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Feasibility Study of Enhanced Arboricultural Education at the Arboretum

Title: **Feasibility Study of Enhanced Arboricultural Education
at the Arboretum**

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Abstract:

An element of the Arboretum’s strategic plan “5.4.3 Develop Morris Arboretum School for Tree Care in professional education program” involves an expansion of current offerings for arborists. This project is a feasibility study of such expansion utilizing several levels of analysis including (a) strengths, weaknesses, opportunities and threats (SWOT); (b) political, economic, social and technological trends (PEST); and (c) industry characteristics for both arboriculture and forestry. The study has data of three main types: (i) institutional research concerning offerings at the Arboretum, (ii) dialogues with Arboretum staff and outside professionals, and (iii) comparisons to other institutions and organizations.

Based on these analyses, the following recommendations are made. (1) The Arboretum should capitalize on its ability to provide advanced, specialty courses for arborists without significantly increasing the frequency of its offerings overall. (2) Expansion of offerings to arborists, especially to workshops on basic topics, should be preceded by in-depth strategic planning to include market studies and institutional cost-benefit analyses. (3) The Arboretum should not at present pursue a certificate in arboriculture having a prescribed program of study. (4) A certificate program should be considered only after workshops are offered and evaluated over several years. However, the Arboretum might consider honoring the professional development of arborists at advanced levels, such as those who have completed a certain number and/or breadth of advanced workshops. Last, recommendations for further analyses and institutional efforts are discussed.

TABLE OF CONTENTS

Introduction.....	3
SWOT Analysis: Strengths and Weaknesses.....	3
Industry Characteristics.....	5
SWOT Analysis: Opportunities and Threats.....	6
SWOT Summary.....	7
PEST Analysis.....	8
Recommendations.....	10
Discussion.....	11
References.....	14
Acknowledgements.....	14

List of Tables

.....	15
Table 1. Workshop Counts and Attendance for Morris Arboretum	
Table 2. Patterns of Workshop Participation Spring 2004 through Fall 2009	
Table 3. Industry Comparisons	
Table 4. Visual Display of SWOT Summary	
Table 5. Means for Gaining CEUs through ISA	
Table 6. Comparative Tuition Costs Per Class Hour at Nearby Institutions	

INTRODUCTION

The topic of enhanced programs at Morris Arboretum for professional arborists is of considerable interest. Most importantly, it is an element of the Arboretum's "Strategic Plan 2010-12...A Vision for the Future." Under the major heading of "5. Disseminate Knowledge about Plants and their Importance to People, and Conduct Research" is "5.4 Goal: Enhance and expand educational programs" within which is the subgoal "5.4.3 Develop Morris Arboretum School for Tree Care in professional education program." Among specific outcomes is to be a "Plan for certificate course in urban forestry (2010)."

Preliminary investigations into these initiatives were made in 2008 by former urban forestry intern Carrie Borgenicht in her report "Revitalizing Arboriculture Education at the Morris Arboretum." The present study provides a more comprehensive exploration of these issues by adopting a method for analysis. Such analyses are of timely significance as the Arboretum makes decisions about resource allocations and priorities. Analyses also provide information to the Arboretum as it enhances partnerships with other institutions, drafts grant applications, and solicits donors.

The main analyses utilized here are the well-known SWOT analysis and the related PEST analysis. For the most part, these are strategic planning frameworks. In as much as the intended focus is the professional arborist working in the tree care and landscaping industry, examinations of both the industry and the practicing arborist will also be made.

SWOT ANALYSIS: STRENGTHS AND WEAKNESSES

A commonplace framework for institutional decision making is the SWOT analysis. SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats. Strengths and Weaknesses are analyses focused on the institution itself constituting an "internal scan." For example: What institutional resources can be capitalized upon to further a goal? What limitations will need to be overcome? Opportunities and Threats comprise an "external scan" looking outside the institution. For example: What new products or services from the institution have a promising customer base? What in-roads from competing institutions might have adverse consequences? Although a SWOT analysis is inherently subjective (namely judgments like stronger/weaker and available/unavailable), it should be based upon as much objective information as possible. The first step in this process is institutional research. What does institutional data have to say about Morris' offerings to arborists?

