



LONGWOOD
GARDENS

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Trader, Andrew Wyatt, and Charles Yurgalevitch

Conserving, Preserving and Training the
Next Generation of Botanic Garden
Horticulturists

Botanic Garden Horticulturists- A threatened species

- Globally, fewer youth entering profession
- Shrinking university and college programs
- Consolidation of degrees
- Faculty retirement and realignment of responsibilities



Why is this happening?

- Lack of awareness and understanding of profession
- Less time spent outside, less immersion in nature
- Confusion with agriculture
- Disconnect with gardening family members



How are we confronting the issue...Opportunity!

- National initiatives
 - UK: Horticulture Matters
 - Young Hort
 - Grow Careers
 - USA: Seed Your Future, National Study of Horticulture





The Professional Gardener 'PG' Program

- Began in 1970
- 2-year program
- ~270 alumni
- Tuition free
- Free onsite housing
- Paid stipend





Curriculum

- Based on credit hours
- Terminal degreed instructors
- Approximately 30 courses
 - 15 HORT
 - 4 LAND
 - 5 PLANT
 - 5 Support
- Hybrid learning

Course Examples

- Horticulture
 - Plant Propagation
 - Greenhouse Management
 - Fruit and Vegetable Culture
- Landscape Design
 - Introduction to Landscape Design
 - Introduction to Landscape Design and Construction
- Plant Science
 - Entomology
 - Weed Identification and Management
 - Plant Pathology



Articulation

- Temple University
- University of Delaware
- Rutgers University
- **University of Maryland**
- In discussion
 - Penn State
 - Cornell



Experiential Learning

- 12 Work Rotations
 - 8 mandatory (one month each)
 - Arboriculture
 - Conservatory Management
 - Greenhouse Production
 - Horticultural Research
 - Integrated Pest Management
 - Nursery Management
 - Outdoor Display
 - Turf Management



Experiential Learning

- 4 Optional rotations
 - Focus in an area already required
 - Natural Lands Management
 - Plant Records Management
 - Plumbing
 - Education
 - Etc.









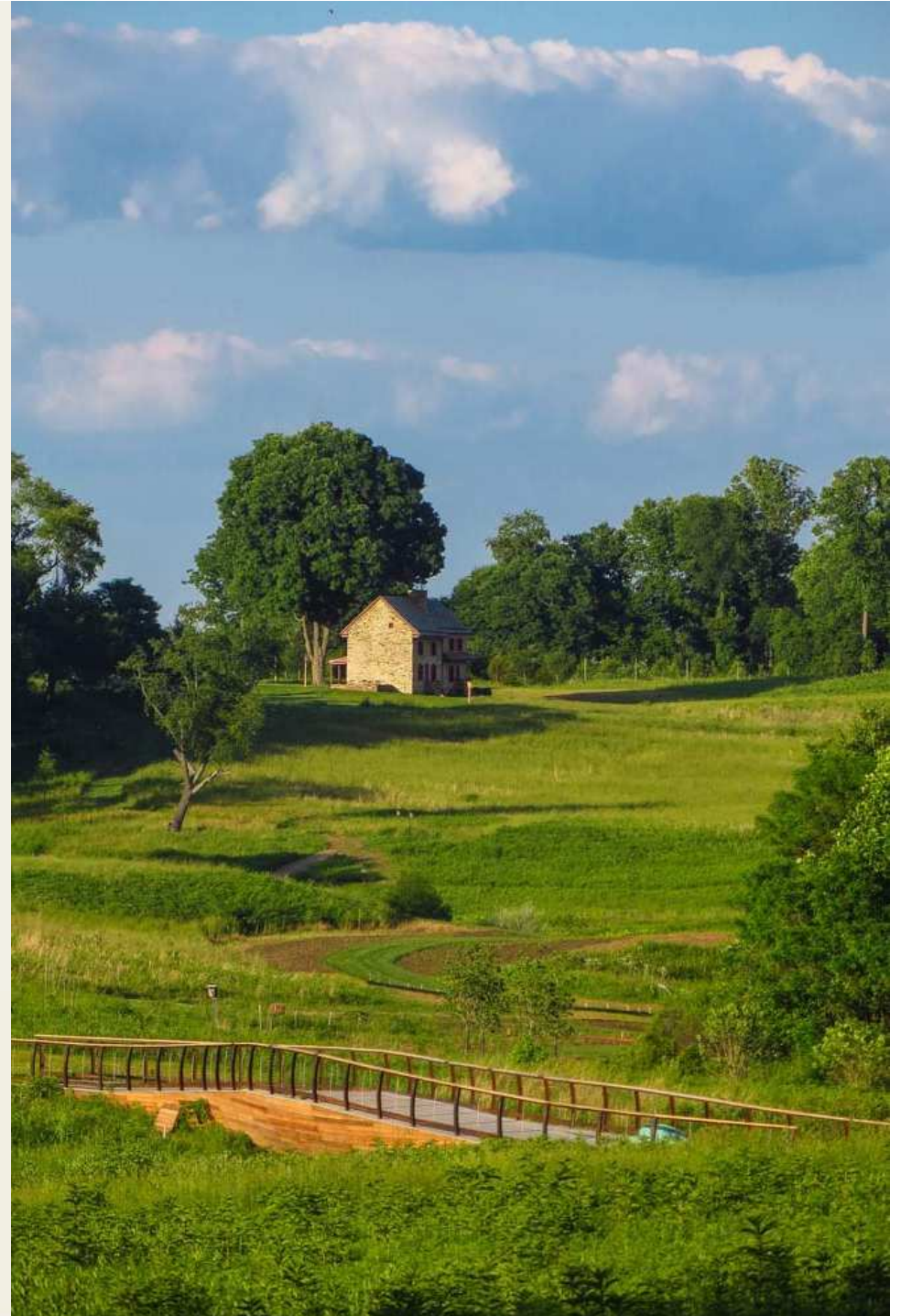
Experiential Learning

- Project-based learning
 - Student Exhibition Garden
 - Garden Practicum
 - Vegetable Venture
 - Study Abroad Course
 - Outreach



