondary, and trace elements are used in plant growth.
  - F2.4 Understand the factors that influence plant growth, including water, nutrients, light, soil, air, and climate.
  - F2.5 Understand the tissues seen in a cross section of woody and herbaceous plants.
  - F2.6 Understand the factors that affect plant growth.
- F3.0 Students understand sexual and asexual plant reproduction.
  - F3.1 Understand the different forms of sexual and asexual plant reproduction.
  - F3.2 Understand the various techniques for successful plant propagation (e.g., budding, grafting, cuttings, seeds).
  - F3.3 Understand how to monitor plant reproduction for the development of a saleable product.
- F4.0 Students understand basic integrated pest management principles:
  - F4.1 Read and interpret pesticide labels and understand safe pesticide management practices.
  - F4.2 Understand how pesticide regulations and government agencies affect agriculture.
  - F4.3 Understand common horticultural pests and diseases and methods of controlling them.
  - F4.4 Understand the systematic approach to solving plant problems.
- F5.0 Students understand water and soil (media) management practices:
  - F5.1 Understand how basic soil science and water principles affect plant growth.
  - F5.2 Know basic irrigation design and installation methods.

F5.3 Prepare and amend soils, implement soil conservation methods, and compare results.

F5.4 Understand major issues related to water sources and water quality.

F5.5 Know the components of soilless media and the use of those media in various types of containers.

F6.0 Students understand ornamental plant nutrition practices:

F6.1 Analyze how primary and secondary nutrients and trace elements affect ornamental plants.

F6.2 Understand basic nutrient testing procedures on soil and plant tissue.

F6.3 Analyze organic and inorganic fertilizers to understand their appropriate uses.

F6.4 Understand how to read and interpret labels to properly apply fertilizers.

F7.0 Students understand the selection, installation, and maintenance of turf:

F7.1 Understand the selection and management of landscape and sports field turf.

F7.2 Understand how to select, install, and maintain a designated turf grass area.

F7.3 Understand how the use of turf benefits the environment.

F8.0 Students understand nursery production principles:

F8.1 Understand how to properly use production facilities and common nursery equipment.

F8.2 Understand common nursery production practices.

F8.3 Understand how to propagate and maintain a horticultural crop to the point of sale.

F8.4 Understand marketing and merchandising principles used in nursery production.

F9.0 Students understand the use of containers and horticultural tools, equipment, and facilities:

F9.1 Understand the use of different types of containers and demonstrate how to maintain growing containers in controlled environments.

F9.2 Operate and maintain selected hand and power equipment safely and appropriately.

F9.3 Select proper tools for specific horticultural jobs.

F9.4 Understand how to install landscape components and electrical land and water features.

F10.0 Students understand basic landscape planning, design, construction, and maintenance:

F10.1 Know the terms associated with landscape and design and their appropriate use.

F10.2 Understand the principles of residential design, including how to render design to scale.

F10.3 Understand proper landscape planting and maintenance practices.

F10.4 Prune ornamental shrubs, trees, and fruit trees.

F10.5 Develop clear and concise landscape business contracts.

F11.0 Students understand basic floral design principles.

F11.1 Understand the use of plant materials and tools.

F11.2 Apply basic design principles to products and designs.

F11.3 Handle, prepare, and arrange cut flowers appropriately.

F11.4 Understand marketing and merchandising principles used in the floral industry”.

("California career technical," 2006)

Another resource that teachers must utilize in order to meet the standards is the California Agriculture Core Curriculum- Ornamental Horticulture. Ornamental horticulture is placed in the advanced clusters section of agricultural topics for curriculum. These are called CLFs and they are the curriculum guides for teachers to go by in order to achieve the requirements for the state standards. These curriculum CLFs for ornamental horticulture are:

(CLF6100) BOTANICAL CLASSIFICATION

(CLF6150) PHOTOSYNTHESIS AND RESPIRATION

(CLF6200) PHYSIOLOGY AND GROWTH

(CLF6250) SEXUAL AND ASEXUAL PROPAGATION

(CLF6300) DISEASES AND PESTS OF ORNAMENTAL PLANTS

(CLF6350) ELEMENTS NECESSARY FOR PLANT GROWTH

(CLF6400) HORTICULTURAL SOILS & PLANTING MEDIA

(CLF6450) IRRIGATION AND DRAINAGE  
(CLF6500) SELECTION, PLANTING, AND CARE OF ORNAMENTAL PLANTS  
(CLF6550) PRUNING AND TRAINING ORNAMENTAL PLANTS  
(CLF6600) GROWTH AND MAINTENANCE OF NURSERY STOCK  
(CLF6650) FLORICULTURE AND FLORAL DESIGN  
(CLF6700) LANDSCAPE DESIGN, CONSTRUCTION, AND MAINTENANCE  
(CLF6750) THE ORNAMENTAL HORTICULTURE INDUSTRY  
(“California core curriculum,” 2011)

A complete list of all of the CLFs can be found in Appendix D.

Agriculture instructors can easily access this information as to what the CLFs are all about on the CALAGED.org website. By using the CLFs the uniformity of the teaching material can be better obtained throughout the schools.

### **Advantages of Having a High School Horticulture Program**

The advantages of having a high school horticulture program are numerous. Horticulture programs allow for a connection between the students and the community through plant sales and community garden projects. Horticulture programs are great learning environments that allow for the students in the high school to learn how to make money from their hard work. It is also a great way for students that cannot afford a livestock Supervised Agriculture Experience (SAE) project to still be involved with their agriculture program and have a SAE project with horticulture. One of the largest benefits of having a high school horticulture program is preparation for the students' futures.

## **Career Preparation for Students**

When an instructor teaches the students about the different aspects of horticulture they are greatly aiding the students for career preparation in the horticulture industry. The instructors will be able to prepare the students for the following career areas teaching the standards of horticulture: “greenhouse personnel, nursery personnel, garden center personnel, ground maintenance personnel, golf course personnel and park personnel.” (Stuttgart Public Schools, n.d. , pg. 12) The responsibilities of these professionals are greatly reflected with the skills that students will learn in their horticulture program.

“Greenhouse personnel-

- o Help grow plants in a greenhouse consisting of heated glass, plastic or fiberglass.
- o May grow vegetables and or flowers.
- o May propagate trees from various means.
- o Help produce out of season vegetables, pot plants, bedding plants and outdoor plants.
- o Help prepare soils and containers for planting.
- o Sow seeds, start cuttings, transplant, water and prune.
- o Act as repairperson for greenhouse structure and equipment.

