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**ORGANIZATIONAL STRUCTURE, ACQUISITION PRACTICE
AND COLLECTION DEVELOPMENT IN A BOTANICAL
RESEARCH LIBRARY IN THE UNITED STATES:**

**THE LUESTER T. MERTZ LIBRARY OF
THE NEW YORK BOTANICAL GARDEN**

VON
HEIDRUN JANKA

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Abstract:

In this survey the organizational structure, the acquisition practice and collection development at the LuEsther T. Mertz Library of the New York Botanical are analyzed and discussed. The Mertz Library specializes in botany and horticulture and it collects materials published in all core botanical subjects as comprehensively as possible. The library serves both as an institutional research library and a public library. It is sought by a broad constituency, locally and abroad, for plant information. The budget organization and financial management is a complex, long-term planning process that requires the implementation of a detailed strategic program and finance plan in which the entire parent institution is involved. The strength-of-collection analysis, the collection development analysis and age-of-collection analysis conducted within the framework of this study provide detailed information on the growth of monograph collections in all main collecting areas of the Mertz Library, in the Library of Congress-Classes Q (Science) and S (Agriculture). This survey also allows a comparison of the library acquisition practice with the goals and mission of the parent organization.

This publication goes back to a master's thesis in the postgraduate distance learning course Master of Arts (Library and Information Science) at the Humboldt University in Berlin.

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SI HORTUM CUM BIBLIOTHECA HABES,
DEERIT NIHIL

MARCUS TULLIUS CICERO
(106 BC – 43 BC)

Botanical and horticultural libraries have a long and noble tradition. They are found in botanical gardens, arboretums, research institutions, horticultural societies, conservatories, colleges, and universities as part of a larger university library. Botanical and horticultural libraries are specialized in the collection and preservation of all materials related to plants. Their mission is to make these materials accessible to a broad constituency interested in this topic. Depending on the mission and purpose of the individual library and its supporting institution, the materials collected include scientific literature of botanical and horticultural disciplines, interdisciplinary sciences or of subjects closely related to botany – they may also collect general plant literature of interest to the non-scientific community. Information regarding the plant sciences is critical for plant taxonomists, plant systematists, economic botanists, ecologists, plant physiologists, geneticists, phytochemists, biologists, horticulturists, paleontologists, historians, anthropologists, life science students and graduate fellows (FRASER 2001).

The earliest botanical gardens date back to the Italian Renaissance in the 16th century. Their particular function was to cultivate plants with medicinal uses for studies on *materia medica* (RUDOLPH 1991). At this time, ‘botany’ did not exist as an individual discipline yet but was part of medical sciences. The gardens therefore were called ‘physic gardens’ and were mostly connected with university medical schools or apothecary guilds. The oldest physic gardens were founded in Pisa (1544), Padua (1545), Florence (1545) and Bologna (1568), all in Italy – and in Leiden (1587) in the Netherlands. In accordance with the prevailing interests on the medical use of plants, famous herbals were produced in this time by OTTO BRUNFELS, HIERONYMUS BOCK and LEONHART FUCHS (HAUSINGER 2009).

NATHANIEL LORD BRITTON (1896), the founder of the New York Botanical Garden describes the historical development of botanical gardens as follows: ‘*Botanical gardens were primarily formed for purely utilitarian purposes, although the aesthetic study of planting and of flowers must doubtless have appealed to their owners and visitors. Their function as aids in scientific teaching and research, the one which at present furnishes the dominating reason for their existence, did not develop much, if at all, before the 16th century and prior to the middle of the 17th century a considerable number existed in Europe, in which this function was recognized to a greater or less degree, of which those at Bologna, Montpellier, Leyden, Paris and Upsala were, perhaps the most noteworthy*’.

Scientific interest increased and the cultivation of rare and exotic species attained more attention during the 18th and 19th century. This was the time of the great voyages and discoveries when professional plant hunters were sent abroad to discover new species for nurseries and botanical gardens (MUSGRAVE et al. 1998). These initiatives were mostly supported by wealthy and influential persons in society: ‘*Many persons of wealth and influence fostered this taste and became, through the employment of men skilled in botany and horticulture, generous patrons of science. The world was searched for new and rare plants, which were brought home to Europe for cultivation, and many sumptuous volumes, describing and delineating them, were published, mainly through the same patronage*’ (BRITTON 1896).

Particularly in this time botanical science flourished as many new plant species were discovered, collected and described on these voyages (e.g. on the travels of JOSEPH BANKS

and J.D. HOOKER) – resulting in significant floristic and taxonomic works (e.g. *Bank's Florilegium*). Prior to this, CARL LINNAEUS had already established the foundations of modern taxonomy by introducing the binomial nomenclature and the scientific criteria for species classification in his works '*Species Plantarum*' (1753) and '*Systema Naturae*' (1758).

According to BRITTON (1896) botanical gardens should comprise four essential elements: the utilitarian or economic element, the aesthetic, the scientific and biologic, and the philosophic element. Considering science and biology he pointed out that the library, herbarium, museums and laboratories serve as central information sources of a botanical garden and should be as complete as possible and thoroughly equipped. As described in chapter 2.1, BRITTON pursued these criteria in the planning and establishment of the New York Botanical Garden while he put particular focus on the herbarium and the library. In his publication on the origin, development and mission of botanical gardens, BRITTON (1896) provides an overview of the most noteworthy botanical gardens in the world of this time, including a detailed characterization of the gardens and their facilities. Referring to a former broad survey of PENHALLOW from 1886, denominating more than 200 botanical gardens worldwide, BRITTON eliminated all gardens which are '*essentially pleasure parks, with the plants more or less labeled*' and pays attention to '*a small number of gardens admirably equipped in all branches of the science*'.

Among the most noteworthy botanical gardens selected by BRITTON were the '*Botanical Garden Buitenzorg*', Java (nowadays '*Bogor Botanical Gardens*'), the '*Royal Botanical Gardens at Kew*' (England), the '*Royal Botanical Garden of Berlin*', the '*Jardin des Plantes*' in Paris, the '*Botanical Garden of the University of Vienna*', the '*Botanical Garden of Geneva*', the '*Royal Botanical Garden of Edinburgh*', the '*Royal Botanical Garden of Dublin*', the '*Brussels Botanical Garden*', the '*Imperial Botanical Garden at St. Petersburg*', the '*Royal Botanic Garden of Trinidad*', the '*Botanical Garden of Jamaica*' and the '*Botanical Garden of McGill University*' at Montreal. More foreign gardens of interest would be those at Munich, Würzburg, Tübingen, Stockholm, Copenhagen, Uppsala, Zürich, Ceylon, Calcutta and Oxford (BRITTON 1896). The institutions named here fulfilled BRITTON'S criteria for botanical gardens and included significant botanical libraries, already at this time.

Since BRITTON'S overview of noteworthy botanical gardens from the end of the 19th century, the number of botanical gardens (including botanical libraries) has considerably increased in all parts of the world, and the list would be much too long to be included here. An up-to-date overview on the world's botanical gardens can be viewed on the Botanical Garden Information System web site:

http://www.biologie.uni-ulm.de/systax/infgard/index_d.html. A global directory of all herbaria, the *Index Herbariorum*, is provided on a web site hosted by the New York Botanical Garden: <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>.

Considering the sizes and significance of botanical libraries and their collections, there are foremost three leading libraries to be named: the '*LuEsther T. Mertz Library*' of the New York Botanical Garden, the '*Library of the Royal Botanic Gardens of Kew*' and the '*Library of the Missouri Botanical Garden*' in St. Louis (based on the results of a '*Strategic Competitive Analysis*' from 2006). Other large and significant botanical libraries in the United States are e.g. the '*Arnold Arboretum Horticultural Library*' in Boston, the '*Botany Libraries of Harvard in Cambridge*', and the '*Hunt Institute for Botanical Documentation*' in

Pittsburgh. In Europe, the ‘Library of the Botanic Garden and Botanical Museum in Berlin’ (BGBM) is considered the largest and most significant botanical library in ‘continental Europe’ (K. OEHME, pers. comment).

Many North American botanical and horticultural libraries are members of the ‘*Council on Botanical and Horticultural Libraries*’ (CBHL), and numerous European botanical libraries have joined the European counterpart, the ‘*European Botanical and Horticultural Libraries Group*’ (EBHL). This globally acting network of libraries fosters the advancement of botanical and horticultural information and encourages collaborations between botanical libraries (see chapter 2.5). An overview of all institutions participating is provided in the member directories of CBHL and EBHL.

At the time when many botanical gardens were founded in North America – in the second half of the 19th century – garden directors and curators made extensive trips to Europe and visited gardens in different countries, for example N.L. BRITTON from New York Botanical Garden and HENRY SHAW from Missouri Botanical Garden (RUDOLPH 1991). Numerous European gardens served as models for American gardens, as e.g. the Royal Botanic Gardens of Kew for NYBG (MICKULAS 2007), Glasgow Botanic Gardens (and others) for the Missouri Botanical Garden (RUDOLPH 1991). But the trips to Europe had other intentions as well: Scientists and librarians were sent out to purchase parts of other libraries and herbaria and to return the assembled collections to their home institutions (see chapter 2.1 for NYBG). Very often, the acquired collections formed a substantial part or even the nucleus of the new garden’s library, as e.g. described from ASA GRAY’S purchases for Harvard (WARNEMENT 1997). This exemplifies the often practiced method of collecting library (and herbarium) collections (CALLERY 1995) (see chapter 2.1).

In history, botanical libraries have often developed in a close connection to herbaria in botanical gardens and other research institutions. This is no coincidence as especially plant taxonomists need to have library resources close to specimens for productive research and teaching. As described by STUESSY & STUCKEY (1997): ‘We continually seek information from books and observe phenomena on herbarium sheets, comparing localities and illustrations with variations in morphological features, written itineraries with site localities, published handwriting with notations on the labels etc.’. Likewise, EWAN (1970) emphasizes the importance of libraries in close proximity to herbaria. According to him four opportunities in botanical history still apply today: pressing the search for records, saving historically valuable materials before they are lost, compiling international retrieval aids, and writing interpretative biographies and social histories. Libraries associated with herbaria must assist with all these tasks.

Field books and correspondence of botanists are materials of great value for taxonomic research and botanical history. Botanical gardens and research institutions with large herbaria recognize the importance of these resources, and keep them in institutional archives in close proximity to their scientific collections. The importance of this is stated by DORR (1997): ‘If we are to extend our knowledge of the plants that surround us, not only must books and herbaria continue to be intimately associated but also archival materials (especially letters and field books) must be preserved and made accessible to those who use herbaria’. Letters and field books have much to teach about how collections came to be formed. A very good example is the Archives of the New York Botanical Garden which contain an extensive collection of field notebooks, manuscripts and correspondence of former staff members and

renowned American botanists such as JOHN TORREY and N.L. BRITTON. The majority of these notebooks document specimens now deposited in the herbarium of the New York Botanical Garden and are of great value in interpreting and evaluating these specimens and the expeditions on which they were obtained (FRASER 1996). These materials reflect the entire history of the institution and contain many significant documents illustrating the history of American Botany (e.g. the often consulted TORREY correspondence).

There are many examples from North America that show how information contained in botanical archives and libraries can help to interpret what is contained in a herbarium, but also enable an understanding of how herbarium materials may migrate from one collection (or one individual) to another. One example is the ‘botanical riddle’ of the Samuel Botsford Buckley Herbarium that would not have been solved had not letters and other documents been saved by individuals and deposited in the archives of botanical institutions (DORR 1997). This shows how much has been learned from materials that botanical libraries have preserved. As has already been stated by BENTHAM (1858) and STUESSY & STUCKEY (1997): ‘A botanical library is useful without a herbarium, but not a herbarium without a library’. BENTHAM (1858) further noted that ‘... it is important that this library should be in the same house ... as the specimen’.

The ‘digital revolution’ and modern technology have brought many changes to botanical libraries. Traditional local library catalogs have been converted into online catalogs that are available to the botanical community worldwide. The Mertz Library’s online library catalog CATALPA has been available in the WWW since 1994 and continues to be used as an international resource (FRASER 2001). Other botanical libraries in the United States established online public access catalogs in the 1990s as well, e.g. the Herbarium Library of the Ohio State University (OSCAR, accessible online via OhioLink) (STUESSY et al. 1997) and the Harvard Botany Libraries (HOLLIS) (WARNEMENT 1997). In addition to this, powerful electronic research tools like BIOSIS, AGRICOLA and OCLC FirstSearch have revolutionized the research for botanical information resources and allow botanists to locate relevant periodical titles in many academic disciplines (FRASER 2001). Other important tools for botanists are large nomenclature databases such as TROPICOS (hosted by the Missouri Botanical Garden) or the *International Plant Names Index* (IPNI) compiled at the Royal Botanic Gardens, Kew including the *Index Kewensis* (IK), the *Gray Card Index* (GCI) from the Harvard University Herbaria and the *Australian Plant Names Index* (APNI) from the Australian National Herbarium (ALLEN 1993, FRASER 2001). Since most of the cited literature in botanical science is published in serials, increased access to e-journals is a priority for botanists (FRASER 2001). As scientists in other disciplines, botanists have become more dependent on remote retrieval systems which allow access to published articles and current scientific data in a more timely manner. This development has a strong influence on the information-seeking behavior of botanists and creates new tasks and challenges for botanical libraries as described by FRASER (2001): ‘The librarian has become an information manager, responsible for tracking and organizing information in a variety of media’.

This thesis focuses on the organizational structure, the acquisition practice and collection development of a botanical research library. Acquisitions and collection development is a very complex and challenging work area in botanical libraries. In general, the numerous tasks and responsibilities of collection development librarians include setting up goals for building collections, designing concepts for collection development or acquisition profiles, the planning, implementation and analysis of all processes and aspects concerning

collection development (including collection assessments and evaluations), vendor selection, budget and fiscal management, cost minimization, organization and supervision of all day-to-day operations, staff organization and resource allocation (FERGUSON 1994, UMLAUF 2002).

What does 'collection development' mean exactly? A succinct definition is provided by BRYANT (1987): 'The goal of any collection development organization must be to provide the library with a collection that meets the appropriate needs of its client population, within the limits of its fiscal and personnel resources. To reach this goal each segment of the collection must be developed with an application of resources consistent with its relative importance to the mission of the library and the needs of its patrons'. According to EVANS (2000), collection development is an area common to both librarianship and information resource management. EVANS (2000) interprets the term 'collection development' in relation to a library environment more in the traditional sense with a centralized collection of materials, while the term 'information resource management' refers to any organizational context in which the information resource manager is responsible for identifying both internal and external sources of information and making them available. EVANS (2000) therefore uses a somewhat broader definition of collection development: 'Collection development is the process of meeting the information needs of the people (a service population) in a timely and economic manner using information resources locally held, as well as from other organizations'. Referring to the development described above in botanical libraries with a large proportion of research materials being retrieved from remote electronic systems, the tasks of collection development librarians certainly have expanded nowadays and include information resource management as well as knowledge management (BRANIN 1994, JOHNSON 1994). Principal goals of collection development in academic libraries have been defined by CRETH (1991) as follows:

- Selection of library materials in all formats (by purchase, gifts or exchanges)
- Weeding: removing library materials from collections including cancellation projects for serials
- Preservation: identifying library materials in need of preservation or conservation treatment and providing secure conditions for collections
- Participation in cooperative projects with other libraries
- Liaison with academic departments: maintaining currency on departmental research, on requirements for materials, and on shifts in the academic programs, keeping abreast of future demands and developments
- Reference and user education: individual specialized reference, teaching subject-oriented seminars, developing bibliographies
- Fiscal responsibility, effective and efficient use of assigned budget (analyzing costs, developing budget requests, monitoring expenditures, assessing publishing trends and vendor performance)
- Policy development

In addition to the above listed tasks, the management of electronic information resources and the handling of leases and licenses are further important questions to deal with in collection development (CLINE 1994). Usually, there is more appropriate information available than the organization can handle. Each library has to select materials carefully - for financial, spatial and content-related reasons - thereby taking account of the library's acquisition profile (UMLAUF 2002). All information concerning the acquisition practice and the goals for collection development should be manifested in the library's concept or

‘acquisition profile’ pointing out all criteria for the selection of library materials (books, serials and electronic media) and for building the library collections. Especially in academic or institutional research libraries with special profiles and information needs, precise criteria for the selection of appropriate library materials are critical. With respect to the selection of library materials the following criteria should be considered (UMLAUF 2002):

- the special tasks of a library (purpose and mission)
- the main collection areas
- the completion of special collections
- regional and supraregional agreements for information supply
- the demands of patrons
- the formats and quality of library materials to be acquired (authors, contents, interpretation)
- the topicality and timeliness
- the future relevance of materials collected
- the archival relevance of library materials

Acquisition profiles can be described either in an ‘acquisition policy’, a ‘selection policy’ or ‘collection development policy’. According to EVANS (2000), the terms should not be used interchangeably. Selection policies often omit references to evaluation, deselection and intellectual freedom. Acquisition policies tend to focus on the mechanics of acquiring materials instead of the selection process or collection building. There are many reasons for establishing ‘collection development policies’. A collection development policy is a library’s master plan for building and maintaining its collections relating to the library’s strategic and long-term plans. The policy provides a framework with written guidelines and serves as a reference point for acquisitions staff to exercise judgment. Without written statements, different views on the library’s purpose might emerge and this divergence of opinions can cause confusion (EVANS 2000). Among its many uses, the collection development policy informs about the nature and scope of the collection, about the collecting priorities and the organizational priorities for the collection, it sets standards for inclusion and exclusion of materials, reduces the influence of a single selector and personal biases, provides a training and orientation tool for new staff, helps ensure a degree of consistency over time regardless of staff turnover, aids in weeding and evaluating the collection, aids in rationalizing budget allocations and provides a public relations document (EVANS 2000).