Morris Arboretum offers a range of topical and specialty workshops for arborists that, to date, have been subsumed under the "professional" category; beyond arboriculture these have included turf management, meadows and wetlands though not landscape design that is a separate area. "Topical" here refers to more traditional subject matter as might be found in a course of study, such as soil science, pruning or evaluating trees for hazards. "Specialty" refers to guest presentations that are typically not rescheduled, such as the session on oaks in October 2008.

Table 1 includes counts for these Professional courses from Fall 2006 forward. For comparison purposes, data for the courses in Landscape Design (LDS), Horticulture and the Audubon series are also displayed; the remaining categories of Arboretum offerings, not pertinent to this analysis, are Arts and Crafts, Families, Floral Design, Guide Training, Special Interest and Trips. As can be seen, during these years there was a decided shift in both the number of Professional workshops offered and in average attendance. Average attendance evolved to be on par with the courses in Landscape Design (LDS) and marginally higher than for the Horticulture workshops geared for homeowners.

It should also be noted that Professional offerings had a higher cancellation rate than for the other categories listed. At the level of individual workshops, the session with the highest attendance was 53 for “Conservation Arboriculture: Care of Veteran Trees” (Spring 2008), with guest instructors from England and Canada. At the other end of the spectrum, other than cancelled sessions, are a session Spring 2008 on “Tree Decay: ID, Assessment & Management” (5 attendees) and those on pruning for professionals (attendance over seven sessions averaged 9.29).

Overall, attendance for the specialty offerings is robust; that for topical offerings is relatively weak. It should also be noted that there is a disparity in the proportion of members versus non-members attending sessions in the various categories. Attendance for non-members in Professional offerings is higher than for members; the reverse is true for all other educational categories including Landscape Design.

The observation on attendance in Morris’ professional offerings is borne out through comparisons to other offerings in the region. When Penn State Co-operative Extension holds a pruning for professionals course at their nearby Great Valley campus, the enrollment tops 30, much higher than the Morris attendance for a similar course. On the other hand, the two special, one-day sessions conducted by Bruce Fraedrich (V.P. for Research, Bartlett Tree Company) co-sponsored by the National Arbor Day Foundation and Penn State Cooperative Extension held in Montgomery County in 2008 had attendance over 40, on par with Morris’ well-subscribed specialty offerings.

Aside from information on individual courses, we can explore what we know about workshop participants. It was mentioned above that the majority of enrollees in arboriculture offerings at the Arboretum are non-members, unlike enrollees in other categories. What else can we learn about individuals who attend workshops at Morris?

Table 2 displays information for six-years of workshop participation for the same four categories. As can be seen, participants in the Landscape Design area were more likely than those in Horticulture or Professional areas to take more than one workshop; 23 individuals took as many as 10 workshops. The more recent Audubon series also had a higher “return” rate. The list of participants over these years was compared to the 67 ISA certified arborists who list Philadelphia in their main contact information. Of these 67 arborists, only 18 have enrolled in workshops at the Arboretum for a total of 22 enrollments: Professional 15, LDS 5 and Horticulture 2. In short, only 15 out of 614 enrollments in Professional workshops were from certified arborists in Philadelphia. To use business terminology, these Professional workshops do not have too many repeat customers and the workshops in arboriculture lack market penetration among arborists in Philadelphia.

Concerning an expansion of arboriculture offerings at Morris, what strengths and weaknesses are significant? A significant strength is the reputation of the Arboretum itself, and its “brand.” Another strength is having on staff two board certified master arborists (BCMAs). That staff, however, is stretched thin with major tree assessment projects. The more they focus on securing contracts, tree assessments and project reports, the less they can devote to educational offerings. Moreover, their contract work is revenue generating and the Urban Forestry unit is largely self-supporting. Although professional offerings generate revenue, those levels are quite modest by comparison.