Nursery personnel-

- o Help grow seedlings and plants for landscaping, fruit farming and forest replanting.
- o Help prepare seedbeds, seedlings, clear weeds, cultivate, water, prune, spray and graft.
- o Pack plants for shipment.
- o Help with shrubs and trees.
- o Help repair buildings and equipment.

#### Garden Center Personnel-

- o Care for and move plants and supplies.
- o Arrange plants and supplies for displays.
- o Help in selling, cleaning, stocking and arranging supplies.
- o Care for plants.
- o Help customers with stock and give information about plants.

#### Ground Maintenance Personnel-

- o Care for an area surrounding a business-church, industry, etc.
- o Care for lawns and shrubs, mow yards, reseed, spray and plant.
- o Do minor repairs around building.

#### Golf Maintenance Personnel-

- o Care for overall maintenance of golf course.
- o Do some pruning, replace sod and do general repairs to building and equipment.
- o Use irrigation and drainage equipment, clean sand traps, change cup location and aerate the soil.

Park Personnel-

- o Maintain proper maintenance of the whole park.
- o Care for flowers, shrubs and lawns in the city parks.
- o Maintain the natural environment in state and national parks.
- o Will care for swimming pools, boat facilities, general maintenance, roads and trash removal.”

(Stuttgart Public Schools, n.d. , pg. 12-14)

There are countless career opportunities other than the ones discussed. Examples of those could be a florist or specialty crop grower that can take parts from these career pathways and utilize the skills learned by the students from the horticulture program.

**Difficulties with Horticulture in the High School Setting**

There are several different issues that a high school agriculture program can have with a horticulture instructional area. One issue is the proper management and direction of the program. It is important to have a dedicated instructor who is willing to put effort into the program so that time and money is not wasted. Another is getting motivation out of the students. This also falls

upon the instructor as a responsibility of having a program that will entice students to enroll in the various courses and maintain involvement of those students throughout their high school career. An additional issue is that of financial burdens. Having a successful horticulture program requires the funds to do so. Many schools and school districts are looking for ways to cut back on their expenses on the school. Unfortunately this means cutbacks in programs like agriculture and horticulture. It is important for the instructors of the program to stand up for their school's program in order for them to survive.

### **California Budget Issues for High Schools**

California is facing some of the worst budgeting issues nationwide. Cutbacks are being taken in all areas of government, industry and education. This is bad news for the education field. Schools are seeing more crowded classrooms. The quality of education for the students is suffering since funds for activities and labs are becoming nonexistent. Another issue that is arising is the need for higher tests scores being put upon teachers. Schools are focusing so much upon test scores that it is becoming all they care about for their students. STAR testing in California is one way how schools receive funding and it is becoming one of the main focuses in K-12 education. "The STAR test is a stressor for most students and teachers." (Amor, 2011) "Students are being set up for failure and punished by losing privileges. The impact on their self-esteem is great." (Amor, 2011) If these problems weren't bad enough, schools are having fewer days in the school year due to budget cuts. Many schools are cutting their school years short so that there are fewer days that they have to pay the teachers and administration staff. The amount of days proposed for schools is 175 days of instruction. This greatly puts California behind other states and even other countries. For example, South Korea has its students go to school for 220 days a year. This is bad news for preparing our youth for the future because students are getting

less and less time to prepare for testing and meeting the standards that they have to meet. This results in poorer test scores and even poorer opportunities for funding. “This critical setback could cost the state school system the hard earned educational gains it’s made over the last few years. In a state defined by advances in cutting edge technology, the education of future generations of Californians is critical to its future.” (Patterson, 2010) With all of these budgeting problems California schools must think of more ways to generate income to keep important programs like agriculture and horticulture running.

### **Fundraising and Money Saving Techniques**

There are many things that a high school agriculture teacher can do to make money for their school. One of the best ways to earn money for the school is to get the community involved through fundraising. Creativity is important for fundraising so that the efforts are new and unique to the department. An example of a common fundraising event is that of having a raffle or silent auction at the banquet. “Elk Grove FFA recently held its annual raffle fundraiser last week, with various prizes such as a one week stay at a Lake Tahoe Vacation resort, a California State Fair Prize Package, a one week-stay for your pet at Camp Bow Wow, and several gift cards to various businesses. Over 5,500 tickets were sold by students in the Elk Grove Chapter and it was a huge success thanks to student efforts and donations made by several local businesses.” (“Elk Grove FFA,” 2010) An event like the Elk Grove FFA raffle is a good way to get businesses and community members involved with the efforts of the agriculture department at the high school. There are many opportunities for the horticulture department to make profits as well. Plant sales are a common way that schools make funds. Plant sales teach the students how to market their plants and interact with the community. Some schools have the plant sales monthly, while others have them for special events. An example of what a high school does for their plant sales is what

Linden High School FFA did for their Fall Plant Sale. “Linden FFA Fall Plant Sale: Tuesday November 15 and Tuesday November 29 from 3-5 p.m. in the New greenhouse behind the CTE Building. Find a variety of plants to last through the winter months. Linden FFA Holiday Plant Sale: November 5-30th Linden FFA Members will be selling Poinsettia plants for the holiday’s. These plants make great gifts or are wonderful to decorate your homes for the holidays. This year we will be offering both Red and White Poinsettia’s.” (“Linden FFA plant,” 2011) By placing the information for the school’s plant sales on their school’s website they allow potential customers to learn when the events are taking place so that they can help out with the fundraising.

Another way to ensure that funds are available is to utilize money saving techniques. By creating time saving and money saving products teachers will be able to save more of their budget for purchasing other items. An example of a product that a school can make instead of having to buy is that of sticky cards. “Commercial growers use sticky traps to monitor (sample) the density of insect pests in large orchards. Knowing the density makes it possible to limit the number of times sprays or other controls are applied and thereby lowering expenses. Monitoring can also locate hot spots, that is, locations in orchards where there are higher numbers of insects, and from there the source of these infestations may be traced, such as a wild apple tree nearby. In more recent years some growers have started using sticky traps for complete control of insect pests such as the apple maggot fly, and reducing or eliminating the need for spraying insecticides.” (“Sticky traps”) These can be made by getting cue cards that are yellow to attract the most insects and covering them with Vaseline and laundry detergent. This can save a school a good amount of money since a pack of ten of these cards would cost \$7.00. (“Sticky traps”) By

using a little creativity and resources a high school horticulture program can be successful with utilizing money saving techniques.