Acquisition profiles of academic libraries should comprise information on qualitative and quantitative elements (UMLAUF 2002). Qualitative criteria address the subject areas represented in the library collections, the languages of publications, the bibliographical value of publications and their relevance for research, the publication types and formats represented in the collections, the placement of the library in comparison to other libraries specialized in the same subjects, and the levels of collecting intensities as defined in a conspectus. Quantitative elements of acquisition profiles refer to the size of collections, the number of library loans and onsite uses of library materials, the frequency of single loaned materials, and the availability of library materials (UMLAUF 2002).

Within the framework of this thesis, the organizational structure, the specific functions, responsibilities and activities of the LuEsther T. Mertz Library are characterized, thereby focusing on the library’s acquisition practice and collection development. Beside a detailed description of the library’s collection profile and collecting intensity in the single

areas represented, the study comprises an analysis of the Mertz Library's up-to-date holdings of monographs – in particular of its 'core collections', the Library of Congress Classes Q (Science) and S (Agriculture). In addition to this, a collection assessment will be performed considering the growth of monograph collections in LC-Classes Q and S in the time period 1995-2009, as well as the expenditures incurred for all categories. One further aspect considered is an 'age of collection analysis' of the Mertz Library's core collections illustrating the age distribution of the monograph holdings in LC-Classes Q and S according to publication dates.

In this survey, the collection analysis mainly focuses on quantitative elements (addressing the collection sizes, percentage growth of single areas and expenditures) - based on data compiled from 'collection development reports' created by the Mertz Library's Integrated Library System, Innovative Interfaces 'Millenium' ILS. Qualitative elements will be addressed with respect to the subject areas represented and the collecting intensities practiced. A comparison of holdings with other libraries could not be performed within the limited time period available for this survey but it would be a valuable addition to this collection analysis. Considering comparisons of collections, there are some difficulties concerning most of all the comparability and availability of data from other botanical libraries. As has been stated from an earlier attempt to compare holdings of U.S. botanical libraries (members of the *Biodiversity Heritage Library*, BHL, see chapter 2.5), there are too many individualities in the libraries surveyed - concerning the classification systems used as well as the depths of the cataloging records. Taking the compatibility problems of different data formats used by the libraries into account as well, these reasons unfortunately rule out a direct comparison of holdings based on single LC-Classes for the time being. One comparison, however, with a large German botanical library has been made regarding an important aspect in collection development: the monograph and serials acquisitions in conjunction with the expenses incurred for these. This serves to analyze trends in acquisitions and budget development in two botanical research libraries over a time period of 8-10 years.

The LuEsther T. Mertz Library is one of the world's largest and most active botanical and horticultural research libraries (FRASER & REED 2002). The Library's collections hold more than one million accessioned items (books, journals, original art and illustrations, seed and nursery catalogs, architectural plans of glass houses, scientific reprints, and photographs), it is widely recognized by the international botanical community as one of the most important research collections in the world (FRASER & REED 2002). The collection is particularly strong in systematic, floristic, and economic botany, phytogeography, plant ecology, as well as in horticulture, gardening and landscape design (REED 1969, FRASER & REED 2002). It holds approximately 80% of the world's published literature on the subjects of plant systematics and floristics (REED 1995). Being an institutional research library since its inception in 1899, the Mertz Library's mission is to serve all parts of the New York Botanical Garden, including the Garden's programs and its affiliated research communities (see the Library's 'collection development policy', chapter 7.1). The Library seeks to collect as comprehensively as possible in systematic and floristic botany with special emphasis on literature about the Western Hemisphere representing the focus of the New York Botanical Garden's research program (see chapter 7.1). In addition, the Library intensely collects in modern science disciplines as genomics, molecular systematics, and climate change resources.

The LuEsther T. Mertz Library serves as both a research and a public library, it is sought by patrons for both scholarly resources and general plant information. The Library is used by a very broad constituency ranging from the Garden's staff, students from affiliated universities in the metropolitan area, as well as members of local, national and international research and academic institutions, researchers from business or industrial communities, and the general public (FRASER & REED 2002). The Library's collections (see chapter 3) are accessible and available to all patrons on site, they do not circulate, except for a small designated circulating collection. Only the Garden's staff and students enrolled at the New York Botanical Garden's *Graduate Studies Program* or *The School of Professional Horticulture* are allowed to take literature from non-circulating collections to their assigned offices on campus.



Fig. 1 : Library Building in the New York Botanical Garden

2.1 History of the Library

The LuEsther T. Mertz Library was established in 1899, eight years after the foundation of the New York Botanical Garden. The Library is located on the top floor of the Beaux-Arts Library Building, built in 1900 (see figs. 1-3). The Garden's first director, NATHANIEL LORD BRITTON, an eminent Columbia University botanist, brought his own private book collection to the newly established Library in 1899. In the same year, the entire botanical library from Columbia University, consisting of 5,000 volumes, was transferred to the New York Botanical Garden, based on an agreement on permanent loan, by the trustees of Columbia University (REED 1969, HANSELL 1957, CALLERY 1995). These two collections, comprising approximately 7,500 volumes, formed the nucleus of today's collections (REED 1969, FRASER & REED 2002). The New York Botanical Garden Library thus began as 'a collection of collections' (CALLERY 1995). The Columbia University's collection was of particular interest as it contained the library of the noted 19th century American botanist JOHN TORREY, including his correspondences. Recognizing the value of creating a single comprehensive botanical library in New York City, other institutions contributed some of their library holdings to the New York Botanical Garden (FRASER & REED 2002). A noteworthy contribution came from the New York Hospital in 1899, comprising works from the botanical library of Dr. DAVID HOSACK, founder of Elgin Botanic Garden, the first public botanic garden in America (REED 1969, HANSELL 1957, CALLERY 1995, FRASER & REED 2002). Other institutions that gave many botanical publications to the New York Botanical Garden Library include the New York Academy of Sciences (1901) and the Union Theological Seminary (1954). Many private donations have contributed to the growth of the Mertz Library's holdings as well. An overview of private holdings donated to the New York Botanical Garden Library is listed by REED (1969), FRASER & REED (2002); a detailed description is given by CALLERY (1995).

The New York Botanical Garden Library did not solely depend on gifts and loans, as the 'Special Book Purchase Fund' to which many persons interested in botanical libraries contributed (REED 1969) shows. A notable contributor to this fund was ANDREW CARNEGIE, a member of the Garden's Board and a wealthy industrial and philanthropist who invested much for the growth and development of libraries throughout the United States (REED 1969, GORDAN 1994). This book fund allowed the Garden to purchase many 18th and 19th century European publications (FRASER & REED 2002). Among the most notable purchases made possible by this fund, was a collection of approximately 400-500 volumes of Pre-Linnean Botany and Natural History works that the Garden's Director NATHANIEL LORD BRITTON acquired from an auction in Berlin in 1902. In addition, over 500 books and pamphlets were purchased at the auction of the botanical library of Professor ALEXIS JORDAN in 1903; most of this collection was a gift of ANDREW CARNEGIE (REED 1969). Furthermore, a collection of books and letters by CHARLES DARWIN, formerly owned by Board member CHARLES FINNEY COX could be saved by this fund. Between 1921 and 1926 the Garden purchased 2,350 books and pamphlets from the private library of NYBG's bibliographer JOHN HENLEY BARNHART (CALLERY 1995, FRASER & REED 2002). In addition, the Garden purchased an immense number of duplicates from some consolidated botanical institutions in Geneva, Switzerland in 1923 (REED 1969, GORDAN 1994, FRASER & REED 2002). However, by the end of the 1920s, and with the beginning of the Great Depression, the Special Book Fund was depleted. Despite its financial problems, the Garden was able to purchase approximately 400 important botanical works from the sale of The New York Society Library in 1938.

A new fundraising campaign initiated by the Garden's Board in the late 1960s and early 1970s allowed the purchase of a very special collection of 15th and 16th century herbals and important manuscripts by Dr. EMIL STARKENSTEIN, a professor of the history of medicine in Berlin (FRASER & REED 2002). The collection included 12th and 13th century copies of *Circa instans*, an early pharmacopoeia originating from the first European School of Medicine in Salerno, Italy (ANDERSON 1975, FRASER & REED 2002). One of the most remarkable collections given to the LuEsther T. Mertz Library between 1978 and 1991, on permanent loan, is the Lord & Burnham Collection (CALLERY 1995). The Lord & Burnham Company of Irvington, New York, the premier glasshouse manufacturer in the United States from the 1860s through the 1980s, transferred its business records and files of architectural plans to the Garden. The unique collection is housed in the Garden's Archives. The responsibility for establishing the Garden's Archives was assigned to the NYBG Library by the Board of Managers in 1968 (FRASER & REED 2002).

In 1978, the NYBG Library started to computerize its holdings and to enter all records into the database of OCLC (Online Computer Library Center), an international bibliographic network. OCLC is widely used for bibliographic and holdings information and consulted by many libraries and their users worldwide. The Garden also uploaded its records to the Research Library Information Network (RLIN), a parallel bibliographic database serving major research libraries world-wide (REED 1995). The Mertz Library's online botanical library catalog CATALPA (**CATAL**og for **L**ibrary **P**ublic **A**ccess) was established in 1994, and is accessible since then to users worldwide over the Internet: <http://library.nybg.org/>. CATALPA features full bibliographic descriptions, subject headings, author and title entries for all items catalogued in the collection. In general, library materials are catalogued according to the Anglo-American-Cataloging Rules, 2nd edition, revised (AACR2) for descriptive cataloging, as well as the Library of Congress Subject Headings (LCSH) and Library of Congress Classification (LCC). The Library maintains an authority file of names and terms. The Mertz Library has made some modifications to the Library of Congress standards, however, in order to better serve the interests of specialists (FRASER & REED 2002):

1. The scientific names for plants are used, instead of common plant names, and subject headings are provided to species level. Cross-references appear for many common names.
2. The catalog uses additional subject headings of a technical nature in more detail than is found in LCSH.
3. The classification for vascular plants (Class QL, see chapter 9) is based on the classification system used by the Garden's Herbarium. As a result, works on these plants are shelved systematically, rather than alphabetically as in LCC.



Figs. 2 + 3: Reference Room (left) and Shelby White and Leon Levy Reading Room of the Mertz Library (right)

2.2 Library Services

The Mertz Library provides a wide range of public services including reference, research and interlibrary loan services. Librarians assist patrons who need assistance with bibliographic or electronic sources. They answer reference and research enquiries either onsite, through telephone, e-mail, mail or fax, process interlibrary loan requests and document deliveries using the OCLC system. The Library's plant information specialists respond to incoming requests concerning plant culture, maintenance and selection of plants. They do research and prepare informational handouts and fact sheets (available on the web site), provide information for popular or timely topics and frequently asked questions. Plant identification questions are also processed after submission of adequate specimens of the plants in question. In addition to providing reference and research services, the Library mounts two public exhibitions per year. The exhibitions feature the library's rich collections, focusing on special topics, e.g. the history of botany or horticulture, works of important writers, artists or researchers, or topics that play an important role in the Garden's program. Announcements on exhibitions currently in preparation or shown at the Library's gallery can be viewed on the Library's web site. The exhibitions provide an educational experience to visitors, encouraging them to do research and to use the Library's collections. Visitors can participate in guided tours through exhibitions and collections offered by the Library staff in regular terms. The exhibitions also allow the Library staff to do research and to interpret the collections as curators.

2.3 Electronic Databases and Reference Tools

The Mertz Library provides access to a wide array of electronic information databases and reference tools. Many of these can be accessed directly from the Library's web site; others are restricted to onsite use at the Library and/or require passwords. Important electronic research tools and databases for botanical literature and nomenclature are: ISI - Web of Knowledge, BIOSIS, AGRICOLA, JSTOR, OCLC First Search, International Plant Names Index (IPNI), TROPICOS, Index to American Botanical Literature. In addition, the Library provides access to a growing number of digital libraries, e.g. the Library's own 'Mertz Digital', Botanicus.org, eFloras.org, Biodiversity Heritage Library (BHL), Hathi Trust Digital Library, Gallica Bibliotheque Numerique, Digital Library del Real Jardin Botanico CSIC.

2.4 Affiliations of the New York Botanical Garden

The New York Botanical Garden collaborates with numerous universities. Students enrolled at the Garden's *Graduate Studies Program* are frequent users of the Mertz Library (see above). The Garden's *Graduate Studies Program* (LENTZ & BELLENGI 1996) is operated in conjunction with the following schools:

- Columbia University - Center for Environmental Research and Conservation (CERC)
- Yale University - School of Forestry
- Cornell University - Biology Department
- New York University (NYU) - Biology Department
- Lehman College Plant Sciences Program - City University of New York (CUNY)
- Fordham University - Biology Department
- Plant Genomics Consortium

2.5 Cooperations of the Mertz Library

The Mertz Library is an active institutional member of

- OCLC (Online Computer Library Center), <http://www.oclc.org/>
- Council on Botanical and Horticultural Libraries (CBHL), <http://www.cbhl.net/>
- Society of American Archivists (SAA), <http://www.archivists.org/>
- American Institute for Conservation, <http://www.conservation-us.org/>
- Biodiversity Heritage Library (BHL), <http://www.biodiversitylibrary.org/>

The Mertz Library is a founding member of the *Biodiversity Heritage Library* (BHL), a consortium of major botanical and natural history libraries which was founded with the aim to pool and digitize holdings of selected biodiversity literature, to share all resources and make them available worldwide under a single online platform (see above). Collaborations such as those with the *Council of Botanical and Horticultural Libraries* (CBHL) and its European counterpart (EBHL) provide an important network, promoting information exchange and resource sharing for libraries. They are an important element for libraries to better support the scientific communities they serve (FRASER 2001).

2.6 Special Projects and Activities of the Mertz Library

The staff of the Mertz Library is frequently involved in special projects associated with the collections, their access or their preservation. One of the large projects concerns the master files of *Taxonomic Literature*, 2nd edition, a comprehensive seven-volume bibliography, compiled by FRANS A. STAFLEU of Utrecht and RICHARD S. COWEN of the Smithsonian Institution from 1976 until 1988. This monumental, systematic botany standard work provides accurate biographical and bibliographical information on botanical publications. It covers a period from 1753 to the early 1940s and contains information from collections of 40 botanical libraries worldwide. The NYBG Library was selected as the repository for this large collection of master files consisting of roughly 1.2 million pages. Four working files were sent to the Garden by the compilers. The project involves interfiling these four files into one, so that they can be more readily accessed (FRASER & REED 2002).