In short, there would be budgetary implications in shifting two BCMAs from contract work to more educational work, whether that might mean instruction, program development and/or marketing. Other weaknesses concern thin staffing levels at the Arboretum as a whole especially for educational marketing and enrollment services, horticulture staff with numerous responsibilities, and insufficient

facilities for educational sessions. Relocating two education staff to the new Horticulture Center may also pose logistical problems in handling workshops held at the Widener building.

INDUSTRY CHARACTERISTICS

Before proceeding with the final two aspects of the SWOT analysis, namely the external scans of Opportunities and Threats, it is useful to review aspects of the industry of arboriculture and arborists briefly. The observations will augment our understanding of arborists as potential participants in Morris workshops.

As an industry, arborists are discussed by the Bureau of Labor Statistics (BLS) under “Grounds Maintenance Workers” and defined as “supervisors of tree trimmers and pruners” who “specialize in the care of individual trees, diagnosing and treating tree diseases and recommending preventative health measures” (<http://www.bls.gov/oco/ocos172.htm>). Entry-level positions do not require prerequisite training; training is mostly hands-on, on-the-job and skills focused. Formal training may be needed for landscapers who own their own business, arborists, and landscape designers.

In the United States, there are no academic programs leading to certification as an arborist; the situations in Canada and England differ in this regard. Arborists become so in a variety of ways, only some of which are academic; many in fact are arborists because it is a trade with mostly hands-on training. ISA certified arborists run the gamut from non-degreed to PhD. BLS’ Occupational Outlook Handbook does not mention certification through ISA, but does mention the various tree worker certifications offered through the Tree Care Industry Association.

Forestry, in contrast, is in a different situation as an industry. Foresters are grouped by BLS with conservation scientists who require at minimum a bachelor’s degree for employment (<http://www.bls.gov/oco/ocos048.htm>). The Society of American Foresters has certified 50 degree programs in professional forestry as part of their forester certification program and they include provisions for candidate foresters. Several schools of forestry have legacies over 100 years old, including Yale, Cornell, Penn State, Georgia and Minnesota. There is a clear, professional career path for foresters and a legacy of professional education. Table 3 summarizes various differences between arboriculture and forestry as industries.

SWOT ANALYSIS: OPPORTUNITIES AND THREATS

Successful expansion of the Arboretum's offerings in arboriculture education hinges on many factors. Strengths and weaknesses deal with supply; with respect to opportunities and threats, a main issue is one of demand. Unfortunately, there is no demand analysis available when it comes to arborist training. Not even ISA has institutional research indicating how certified arborists obtain their necessary CEUs, what patterns exist by years in the profession, demographic characteristics or regional variations. We therefore must rely on our best estimates.

According to the online listing from ISA (accessed 3/2/2010), there are 67 certified arborists who live in Philadelphia. To be recertified, these arborists would need to acquire a minimum of 30 continuing education units (CEUs) over a 3-year period; BCMAs need a minimum of 60 CEUs with other specialties, such as municipal and utility having levels in between. As a rough estimate, we can say that over a 3-year period this cadre of arborists needs to complete 2100 CEUs, on average 700 per year. Offerings at Morris carry 1 CEU per session hour; a typical one-day workshop with 6 session hours carries 6 CEUs. On a per year basis, this cadre would need to generate 117 enrollments in day-long workshops at Morris in order to meet their recertification requirements solely from Morris. Assuming the Arboretum offers 10 days of workshops per year, this cadre would generate session enrollments of 11-12 per workshop. Such a 100% market share is an unlikely attainment, but there is considerable market potential from arborists in Philadelphia alone (namely 18 of 67), let alone surrounding areas.