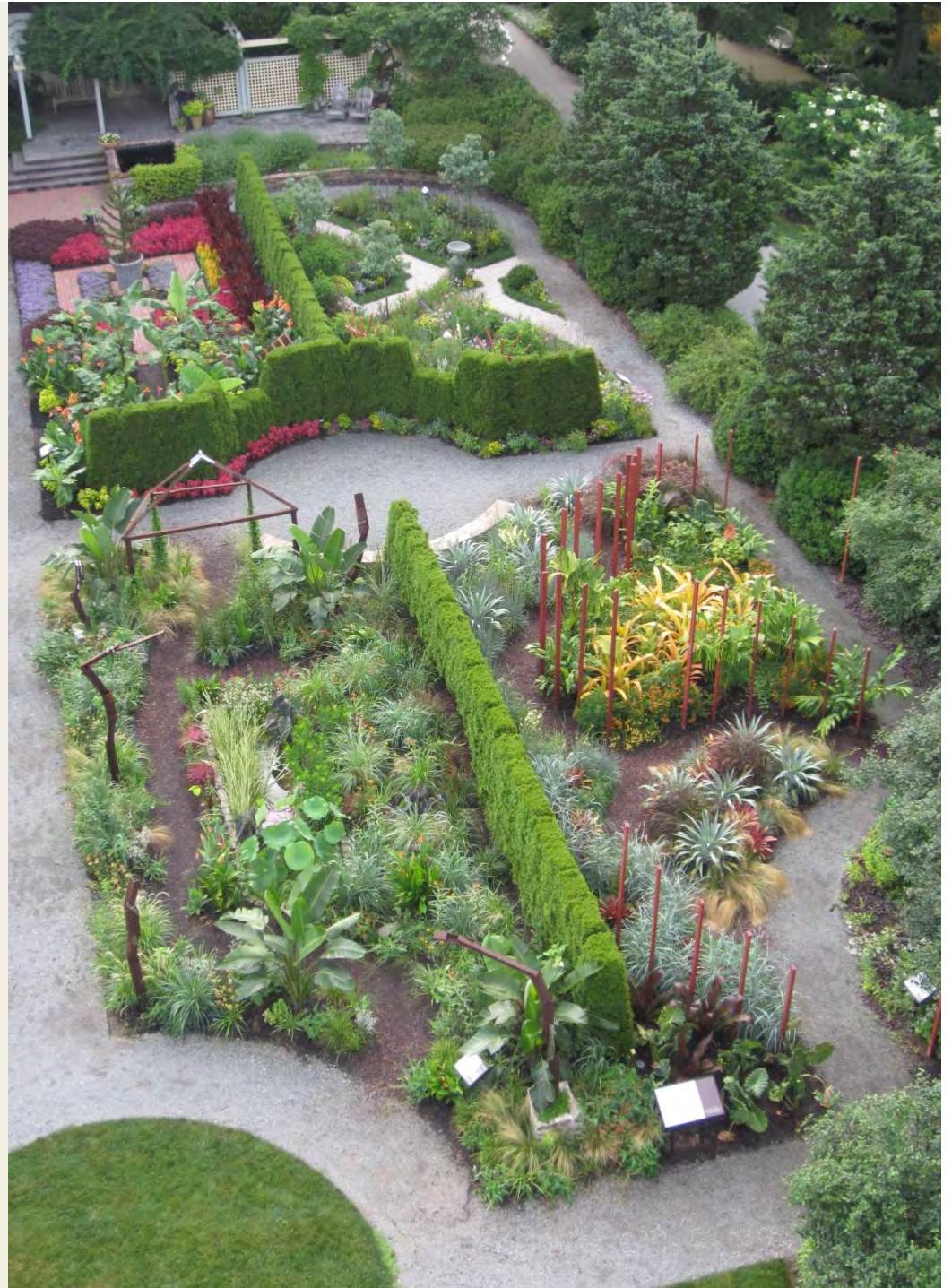
Native Lands Management

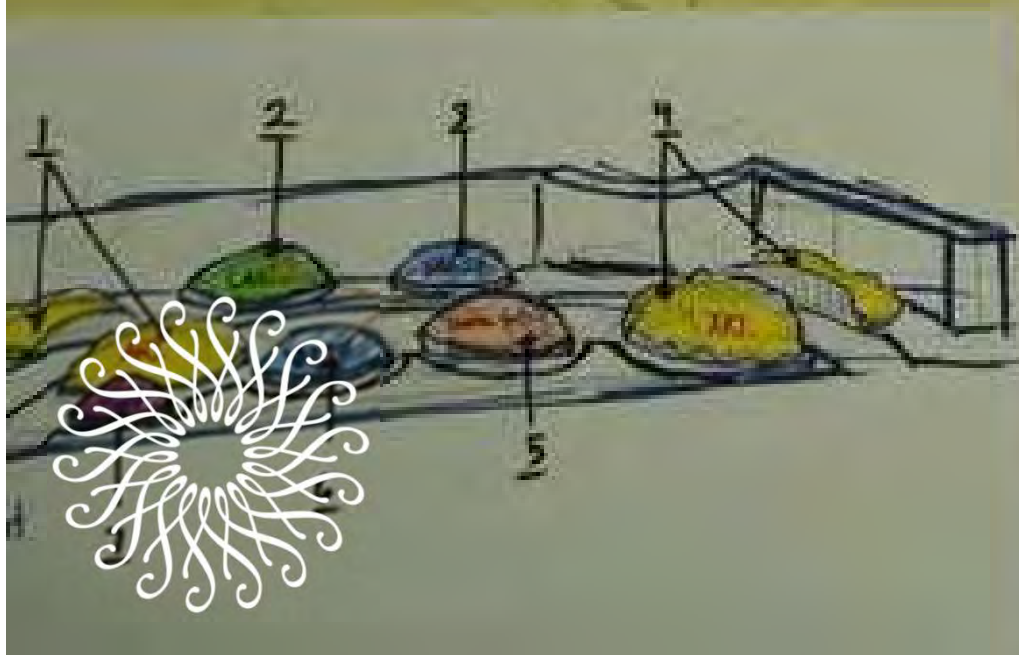
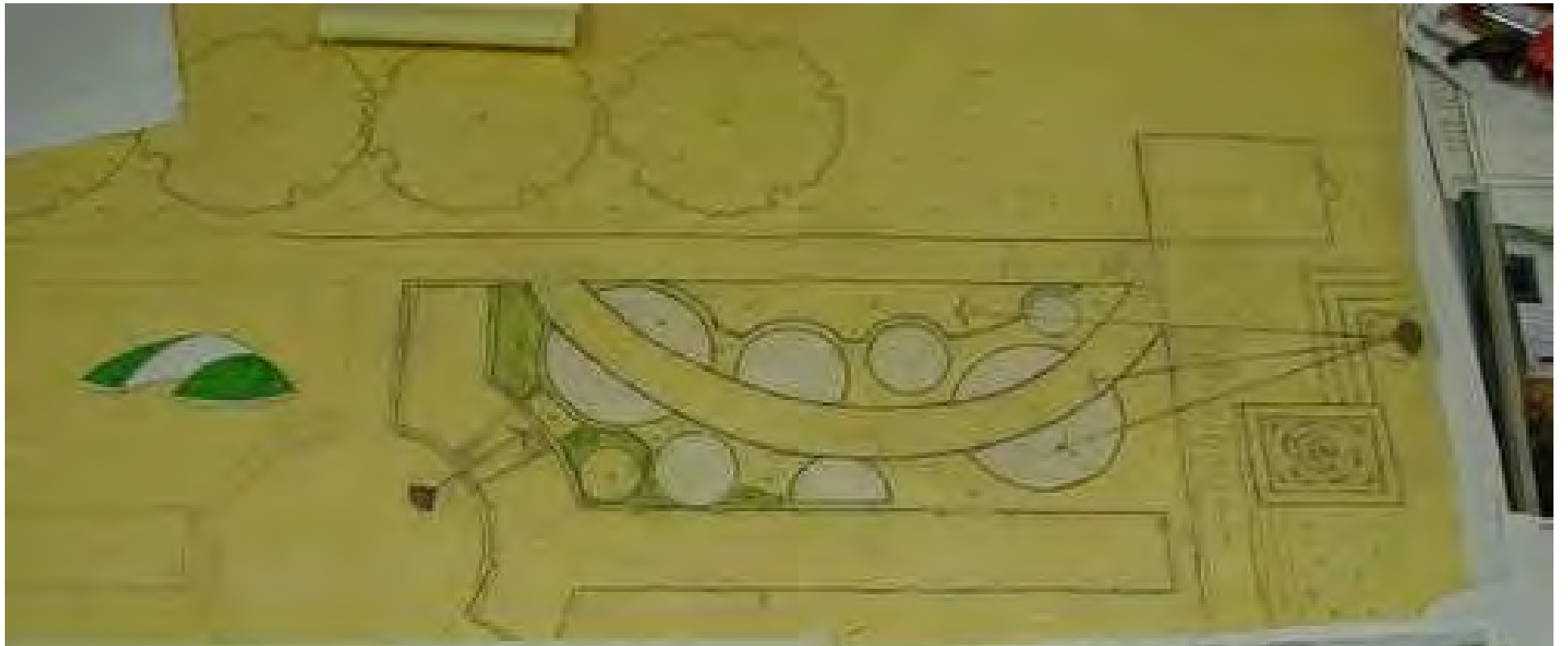
- Meadow Garden- 2014
- Natural Lands Stewardship
- Bivalve water purification
- Biological/Beneficial Pest management
- Chemical use reduction



Student Exhibition Garden

- **Purpose:** Showcase student talent and offer real-world experience
- **How does it work?**
 - Three courses
 - 6 months
 - 4 installation days
 - 10 guided tours
 - Management to Longwood standards
 - Interpretation













Vegetable Venture

- Since 2010
- Partnership with Longwood's Certified Green Terrace Restaurant
- Student-managed
- Outcome-based





Study abroad

- Practical experience
- Student-driven
- Immersive experiences
- International horticultural exposure





Outreach

- Core value of Community engagement
 - Delaware Center for Horticulture
 - Pennsylvania Horticultural Society
 - Local gardens
 - Local schools