## **Chapter Three**

### **Methods and Materials**

For an author to develop a handbook on how to have a successful horticulture program on a tight budget, it is important to hear from the instructors that are teaching in programs statewide. By hearing feedback from them will allow for their input into the handbook so that it can be best utilized by them. The first step of this project was to research what the issues that the ornamental horticulture instructors were facing with emphasis on how budget restrictions were affecting their schools. The second step of the project was to create a survey that could be sent out to instructors throughout the state of California. The questions were derived from doing research as to what was happening with ornamental horticulture in high schools statewide. The third step was to put this survey on surveymonkey.com so that the results could be posted immediately and easily accessed. The survey can be found in Appendix C. The fourth step was to email the regional supervisors for agriculture education in California. Their contact information was obtained from Mr. Greg Beard, a consultant for the California Department of Education-Agriculture Education Unit. The email asked the regional supervisors for the instructors they recommend for the survey. The email to the regional supervisors can be found in Appendix A. The fifth step was to email the survey to the ornamental horticulture instructors that the regional supervisors selected. The email to the instructors can be found in Appendix B. The sixth step was to collect the responses off of surveymonkey.com and determine the reasons why OH programs may be struggling. The final step was to email the results of the survey to the regional supervisors and to the instructors that completed the survey.

## **Population**

The sample that was selected for the project was high school ornamental horticulture instructors throughout California. They were selected by the regional supervisors for agricultural education program. The regional supervisors were asked to provide the information of the top three most successful instructors in their region for ornamental horticulture and three instructors that were struggling with their program. By having the responses from these groups of instructors the results would be the most complete. The top performing instructors would provide insight as to what made them successful, and the struggling instructors could share what was causing problems for them with their programs.

## **Instrumentation**

The survey that was created and placed on surveymonkey.com was an important collection tool for the information. The survey is found in Appendix C. The survey was made up of eight questions. Those questions were:

1. How involved are your students in your ornamental horticulture program?
  - Highly involved- most students participate in most Ornamental Horticulture activities
  - Somewhat involved- some students participate in a few OH activities
  - Minimally involved- students only participate in classroom activities

This question was of importance because it was necessary to determine how many students were involved with the horticulture programs in the way that they were being presented.

This also gave the idea of how the instructors felt about how involved their students were with their program.

2. What are some of the difficulties that your horticulture program faces? (select all that apply)

- Budget/ funding
- Student involvement
- None or outdated facilities
- Standardized testing requirements
- Access to supplies
- Support from school administration
- Other (please specify)

This question allowed the instructors to provide information on the troubles that their horticulture program was dealing with. These responses were based off of the information that was found in the research. By pinpointing the difficulties that instructors are facing the solutions to those problems would be able to be found.

3. Do you find standardized testing to interfere with the out of class horticulture activities that you would like to do with your students?

- Yes
- No

According to the research, standardized testing was an interference for instructors. This question helped to back up the research and was important factor to determine if instructors were having problems with standardized testing.

4. Do you find that your school has a limited budget for Ornamental Horticulture that keeps you from doing activities that you would like to with your students?

- Yes
- No

Budgeting was the main focus of this project and this question allowed for the instructors to respond as to how difficult it was to have their program with a limited budget. This question also was able to show how many of the instructors were facing budgets that were limiting their activities with their students.

5. Where do you receive most of your funding for your Ornamental Horticulture program?

- Community members/ local businesses
- Budgets
- State and Federal grants
- Fundraising

This question was important for the project so that fundraising could be looked at as a difficulty for the instructors. By seeing from the instructors what areas they received their funding from it allowed for a breakdown of the types of funding to see what were the ones that were harder to get for the instructors.

6. Is your horticulture program involved with the community? If so, how? (select all that apply)

- Event planning and wedding design
- Farmer's Markets
- Plant sales
- Community gardens
- Community clean-ups/ landscaping improvements
- Not involved with community
- Other (please specify)

Community involvement has been important for an ornamental horticulture program and there has been several different ways that a school could be involved in the community.

Community involvement also has allowed for the schools to get recognition and funding. This question allowed the instructors to share ways that they were involved with the community and how others could learn from them to be successful.

7. What type of things would you like to have in a handbook about having an ornamental horticulture program with a limited budget? (select all that apply)

- Fundraising ideas
- Overcoming budgeting obstacles
- How to get community support/ involvement
- How to have a successful ornamental horticulture program
- Things that every OH program needs to have to be successful
- SAE/ project ideas for student involvement

- Other (please specify)

This was a direct question for the instructors to respond to with what they would want to have in a handbook. This question was important so that the instructors could provide input on what would be useful for them in a handbook that could be created after the results of the survey.

8. In your opinion what is important to incorporate in your OH program to make it successful?

This was an open ended question that the instructors could respond to and share their experiences and opinions. This question is important because allowed the instructors to respond to what they felt was an important thing to have in an ornamental horticulture program. It allowed them to share what they like to do and have done with their program, even with the issues that they were facing.

### **Data Collection**

The first step that was taken to collect the data was to send out the initial email to instructors with the surveymonkey.com survey link on March 1, 2012. The second step that was taken was to resend out the link one week prior to the deadline of March 30, 2012. The data were collected on surveymonkey.com with the website's automatic collection and organization of data. The data were collected beginning March 1, 2012 and ending March 30, 2012. The data were collected by having the instructors submit their completed surveys to surveymonkey.com. The nature of the data were responses to the questions asked within the survey pertaining to the information that would be placed within the handbook. After the data was collected it was compiled and sent out to the participating instructors and regional supervisors. This data determined some of the difficulties the teachers were facing trying to manage OH programs.

## **Data Analysis**

The data were collected by the researcher, and placed within the findings report, which was the desired outcome of the project. The data were interpreted with the method of a table which can be found in Table 1. All of the respondents were included in the data analysis as long as they had submitted the survey onto the surveymonkey.com website. The responses to the survey allowed for determination to be made as to what the main issues that ornamental horticulture instructors were facing within their OH programs.

## **Chapter Four**

### **Results and Discussion**

The data that was collected was done so using the survey method on surveymonkey.com so that it would be quick and easy to use for the ornamental horticulture instructors. The instructors were sent an email with a link to the survey where they could complete the survey. The researcher gave the instructors one month to complete the survey. After all of the responses were collected on the website, and the researcher put them together on pie charts. All of these sources of data were collected and considered for input into the booklet.

#### **Results**

All of the results from the data collected have been placed within a series of tables and bar charts showing accurately the amounts of responses for each piece of data. The survey was broken down into eight pie charts to show the responses for each selection available. (Figures 1 through 8), responses from 15 of 20 instructors (75% response rate) were recorded to determine the difficulties that the instructors were dealing with.