On the other hand, there are many professional opportunities throughout Pennsylvania, New Jersey, Delaware and Maryland that provide CEUs. In addition to educational institutions, various training companies such as ArborMaster Training, Inc. offer CEU-granting workshops in the region. Moreover, there are various "mail in" opportunities provided by ISA in the form of continuing education booklets with an attached quiz. ISA has inaugurated a series of podcasts available through their web site and is in the testing phase for online quizzes for CEUs. CEUs are currently available for webcasts from the Urban Natural Resources Institute of the USDA Forest Service and no fees are involved.

Rutgers University is doing more with distance education, and such developments would also have an impact regionally; Oregon State offers an online course in urban forestry, and so on. The Arboretum could replicate and keep pace with such innovations in distance education for arborists, but doing so would entail a sizable allocation of resources and expansion into entirely new ventures with minimal revenue generated. Table 5 lists the various means for gaining CEUs through ISA, most of which Morris does not offer.

Practicing arborists do not need ISA certification, of course. And there are many opportunities for training that do not carry CEUs. Outside of ISA, the Tree Care Industry Association certifies companies as well as safety experts. The Davey Tree Expert Company has its own in-house training programs, many of which are open to non-employees, as well as a newly launched video presence on YouTube concerning tree care. Other companies offer apprentice programs as is more common in other countries such as Canada and England. An increase in the number of workers in the industry, therefore, does not mean an increase in demand for CEUs overall let alone workshops from Morris.

In short, there are opportunities for the Arboretum to carve out a greater niche in terms of training for arborists in spite of many alternate means for enhancing one's skills, but pursuing those opportunities would require an institutional, multi-department commitment and re-examination of priorities.

SWOT SUMMARY

We can summarize the results of the SWOT analyses. As graphically displayed in Table 3, Strengths are not as prominent as Weaknesses, and Opportunities are not as prominent as Threats. It is also the case that Opportunities and Threats are more prominent than Strengths and Weaknesses, implying that addressing external context would be of critical concern in the success of enhanced training for arborists at Morris.

PEST ANALYSIS

The PEST analysis concerns trends that may impact the SWOT analysis. For example, a strength in the short run may not persist in the long run. The major trends are examined under the categories of Political, Economic, Social and Technological.

Political.

Examined here are two kinds of political trends as they affect arborists: industry regulation and municipal plans for urban trees. Although there are few moves to regulate arboriculture as an industry, there are states requiring training of those who perform certain kinds of state-contracted tree work; New Jersey recently passed legislation regarding licensure of “tree experts” and “tree care operators.” Some states, including New Jersey, further require municipalities to have trained shade tree commissions in order to receive urban forestry grants. Should Pennsylvania follow their lead, the Arboretum could position itself to conduct such training for arborist and/or shade tree commission certification. Municipal plans for trees are burgeoning as more cities recognize the economic and community benefits of trees and plan to plant more trees, and there is interest in establishing or reviewing municipal ordinances that affect trees and their care. Cities are also viewing trees as an answer to issues of storm water management and sustainability, as evidenced by Philadelphia’s Greenworks plan and extensive “green infrastructure” proposals from the Water Department. In short, the political trends tend to favor arboriculture as a profession and thus training as well.

Economic.

The Bureau of Labor Statistics projects a much better than average increase in employment of tree workers over the next 10 years of over 26%, mostly through the creation of new jobs. They cite increased employment by municipalities and the need to control pests and diseases affecting trees. Based on these observations, we can presume the general trend for training for arborists to be positive. The current discussion of the “green industry” also bodes well. On the downside, given current fiscal realities, municipalities may need to defer funding their visions of the urban forest, home owners may defer expenditures for tree care, and arborists with reduced income may be less likely to enroll in workshops. While the long-term trend is positive, the short-term is less so.

Social.