The Mertz Library digitizes some of its holdings, independent of larger collaborative projects like the *Biodiversity Heritage Library* (BHL). This includes items unique to the Library, as well as material supporting the work of the Garden or contributing to specific projects as part of the *Digital Plant Research Center* (DPRC). The DPRC is a system of interconnected digital resources that is being developed at the Garden which proposes to link botanical literature, herbarium specimen, and other research data from the Garden's scientists (field notebooks, films, interviews etc.) to create comprehensive 'electronic floras' in a unified search tool. Modern computer technology allows the Mertz Library to better manage its collections and to provide knowledge to patrons for their use. The Library's electronic materials are in quite different formats: CDs, DVDs, electronic indexes and databases, and PDFs. An important goal of the Library is to unify and to better manage its electronic collections, so that seamless links to all available resources are created, and that they can be accessed via a single point of entry. For this purpose, electronic resource management tools like Serials Solutions and CASE/ERMS (Electronic Resource Management Systems) are being introduced to the Library.

2.7 Strategic Competitive Analysis, Benchmarking

The Mertz Library coordinates strategic competitive and benchmarking analyses, against other botanical research libraries in the United States and abroad. This serves to compare and evaluate different aspects of the library and includes (among other factors) the size of collections, number of subject fields, the technical infrastructure, library services and the staff size. By comparing collection size (using the ratio of number of book and journal volumes) to staff size, the results measured can tell how much staff supports a collection (or covers a subject field) in each library. Competitive analyses may reveal the strengths and weaknesses in different categories measured from the participating libraries. The results of these analyses are used for planning budgets, programs and new initiatives in the future.

3. COLLECTIONS OF THE LUESTHER T. MERTZ LIBRARY

A detailed description of the Mertz Library's rich and varied holdings is provided by FRASER & REED (2002) and REED (1969). Books and journals are found in the 'General Research Collection', the 'Rare Book and Folio Collection', the 'Pre-1850 Collection', the 'Circulating Collection', as well as in a number of special-use collections, including the 'Reference and Bindery Collections' and the 'Cryptogamic/Britton' and the 'Herbarium Libraries'. All book and journal holdings are fully cataloged and accessible in the Library's online catalog CATALPA. The 'Non-Book and Special Collections' include 'The Archives', the 'Art and Illustration Collection', the 'Seed and Nursery Catalog Collection', the 'Index Seminum Collection', the 'Reprint Collection', the 'Lord & Burnham Collection', the 'Photograph Collection', and the 'Vertical File'.

3.1 The Book and Journal Collections

The General Research Collection

The General Research Collection consists of all books published after 1850 and nearly all of the Library's serial titles.

The Rare Book and Folio Collection

The Rare Book and Folio Collection includes the earliest books and manuscripts held by the library, dating from the 12th century to 1753, the publication of CARL LINNAEUS' 'Species Plantarum'. Included in this collection are scarce works from the Linnean and pre-Linnean times, among them herbals, incunabula, and works considered to be foundations in the fields of botany, biology, materia medica, horticulture and gardening, and agriculture. Some of them are as well the most beautiful and valuable volumes held by the Library. The Folio Collection is particularly notable for its holdings of 18th and 19th century featuring many fine botanical plates, rendered in print from paintings and drawings by many notable artists as PIERRE JOSEPH REDOUTÉ, PANCRACE BESSA, GEORGE DIONYSIUS EHRET and WALTER HOOD FITCH.

The Pre-1850 Collection

The Pre-1850 Collection consists of books published between the years 1753 and 1850. The collection is particularly noteworthy for its early American imprints. As this period is also known as the 'great age of botanical illustration', many of the volumes feature outstanding hand colored illustrations.

The Circulating Collection

The Circulating Collection is a small collection of about 4.000 titles of general interest focusing on basic botany, gardening, and landscape design. The holdings may be borrowed for home use by Garden Members, Garden Staff, volunteers and students enrolled in the *Graduate Studies Program* and *The School of Professional Horticulture*.

3.2 The Non-Book Collections

The Archives and Manuscripts

The Archives include manuscripts of important botanists and horticulturists, correspondence, working papers, field notebooks, photographs, architectural plans, maps, illustrations, portraits, and artifacts. The collection provides a comprehensive history of the growth and

development of the New York Botanical Garden since its inception in 1891 as well as the history of botanical science and horticulture as fields of study. They also document the relationships between the Garden and its personalities with other botanical, horticultural, and cultural institutions in the 19th and 20th century, in the United States and other nations.

The Archives are arranged in three categories:

1. Institutional records were created as a result of official Garden activities.
2. Personal papers contain correspondence, manuscripts, research notes, and other materials from botanists, horticulturists, and landscape designers associated with the history of botany and horticulture in the U.S., the development of the landscape, and the growth and evolution of the Garden and its work.
3. Repository archives are the historical records of selected botanical and horticultural organizations, plant societies and plant-related businesses and industries.

The Lord & Burnham Collection is an important attraction of the repository archives. It holds architectural drawings, correspondence and account books for greenhouses, conservatories, and related structures erected in the United States in the late 19th and 20th centuries by the Lord & Burnham Company and by other manufacturers associated with the firm. The collection contains over 140.000 architectural plans and includes data on structural and site elements for more than 7.000 glass structures.

The Art and Illustration Collection

The Art and Illustration Collection encompasses watercolors, oil paintings, line drawings, sculptures, and photographs – thus covering a wide range of illustration techniques and media. Included in this collection are drawings done to illustrate renowned Floras, illustrations to supplement botanical descriptions in taxonomic works, as well as garden-related illustrations. The Art and Illustration Collection is an important tool for taxonomic research and a valuable and useful resource for studies of the history of botanical art, as well as for exhibitions.

Seed and Nursery Catalog Collection

The Seed and Nursery Catalog Collection contains approximately 150.000 items, the earliest dating back to the first half of the 19th century. It is particularly strong in catalogs of American purveyors of seeds and plants in the 20th century. The holdings are not yet cataloged but have been inventoried in two local databases available in the Library.

Index Seminum

The Index Seminum (Seed Exchange Lists) Collection contains printed lists of documented seed collections made from wild plants available for distribution through exchange by botanical gardens and arboreta. These publications are of interest to scholars studying the introduction of new species. In the 18th and early 19th centuries, the first descriptions of new plants sometimes appeared in such publications.

The Reprint Collection

The Reprint Collection holds a large collection of scientific reprints arranged alphabetically by the first author's name. The reprints are copies of articles, printed separately from scientific

and technical journals, for distribution by the author(s). The collection conveniently brings together many of the writings of a single author. It often contains articles from journals not held in the general research collection. The Library is presently creating records in the online catalog to indicate that an author is represented in the collection.

The Photograph Collection

The Photograph Collection was gathered in the Library in the 1960s from a number of collections housed elsewhere in the Garden. The most important ones are the historical photographs of the Garden, especially those taken before World War II. Access to these collections is limited.

The Vertical File

The Vertical File is a subject file containing magazine and newspaper clippings, photographs, ephemeral publications, and other miscellany. This collection, begun in the 1920s, now numbers over 40,000 file folders. The file is still maintained and added to, although the Library depends increasingly on searchable databases for the kinds of information once designated for the Vertical File.

4. ORGANIZATIONAL STRUCTURE OF THE LUESTHER T. MERTZ LIBRARY, FUNCTIONS AND RESPONSIBILITIES OF THE LIBRARY DEPARTMENTS

The Mertz Library has six departments (see chart 4.1), each with its own manager or head of department, and all of them supervised by the Library Director:

1. Director, Administration Department
2. Department for Acquisitions and Collection Development
3. Cataloging Services Department
4. Conservation / Preservation Department
5. Information Services Department and Archives
6. Library Systems Department

4.1 Director, Administration Department

The Library Director manages all aspects of the Library operation and develops direction and policies for the Library. The Director plans and coordinates the Library's programs and activities, and delegates responsibility for these to the Department Managers. All department activities are reviewed and evaluated by the Library Director, then directed to the Garden's programmatic and administrative departments, the research communities and to the general public, to meet their information needs. The Library Director identifies fund raising opportunities and determines strategies to develop funding for the Library operation and project support. The Director identifies and writes grants, prepares the departmental budget and allocates resources. In addition, the Library Director actively participates in numerous professional organizations to facilitate collaborations. The Library Director recruits and hires new Library staff, supervises staff and coordinates staff performance reviews. The Director is assisted by a Secretary who is responsible for the day-to-day operations in the Library.

4.2 Department for Acquisitions and Collection Development

The Department for Acquisitions and Collection Development is comprised of three employees: an Acquisitions Manager or Collection Development Librarian, a Serials Specialist (part-time) and a Book Purchasing Clerk (part-time). The Collection Development Librarian is responsible for the identification, selection and acquisition of printed and electronic publications for the Library collections. The tasks include supervision of the ordering, receiving, accessioning and processing of materials in preparation for inclusion into the collections. The Collection Development Librarian develops monographic and serials collections of the Library and provides for the continuity and integrity of the core collection. The Collection Development Librarian develops and implements policies and procedures relating to collection development, management and assessment in coordination with other Library Managers and with the Director of the Library. In addition, the monitoring and maintaining of the acquisitions budgets, the fiscal management of those budgets, are under the

Collection Development Librarian’s responsibility. Other duties include reviewing and administering of license agreements with vendors, distributors and aggregators for electronic content of book and serial titles and indexing tools.

The Collection Development Librarian prepares statistical reports reflecting the department’s activities, as well as of purchase and collecting patterns. The Collection Development Librarian seeks and monitors collaborations with publication exchange partners, and participates in local, regional and national collection development forums. In addition, the Collection Development Librarian conducts regular staff trainings, supervisions and evaluations. The Serials Assistant is responsible for the physical and electronic processing of serials received by the library. The Serials Assistant has to ensure the accurate receipt of materials on subscription and exchanges, to monitor and claim missing issues, and to gather statistical information about the serials collection. The Serials Assistant further prepares materials for commercial binding. The Book Purchasing Clerk is responsible for initiating book orders, purchases and receipts. The Book Purchasing Clerk assists the Collection Development Librarian with the maintenance of records for gifts and exchanges. Other duties include organizing collection assessment activities and gathering statistical information about acquisitions patterns.

The LuEsther T. Mertz Library

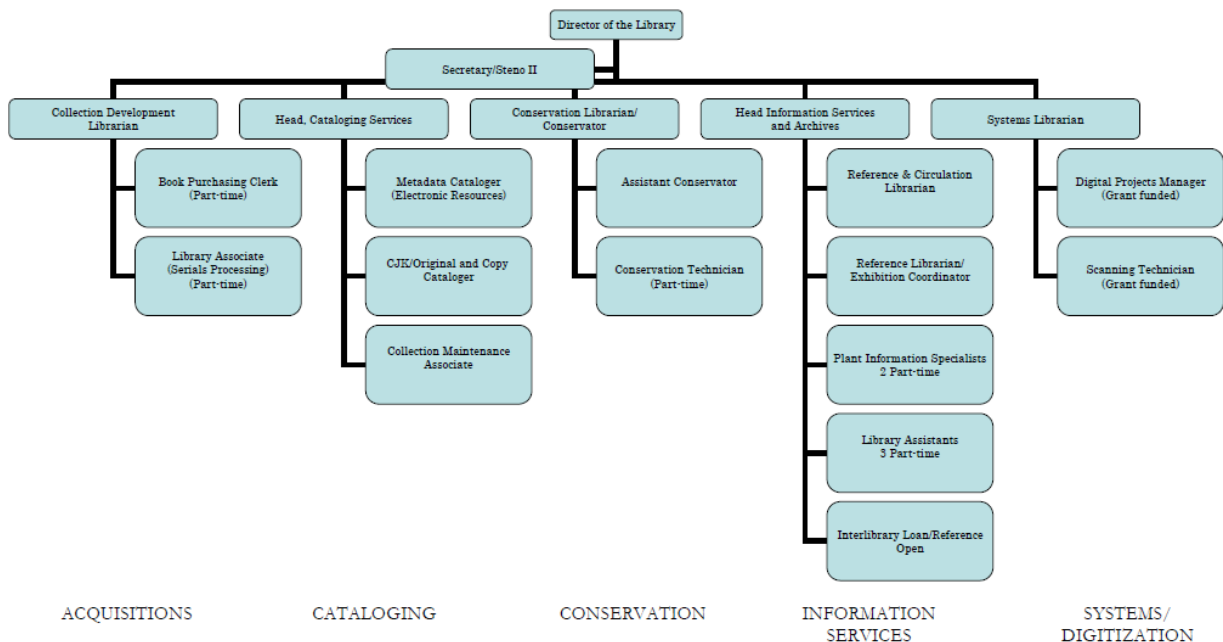


Chart 4.1 : Organizational chart of the LuEsther T. Mertz Library (April 2010)

4.3 Cataloging Department

The Cataloging Services Department provides bibliographic control and intellectual access to the Library's collections and maintains the content of the Library's online catalog

CATALPA. Its work enables catalog users to determine what titles the Library has and where to find them. The Department is responsible for the descriptive and subject cataloging of all acquired materials, it provides cataloging and metadata for electronic formats. The Library's collection records with detailed bibliographic descriptions are entered into OCLC (Online Computer Library Center). The Cataloging staff conducts long-term projects such as the cataloging of the Index Seminum, the Seed and Nursery Catalog collections and the establishment of entries in the catalog for the Vertical file.

The Cataloging Department has four employees: the Head of Cataloging Services, the Catalog Librarian, the Metadata Cataloger and the Collection Maintenance Associate. The Head of the Cataloging Services has the overall supervision of all aspects of the Library's cataloging and classification system. This includes maintaining the quality, integrity and functionality of the catalog database and the online library system, monitoring standards and providing guidance for quality control procedures for cataloging. The Head of Cataloging Services is responsible for the supervision and training of all Cataloging staff, for the establishment and adherence to descriptive and subject cataloging standards and policies. The Catalog Librarian prepares all descriptive and subject cataloging for monographs and serials in all formats, including original and complex copy cataloging for materials in all languages, as well as the associated work on authority files. The Metadata Cataloger prepares descriptive and subject cataloging for all formats as well, but with emphasis on monograph cataloging and metadata cataloging. Further, the Metadata Cataloger has to ensure the quality of bibliographic and digital databases through compliance with national and local practices for cataloging and the use of appropriate metadata standards. The Metadata Cataloger participates in Digital Library projects and keeps track of developments in electronic publishing, networking and indexing to design methods for including off-site access to electronic documents in the Library's online catalog, including images and full text. The Collection Maintenance Associate is responsible for the general maintenance of the library stacks, rare book and circulating collections and other collection areas. The Collection Maintenance Associate oversees the shelving of all Library materials, carries out detailed inventory of serial collections and surveys collections for physical condition as well as helping to prepare materials for scanning.

4.4 Conservation / Preservation Department

The Conservation and Preservation Department is comprised of three employees: the Conservation Librarian (Manager), a Conservation Technician (part-time) and an Assistant Conservator. The Conservation/Preservation staff is responsible for all aspects of the long-term care and preservation of library and archival materials. To assure the physical and chemical stability of these collections, the staff performs a wide range of activities including the monitoring of environmental conditions in the Library storage areas, collection care maintenance (cleaning, minor repair and re-housing), conservation treatment (physical rebinding and restoration) and reformatting. In addition, the Conservation Department is responsible for the preparation and mounting of Library exhibitions. Additionally, the Conservation/Preservation staff is involved in special projects, internship training and disaster and recovery planning. Ongoing projects carried out by the Conservation department include collection inventory, cleaning and re-housing of the 'Art and Illustration' and the 'Lord & Burnham Collections' as well as the long-term work of repairing, restoring and creating

protective enclosures for items from the 'Rare Book and Folio Collection' and the 'Pre-1850 Publication Collection'.