## Tables and Figures

Figure 1 - Response to survey question 1

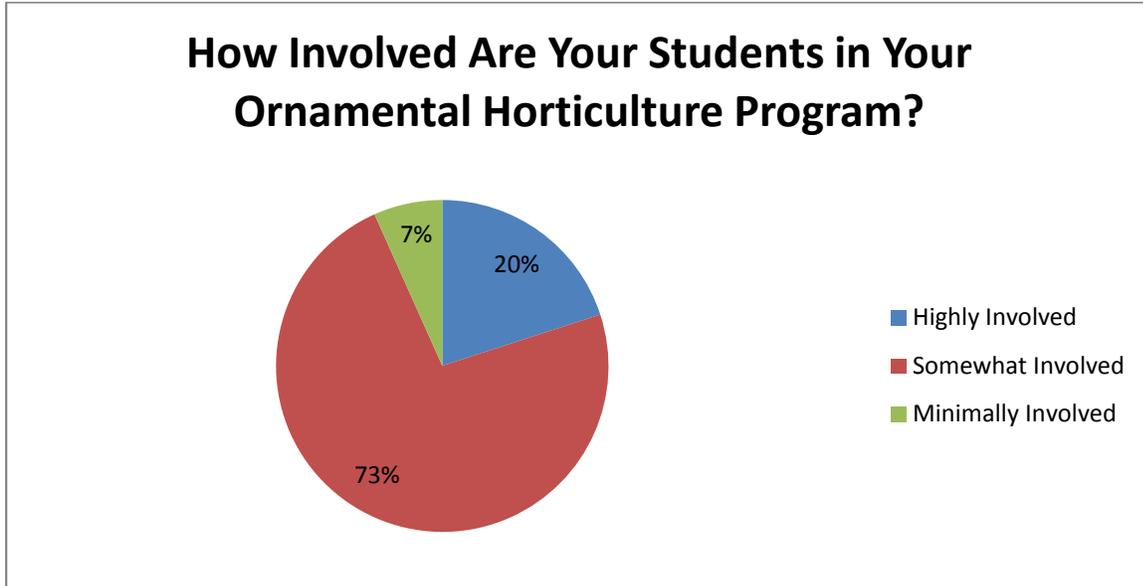


Figure 2 - Response to survey question 2

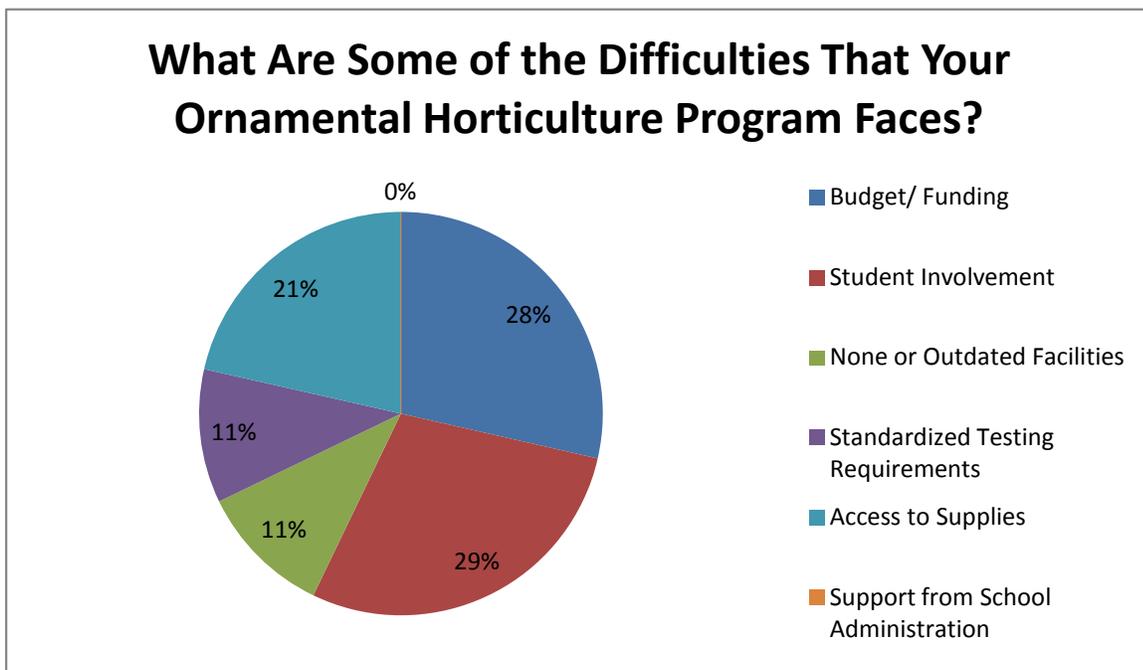


Figure 3 - Response to survey question 3

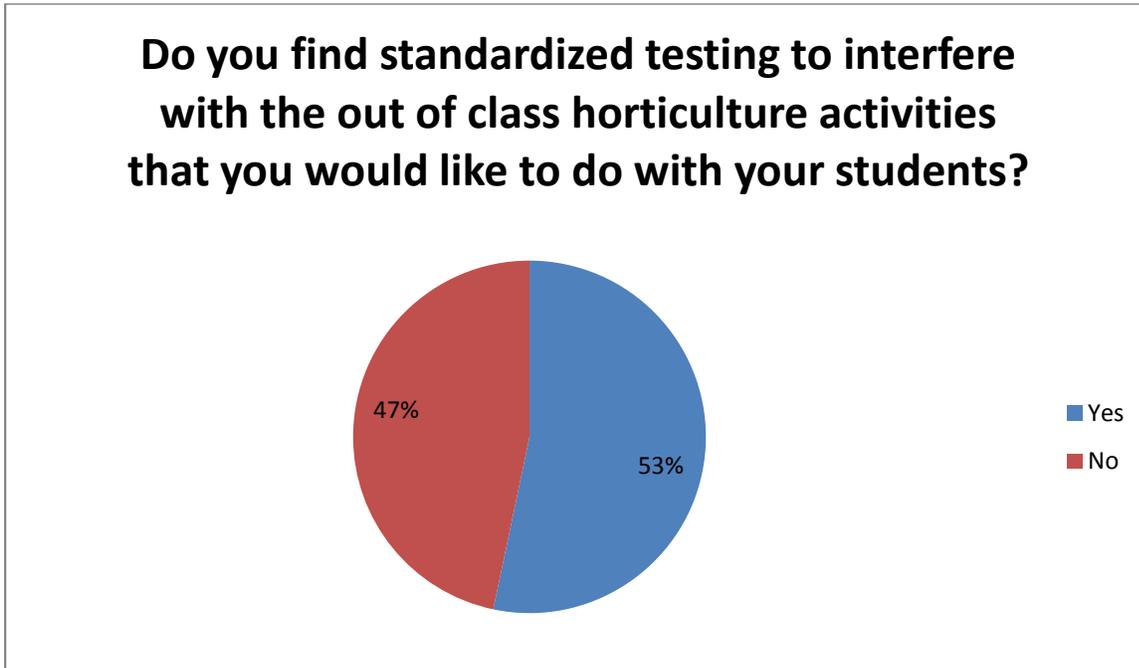


Figure 4 - Response to survey question 4

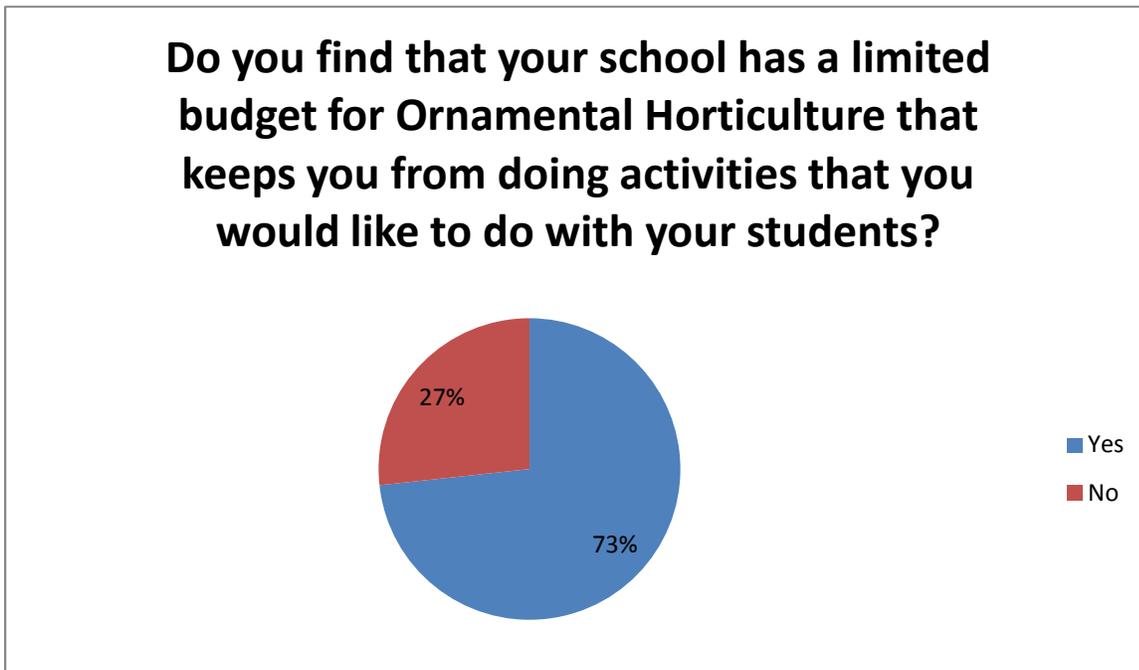


Figure 5 - Response to survey question 5

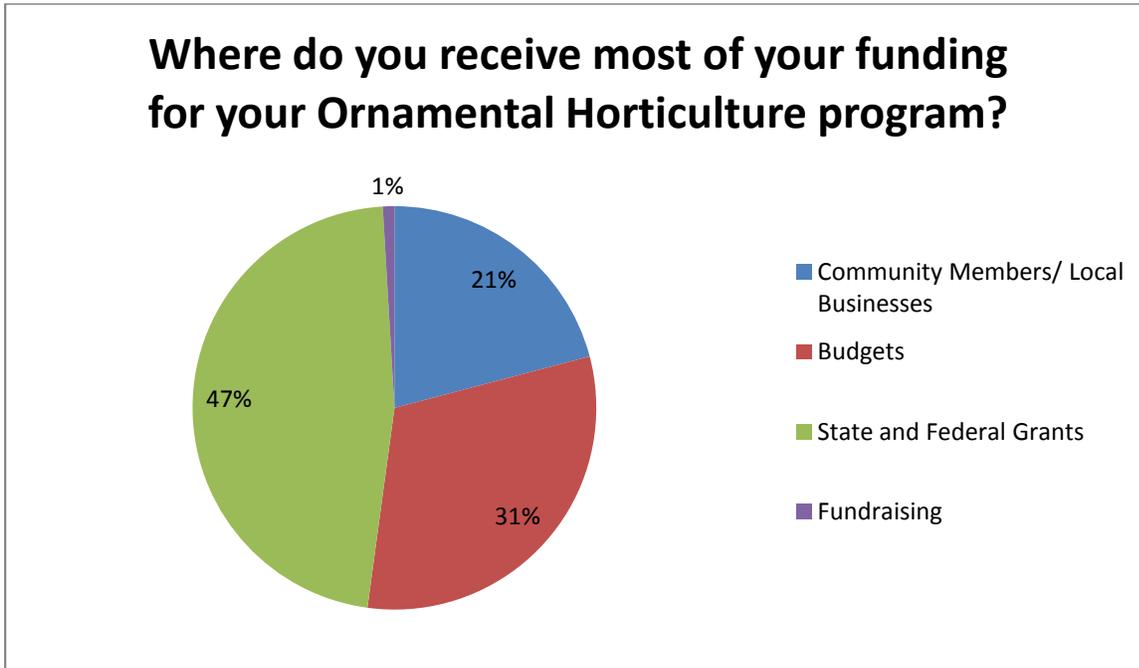


Figure 6 - Response to survey question 6

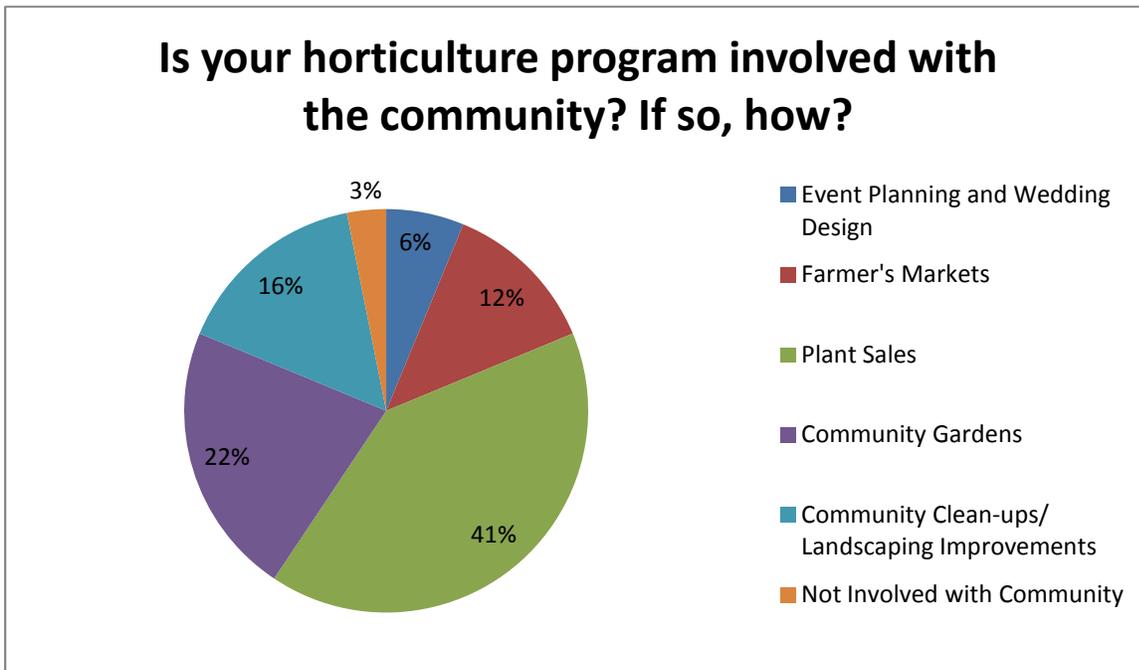


Figure 7- Response to survey question 7

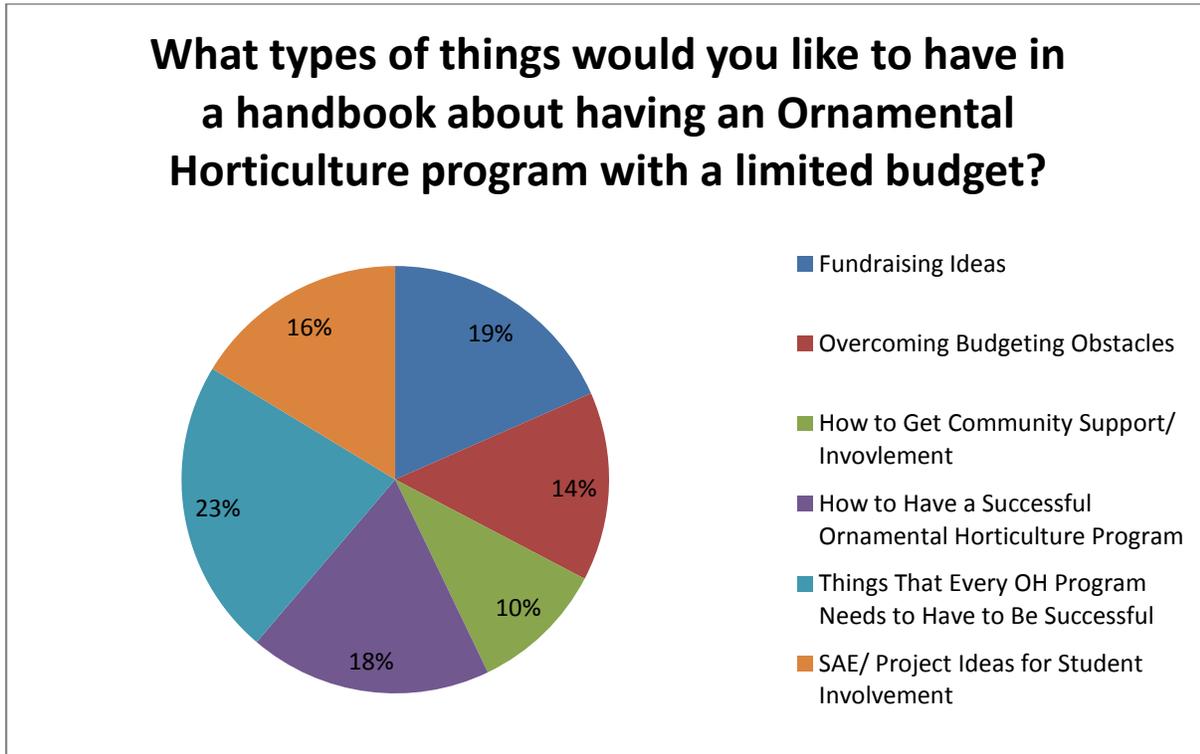


Table 1 - Response to survey question 8

In your opinion what is important to incorporate in your OH program to make it successful?

<b>Instructor 1</b>	By having flowers, plants and landscaping all together it makes it so both male and female students work together in the same class. Also picking up students from the main part of the campus, makes the program have a very good, positive and different outlook. It brings a higher level of students into the program.