The increased interest in such issues as sustainability is likely to augment demand for tree-related workshops. What is unclear is how interest in sustainability will evolve. Currently, as witnessed by the Sustainable Sites Initiative, sustainability is a design concept, namely planning by experts versed in the pertinent sciences and systems. In as much as the Arboretum is not engaged in this kind of research, it is less likely to become a voice in these efforts or to establish an ethos of expertise. Sustainability may indeed become more of a focus in landscape design, in which case the workshops Morris offers in that domain may witness increased demand. But unless sustainability or the related “green” movement are embraced more universally in Philadelphia and the surrounding region, as has happened in cities like Seattle, WA and Portland, OR, they are unlikely to heighten demand for the professional arborist workshops at Morris independently of regional economic or political trends.

Technological.

Concerning technology, notable trends are those that would negatively impact workshop enrollment. Arborists increasingly rely upon hand-held information devices to access information about trees, diseases and pests. Expert sources of such information are likely to become more available as has happened in the medical field. Related to this development are increases in distance education by institutions already leaders in this area (see above SWOT discussion).

On the other hand, with the information age has come more available information about the urban forest through satellite imagery. Tree mapping and with it tree inventory and assessment may likely increase, though project funding will depend on political and economic trends. Enhanced tools for arborists, such as new techniques for assessing tree health or hazards, would result in a demand to learn about the innovations. In short, advancements in technology cut both ways: Morris may be less important to arborists as a source of information on trees in general but more important in the areas of consulting, specialty skills such as mapping and learning new techniques. In terms of technology, a growth industry in arboriculture is in consulting and the use of specialized tools or techniques.

To summarize, many trends lead toward a more positive climate for arborist training while on the other hand the economic realities are a major obstacle. This positive climate, though, also creates enhanced demand for Morris' urban forestry staff to do contracted consulting work thus increasing an internal tension between (among other tasks) contractual obligations and training arborists.

RECOMMENDATIONS

Based on the foregoing SWOT and PEST analyses, the following four recommendations are provided:

Recommendation #1: In the near-term the Arboretum should continue to capitalize on its ability to provide advanced, specialty courses for arborists without significantly increasing the frequency of its offerings overall. This recommendation stems from the competitive advantage the Arboretum has for these courses as well as the realities of infrastructure, especially staffing in Urban Forestry and Education.

Recommendation #2: Expansion of offerings to arborists, especially to regular workshops on basic topics, should be preceded by in-depth strategic planning to include market studies and institutional cost-benefit analyses. There needs to be more information concerning enrollment in workshops at Morris and how certified arborists acquire their CEUs. What motivates arborists to enroll in Morris workshops? Why do they go elsewhere? There also needs to be more analysis of the infrastructure necessary to augment offerings in arboriculture, especially staffing levels in Urban Forestry and Education. More broadly, would this allocation of resources be put to better effect in other endeavors within Public Programs or the Arboretum as a whole? This latter question entails a strategic, multi-departmental examination of priorities, costs and benefits.

Recommendation #3: In the near-term, the Arboretum should not pursue a certificate in arboriculture for completion of a prescribed program of study. This recommendation follows from the first two: the Arboretum's current niche is in specialty courses and there is no indication that such a certificate at Morris would have sufficient demand to make it viable.

Recommendation #4: The Arboretum should consider means for honoring the professional development of arborists at advanced levels, such as a process of recognizing those who have completed a certain number and/or breadth of advanced workshops. Recognition of this kind stems from several observations.

First, it builds upon Morris' niche for specialty workshops in arboriculture as has been mentioned above. Second, it rewards friends of the arboretum. One of the Arboretum's strengths as an institution is its quality service and welcoming character, in short, the connection between staff and the public. Public recognition of an arborist's professionalism would enhance the bonds between the arborist and the Arboretum, as well as provide an opportunity for publicity regarding Morris workshops and arboriculture as an industry.

Third, such recognition does not compete fundamentally with ISA certification (not even BCMA status), nor does it entail a change in curriculum. Arborists, whether ISA certified or not, could continue to pick and choose among the array of workshops Morris offers and focus on areas of particular professional interest.