4.5 Information Services Department and Archives

The Department of Information Services and Archives includes the Head of Department, two Reference Librarians, an Interlibrary Loan Coordinator, two Plant Information Specialists (part-time) and three Library Assistants (part-time). The Head of The Archives and Information Systems is responsible for the supervision of all public service aspects of the Library, including reference, circulation, plant information, interlibrary loan and Archives activities. In addition, project coordination, scheduling, record keeping are part of the Manager's duties. The Head of The Archives and Information Systems responds to requests for information from all collections, provides curation and research and interpretation including the 'Rare Book and General Collections', the 'Art and Illustration and Photographic Collections' and 'The Archives'. The Head of Department oversees the Archives program, accessions all material transferred to the Archives from NYBG departments and manages grant-funded Archives projects. Other duties include overseeing the content of Library, Archives and Plant Information Web pages to assure consistency in format and timely uploads to the server. The Interlibrary Loan Coordinator is responsible for the operation of interlibrary loan and document delivery using OCLC. In addition to processing all such orders, the preparation of monthly statistical reports and the staff supervision are under the Interlibrary Loan Coordinator's responsibility. The Reference Librarians conduct research, respond to reference enquiries from patrons and provide reference assistance to onsite users. The Circulation Librarian manages all aspects of the online circulation system and oversees the barcoding of books and journals. The Plant Information Specialists respond to all incoming plant information requests, they conduct research and prepare online plant information fact sheets and printed handouts for special plant topics and frequently asked questions.

4.6 Library Systems Department

The Library Systems Department is responsible for the installation, training and operational support for computer hardware, software and networks used in the Library's information technologies. The Library Systems Department has four employees, consisting of the Library Systems Manager (Head), the Digital Projects Manager (grant funded) and two Scanning Technicians (grant funded). The Library Systems Head manages and coordinates planning, evaluation and implementation of the Library's electronic resources including the Integrated Library System (ILS), databases, document delivery and digitization. The Systems Manager establishes best practices for the Digital Library, coordinates large digitization projects and conducts quality and integrity controls. Further duties include web page development and initiation of collaborations with other research institutions for information exchange and introduction of electronic standards. The Systems Manager supervises all Department staff for the digitization projects. The Digital Projects Manager is responsible for the planning and management of all projects related to the Library's digital collection. The duties of the Digital Projects Manager include the performance of detailed analysis of digitization and digital collection projects and budget development for new projects and managing approved projects to completion. The Scanning Technicians digitize and add image files into the Library's digital repository and perform image correction as needed.

5. ORGANIZATIONAL STRUCTURE OF THE NEW YORK BOTANICAL GARDEN

The New York Botanical Garden is a non-profit organization and endowment. As applies to many academic and cultural institutions in the United States controlling endowments, the endowment fund of the New York Botanical Garden makes up a portion of the organization's operating and capital requirements (19% in fiscal 2008, see chapter 6). In addition to the Garden's general endowment fund, there are a number of further restricted endowments funding specific areas within the Garden. All programmatic and financial activities taking place at The New York Botanical Garden have to be made public, and they must serve the Garden's purpose and mission. The mission statement of The New York Botanical Garden is as follows:

'The New York Botanical Garden is an advocate for the plant kingdom. The Garden pursues its mission through its role as a museum of living plant collections arranged in gardens and landscapes across its National Historic Landmark site; through its comprehensive education programs in horticulture and plant science; and through the wide-ranging research programs of the International Plant Science Center'.

Chart 5.1 shows the organizational structure of the New York Botanical Garden, including all departments and senior management positions as well as their interconnections and ranks. The Garden's Director and Chief Executive Officer (CEO), the Chief Operating Officer (COO) and the Vice Presidents jointly represent the Executive or Senior Management of The New York Botanical Garden. The Director (and CEO) reports to the Board of Directors, a body of elected members who jointly oversee the Garden's activities. The CEO's responsibility is to develop a strategic vision for the institution and to coordinate and balance all internal and external activities required for achieving the envisioned objectives. He facilitates business outside the Garden while guiding executive officers and employees towards a central objective. The Chief Operating Officer (COO) is responsible for the operations management and the day-to-day activities of the Garden. As the second highest-ranking member in the organization (following the CEO), the COO monitors the daily operations and ensures their efficiency and effectiveness. The COO is also responsible for a proper resource management and reports to the Board of Directors and to the CEO.

The New York Botanical Garden encompasses eleven departments, of which six are under the Garden Director's responsibility: Science, Horticulture & Living Collections, Education, Individual Giving & Special Events, Corporate & Foundation Relations, Marketing, Business Development & Visitor Experience. The remaining five departments are supervised by the Chief Operating Officer: Finance & Planning, Administration, Site Operations, Capital Projects, Government & Community Relations. The LuEsther T. Mertz Library is assigned to the Education Department.

ORGANIZATIONAL STRUCTURE OF THE NEW YORK BOTANICAL GARDEN

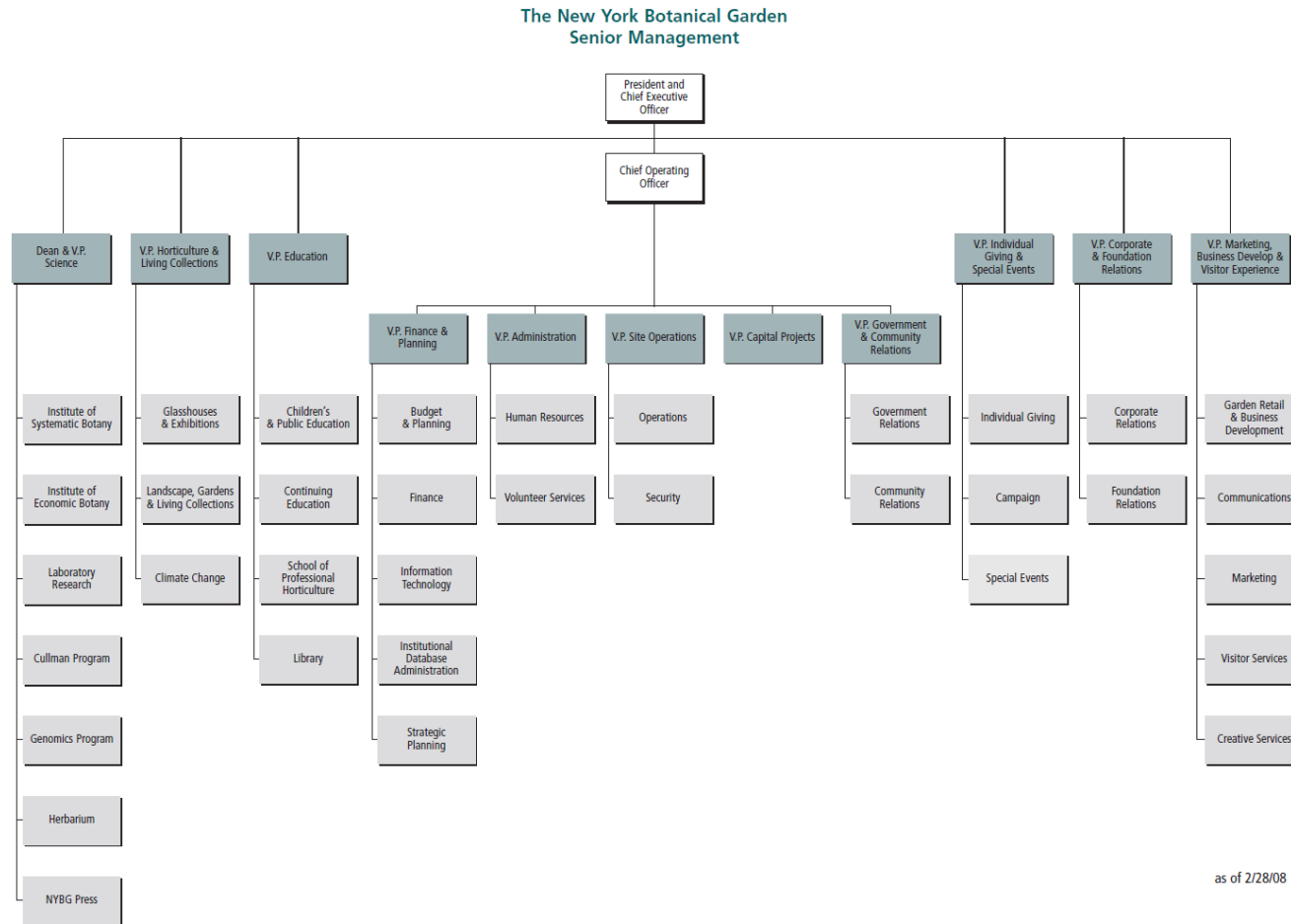


Chart 5.1 : Organizational chart of the New York Botanical Garden

6. FINANCIAL MANAGEMENT, STRATEGIC PLANNING AND BUDGET ORGANIZATION AT THE NEW YORK BOTANICAL GARDEN

A large and complex institution with the stature of The New York Botanical Garden needs a comprehensive and long-term strategic planning to ensure a secure financial base for operational processes, to maintain its facilities, collections and programs, as well as for future investments and development. Since 1993 the New York Botanical Garden implements a strategic plan every seven years in which the entire organization is involved. Until today, three strategic plans have been developed:

- *A New Strategic Plan: Into the 21st Century, 2009-2015*
- *Plan for a New Era: 2001-2007.*
- *The New York Botanical Garden Plan for 1993-1999*

Each strategic plan is tripartite and consists of a ‘Program Plan’ (including the priorities of the projects set out for strategic investments), a ‘Capital Plan’ and a ‘Financial Plan’. The complex, cooperative planning process takes more than one year and a half to be accomplished and it proceeds up through four levels of management hierarchy with projects being discussed and analyzed along the way. The planning process commences with a six-months-long strategic competitive analysis, it continues with presentations of program plans from the Expanded Planning Group, comprising nearly 150 managers with program responsibility. In the bottom-up process all managers on ground levels first outline their programs and objectives for their own sections for the following ten years (first level). The directors prioritize these programs and make a single plan from all plans of the sections they supervise (second level). After this, the vice presidents synthesize a series of the plans and initiatives from all departments of the New York Botanical Garden (third level). Subsequently, the Board of Directors finalizes and approves a plan synthesized by all (fourth level). In the following process, the Garden’s own development department suggests funding sources for the new initiatives envisioned in the strategic plan. Once the plan has been approved by the Board of Directors, all department directors begin pursuing grants for their own projects and objectives set out in the strategic plan. But these must be coordinated centrally through the Development Office to focus the funding applications and to reduce competitive redundancy. There are special programs and stewardships for different projects where grant applications can be directed to, e.g. for living collections, biodiversity programs etc.

The ‘Program Plan’ will be supported by the ‘Financial Plan’. According to this, the ‘Capital Campaign of Investments 2009-2015’ consists of four different components: Operating Funds 27%, New Initiatives 14%, Endowment 28% and Capital 31% (see chart 6.1).

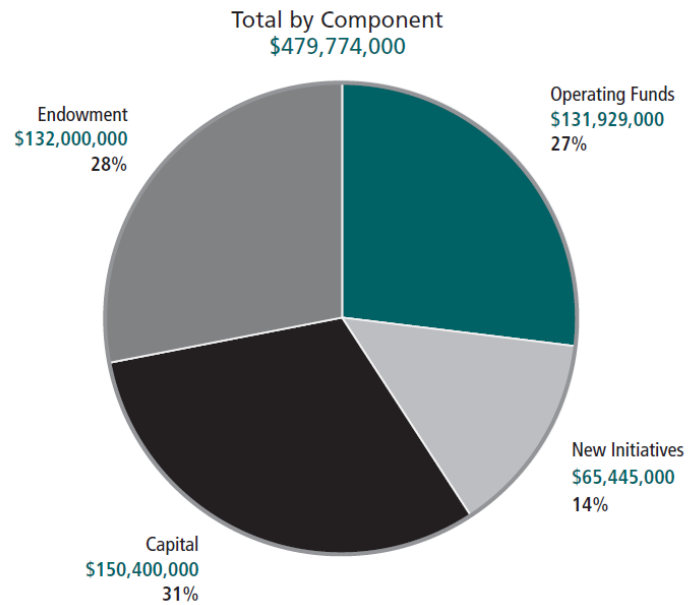


Chart 6.1 : Components of the Strategic Plan (Source: The New York Botanical Garden: ‘A New Strategic Plan: Into the 21st Century 2009-2015’)

The details of the Operating Funds and New Initiatives for the different program areas in NYBG are shown in chart 6.2:

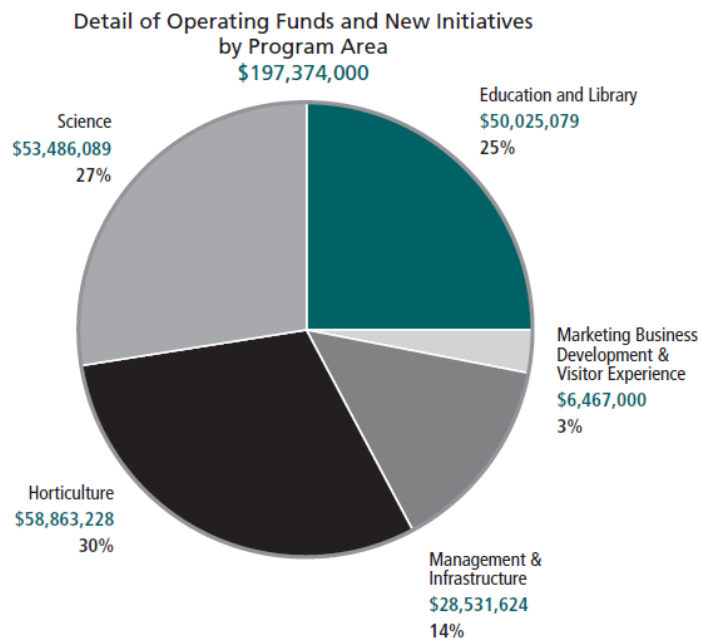


Chart 6.2 : Detail of Operating Funds and New Initiatives by Program Area (Source: The New York Botanical Garden: ‘A New Strategic Plan: Into the 21st Century 2009-2015’)

The Operating Revenue of the New York Botanical Garden is comprised of four different financial sources (includes percentages of fiscal 2008):

- Government Support (Federal level, State level, City level): 19%
- Private Support (corporate sponsors, foundations, private donors): 34%
- Endowment: 19%
- Earned Income (retail sales from shop, tickets, events): 28%

Chart 6.3 shows an overview of NYBG’s Annual Operating Revenue Mix in history:

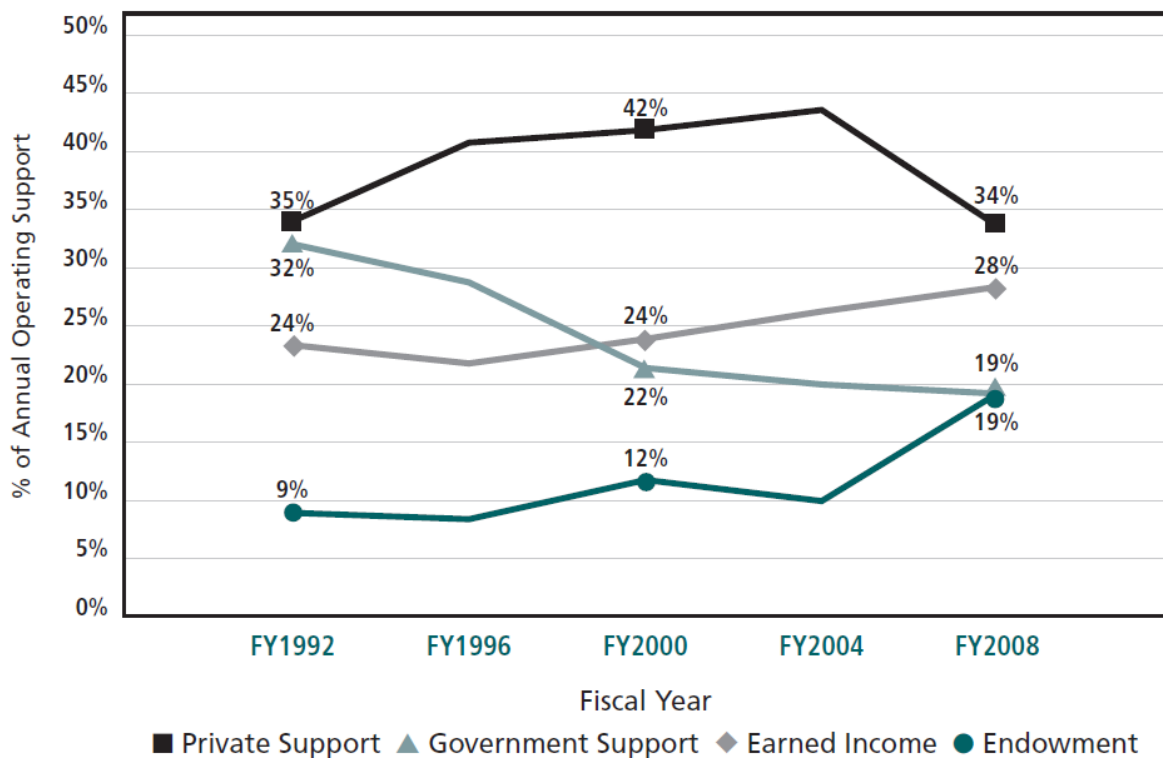


Chart 6.3 : Revenue Mix History (Source: The New York Botanical Garden: ‘A New Strategic Plan: Into the 21st Century 2009-2015’)