Focus is the hands-on

- Field trips
- Laboratories
- Working alongside experienced staff







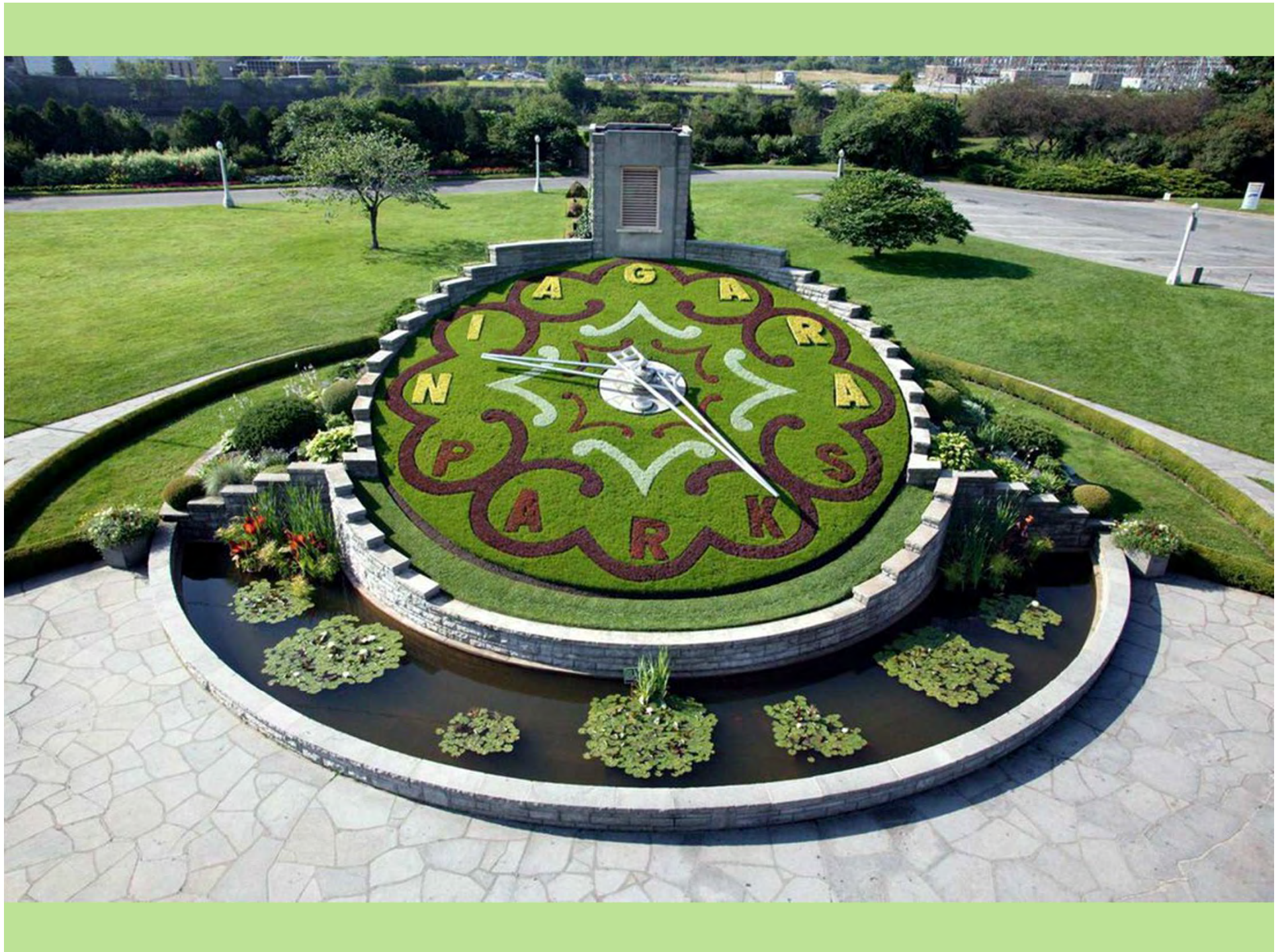
LONGWOOD
GARDENS



An agency of the Government of
Ontario since 1885

Botanical Gardens & School of Horticulture





























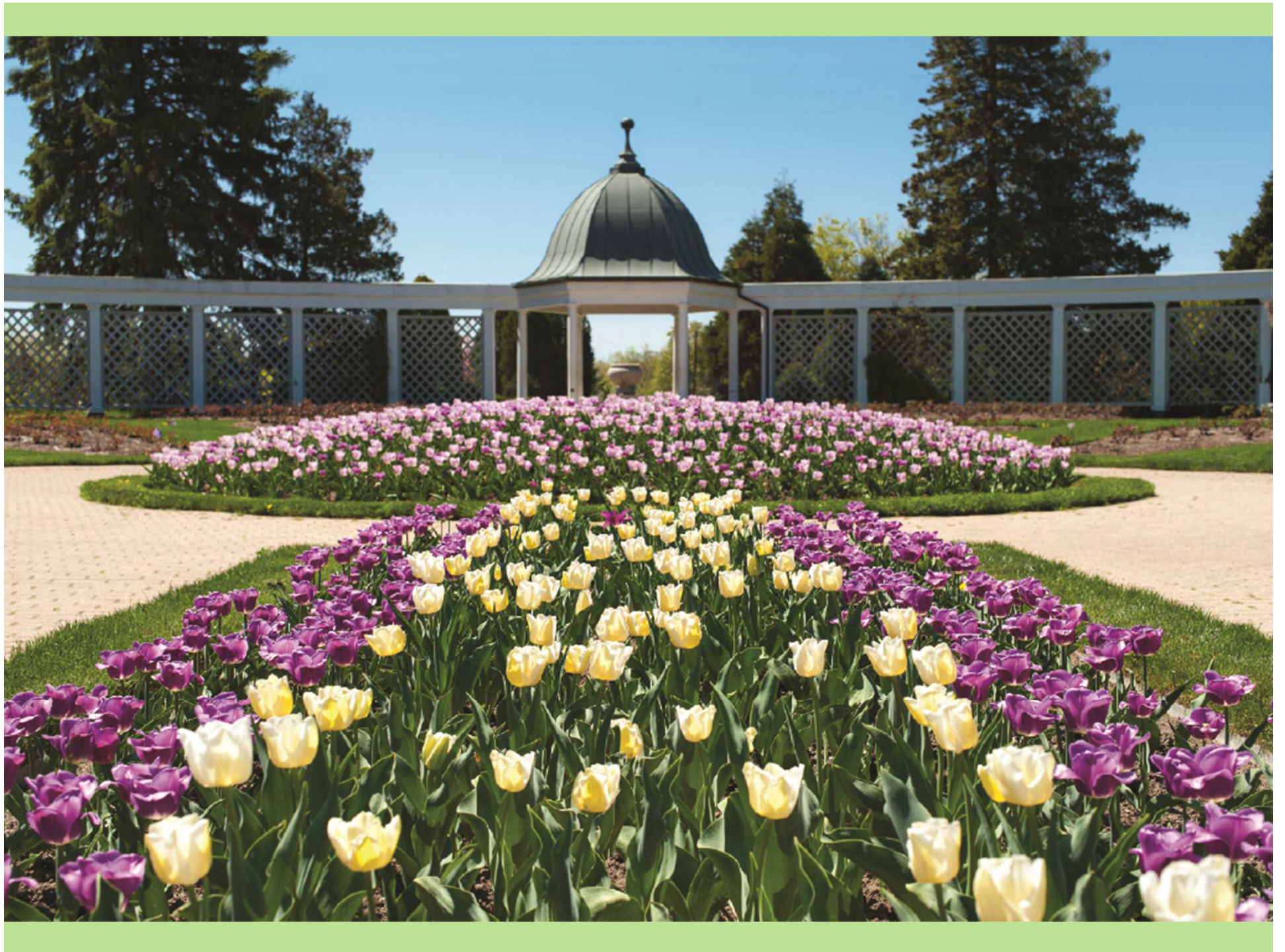



























The background image shows a stone terrace with two tall, weathered columns. A group of four people is standing on the terrace, looking towards the camera. In the background, there is a deep valley with a river and a forested hillside under a clear blue sky.

THE NEW YORK BOTANICAL GARDEN School of Professional Horticulture

*Conserving, Preserving & Training
the Next Generation of Botanic
Garden Horticulturists*

Botanic Gardens Conservation International
27 April 2015

THE NEW YORK BOTANICAL GARDEN

School of Professional Horticulture

- Established in 1932
- Modeled after practical training programs at RBG-Kew and RBG-Edinburgh

The School of Professional Horticulture seeks to educate and train motivated individuals to become horticulturists of the highest caliber equipped to take on leadership positions in either the public or private sectors.