Last, such a recognition program entails minimal resources to implement. What would be involved logistically is a tabulation of workshop attendance from the Arboretum's database, similar to the compilation concerning repeat attendees (per Table 2), followed by a file review of workshops attended and categories, e.g., Arboriculture versus Horticulture.

DISCUSSION

Admittedly, the current internship project reported on here cannot do full justice to the range of issues and methodologies involved in a comprehensive feasibility study of workshops in “the Arboretum School for Tree Care in professional education program” per the strategic plan. There is a wealth of both internal and external information yet to be gathered and examined; a variety of staff perspectives evaluating such information should be aired. A full programmatic assessment is warranted as is more marketing analysis.

Given the cross-departmental, strategic nature of such studies and initiatives, the best course of action at present would be to convene a study group of staff and selected outside persons to review the status quo, compile additional information and issue recommendations. In addition, and more significantly, is the extent to which new programs for arboriculture should be pursued in the light of competing demands for programmatic resources. Even if a plan were feasible, it might not be the optimal use of limited funds and personnel given other, strategic objectives.

The functions of membership, development and giving are crucial to the budget of the Arboretum and there may well be competing expansions of educational programs viewed as more essential for the lifeblood of the institution, impacting more citizens more broadly and thus more likely to cultivate as well as capture the attention of a potential member or donor. Interviews and observations as part of this study have hinted that this connection between, on the one hand, educational programs and, on the other hand, membership and development has great validity. Such connections emphasize the value in the Arboretum addressing major programmatic initiatives in a strategic manner at the highest levels. In other words, to what extent are enhanced programs for arborists the best investment of limited Arboretum staff time and budgetary resources?

Beyond the foregoing general observations, there are several issues that have emerged in the course of this study that bear some attention in closing although they were not the main focus of the study. Those issues have to do with marketing, a certificate in urban forestry, and academic credit. These three issues will be examined briefly in turn.

Marketing for workshops.

An expansion of workshop enrollments for arborists depends upon improved marketing and it would be prudent to examine what is in place currently and where improvements could be made. What is printed and distributed to whom, when? What is available on the web site, when? What is emailed to whom, when? For example, there are advertisements of individual workshops, but no display ads for offerings for arborists are in place in major outlets, nor is there a campaign to increase awareness of such offerings. Strategic positioning of the Arboretum in this regard needs significant improvement and ought to entail a multi-departmental, concerted effort of Urban Forestry, Education and Marketing (if not others as well) with recommendations for increased resources for marketing as warranted. (Cf. strategic plan goals 7.1 “Create a one year marketing plan to be updated annually,” and 7.5 “Update and improve website and online communications.”)

Increasing regional awareness of the Arboretum as a leader in arborist training is a related, strategic issue. Networking by arborists from Morris -- both urban forestry and horticulture included -- would be crucial in spreading the word about Arboretum educational programs. For example, the Penn-Del ISA chapter holds a day of service each Arbor Day. For the 2009 day of service, no one from Morris Arboretum attended in contrast to crews from Longwood Gardens and Awbury Arboretum, not to

mention dozens of commercial arborists from around the region. This service day was a missed opportunity for community building and Arboretum marketing.

Other opportunities exist for volunteer service in Philadelphia and surrounding counties, such as community plantings, reforestation efforts, pruning clubs and meetings of conservancy groups. Limiting such involvement is Arboretum staff size and commitments. Nevertheless, if public outreach of these kinds were seen as a shared responsibility by all Arboretum staff, much could be accomplished; such participation would be a question of priorities and what will best move the Arboretum forward.