Chart 6.3 shows the change in the Garden’s annual operating revenue mix over 17 years, from fiscal 1992 (budget: \$21 million) to fiscal 2008 (budget: \$62 million). In fiscal 1992 private support provided about the same level of funding as did the government, 35% and 32% respectively. Government support was on a rapid and continuous decline. By fiscal 2000, government funding was only providing 22% of the total annual operating revenue. Because earned income and endowment income were not developed well enough at that point, private fundraising had to compensate for declining government support. Fundraising peaked at 44% in fiscal 2004 when government funding declined to 20% in the years following the 9/11 cutbacks. The Garden’s heavy reliance on private fundraising finally began to trend downward in fiscal 2005 when earned income activities and the endowment started to generate new revenue. By 2005 the Garden’s expanded exhibition program was attracting increased visitation. In addition, financial markets had recovered from the post-9/11

doldrums, permitting the endowment to generate significant gains in market value. According to an Operating Revenue Forecast presented in the Strategic Plan of 2008, the percentages represented by the components of the revenue mix will change over the next 6 years in so far that ‘Earned Income’ and ‘Endowment’ will play an increasingly important role whereas ‘Government support’ and ‘Private support’ are likely to decline further. (Source: The New York Botanical Garden: ‘A New Strategic Plan: Into the 21st Century 2009-2015’).

In the Garden’s Strategic Plan of 2008 the LuEsther T. Mertz Library has prioritized three main initiatives for 2009-2015, summarized as follows:

Priority 1: Modernize Library Collections and Services

Modernization is the top priority for the Library. This involves building a modern technical infrastructure and electronic management tools to increase access to electronic resources for users and make more Library resources available online. The Library will strongly enhance its digitization efforts: biodiversity literature will be digitized in conjunction with the Biodiversity Heritage Library (BHL) and literature that supports the work of scientists at the Garden or which is unique to the collection will be digitized by the Library itself. A unified, online presence for all Library resources accessed through a single point of entry will make the information more usable. Continued acquisitions of both electronic and print material will ensure that the Library maintains its preeminent position.

Priority 2: Upgrade Conservation Facilities

Maintaining and displaying the collection are also important priorities over the plan period. The conservation lab will be renovated, and new state-of-the-art equipment will be added to ensure the continued preservation of the Library’s rich assortment of historical documents and art.

Priority 3: Enhance Exhibition Program

The Library exhibition program will be enhanced and a long range plan for exhibitions will be created. Library exhibitions will be coordinated and marketed in conjunction with other exhibitions at the Garden, while fostering collaborations with other institutions will enhance the exhibitions’ profiles and create broader international appeal. Online and interactive technologies will be employed to enhance the experience for the visitors.

Already in the early years after its inception, the LuEsther T. Mertz Library was considered to have an outstanding position with its special collections among all botanical and horticultural libraries in the New York metropolitan area and supraregional. NATHANIEL LORD BRITTON, the founding director of the New York Botanical Garden, and his wife ELIZABETH had visited the Royal Botanic Gardens in Kew, Great Britain, during their honeymoon in 1888 (MICKULAS 2007). For the Brittons, as well as for other botanists in America and abroad, Kew Gardens represented the largest and most recognized Botanical Garden in the world. Much inspired by their visit, the couple returned to New York and thought about creating ‘something similar’, an American Kew, in the North American metropolis. Although not officially documented at the time, this story served as a fitting start point for the New York Botanical Garden (MICKULAS 2007, HANSELL 1957).

The LuEsther T. Mertz Library was founded as the NYBG institutional library in 1899 (REED 1969). Strong library collections were regarded essential for the botanical research facility the Brittons envisioned, the ‘American Kew’. The value of the Library for research as well as general public information in botany and horticulture is clearly stated in the Garden’s ‘Act of Incorporation’, signed into law on 28 April 1891. A major research library is necessary ‘for the advancement of botanical science and knowledge, and the prosecution of original researches therein and in kindred subjects’ (CALLERY 1995). With this background, the Garden’s first director, NATHANIEL LORD BRITTON, expressed his original guidelines for the Library. In his report of 1904, he stated that:

‘We should certainly aim to make the library as complete as possible in pure botany, and in its related sciences of horticulture, agriculture, forestry, and such portions of general biology as apply to plants, and I believe that no greater service could be rendered to these subjects in America, than by some provision by means of which our library should be perfected.’

7.1 Collection Profile of the Library

Purpose and Mission

The collection development policy of the LuEsther T. Mertz Library takes account of its dual responsibility, first as a research library of international standing, serving as the ‘library for plant sciences of record’ for the larger metropolitan New York community, and second as the institutional library of The New York Botanical Garden. To meet the information needs of the international research community, the Mertz Library collects material in botanical subjects as comprehensively as possible (see table 15.1, appendix). To fulfill its responsibility to its parent institution, the Mertz Library collects all research publications needed by the New York Botanical Garden staff, as well as the Garden’s own publications, and makes those resources available to library users.

Guided by the goals of the Garden’s first director that the Library should be as complete as possible in plant sciences, the acquisitions staff identifies and collects materials published in plant systematics and taxonomy, world and regional floras, and economic botany at a comprehensive level (see table 15.1, appendix). Particular emphasis is placed on publications on the Americas (‘Western Hemisphere’) which represents the geographical

focus of the Garden's research programs. The Library also collects publications in horticulture, gardening and landscape design (see table 15.1, appendix). These publications, collected as print and electronic resources, support the Garden's work in science and education.

Collection Development Policy

The collection development policy provides the official framework for the Mertz Library's collecting activities including all criteria set for media selections, for the goals to be achieved in all collection areas, for the levels of collecting activity and for media exclusions. The policy includes detailed information regarding:

1. All scientific subjects collected
2. The Garden's departmental research and education programs
3. Special collections: e.g. the 'Rare Book Room'
4. The types of materials collected

The Mertz Library has adopted definitions of collecting levels as used in the Conspectus of the Library of Congress (see LOC web site for definitions: <http://www.loc.gov/acq/devpol/cpc.html>) which is essentially based on the Conspectus of the Research Libraries Group (RLG).

1. The Library collects materials in the following scientific subjects (for details on subjects and levels of collection intensity, see table 15.1, appendix):

- Plant systematics and taxonomy (including molecular phylogenetics)
- Floristics (world and regional floras, plant geography)
- Economic botany (including ethnobotany)
- Plant ecology
- Plant physiology
- Plant anatomy
- Plant biology and environmental influences
- Microbiology and genetics
- Horticulture, gardening, landscape design
- Agriculture
- Zoology
- Forestry
- Natural history

2. The Mertz Library seeks to collect all materials serving the Garden's research programs at a comprehensive level (only materials in horticultural disciplines are collected selectively, mostly at a research level, see table 15.1, appendix). A brief overview of NYBG's departmental programs are given in the following:

Systematic Botany

NYBG has a very intensive and distinguished program in systematic botany. Plant systematics has always been at the center of the Garden's scientific endeavors. Systematic research is currently conducted in a broad range of plant taxa: all cryptogams, fungi and many

spermatophyte families (see table 15.1, appendix). The research activities in traditional systematics is organized within the *Institute of Systematic Botany (ISB)*, founded in 1991.

Continuing Education

The New York Botanical Garden offers a broad and diverse education program, including the *Continuing Education* and *The School of Professional Horticulture*. The Library collects materials in support of these programs, especially when they provide academic credit or professional certification. The ‘Academic Programs’ include Botany, Horticulture, Landscape Design; the ‘Certificate Programs’ encompass Botanical Art and Illustration, Botany, Floral Design, Horticulture, Gardening, Horticultural Therapy and Landscape Design.

Economic Botany

The *Institute of Economic Botany (IEB)*, founded in 1981, focuses on applied botanical knowledge to questions of human concern. The research field of economic botany (including its allied discipline ethnobotany), studies the relationship between plants and people. Principal activities of the IEB include the research on useful plants, gathering information on their uses, developing concepts for biological diversity conservation through habitat preservation, and the study of natural resource management on regional and national level.

Molecular Systematics

Molecular systematics has developed within two programs. The *Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies* supports all forms of molecular research within the Garden’s Plant Research Laboratory. The *Plant Genomics Consortium* (<http://nypg.bio.nyu.edu/>) is a collaborative research initiative between the New York Botanical Garden, Cold Spring Harbor Laboratory, American Museum of Natural History and New York University which contributes to the creation and dissemination of scientific knowledge in the field of comparative and functional plant genomics, biodiversity, and evolution. Goals of these initiatives include addressing questions of plant classification, historical biogeography, plant-animal interactions, and character evolution. The majority of research in this program focuses on phylogenetic studies of plants and fungi.

Horticulture

The Mertz Library collects horticultural subjects at different intensity levels and selects materials according to the Garden’s focus on living collections and horticultural education programs, as well as the scientific quality of these publications (see table 15.1, appendix). Concerning horticulture, NYBG has prioritized the following categories:

- to support the living collections maintained at the Garden
- to support the Certificate Program in Professional Horticulture
- to support the classes offered through the Continuing Education Program
- to reflect the horticultural interests of New York State, New York City and the metropolitan tri-state area
- to maintain a historic scope of published information concerning the cultivation of plant materials for human use and enjoyment.

3. The Mertz Library has established special instructions for collecting material to be included in special collections, as the ‘Rare Books Collection Policy’. The Rare Book Program acquires, preserves and services the most valuable or scarce codices in the Library’s collections, published prior to 1753. Publications collected include manuscripts, incunabula

prints and printed books, as folio or quarto. The materials should have a significant botanical or horticultural content, bear signatures of persons of international importance, or originate from limited editions.

4. Types of materials collected: The Mertz Library has set priorities for collecting different publication types. The criteria for acquisitions of electronic resources are specified in the policy. The spectrum of electronic resources acquired and serviced by the Mertz Library includes remotely accessible files that are openly available on the Internet and those for which the Library must pay a licensing fee and negotiate access with the provider (see chapter 7.2). They also include files residing in a variety of storage media. Electronic resources include file types such as:

- Bibliographic files (containing information that leads users to material)
- Full text / numeric / graphic files
- Instructional or modeling software
- Applications software (to be acquired when needed by NYBG staff, but not cataloged)

Discard Policy

The Mertz Library's collection development policy includes as well a Discard Policy. The Library has adopted the standard of *The Code of the American Association of Museums* as guiding principle regarding the deaccessioning and disposal of material from its collections. The Code states that the 'acquisition, disposal, and loan activities of the institution conform to its mission and public trust responsibilities. The disposal of collections through sale, trade, or research activities is solely for the advancement of the institutions's mission'. In conformity with these statements, the LuEsther T. Mertz Library (being a non profit organization) follows the guiding principle that 'collections shall not be deaccessioned or disposed of in order to provide financial support for institutional operations, facilities maintenance, or any reason other than the preservation or acquisition of collections'. It is allowed to deaccession items that need to be replaced by better copies, or items not related to collections criteria, or items deemed no longer useful because of 'inaccurate, superseded, or untimely information'.

7.2 Forms of Media Acquisitions: Purchase, Exchange and Donations

Books and journals are either acquired by purchase, as donations, or through exchange with other botanical and academic institutions in Europe, Africa, Asia, North, Central and South America.

Purchase

In the Mertz Library approximately 30% of the serials are received through purchase, 40% through exchanges and 30% as gifts (D. WHEELER, pers. comment). The percentage for monograph purchases is not certain but it appears that the proportion of monographs received as gifts is larger than the proportion received through purchases. Suggestions or requests for book and serial purchases are often made by the NYBG scientific staff. In general, the Acquisitions Librarian follows all staff requests for purchases, unless price limits or technological limits forbid this, or in case the requested items are out of the Library's scope. Apart from staff requests, selection processes are carried out by the Acquisitions Librarian according to the Library's collecting goals described in the collection development policy (see

chapter 7.1), thereby making use of various research tools and methods (see chapter 7.3). Depending on the kinds of materials to be purchased, their origin or place of publication, the Acquisition Librarian makes use of services from scientific publishers and vendors, most of them located in the United States and Europe. Important vendors of scientific literature, as well as database and content providers, used by the Mertz Library are listed in the following:

Vendors used for Monograph Acquisitions and Serials Subscriptions

- Koeltz Scientific Books (Botany and Zoology), <http://www.koeltz.com/>
- NHBS – Environment Bookstore (often used for Ecology), <http://www.nhbs.com/>
- Springer (all Sciences), <http://www.springer.com/>
- Balogh (Natural Sciences), <http://www.balogh.com/>

Online Database and Content Providers used for Serials Subscriptions and Full-Text Documents

- EBSCO, <http://www.ebsco.com/>
- Harassowitz, <http://www.harassowitz.de/>
- JSTOR Biological Sciences Collection, <http://www.jstor.org/>
- BioOne, <http://www.bioone.org/>

Databases for Citation Indexes (some with links to Full-Text Documents)

- ISI Web of Knowledge, <http://isiwebofknowledge.com/>
- AGRICOLA, <http://agricola.nal.usda.gov/>
- OCLC First Search, <http://www.oclc.org/firstsearch/>

The Mertz Library has a keen interest to build as complete as possible the corpus of literature in its core collections, especially regarding floras and important taxonomic literature. Active research for relevant single items or serials to be included in the collections is conducted by the Book Purchasing Clerk in the Acquisitions Department. For this purpose, catalogs and offers from different booksellers (including antiquarian booksellers) are searched. In addition, rare items may occasionally be purchased from special auctions.

Scientific content providers like JSTOR and BioOne offer a wide selection of electronic full-text journals in the Life Sciences that are frequently used by the Garden's science staff. The costs for some of these services, such as provided by *Elsevier* or *Springer*, are usually very high for the Library's budget, and they depend on negotiations with the provider. Commonly, content providers organize purchase models based upon different criteria or categories. Institutions of higher education that intend to make use of services from content providers, have to provide detailed profiles of their institutions, in order to be classified for pricing. This includes, among other factors, the size of the institutions with the number of departmental programs offered, the quality of these programs, the number of students enrolled at the programs, the number of employees working for the institutions, the number of items in their library collections, sometimes the size of their library's acquisitions

budget, or the number of library patrons. A well reputed organization that classifies other institutions according to these categories is the *Carnegie Foundation*. Content providers often rely on classifications accomplished by the *Carnegie Foundation* as a determination base for pricing.

A very important task of the Acquisition Librarian, especially in times of low budgets, is the negotiation of licensing agreements terms with vendors, publishers, database and content providers, and providers of electronic management resource systems. Usage statistics plays an important role in this context and can be used as a foundation or determination base for such negotiations. Thus, it is important for the Library to keep track on usage statistics for all services provided. At The New York Botanical Garden, licenses from different content providers have been arranged to make online content available to all staff on campus and for all library patrons. These systems keep usage statistics of the Library's electronic resources (e.g. full-text document downloads from databases) which is a very helpful tool for budget calculations and for writing annual reports.