LICENSES & CERTIFICATIONS

NYSED Bureau of Proprietary School Supervision (1977)

ACCET (2005) – held to the highest standards

U.S. Department of Education - Title IV (2005)

U.S. Department of Homeland Security - SEVIS (2004)

NY State Department of Veterans Affairs (2007)

Visit www.nybg.org/edu/soph



@SoPH_NYBG

17 CURRENT STUDENTS

- Career changers
- 14 bachelors; 1 masters; 1 associates; 1 HS
- Age range: 22 - 58
- Average age: 30
- 5 International: Argentina, Italy, Korea, Nigeria

Visit www.nybg.org/edu/soph



@SoPH_NYBG

ACADEMIC PROGRAM

640 clock hours (or $\frac{1}{4}$ of program) in botany, horticulture, landscape design, communications & business management.



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1st-YEAR HORTICULTURE ROTATIONS

4 rotations, each 200-hours @ 4 locations

Skills learned:

- transplant, propagate & produce crops
- manage glasshouse plants, collections, & exhibitions
- plant & maintain outdoor displays,
- care for trees, turf & shrubs.

Plant Health Care & Plant Records are part of each.



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PLANT ID WALKS

Plant walks are designed to help students learn to identify the 1,000+ plants on their Master Plant List.



Plant ID Final at Wave Hill, Bronx.

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FIELD TRIPS



- Explore horticultural opportunities
- Meet practitioners in the field



- Learn how horticulture sites function
- Networking

HERBARIUM WORKSHOP

Students learn the techniques and skills to collect, dry, press, mount and label museum-quality specimens over a 9-month period.



STUDENT GARDEN PLOTS



In their 1st year, students are assigned ~ 100 ft² plot and given instruction on how to design, install, maintain and dismantle a cool-season vegetable & flower garden.

“This is exactly why I came to the School”
C. Ruiz (Class 2016)

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SECOND-YEAR LEARNING

Internships provide for specialized training that further expands & deepens a student's horticultural & professional development skills.



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LECTURES & SYMPOSIA

Special lectures with international experts allow students to further expand their knowledge.

Subjects range from native plants, ecological design & restoration, urban farming, etc. - topics that enrich the students' experience at NYBG.



Brian Huntley, Kirstenbosch
Jan. 2014

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OUTREACH

- Local NYC high schools:
 - Urban Assembly School for Green Careers
 - Stephen T. Mather High School
- Serve as secretary on Metro Hort Board of Directors
- Green Industry Intern Field Day (Hortie Hoopla)
- NYBG's Adult Ed program
- Veterans – M.O.V.A.
- Increase diversity

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GREEN INDUSTRY INTERN FIELD DAY

Hortie Hoopla - 23 July 2014



To bring together interns in the green industries to discuss career opportunities, increase awareness of the need for educated and skilled horticulturists, and network with other interns.

Horticulture Matters!

GREEN INDUSTRY INTERN FIELD DAY

- Inspiring talks
- Career Info session
- Tours of NYBG gardens
- Plant ID contests
- BBQ – food, prizes, etc.
- Sponsor-supported



Visit www.nybg.org/edu/soph
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CHALLENGES

- Tuition - \$7,500/year (£5,000)
- Cost of Attendance - \$31,000/year (£21,000)
- No stipend
- No health insurance
- No housing - commutes range from ½ hr - 2 hrs each way
- NYC - tough and expensive place to live

Visit www.nybg.org/edu/soph
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BENEFITS

- Horticulture – expert staff teach students in the classroom & on the beautifully maintained grounds
- Library – largest in Western Hemisphere
- Herbarium – largest in Western Hemisphere
- Science – among top 3 in the world.
- Education – largest program in world
- Networking opportunities
- Title IV – Pell grants & Direct loans if qualified
- NYC – many want to study here.

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SUCCESES

- Career Opportunities:
 - Public gardens & parks – Dumbarton Oaks, BBG, Chicago BG, High Line, City Field Stadium
 - Private estates - Letterman's, Bass, Rockefeller's, Bruce Kovner, AZ Ice Tea, Martha's and more
 - Landscape Design/Build
 - Self-employed
- More opportunities in the private sector (higher salaries)
- 100% placement past 5 years
- Graduates are well-prepared professionally.

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ROYAL BOTANIC GARDENS

Tim Hughes

Head of School of Horticulture



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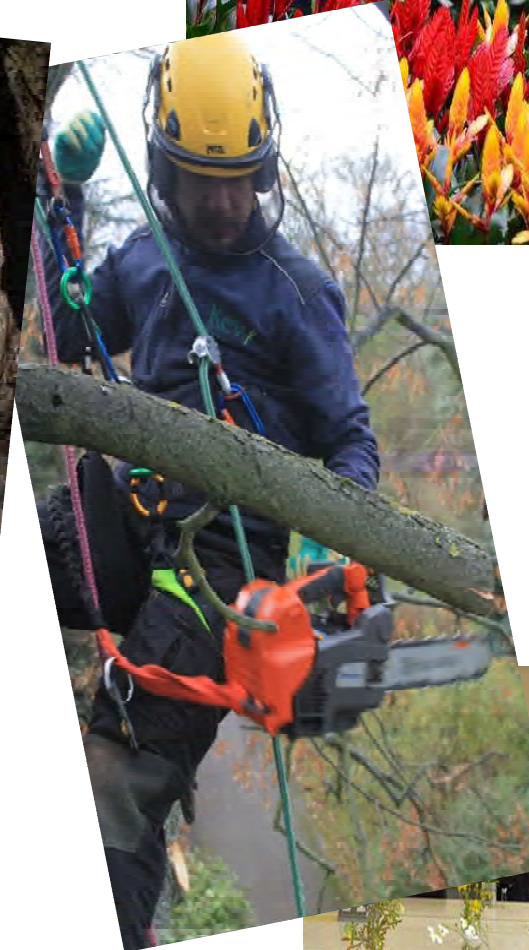
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Kew's horticultural training
programmes:
*'A horticultural passport to travel
and work around the world'*





Practical training programmes with an academic c

What are the outcomes we want to achieve?

To ensure our training meets the requirements of the horticultural sector....i.e. they are 'Industry Ready'.

To ensure our students graduate with 'professional standard' practical skills and are at least and on the way to being proficient.

To ensure our students graduate with an academic understanding around the practical skill undertake.



Practical training programmes with an academic c

What are the outcomes we want to achieve?

To give our students a good work ethic.

To provide a means for students to identify areas within the horticultural industry which th
to develop further.



Practical training programmes with an academic cor

What are the challenges we face in the delivery and management of a practical training programme?

Dealing with students who meet the entry requirements but come in with very different standards of horticultural knowledge/experience.

Making sure we keep up to date with the skills/knowledge that employers are looking for.