Certificate program in urban forestry

The main focus of this study has been on workshops for arborists. A related discussion is expansion of offerings in urban forestry with the aim of establishing a certificate program. Such a program might be marketed to local Tree Tenders, members of shade tree commissions, arborists new to the profession and/or individuals with an avocational interest. Establishing a niche for a program where there is no clear demand or trend is not easy, but there are several preliminary steps that could be taken to move in that direction:

- (a) Become more active with neighborhood tree plantings groups.
- (b) Become more active with local shade tree commissions.
- (c) Form regional partnerships, alliances and networks with other organizations striving to address issues in urban forestry and become institutional members of related national organizations.
- (d) Become an active partner with the city of Philadelphia's rejuvenated efforts to improve its urban forest under the new Department of Parks and Recreation and the green infrastructure plan unveiled by the Water Department.
- (e) Identify a qualified list of persons who could serve as instructors for elements of the program.
- (f) Review tree stewardship training programs elsewhere and devise a suitable curriculum. Such steps serve to gauge regional interest in urban forestry as a program of study as well as the Arboretum becoming well versed in that domain. Here again, moving forward with this initiative should be examined for its strategic import, costs and benefits relative to other initiatives.

Academic credit for workshops.

One prospect for both enhanced programs for arborists and offerings in urban forestry is linking these workshops to academic programs at Penn with the prospect of persons enrolling for college credit if desired. Augmenting the academic aspect of the Arboretum may have many benefits.

However, if this vision is to be pursued, it seems preferable to lead with the Arboretum's academic strength, namely botany, and eventually develop other, related courses such as Morton Arboretum, among others, has done. For one thing, botany is more closely related to Penn's academic emphasis than either arboriculture or urban forestry. New courses could be promoted as an expansion of current academic efforts in botany and Morris' mission to promote the understanding of plants. Second, it would have a wider market with potential students at local colleges; Morton's program is linked to a consortium of colleges in the Chicago area and students enroll from partner colleges.

That being said, it is unclear to what extent a person with either professional or avocational interest in urban forestry would be willing to pay Penn's tuition rates for academic credit that may be of marginal benefit to them. Courses offered through Penn's College of Liberal and Professional Studies

(LPS), the outreach division of the School of Arts and Sciences, have roughly three times the tuition of School of Arboriculture offerings, rates also higher than courses at nearby Temple University and Penn State's commonwealth campuses at Brandywine and Abington; regular undergraduate tuition at Penn is even higher (see Table 6). Such considerations of tuition costs give further support for Morris to pursue the Morton model of agreements with local colleges, namely of sharing our expertise and excitement for plants with undergraduates in the region, partnerships with other faculty and departments, and becoming a regional center known for its educational and research efforts.

REFERENCES

Borgenicht, Carrie. "Revitalizing Arboriculture Education at The Morris Arboretum." [intern report] April, 2008.

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I particularly appreciate Debbie Caraher for indulging my inquiries of the Arboretum database. Sharon Lilly (Director of Educational Goods and Services of ISA) was especially helpful concerning CEUs for certified arborists, various products and avenues for obtaining them, and the status of the ISA data base. Megan Dunning (Head of Education, Morton Arboretum) kindly answered my questions about their course offerings and provided sample course syllabi.

Lastly, I would like to extend a warm thank you to the Martha S. Miller family for funding this internship; this project would not have been possible without their kind generosity for which I am exceedingly grateful.