<b>Instructor 2</b>	It needs to be tied to the real world so students can find validity in the program.
<b>Instructor 3</b>	Student projects and fundraising.
<b>Instructor 4</b>	Show students why plants are essential to life and the key to our agriculture success. Also show them that there is monetary value and lots of careers.

<b>Instructor 5</b>	Student recruitment.
<b>Instructor 6</b>	A buy in from the students. When students see that the program as "their" program I feel the students are willing to put the time in after school to get everything done. There is not enough time during the school day to complete everything within the program.
<b>Instructor 7</b>	Growing healthy produce and creating plant designs that sell. This year I have a bunch of kids that really don't care about their grades or about the quality of work that they produce...very sad and a waste of my time and energy.
<b>Instructor 8</b>	A solid marketing program so students and departments can sell their products.
<b>Instructor 9</b>	Support of administration.
<b>Instructor 10</b>	Community Support, we are lucky enough to have a plug supplier near us that donates plugs that can no longer be sold. Also, if you don't have the school and community support then you won't have anyone to buy your products.
<b>Instructor 11</b>	Life skills - what students need to know to grow their own plants.
<b>Instructor 12</b>	The program has to be relevant to students. What is taught in class has to be directly tied into a use in a real world setting.

## **Summary of Results**

The survey was a successful one with having a 75% participation rate. The results of the survey did indeed determine that ornamental horticulture programs are suffering statewide. Instructors have found difficulties in many areas which have put them further behind from what they were trying to accomplish with their students. Based upon the results, student involvement, budgeting and standardized testing were all areas that posed a difficulty among the instructors.