Ensuring an excellent standard, in delivery of horticultural training in both, practical and academic.

Achieving, as much as we can, some standardisation within the practical training elements



Practical training programmes with an academic cor

What are the challenges we face in the delivery and management of training programmes?

The vagaries of the weather and the seasonality of our industry.

Delivery of training programmes is a significant financial investment for all of us who provide

Promotion and marketing - *"there's no point in applying"*



On a positive note....what we do is important!

Richard Barley, Director of Horticulture, at Kew recently said, *“The applied practice of horticulture has never been more important, not only in terms of curation and development, but also for food security, environmental management and conservation of threatened species”*



And finally.....Horticulture can be fun!



Training and Education is REALLY needed!!!



Kew

ROYAL BOTANIC GARDENS



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Thank you

Developing a School of Horticulture



MISSOURI BOTANICAL GARDEN

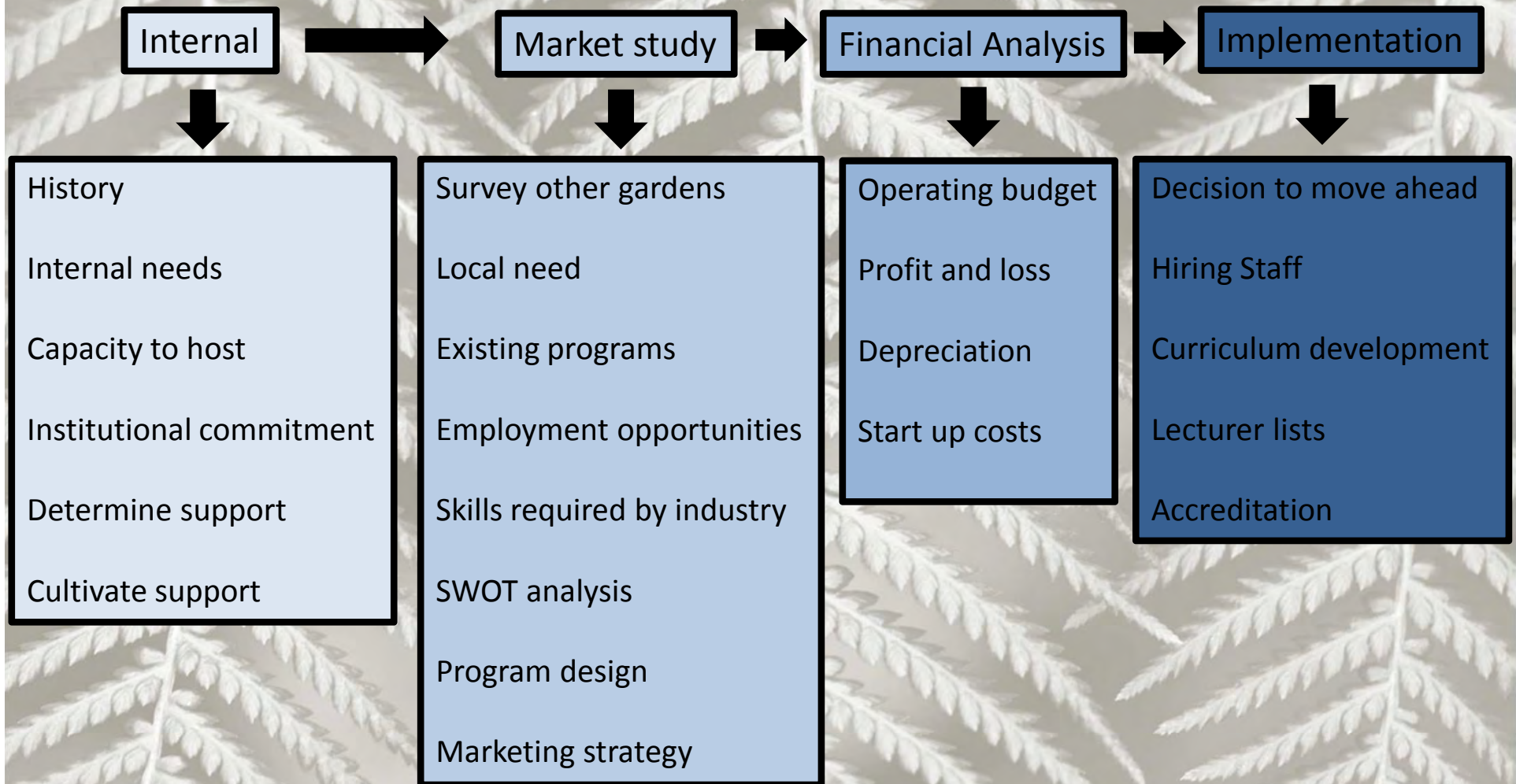
Value of Studying in a Botanic Garden

A screenshot of a botanical database interface showing a list of plant specimens with columns for Date, Locality, Collector, and other details. The interface includes search filters and a table of data.

Date	Locality	Collector	Other
1980-01-15
1980-01-16
1980-01-17
1980-01-18
1980-01-19
1980-01-20
1980-01-21
1980-01-22
1980-01-23
1980-01-24
1980-01-25
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1980-02-28
1980-02-29



Four Phases of Planning



A photograph showing a field of Ranunculus acris (Cuckoo-pint) flowers. The flowers have large, white, papery petals and dark, almost black, centers. They are growing in a grassy field with some small purple flowers scattered around. The background is a blurred landscape with a body of water and hills.