TABLES

Table 1. Workshop Counts and Attendance for Morris Arboretum

<u>Professional</u>	<u>Year/Term</u>	<u>Held</u>	<u>Cancelled</u>	<u>Registration</u>	<u>Ave Att</u>
	2006 Fall	4	0	29	7.25
	2007 Spring	1	2	5	5.00
	2007 Fall	4	1	62	15.50
	2008 Spring	4	1	92	23.00
	2008 Fall	5	1	142	28.40
	2009 Spring	5	2	58	11.60
	2009 Fall	5	2	102	20.40
<u>Horticulture</u>	<u>Year/Term</u>	<u>Held</u>	<u>Cancelled</u>	<u>Registration</u>	<u>Ave Att</u>
	2006 Fall	6	1	52	8.67
	2007 Spring	15	1	185	12.33
	2007 Fall	9	0	136	15.11
	2008 Spring	8	0	138	17.25
	2008 Fall	8	0	87	10.88
	2009 Spring	12	0	144	12.00
	2009 Fall	6	1	56	9.33
<u>LDS-Core</u>	<u>Year/Term</u>	<u>Held</u>	<u>Cancelled</u>	<u>Registration</u>	<u>Ave Att</u>
	2006 Fall	1	1	12	12.00
	2007 Spring	3	0	48	16.00
	2007 Fall	2	0	29	14.50
	2008 Spring	2	0	34	17.00
	2008 Fall	2	0	27	13.50
	2009 Spring	2	0	24	12.00
	2009 Fall	2	0	28	14.00
<u>LDS-Electives</u>	<u>Year/Term</u>	<u>Held</u>	<u>Cancelled</u>	<u>Registration</u>	<u>Ave Att</u>
	2006 Fall	9	0	113	12.56
	2007 Spring	6	1	121	20.17
	2007 Fall	5	0	103	20.60
	2008 Spring	6	0	161	26.83
	2008 Fall	5	2	88	17.60
	2009 Spring	7	0	113	16.14
	2009 Fall	5	0	100	20.00
<u>Audubon</u>	<u>Year/Term</u>	<u>Held</u>	<u>Cancelled</u>	<u>Registration</u>	<u>Ave Att</u>
	2008 Spring	6	0	121	20.17
	2008 Fall	5	0	85	17.00
	2009 Spring	4	0	54	13.50
	2009 Fall	4	0	51	12.75

Table 2. Patterns of Workshop Participation Spring 2004 through Fall 2009

	Workshop Category				
	<u>Audubon</u>	<u>Horticulture</u>	<u>LDS</u>	<u>Professional</u> [†]	<u>Combined</u>
Workshops	19	105	104	42	270
Enrollments	298	1249	1779	614	3940
Individuals	160	790	868	408	1776
Average Workshops/person	1.863	1.581	2.050	1.505	2.218
% Who took more than 1	36.9%	29.5%	36.9%	28.4%	40.3%
# Who took 5+ workshops	4	28	75	11	176
# Who took 10+ workshops	0	6	23	0	50
Highest # of Workshops	8	15	17	8	39

[†] These courses are predominantly in arboriculture.

Table 3. Industry Comparisons

Arboriculture

Forestry

Grounds Maintenance Workers (BLS)

Conservation Scientists (BLS)

No degree required

Degree required

Short academic legacy

100-year-old academic legacy

No academic accreditation

Academic accreditation

No clear career definition

Clear career definition

No apprentice status (in USA)

Candidate status

Hands-on, word-of-mouth training

Forestry schools

Table 4. Visual Display of SWOT Summary

Strengths	Weaknesses
Opportunities	Threats

Table 5. Means for Gaining CEUs through ISA

Conferences

Workshops

Booklets (with quizzes)

Professional newsletters (with quizzes)

CDs/DVDs (with quizzes)

Webcasts (with quizzes)

Academic courses

Writing articles

Table 6. Comparative Tuition Costs Per Class Hour at Nearby Institutions

<u>Morris Arboretum</u>	Professional	\$20-25/CEU hour
	Horticulture	\$15-20/session hour
<u>Rutgers University</u>	Professional Landscape Program (including arboriculture)	\$25-60/session hour
<u>University of Pennsylvania</u>	Regular Undergraduate	\$120/session hour
	College of Liberal and Professional Studies	\$60/session hour
<u>Temple University</u>	Undergraduate	\$30/session hour
<u>Penn State-Brandywine / Abington</u>	Undergraduate	\$36/session hour

Note: Tuition per class hour figures were derived from published tuition rates and workshop fees and the number of class hours scheduled per course or workshop.