Companies like EBSCO and Harassowitz offer additional services to libraries, e.g. library management systems that support subscription management, financial control and invoice predictions (co-called 'Annual Renewal Lists') which are useful, albeit expensive tools for fiscal management. The Mertz Library currently makes use of services from EBSCO to consolidate subscriptions and for predictions of invoices, but these might, however, be reduced or abandoned again due to the high charges involved.

Donations

Nowadays, as in earlier times, the Mertz Library receives special collections of monographs, periodicals, maps and plans, reprints and other materials, as gifts to be included in the Library's collections. The donors may be NYBG scientists, wishing to give their own private research collections to the Library, as well as academic institutions, companies or private collectors. A further possibility of making a contribution to the Library is by the purchase of a 'memorial bookplate' for a minimum of 250 US Dollars. Upon paying this amount of money to the Library, donors may suggest their preferred botanical or horticultural subject they wish the bookplates to be assigned to. Subsequently, the acquisitions staff suggests one or several books to the donor (depending on the price) from which the donors may select an appropriate title. In honor of all donating persons, the selected items as well as the corresponding catalog records acknowledge the donor's names with an inscription.

Exchange

The New York Botanical Garden operates a well respected publishing program for research carried out by scientists involved in the Garden's programs. The publishing program of 'The New York Botanical Garden Press' (<http://www.nybgpress.org/>) focuses on classification, utilization and conservation of plants and fungi. Current series titles include *Advances in Economic Botany*, *Intermountain Flora*, *Flora Neotropica*, *Memoirs of The New York Botanical Garden*, *Contributions from The New York Botanical Garden*, *Botanical Review*, *Brittonia*, and *Economic Botany*. Titles published by the NYBG Press are used in publication exchange programs with other botanical gardens and research institutions

worldwide. The Acquisition Department is responsible for the initiation of new cooperations, as well as for the organization and coordination of exchange programs. Ideally, titles selected for exchange should have a similar value and publication frequency as the titles received by other institutions. Publication exchange programs are a common and low-cost acquisition method used by many research institutions worldwide. Especially research libraries with low acquisition budgets benefit from this system as it allows them to receive periodicals that would otherwise be too costly to acquire. In addition, exchange programs enable libraries to cooperate directly with research institutions from far countries where delivery services from publishers and vendors are often not working satisfactory and communication is difficult. One disadvantage of publication exchange programs might be the untimely delivery of publications from exchange partners. The Mertz Library usually excludes exchange partners when they are overdue with deliveries for more than a year.

7.3 Research Tools used for Media Acquisitions

For the identification of the appropriate publications collected by the Mertz Library, the following research tools are used:

Catalogs, booklists, newsletters

- Printed catalogs and booklists from publishers of scientific literature, scientific and antiquarian booksellers
- Newsletters from vendors (set profile for botany): e.g. Koeltz Scientific Books, NHBS, Balogh, Springer, received by email.

Bibliographies and botanical standard works

- Stafleu, F.A. & Cowen, R.S. *Taxonomic Literature* (TL-2), bibliographical and biographical standard work for botanical collections
- Frodin, D.C.: *Guide to Standard Floras of the World*
- Pritzel, G.A.: *Thesaurus Literaturae Botanicae*
- Schmidt, D.: *Guide to reference and information sources in plant biology*
- Nissen, C.: *Die botanische Buchillustration: Geschichte und Bibliographie*

Tools to follow the book market and literature reviews

- *The Bowker Annual Library and Book Trade Almanach* (Book reviews, book price statistics)
- *Publisher's Weekly* (Book reviews)
- *Library Journal*, ALA (professional journal literature)
- Literature reviews in taxonomic botanical journals, e.g. *Taxon* and *Systematic Botany*
- *The Publisher's International ISBN Directory*, PIID

8 DEVELOPMENT OF ACQUISITIONS BUDGETS AND EXPENDITURES AT THE MERTZ LIBRARY AND AT THE LIBRARY OF THE BOTANIC GARDEN AND BOTANICAL MUSEUM BERLIN-DAHLEM, 1999 – 2010

Libraries are facing multiple pressures nowadays, in the United States as well as in other countries. In most libraries, acquisition budgets have not increased over a long period of time or have even been reduced (MEIER 2002). At the same time, the economy has weakened and funding resources have decreased. This is especially difficult because publication rates strongly increase worldwide due to expanding scientific programs, and new journals are being established on the market. Increasing requirements for up-to-date computer technology for research, administration and teaching are large, continuous cost factors for libraries. Prices for books and journals have rapidly increased during the past two to three decades, and they still continue to increase, especially in Science, Technology and Medicine (STM) (KANTHAK 1998, EVANS 2000, MEIER 2002). In the United States, costs of academic library materials consistently have a much higher inflation rate than the Consumer Price Index (CPI) (DANNELLY 1994, EVANS 2000, MEIER 2002). Due to this development, academic libraries have lost much of their purchasing power, they need tighter control over their expenses and have to improve in their efficiency. In the following, acquisitions budgets and expenses for library materials are shown from two botanical research libraries, the LuEsther T. Mertz Library of The New York Botanical Garden and the Library of the Botanic Garden and Botanical Museum in Berlin (BGBM), over a period of time of eleven years and eight years respectively.

Chart 8.1 shows the Mertz Library's expenses on books, serials, electronic resources, exchanges and standing orders in the fiscal years 1999 – 2010. First of all, the fiscal year for some organizations in the United States is different from the calendar year. It starts in July of one year and ends in June in the following year. This is important to know for budget planning, as many invoices from annual subscriptions have to be paid at the beginning of the calendar year in January, whereas institutional budgets are allocated at the beginning of each fiscal year in July (or sometimes later). All funds the Mertz Library receives have to be spent within the current fiscal year as the money generally does not 'roll over' to the next fiscal year. The total acquisitions budget of the Mertz Library (chart 8.1) has not, in practically terms, increased over the past ten years, the overall budget growth is only 2%. However, there have been considerable budget declines in some years, especially in fiscal year 2001 (-8%) and the following, resulting from the general cutbacks after the 9/11-events from which all economic sectors suffered. There have been strong budget declines as well in 2004 (-18%) and 2005 (-11%).

When looking at the budget allocations shown in chart 8.1, some changes and trends can be seen. Particularly noticeable is that the amount of money spent on books in fiscal year 2010 (\$32.974) is only half as much as in fiscal year 1999 (\$64.295). So, within the last ten years book acquisitions have dropped down by 49%, the strongest declines having taken place in fiscals 2001 (-41%) and 2004 (-52%). Also, in fiscal 2004, much less money has been spent on serials (-17%) and on electronic resources (-12%) than in the years before. While the Mertz Library has spent much less money on books within the time period measured, expenses for serials have increased by 8% in total. In fiscal year 1999, serials expenses have been 2.3 fold higher than expenses on books (in fiscal 2010, this difference has enlarged to 4.8 fold). Beginning with fiscal year 2000, the Mertz Library spent more money on electronic resources (databases, electronic journals). Expenses increased dramatically between fiscal 2000 (\$19.000) and fiscal 2010 (\$29.000), adding up to a 56% increase in total. This

development reflects a gradual shift from the purchase of print journals towards electronic journals.

| FY | Allocation | | Allocation | | Allocation | | Allocation | | Allocation | | TOTALS | |
|----------------|------------|----------|------------|----------|----------------------|----------|------------|----------|-----------------|----------|------------|----------|
| | Books | % change | Serials | % change | Electronic Resources | % change | Exchanges | % change | Standing Orders | % change | | % change |
| 1999 | \$ 64,295 | | \$ 148,767 | | | | \$ 46,585 | | \$ 27,300 | | \$ 286,947 | |
| 2000 | \$ 93,958 | 46% | \$ 139,435 | -6% | \$ 19,000 | | \$ 30,660 | -34% | \$ 27,300 | 0% | \$ 310,353 | 8% |
| 2001 | \$ 55,251 | -41% | \$ 138,302 | -1% | \$ 19,000 | 0% | \$ 44,160 | 44% | \$ 27,300 | 0% | \$ 284,013 | -8% |
| 2002 | \$ 41,070 | -26% | \$ 167,634 | 21% | \$ 19,400 | 2% | \$ 29,958 | -32% | \$ 15,349 | -44% | \$ 273,411 | -4% |
| 2003 | \$ 50,422 | 23% | \$ 165,356 | -1% | \$ 29,900 | 54% | \$ 30,578 | 2% | \$ 13,700 | -11% | \$ 289,956 | 6% |
| 2004 | \$ 24,412 | -52% | \$ 137,767 | -17% | \$ 26,300 | -12% | \$ 32,947 | 8% | \$ 15,513 | 13% | \$ 236,939 | -18% |
| 2005 | \$ 21,000 | -14% | \$ 126,956 | -8% | \$ 20,900 | -21% | \$ 29,000 | -12% | \$ 13,700 | -12% | \$ 211,556 | -11% |
| 2006 | \$ 24,000 | 14% | \$ 133,207 | 5% | \$ 26,300 | 26% | \$ 32,947 | 14% | \$ 15,344 | 12% | \$ 231,798 | 10% |
| 2007 | \$ 25,824 | 8% | \$ 154,376 | 16% | \$ 28,900 | 10% | \$ 32,947 | 0% | \$ 17,000 | 11% | \$ 259,047 | 12% |
| 2008 | \$ 35,824 | 39% | \$ 156,576 | 1% | \$ 28,900 | 0% | \$ 50,784 | 54% | \$ 17,000 | 0% | \$ 289,084 | 12% |
| 2009 | \$ 39,474 | 10% | \$ 161,000 | 3% | \$ 29,601 | 2% | \$ 50,784 | 0% | \$ 17,000 | 0% | \$ 297,859 | 3% |
| 2010 | \$ 32,974 | -16% | \$ 161,000 | 0% | \$ 29,601 | 0% | \$ 50,784 | 0% | \$ 17,000 | 0% | \$ 291,359 | -2% |
| %chg 1999-2010 | | -49% | | 8% | | 56% | | 9% | | -38% | | 2% |

Chart 8.1 : Acquisitions budget allocations of the LuEsther T. Mertz Library of the New York Botanical Garden in fiscal years 1999 - 2010

Further trends that can be seen in chart 8.1 include an increase in expenses in 'exchanges' (9%) and a decline in expenses in standing orders (-38%). In times of low budgets, the increase of publication exchange programs (see chapter 7.2) may help to some extent to save costs. Although the publication exchange is overall not a small expense factor - as it includes purchasing costs for the Garden's own periodicals plus costs for mailing - it is nonetheless a more economic way to acquire titles from other institutions than by purchasing those titles. Roughly estimated, the Mertz Library receives - for every US Dollar spent on periodicals from purchases and exchanges - four times more titles from the exchange program than from purchases through commercial vendors (D. WHEELER, pers. comment). Standing orders include journal subscriptions. Due to the rapid cost increases of scientific journals in recent times (see chart 8.3 below), the Mertz Library cannot avoid cancelling expensive journal subscriptions from time to time in order to save costs. The selection of journals designated for cancellations is made by the Collection Development Librarian who, prior to cancellations, conducts questionnaires primarily directed to the NYBG Science staff to get a picture of their journal preferences and the usage frequency. The use of all online journals can be measured by electronically recording the number of full-text downloads by all library constituents.

Chart 8.2 shows the budget development and expenses of the Library of the Botanic Garden and Botanical Museum in Berlin (BGBM) in all calendar years between 2000 and 2008. The BGBM Library is Germany's largest botanical library and one of the leading botanical libraries in Europe. Management, organizational structure and financial structure of this institution are much different to the Mertz Library, therefore direct comparisons between both institutions are difficult. This comparison is supposed to focus only on budget developments relative to the expenses on library materials within more or less the same period of time. Founded in 1815 as an institutional library of the Botanic Garden in Berlin-Dahlem, the BGBM Library became part of the Freie Universität Berlin in 1995. Being the largest library in the natural sciences of the Freie Universität, the library also functions since 1999 as administrative center for the university's natural sciences libraries in Dahlem. Since 2000, it

includes in its premises the Biology Library of the Department of Biology, Chemistry and Pharmacy. The acquisitions budget administered by the BGBM Library covers the expenses for all library materials except electronic resources (electronic journals) which are purchased by the Freie Universität Berlin. Electronic journals are acquired in packages by a consortium of university libraries, the negotiations however are accomplished only by the university. Because of this, unfortunately no data on costs or usage of e-journals are available. Aside from the Library's acquisitions budget, an additional fund by the Deutsche Forschungsgemeinschaft (DFG) of 10.000 € per year supports the Library in the purchase of special botanical literature on and from Latin American and Asian countries for an overall period of ten years.

| Year | Allocation | | Allocation | | Total Budget | |
|-----------------------|------------|----------|------------|----------|--------------|----------|
| | Books | % change | Serials | % change | | % change |
| 2000 | 72.000 DM | | 61.000 DM | | 133.000 DM | |
| 2001 | 96.000 DM | 33% | 75.000 DM | 23% | 171.000 DM | 29% |
| 2002 | 41.700 € | -15% | 41.100 € | 7% | 82.800 € | -5% |
| 2003 | 30.800 € | -26% | 47.200 € | 15% | 78.000 € | -6% |
| 2004 | 33.000 € | 7% | 44.000 € | -7% | 77.000 € | -1% |
| 2005 | 23.200 € | -30% | 46.000 € | 5% | 69.200 € | -10% |
| 2006 | 30.600 € | 32% | 48.700 € | 6% | 79.300 € | 15% |
| 2007 | 28.600 € | -7% | 56.300 € | 16% | 84.900 € | 7% |
| 2008 | 12.000 € | -58% | 49.000 € | -13% | 61.000 € | -28% |
| %chg 2000- 2008 | | -63% | | 51% | | 0% |

Chart 8.2 : Acquisitions budget and expenses of the Library of the Botanic Garden and Botanical Museum in Berlin-Dahlem (BGBM) in the years 2000 - 2008

As shown in chart 8.2, the BGBM Library's budget first grows in the changeover from calendar year 2000 (133.000 DM ~ 68.002 €) to 2001 (171.000 DM ~ 87.431 €) by a total of 29%, then almost continually declines until 2008 to 61.000 €. The strongest budget cutbacks have taken place in 2008 (-28%). In 2000, the BGBM Library spent 72.000 DM (~36.813 €) on books. Beginning with this time, the expenses for books have sharply dropped down to only 12.000 € in 2008, which corresponds to only one third of the former expenses in 2000. In accordance with the severe budget cutback from 2008, expenses on books strongly decline by 58% in this year in comparison to 2007. The expenses for serials were formerly much lower than those for books: in 2000, the BGBM Library spent 61.000 DM (~31.189 €) on serials, 11.000 DM less than on books. In 2002 expenses for books and serials are almost in an equal ratio, of around 41.000 €. In the following years, however, the expenses for serials increase strongly to a total of 56.300 € in 2007. Overall the expenses for serials have increased by 51% in the period of time measured.

The above mentioned manifold pressures academic libraries are facing in connection with static budgets, high publication rates and rapidly increasing prices for library materials, especially regarding journal subscription rates, are reflected in part in the acquisitions budget statistics of both institutions presented here. Although the above mentioned allocations can not thoroughly be compared against each other (e.g. the electronic resources, exchanges and

standing orders), some similar patterns may be stated for the books and serials. For instance, the expenses for books have dropped down in parallel and to similarly large degrees in both the Mertz Library and the BGBM Library. In both institutions, reallocations on account of book acquisitions have taken place in response to the strong price increases for serials. These are typical actions of research libraries confronted with these problems (EVANS 2000, MEIER 2002). According to statistics presented by the American Association of Research Libraries (ARL) the average prices for science journals have increased by 226% in the period of time between 1986 and 2000 (see chart 8.3). This is four times as much as the inflation rate. In addition to this massive price increase, the number of peer-review electronic journals has increased by 570% in the period of time between 1991 and 2000 (MEIER 2002).