## **Discussion**

The first question about student involvement showed that most instructors had their students somewhat involved within their program. The second question showed that the top three issues that instructors had were budgeting, student involvement and access to their supplies. The third question showed that just over half of the instructors felt that their programs were limited due to standardized testing requirements. The fourth question showed that about three quarters of the instructors were dealing with budgeting difficulties. The fifth question showed that most of the funding for their programs came from state and federal grants, community support and their allotted budget. The sixth question showed that the instructors had their ornamental horticulture programs involved with the community through plants sales, community gardens, farmers' markets and community clean-up/landscaping projects. The seventh question showed that all of the areas offered would be of interest to the instructors to have within a booklet about ways to have a successful horticulture program. The final question was an open ended question that gave the instructors the opportunity to discuss what they had felt made their programs successful. The answers to it were diverse with a common trend of having student and community involvement being of top priority.

## Chapter Five

### Conclusions and Recommendations

#### Conclusions

Based on the findings, the conclusions of this study were:

1. Ornamental horticulture instructors were struggling with their programs throughout the state and the main areas that were of trouble to them were budgeting, student involvement, support from the community and standardized testing requirements.
2. Ornamental horticulture instructors would have liked to improve their programs by having a guide to overcome the difficulties that they had faced.

#### Recommendations

1. Since budgeting within the ornamental horticulture programs was determined to be such a difficulty, a manual/handbook should be formulated to address the concerns of how to have a successful ornamental horticulture program with limited resources.
2. The California State FFA should recognize these difficulties, and develop a way to aid the instructors so that their schools would be able to become more successful with ornamental horticulture programs by having more events based upon horticulture. These events would promote the OH program within high schools.
3. The California Department of Education should develop a curriculum that utilizes the OH program so that instructors would be more successful with those programs.

## References

Agricultural education. (n.d.). Retrieved from

<https://www.ffa.org/about/howeare/Pages/AgriculturalEducation.aspx>

(2006). California career technical education model curriculum standards. Retrieved from: The

California Department of Education website:

<http://www.cde.ca.gov/ci/ct/sf/documents/ctestandards.pdf>

(2011). California core curriculum ornamental horticulture. The California Department of

Education, Agricultural Education Unit. Retrieved from:

<http://calaged.org/ResourceFiles/Curriculum/advcluster/6000.htm>

Amor, C. (2011, Sept 22). Star testing not for all students. Retrieved from:

<http://www.theacorn.com/news/2011-09->

[22/Letters/STAR\\_testing\\_not\\_for\\_all\\_students.html](http://www.theacorn.com/news/2011-09-22/Letters/STAR_testing_not_for_all_students.html)

Elk grove ffa fundraiser. (2010, May). Retrieved from

<http://elkgroveffa.com/ffa/pressreleases.html>

Lassanske, D. D. (1974). Teaching ornamental horticulture at the high school level. Comb Proc

Int Plant Propag Soc, 74-75.

Linden ffa plant sales. (2011, November 07). Retrieved from

<http://linden.ca.luh.schoolinsites.com/?PageName=LatestNews&Section=Spotlight&ItemID=17808&ISrc=School&Itype=Spotlight&SchoolID=4037>

Merriam webster dictionary. (n.d.). Retrieved from <http://www.merriam-webster.com/dictionary/horticulture>

Patterson, H. (2010, July 19). Budget cuts rob students of education. Retrieved from

<http://www.examiner.com/headlines-in-san-francisco/budget-cuts-rob-students-of-education>

Sticky traps. (n.d.). Retrieved from: <http://www.appleman.ca/korchard/traps.htm>

Stuttgart Public Schools, A. R. (n.d). Agriculture Education. Horticulture. 12-14.

Supervised agricultural experiences. (n.d.). Retrieved from

<https://www.ffa.org/about/howeare/sae/Pages/default.aspx>

## Appendices

### **Appendix A- Regional Supervisor Email**

Dear <Mr./Ms. First Name Last Name>,

I would like to introduce myself, my name is Elizabeth Basham and I am a senior at Cal Poly San Luis Obispo. I am working on my senior project for my B.S. degree in Agricultural Science. My senior project is to determine what difficulties ornamental horticulture instructors are facing. I have created a short survey that I would like to send out to ornamental horticulture instructors to get their opinions on what their struggles are. I would like to hear from your three most successful ornamental horticulture instructors and also your three instructors that have faced the most difficulties. I will utilize their responses so that I can put them into my senior project to determine what the common issues that are occurring with high school ornamental horticulture programs. I would greatly appreciate it if you would be able to give me the email information of these instructors so that I can send out the survey to them as soon as possible. If you have any questions feel free to email me at [ebasham@calpoly.edu](mailto:ebasham@calpoly.edu). Thank you for your assistance.

Elizabeth Basham

Agricultural Science Student

California Polytechnic State University San Luis Obispo

## **Appendix B- Instructor Email**

<Mr./ Ms. First Name Last Name>,

I am a senior at Cal Poly, San Luis Obispo and I am currently working on my Bachelor's degree in Agricultural Science with a concentration in Ornamental Horticulture. I am working on my senior project and I would greatly appreciate your feedback from this email that I have sent you. I have created a short survey that I would like you to answer about your high school horticulture program. If you have any questions at all please do contact me at (760) 521-1018 or at [ebasham@calpoly.edu](mailto:ebasham@calpoly.edu). Please do complete the questionnaire at your earliest convenience since I hope to compile the data by March 30, 2012.

Here is the link to the survey:

[http://www.surveymonkey.com/s.aspx?sm=MVao8lfMqtC0VuTi7iY93A\\_3d\\_3d](http://www.surveymonkey.com/s.aspx?sm=MVao8lfMqtC0VuTi7iY93A_3d_3d)

I greatly appreciate you in taking the time in your busy schedule to assist me with this project.

Sincerely yours,

Elizabeth Basham

Agricultural Science Student

Cal Poly, San Luis Obispo

Agriculture Education and Communication Department

## Appendix C- Survey

### Ornamental Horticulture Survey

#### 1. How involved are your students in your ornamental horticulture program?

- Highly involved- most students participate in most Ornamental Horticulture activities
- Somewhat involved- some students participate in a few OH activities
- Minimally involved- students only participate in classroom activities

#### 2. What are some of the difficulties that your horticulture program faces? (select all that apply)

- Budget/ funding
- Student involvement
- None or outdated facilities
- Standardized testing requirements
- Access to supplies
- Support from school administration

Other (please specify)

**3. Do you find standardized testing to interfere with the out of class horticulture activities that you would like to do with your students?**

Yes

No

**4. Do you find that your school has a limited budget for Ornamental Horticulture that keeps you from doing activities that you would like to with your students?**

Yes

No

**5. Where do you receive most of your funding for your Ornamental Horticulture program?**

Community members/ local businesses

Budgets

State and Federal grants

Fundraising

**6. Is your horticulture program involved with the community? If so, how? (select all that apply)**

Event planning and wedding design

Farmer's Markets

Plant sales

- Community gardens
- Community clean-ups/ landscaping improvements
- Not involved with community

Other (please specify)



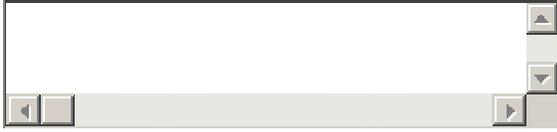
**7. What type of things would you like to have in a handbook about having an ornamental horticulture program with a limited budget? (select all that apply)**

- Fundraising ideas
- Overcoming budgeting obstacles
- How to get community support/ involvement
- How to have a successful ornamental horticulture program
- Things that every OH program needs to have to be successful
- SAE/ project ideas for student involvement

Other (please specify)



**8. In your opinion what is important to incorporate in your OH program to make it successful?**



Done

Powered by **SurveyMonkey**

Create your own [free online survey](#) now!