Quality of the Garden & Living Collections Development

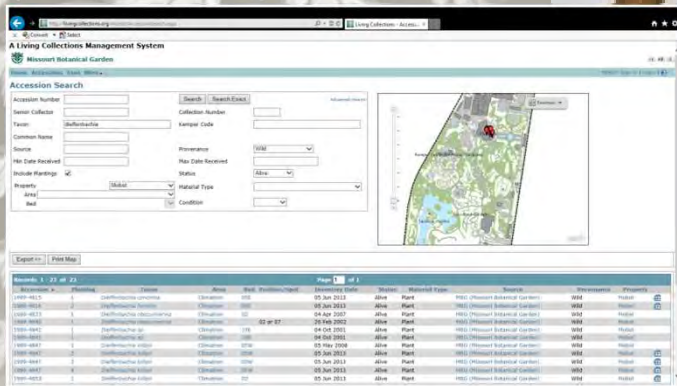


Collections management database

Staff capacity
MBG School
of Horticulture



Propagation and production

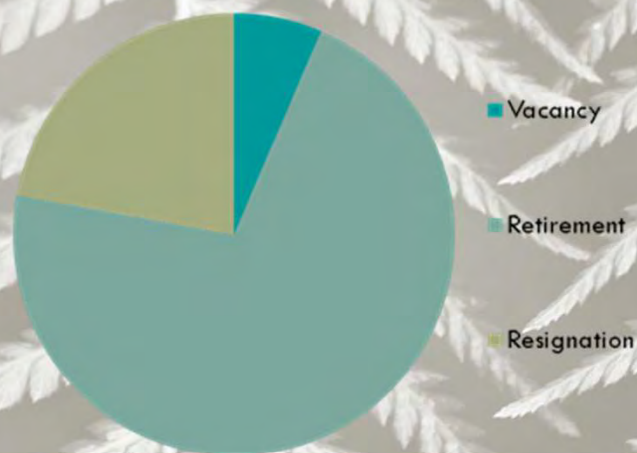


Results of our Market Research



MISSOURI BOTANICAL GARDEN

Sources of Position Openings



Number of Gardens	700
Number of Botanical Gardens	245
-Number of Employees	14,235
-Percentage of Horticulturist	45%
Number of Horticulturist	6,406
Number of Non-Botanical Gardens	455
-Number of Employees	26,437
-Percentage of Horticulturist	6%
Number of Horticulturist	1,586
Total Number of Horticulturist	7,992
Vacancy Rate	1%
Current Positions Opening / Year	80
Number of Retired Horticulturist / Year	885
Resignation Rate	9%
Number of Annually Resigned Horticulturist	685
Percentage of Resigned Horticulturists out of horticulture industry	5%
Number of Resigned Horticulturist out of Industry / Year	34
Horticulture-Related Positions Needed / Year	999

Horticulture-Related Positions Available / Year	999
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Horticulture Programs in US	200
Number of Students / Program / Year	50
Total Number of Students Majored in Horticulture	10,000
Number of Students in Gardening Related Concentration	4,000

Current Horticulture Graduates Work for Botanical Gardens after Graduation / Year	600
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Number of Students Expected to Graduate from MOBOT Horticulture Program / Year	15
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The Job Market for Horticulturalists

Plan to Expand?



Plan to Recruit More Horticulture Staff?

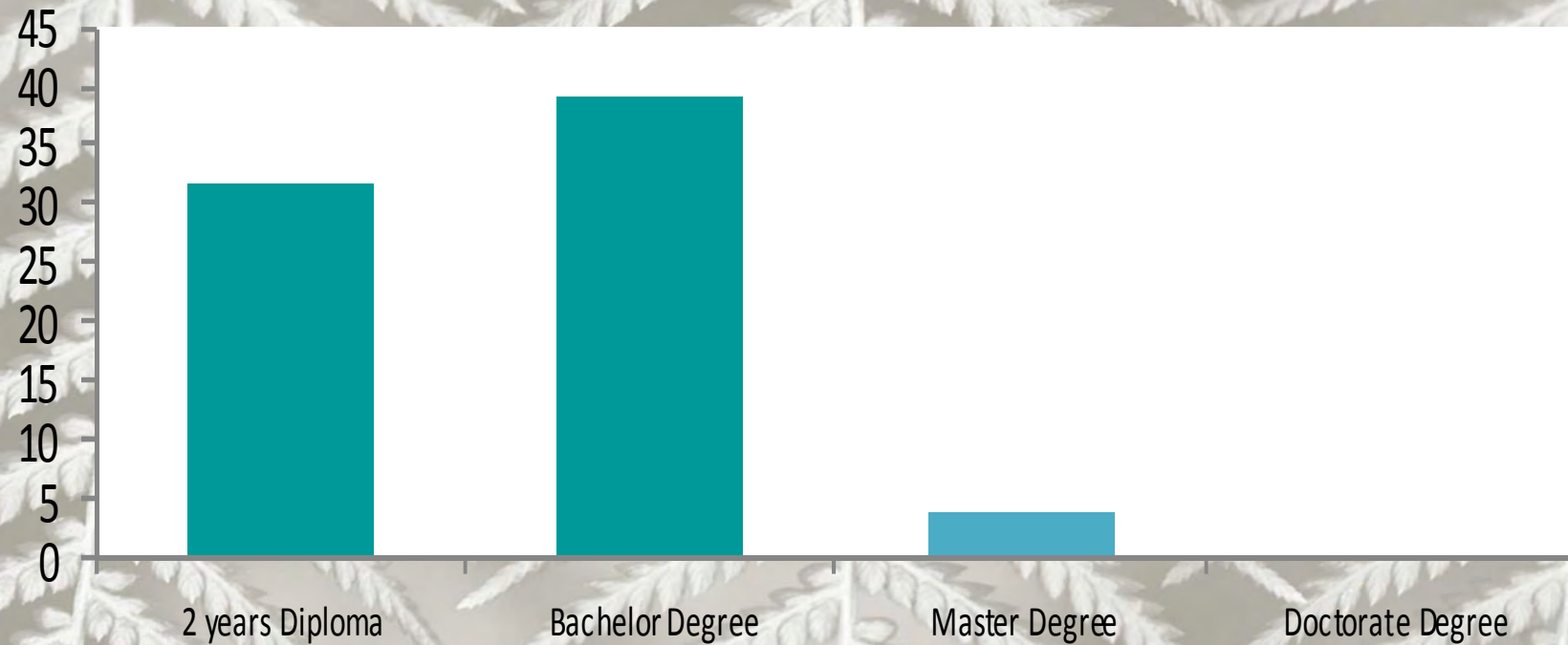


Expected Increasing Demand for Horticulture Staff with Qualification?