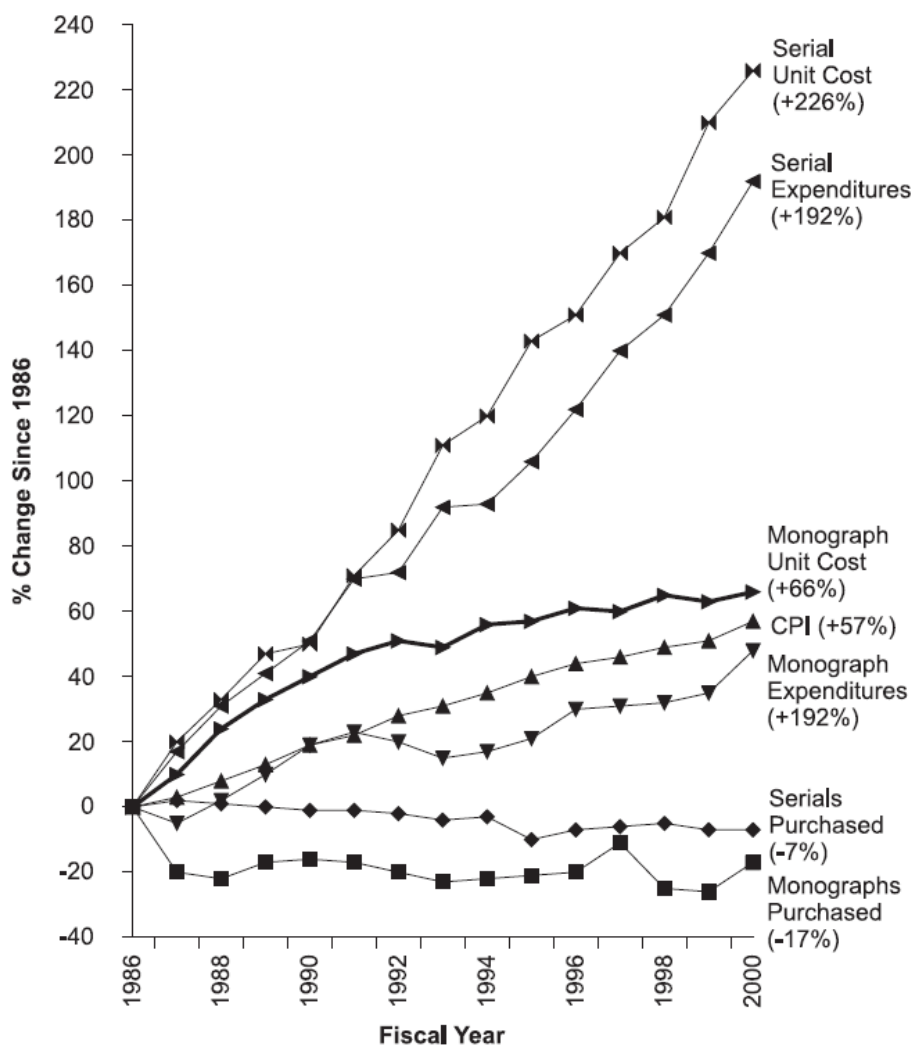


Chart 8.3 : Expenditures for books and serials in ARL-Libraries, 1986-2000 (source: Meier 2002)

Approximately thirty years ago, research libraries in the United States began to call the public attention to the growing disproportion between the strongly increasing scientific output and the financial resources available for library acquisitions (MEIER 2002). According to another survey conducted by the ARL, the average budget of an American university library

increased only 8% per year between 1963 and 1998 (inflation-adjusted only 3% per year) (MEIER 2002). This problem is by no means restricted to the United States but is known worldwide. As stated by MITTLER, cited by SCHULZKI-HADDOUTI (2002), German libraries have lost around 10% of their order volume within one decade due to their budget problems.

Subscription prices for STM journals have increased at a much faster rate than the inflation rate, a process known as the 'serials crisis' which began several decades ago and continues today. The reasons for this crisis are many. During the 1960's several factors, including the coming of college age of the 'baby boomers', the increased subsidization of science by the Federal government as well as the growth of colleges and universities, led to a sharp increase in publication for the many science disciplines. Existing journals expanded and new journal titles were born. Already in the 1970s, publishers of the sectors science, technology and medicine began to raise prices for serials subscriptions. In this time, scientific disciplines and research projects expanded and scientists published their new results in the journals of their discipline. Libraries were forced to cancel more and more serials subscriptions because their budgets remained static or even declined since the time of the oil crisis. As a result of the low subscription rates, the prices have been adjusted again by the publishers, leading to increased subscription prices – a vicious circle.

Since the 1980s, most large research libraries in the United States and Canada have come to depend upon fundraising for support (see also chapter 6 for NYBG), as was revealed in a survey of the collection development librarians of the forty-six largest public and private research libraries (FARRELL 1994, MACEWAN 1994). According to survey results, libraries in private institutions derive up to 30 percent of their collections budget from endowments and gifts from individuals. Collection development librarians are spending increased amounts of time – up to 25 percent – in fundraising activities, including grant writing (FARRELL 1994).

Collection assessment is an important task for each library. It is a helpful tool for tracking changes in the collections over long periods of time and for quantifying library holdings in various ways. Collection assessments illustrate the library’s up-to-date collection profile and point out the strengths and weaknesses of the collections surveyed. Further, they allow an analysis of the collections in terms of all qualitative and quantitative elements (UMLAUF 2002, see chapter 1), and to compare these against the goals set in the collection development policy (see chapter 7.1). In this survey, the up-to-date holdings of the Mertz Library’s collections are shown for all subjects collected, according to data compiled in November 2009. This includes the number of items held in all collection areas (see table 15.2, appendix), as well as the relative size (in percentage) of the single areas represented as part of the total holdings (see chart 9.1). The focus of this study is on the Mertz Library’s ‘core collections’ in monographs, represented by the Library of Congress Classes Q (Science) and S (Agriculture). The profile of the ‘core collections’ is illustrated in charts 9.2 + 9.3. While these data represent the Mertz Library’s up-to-date holdings, the following chapter 10 pictures the Library’s collection development over time.

As shown in chart 9.1, the bulk of the Mertz Library’s collections (~70%) are represented by monographs assigned to the LC-Classes Q (54,4%) and S (15%). Periodicals (single bound volumes are counted) make up 20% of the Library’s holdings. The periodical collection is physically separated from the monograph collections and organized differently (alphabetically instead of by LC-subject). The remaining monograph holdings are shared by the LC-Classes A-P (6%), R (0,9%), T-W (1,4%), and together represent a minority with only 8,3% of the Library’s total holdings. For details on the Library’s strength of collection in all subjects, including item numbers, see table 15.2 (appendix).

The majority of monographs held by the Mertz Library are scientific works of LC-Class Q (54,4%). Class Q encompasses 12 subclasses which are circumscribed on the Library of Congress Classification web site:

http://www.loc.gov/aba/cataloging/classification/lcco/lcco_q.pdf

and in *Gale’s Library of Congress Classification Schedules, Super LCCS, Class Q*.

The Mertz Library primarily collects materials published in subclass QK (Botany), but to some extent also in subclasses QE (Geology), QH (Natural History-Biology), QL (Zoology), QP (Physiology) and QR (Microbiology), see chapter 7.1. Subclass QK (Botany) encompasses all general works on botany, works on plants by their geographical distributions (Floras), systematic and taxonomic works on all plant groups and fungi, plant anatomy, plant physiology and plant ecology.

The strength of collection analysis for LC-Class Q (chart 9.2) illustrates that the strongest categories represented in the core collections are ‘Floras and Botany by place’ (12,93%), ‘Botany general’ (11,86%), followed by all categories specific to plant groups: ‘Seed plant families and genera’ (10,75%), Cryptogams (including ‘Cryptogams general’, ‘Algae’, ‘Bryophytes’, ‘Lichens’ and ‘Ferns’) with a total of 4,4%, and ‘Fungi’ with 2,84%.

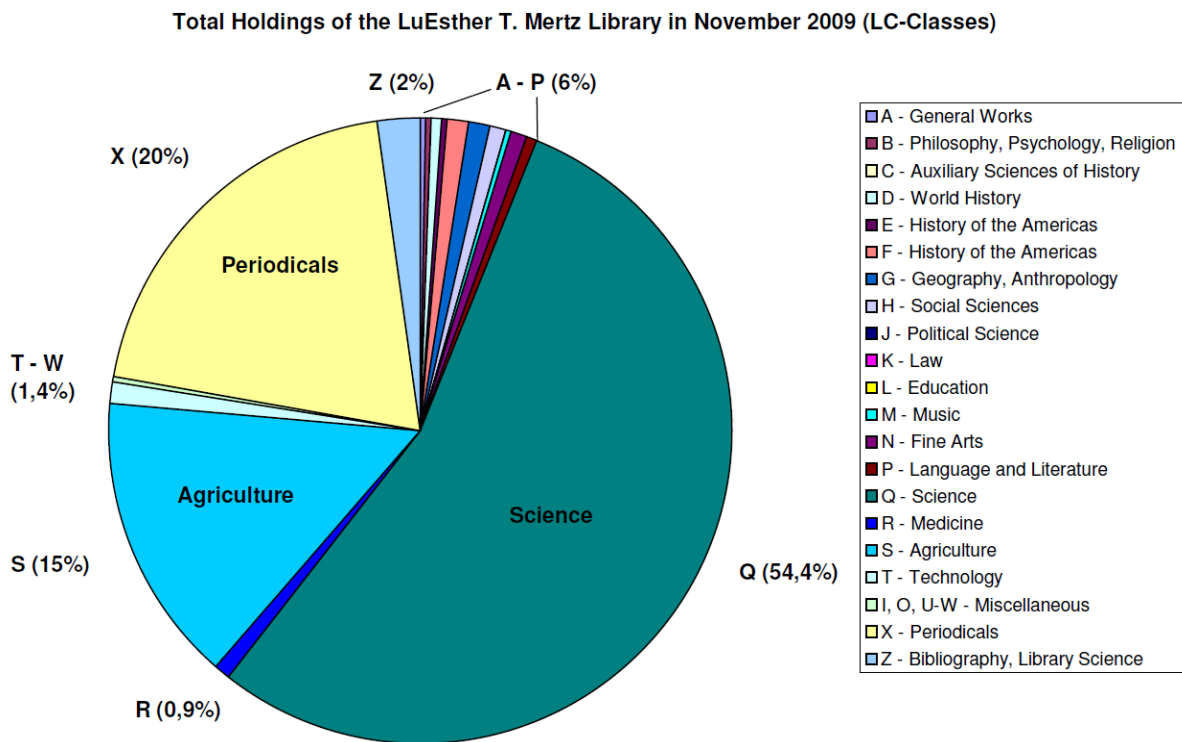


Chart 9.1 : Total Holdings of the Mertz Library in November 2009

It is important to mention that the Mertz Library has appropriated the LC subclass 'QL' for botany. This subclass is, according to the Library of Congress Classification, originally intended for Zoology. However, because the LC subject classifications did not provide for discrete detail in the plant sciences and due to the Mertz Library's specificity on taxonomic and biogeographical literature, it was necessary to establish a further botanical subclass for classifying large taxonomic groups, such as the fern and seed plant families, in an appropriate depth and detail. A further change has been made on the classification concerning the Library of Congress subclass 'QM' (Human Anatomy). This subclass has been appropriated for Zoology (instead of 'QL').

The Mertz Library's strong holdings in plant systematics and taxonomy, floristics and general botany works are in accordance with the original intentions of the Garden's founder NATHANIEL LORD BRITTON who stated that the *'library should be as complete as possible in pure botany'*. These results also reflect the high (comprehensive) level of collection activity as defined in the Library's collection development policy (see chapter 7.1).

The very well documented research history of the New York Botanical Garden reveals that the central research disciplines for which the Library collects, have developed early with the establishment of NYBG's science programs between 1891 and the mid-1930s (BOOM 1996a). Concerning systematic botany and taxonomy, the disciplines representing a strong and continuous research activity from the Garden's inception until today are pteridology (ferns), beginning in 1896 (MICKEL 1996), mycology (including lichenology; fungi and lichens) beginning in 1895 (ROGERSON & SAMUELS 1996), and bryology (mosses) beginning

in 1891 (BOOM 1996a, BUCK 1996). A more detailed description on the development of scientific research at The New York Botanical Garden in conjunction with the Mertz Library's collection development is given in chapter 10.

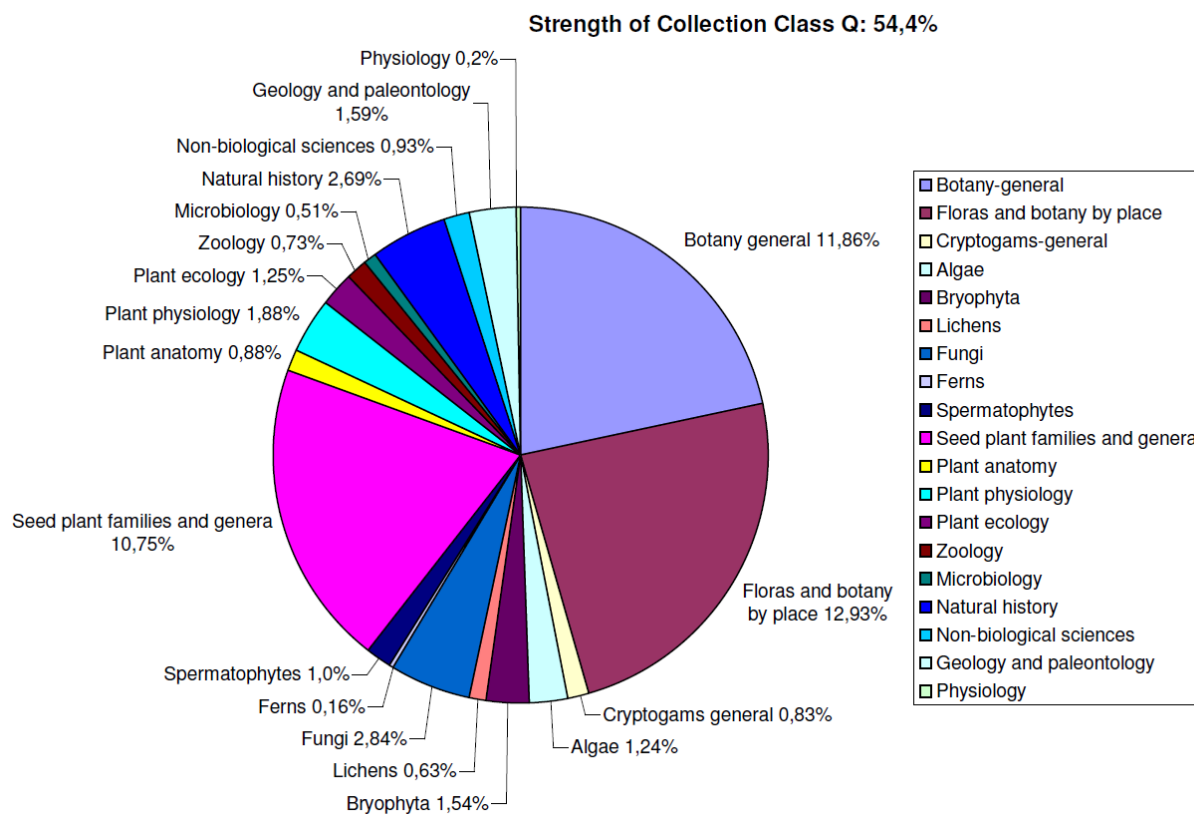


Chart 9.2 : The Mertz Library's holdings in LC-Class Q in November 2009

Other botanical disciplines are not represented as strongly in the Library's holdings, these include Plant Physiology (1,88%), Plant Anatomy (0,88%) and Plant Ecology (1,25%). Although important for the Garden's work, publications of these disciplines are acquired selectively, depending on the current study focus and special topics arising from the departmental research programs. This is in accordance with the research level of collection intensity that has been set for all three disciplines.

Other sciences than botany represent a smaller part of the Mertz Library's holdings in Class Q. Subjects like Geology and Paleontology (1,59%) and Natural History (2,69%) are important for the Garden's science, and publications are acquired (Geology at a research level, Natural History at a study level), especially when focusing on paleobotany or the evolution of certain plant taxa in earth history. These disciplines are necessary for botanists to reconstruct a picture of plant phylogeny. In earlier times, collection activity was focused more towards other related sciences than nowadays, leading to somewhat different patterns in the collection profile.