## **Appendix D- CLFs**

### (CLF6100) BOTANICAL CLASSIFICATION

- CLF6101 History and Terminology of Taxonomy
- CLF6102 Practical Taxonomy
- CLF6103 Use of the Plant ID Key
- CLF6104 Characteristics of Leaves and Leaf Surfaces
- CLF6105 Characteristics of Stems and Roots
- CLF6106 Characteristics of Fruits
- CLF6107 Characteristics of Flowers
- CLF6108 Identifying Ornamental Plants
- CLF6149 Unit Exam

### (CLF6150) PHOTOSYNTHESIS AND RESPIRATION

- CLF6151 Photosynthesis
- CLF6152 Respiration
- CLF6153 Photosynthesis and Respiration in Horticulture
- CLF6154 Cellular Function in Plants
- CLF6199 Unit Exam

### (CLF6200) PHYSIOLOGY AND GROWTH

- CLF6201 Growth Structures and Functions
- CLF6202 Growth Patterns
- CLF6203 Growth Requirements
- CLF6204 Seedling Growth

### (CLF6250) SEXUAL AND ASEXUAL PROPAGATION

- CLF6251 Sexual & Asexual Propagation
- CLF6252 Parts of the Flower
- CLF6253 Pollination and Seed Production
- CLF6254 Reproduction by Spores

- CLF6255 Vegetative Cuttings
- CLF6256 Budding and Grafting
- CLF6257 Other Propagation Methods
- CLF6299 Unit Exam

(CLF6300) DISEASES AND PESTS OF ORNAMENTAL PLANTS

- CLF6301 Plant Pathology and Plant Health
- CLF6302 Weed Control
- CLF6303 Safe and Effective Use of Chemical Pesticides
- CLF6304 Introduction to Integrated Pest Management (IPM)
- CLF6305 Nursery Sanitation
- CLF6349 Unit Exam

(CLF6350) ELEMENTS NECESSARY FOR PLANT GROWTH

- CLF6351 Primary, Secondary, & Micronutrients Necessary for Plant Growth
- CLF6352 Sources of N, P, and K
- CLF6353 Function of Nutrients in Plant Growth
- CLF6354 Reading the Fertilizer Label
- CLF6355 Soil Amendments
- CLF6356 Uses of Fertilizers
- CLF6357 Symptoms of Nutrient Deficiencies (N,P,K,FE,S,MG,B, and ZN)
- CLF6358 Determining Nutrient Deficiencies
- CLF6359 Methods of Application

(CLF6400) HORTICULTURAL SOILS & PLANTING MEDIA

- CLF6401 Soil Basics
- CLF6402 Horticultural Soils
- CLF6403 Managing Horticultural Soils
- CLF6404 Seedbed Preparation
- CLF6405 Composting

- CLF6449 Unit Exam

(CLF6450) IRRIGATION AND DRAINAGE

- CLF6451 Irrigating Ornamental Plantings
- CLF6452 Drainage
- CLF6453 Sprinkler Irrigation Systems
- CLF6454 Drip Irrigation Systems
- CLF6455 Conserving Water in Irrigation
- CLF6499 Unit Exam

(CLF6500) SELECTION, PLANTING, AND CARE OF ORNAMENTAL PLANTS

- CLF6501 Evaluation and Selection of Quality Plants
- CLF6502 Planting Techniques
- CLF6503 Determining Spacing and Planting
- CLF6504 Staking and Tying plants
- CLF6505 Frost Protection
- CLF6506 Benefits of Xeriscape
- CLF6507 Sales and Merchandising of Plants
- CLF6549 Unit Test

(CLF6550) PRUNING AND TRAINING ORNAMENTAL PLANTS

- CLF6551 Purposes of Pruning
- CLF6552 Timing of Pruning
- CLF6553 Identification, Safe Use, and Maintenance of Pruning Equipment
- CLF6554 Techniques for Making Pruning Cuts
- CLF6555 Methods of Pruning Trees and Shrubs
- CLF6556 Major Tree Pruning Systems
- CLF6557 Plant Support Systems
- CLF6599 Unit Exam

(CLF6600) GROWTH AND MAINTENANCE OF NURSERY STOCK

- CLF6601 Horticulture Structures
- CLF6602 Sterilization & Sanitation
- CLF6603 Mixing Growing Media
- CLF6604 Planting of Seeds
- CLF6605 Watering Nursery Stock
- CLF6606 Tool & Equipment Identification
- CLF6607 Transplanting Growing Stock
- CLF6608 Irrigation Systems
- CLF6649 Unit Exam

(CLF6650) FLORICULTURE AND FLORAL DESIGN

- CLF6651 Floriculture Terms
- CLF6652 Identification of Foliage and Seasonal Plants
- CLF6653 Classification and Use of Flower Design Categories
- CLF6654 Identification and Use of Design Tools and Materials
- CLF6655 Preparation and Conditioning of Flowers and Foliage
- CLF6656 Basic Floral Design Shapes
- CLF6657 Simple Floral Arrangement and Corsage Construction

(CLF6700) LANDSCAPE DESIGN, CONSTRUCTION, AND MAINTENANCE

- CLF6701 Plant Selection and Design
- CLF6702 Landscape Options and Design
- CLF6703 Turf in the Landscape
- CLF6704 Irrigation Design and Installation
- CLF6705 Design Techniques
- CLF6706 Estimating and Bid Preparation
- CLF6749 Unit Exam

(CLF6750) THE ORNAMENTAL HORTICULTURE INDUSTRY

- CLF6751 Career Opportunities and Educational Requirements

- CLF6752 Horticultural Trade Associations
- CLF6753 Utilizing Trade Association Publications