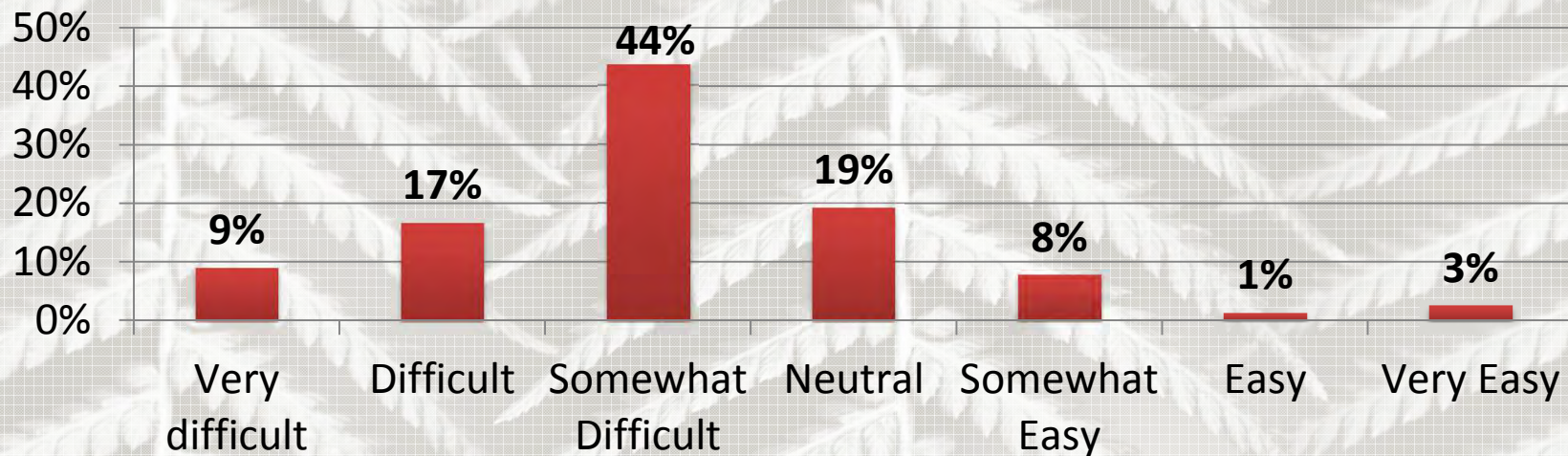


- 68% Botanical Gardens plan to expand
- 76% Botanical Gardens plan to recruit more horticulture staff
- 75% Botanical Gardens expect an increasing demand for horticulture staff with qualifications

Degrees Preferred by Employers



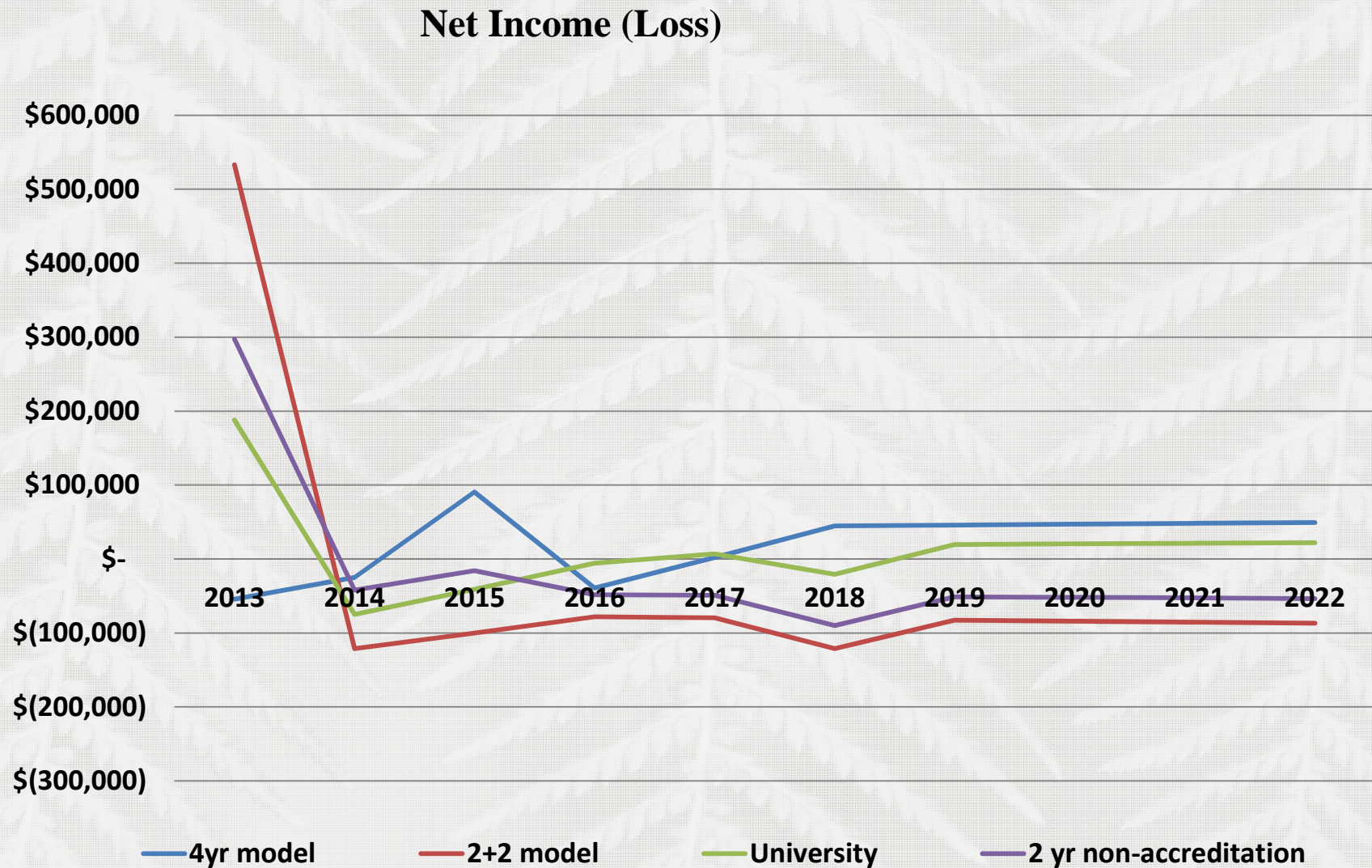
Difficulty of Rescruiting Qualified Staff



- **70%** of respondents found it difficult to recruit qualified staff
- **92%** welcomed an accredited MOBOT program
 - Combination of practical experience and academic knowledge of public horticulture
 - Larger pool of potential employees (Midwest)
 - Improvement of industry standards
 - MBG Reputation
 - Accredited program



Results of Our Program Startup Accounting



Implementation Phase (where we are today)

- Institutional decision to move ahead ✓
- Hiring a Principal for the School
- Finalizing Development of Curriculum
- In-house and external lecturers lists
- Negotiations with University Partner
- Predicted First enrolment of students 2017