The LC-Class S (Agriculture) represents the smaller part of the Mertz Library's 'core collections' with 15% of the total holdings, see chart 9.3. In the Library of Congress Classification, the Class S is subdivided into 6 subclasses, for all details and descriptions see http://www.loc.gov/aba/cataloging/classification/lcco/lcco_s.pdf or *Gale's Library of Congress Classification Schedules, Super LCCS, Class S*.

The Mertz Library collects materials only from the subclasses S (Agriculture general), SB (Plant Culture), SD (Forestry) and SH (Aquaculture). As illustrated in the strength of collection analysis for Class S (chart 9.3), 19 categories are held by the Library, differing in their collection strengths between 0,03% (Aquaculture) and 2,12% (Gardening). Thus, holdings in Class S are more evenly distributed across the subjects represented than in Class Q. The strongest categories in Class S are Gardening (2,12%), Types of Plants (1,71%), Forestry (1,70%), Pests and Diseases (1,56%), Agriculture general (1,51%) and Flower Culture (1,24%).

The above cited statement of the Garden's founder continues with the words that, beside botany, the Library should also be as complete as possible '*in its related sciences of horticulture, agriculture, forestry, and such portions of general biology as apply to plants*'. The mission statement of The New York Botanical Garden explicitly points out the importance of the Garden's living plant collections, their cultivation, propagation and preservation in plant conservatories as well as in the garden and landscape. The living collections are a main attraction for the Garden's visitors and they are much used by the Garden's comprehensive education programs, the School of Professional Horticulture and the wide-ranging research programs. NYBG's science conducts research on a variety of useful plant species which are important for horticulture, floriculture or agriculture. The research focuses on the biology of useful plants, plant breeding, plant pathology, weed science, ecology but also on horticultural practices and techniques needed for plant propagation. Thus, the Mertz Library collects materials in most horticultural and agricultural areas to meet the information needs of its parent institution and the public.

In accordance with the results obtained from the 'strength of collection analysis' for LC-Class S (chart 9.3), the current collection intensity is research level for most categories, study level for a few. One subject in Class S is collected at a comprehensive level, 'Economic Botany', due to the research activities conducted at the Institute of Economic Botany (see chapter 7.1). This high level of collecting activity is, however, not reflected in the 'strength of collection analysis' where 'Economic Botany' has a current collection strength of only 0,97%. This, however, might be explained to some extent with cataloging and the classification system used. Economic Botany is a subject assigned to Class S, but its allied discipline ethnobotany, focusing on applied research on useful plants by different cultural groups, is assigned to Class Q (QK 86.5). Similarly, the subject 'Useful Plants' covers many aspects of economic botany as well, it belongs to Class Q (QK 98.4). Further, the Mertz Library collects titles in the LC-Subclasses RS and RM (Medicine) for medicinal plant related subjects which are also part of the interdisciplinary science Economic Botany. Thus, the actual library holdings on 'Economic Botany' are in fact much higher than 0,97%.

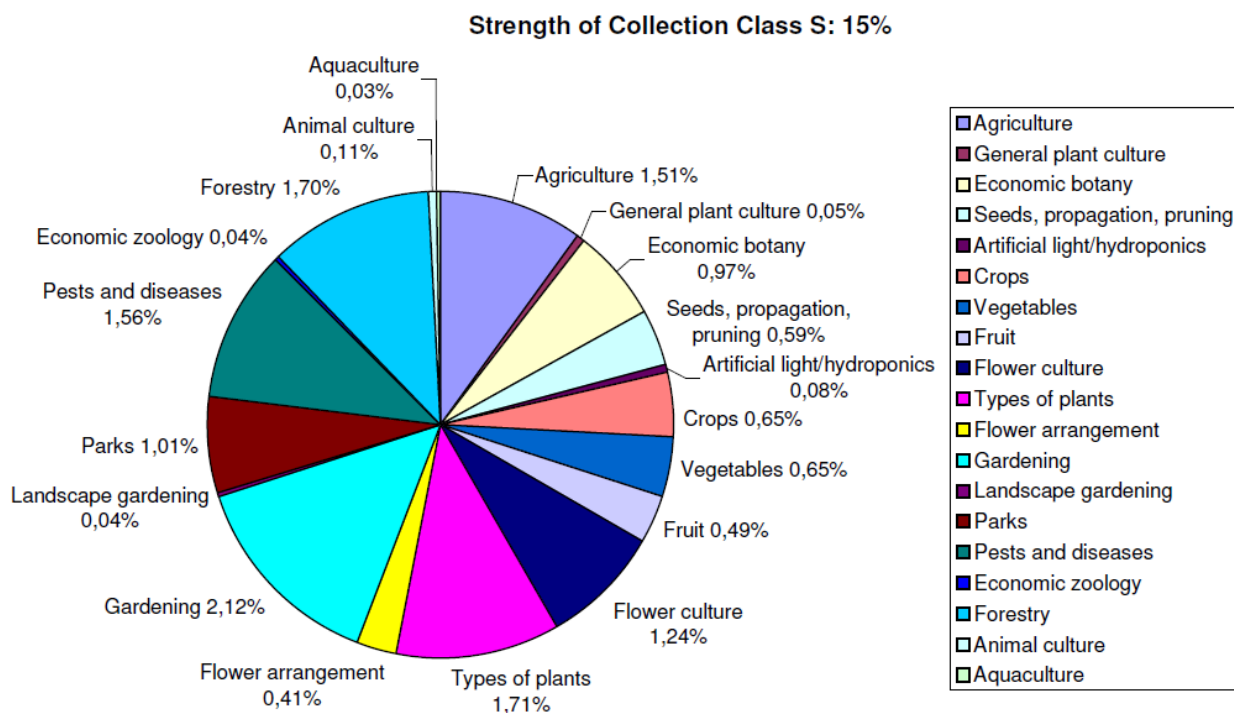


Chart 9.3 : The Mertz Library's holdings in LC-Class S in November 2009

A similar case is the modern research discipline 'Molecular Systematics'. This complex research discipline comprises aspects of several disciplines assigned to different classification categories within Class Q, such as 'Systematic Botany', 'Genetics', 'Genomics', 'Molecular Biology', 'Molecular Evolution' and 'Molecular Phylogenetics'. Thus, when holdings of such complex or interdisciplinary subjects are assessed it is necessary to look as well at holdings of the allied subjects which are cataloged in different categories.

Further important aspects of collection assessments include comparisons of library holdings against those of other research libraries specialized in the same subjects, comparisons with holdings of the National Libraries (The Smithsonian Botany Library, The National Agricultural Library), with bibliographies or acknowledged compilations, to calculate the percentage of important titles present in the collections (UMLAUF 2002, see chapter 1). Such comparisons would have been a very useful supplement to this collection assessment but they could, unfortunately, not be conducted within the framework of this study.

10 COLLECTION DEVELOPMENT IN THE MERTZ LIBRARY'S 'CORE COLLECTIONS', THE LIBRARY OF CONGRESS CLASSES Q (SCIENCE) AND S (AGRICULTURE) OVER THE TIME PERIOD 1995 - 2009

This part of the survey focuses on quantitative elements in collection development and illustrates the growth of the Mertz Library's monograph collections in LC-Classes Q and S as well as the expenditures incurred on these categories over the time period 1995-2009. It is based on data originating from a 'collection development report' created by the Mertz Library's Integrated Library System (ILS) in April 2010. Collection development is presented as percentage growth separate for each class (see charts 10.1 + 10.3 below) in five year periods. All detailed information is given in table 15.3 (appendix).

First of all, when comparing growth rates in the core collections over the entire time period investigated, it is notable that the total number of monographs added to Class Q varies little over time (ranging between 8769 items and 9680 items) whereas in Class S the number of monographs added declines distinctly from 4470 (1995-1999) to 2461 items (2005-2009), see table 15.3 (appendix). In the period 1995-1999, the ratio of monographs added to Class Q in comparison to Class S is approximately 2 : 1. This proportion, however, changes towards a 3,8 : 1 ratio (Q : S) in period 2005-2009. As described in chapter 8, purchases of monographs have generally decreased in this period of time. This seems to affect Class S to a much larger extent than Class Q. When looking at the expenditures for monographs in Class S (see table 15.3, appendix), it can be stated that these declined to approximately half the amount of US \$ between period 1995-1999 (\$72.265,87) and period 2005-2009 (\$35.599,97) (~50,7% decline). While expenses for monographs in Class Q decreased in this period of time as well - from \$189.191,95 to \$162.425,48 (the difference being \$26.766; ~14,1% decline), the total number of items added, however, has not dropped considerably. This may, in part, be explained by other ways of acquisitions - exchanges and donations. Considering the expenditures for monographs as shown in table 15.3 (appendix), it is important to mention that these are solely costs incurred for purchases - they do not include costs for exchanges or any other kinds of expenses (see chapter 7.2). Further, the costs for monographic titles received as standing orders are not wholly captured in the collection development reports the ILS creates. Although every item published in a series is given a bibliographic record upon arrival, the costs associated with this item may, however, be captured much later. This has to do with the programming of the Mertz Library's ILS and needs to be taken into account for the interpretation of costs.

When focusing on collection growth in the single Q-Class categories represented (see chart 10.1 below), certain trends become apparent. Over the entire period investigated, most monographs have been added to 'Floras and Botany by place' which is also reflected in the continuously high percentage growth: 10,9% (2297 items) in period 1995-1999, 11,4% (2670 items) in period 2000-2004 and 10% (2602 items) in period 2005-2009. The results of this strong growth rate can be measured by the Mertz Library's large up-to-date holdings of floras (see chapter 8) which are estimated to represent about 82% of the world's floras (as listed in the 2nd edition of David Frodin's *Guide to standard floras of the world*, 2001). Considering costs, the largest amount of money by far has been spent on floras within the time period 1995-2009 (\$144.901,63 in total, see table 15.3, appendix). In contrast to the above stated general trend for a decline in monograph purchases - and in contrast to all other Q-Class categories (except 'Bryophytes') - expenditures for floras have even increased with each five year period from \$48.565,00 in period 1995-1999 to \$50.862,53 in period 2005-2009 (see chart 10.2 below).

Collection Development in Class Q: 1995 - 2009

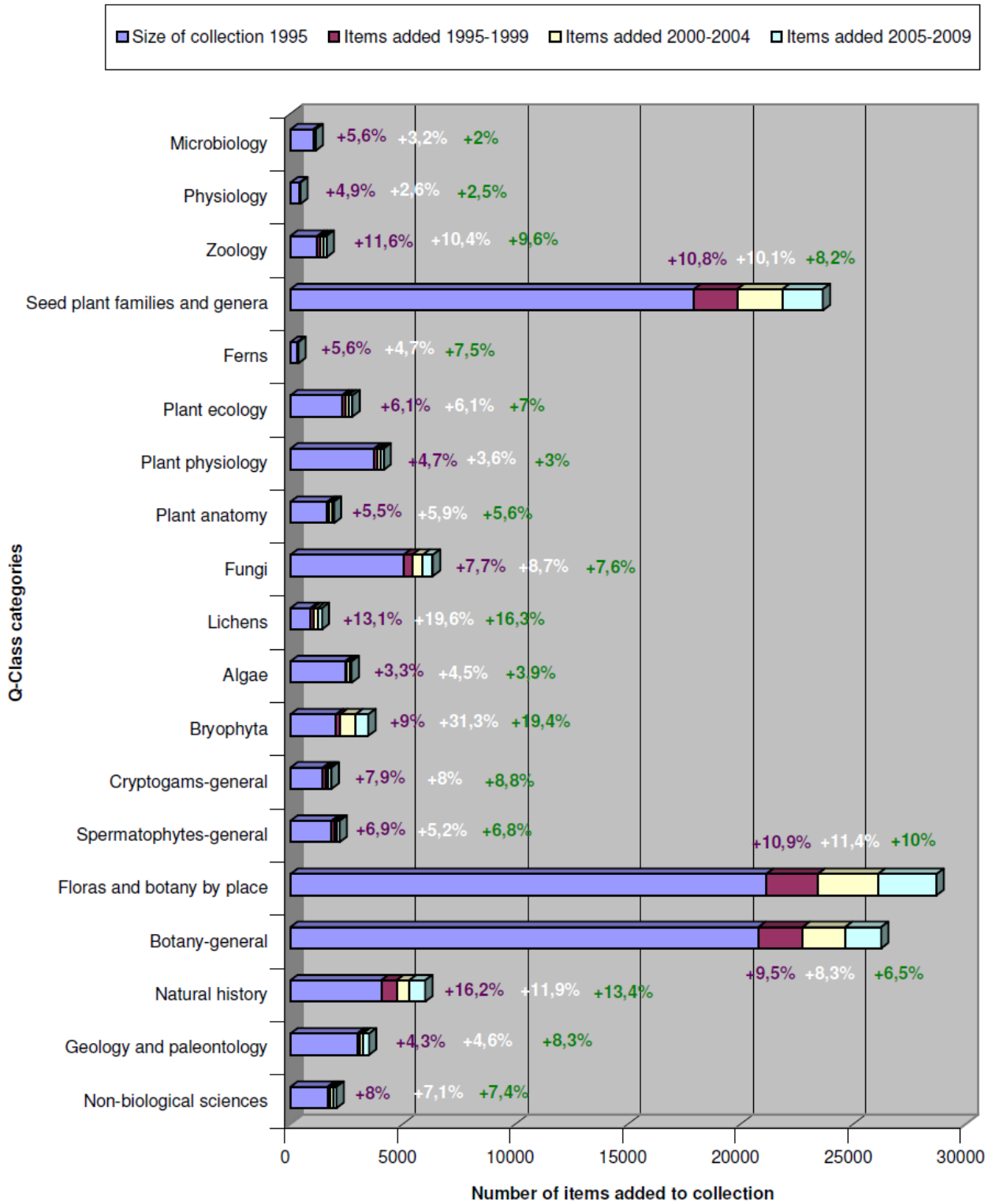


Chart 10.1 : Collection development in LC-Class Q (Science) in the time period 1995 – 2009

With regard to floras, it is important to mention that the New York Botanical Garden has achieved an early international reputation as a center for floristic and taxonomic research (BOOM 1996a). NYBG has conducted field trips for floristic investigations in the Western Hemisphere since the 1890s and major floras have been produced since then by such renowned botanists and NYBG staff members as N.L. BRITTON, P.A. RYDBERG and ARTHUR CRONQUIST (BOOM 1996b, GLEASON 1996, SASTRE & SANTIAGO 1996), and so they are today: e.g. 'Flora Neotropica', 'Intermountain Flora' (BARKLEY 1996, TAKHTAJAN 1996).

The second strongest category with respect to collection growth is 'Seed plant families and genera': 1928 items were added in period 1995-1999, 2007 items in period 2000-2004 and 1788 items in period 2005-2009. This corresponds to a growth of more than 10% in the first two investigation periods and - somewhat less, 8,2% - in the last period 2005-2009. This development also correlates with the expenditures incurred on 'Seed plant families and genera' over these periods (\$33.598,49 spent in period 1995-1999, \$36.088,04 in period 2000-2004 and \$31.615,73 in period 2005-2009, see chart 10.2 below). As this category encompasses all systematic and taxonomic works specific to seed plant taxa, it is of particular interest for the Mertz Library to know the exact holdings and to keep track on the development of these collections. Therefore, a more detailed collection development report focusing on single fern and seed plant families for the period 1995-2009 is presented in table 15.4 (appendix) and will be discussed in chapter 10.1.

'Botany general' (see chart 10.1) represents the third strongest category in collection growth as reflected in the number of monographs added as well as in percentage growth: 1968 items (9,47%) in period 1995-1999, 1883 items (8,28%) in period 2000-2004 and 1597 items (6,48%) in period 2005-2009. There is, however, a decrease in the most recent period of time. 'Natural History' is also a strong category with a stable growth: 676 items (16,72%) in period 1995-1999, 563 items (11,93%) in period 2000-2004 and 709 items (13,43%) in 2005-2009 (see chart 10.1).

In other Q-Class categories collection sizes are much smaller than in the above mentioned categories. However, relatively strong trends for collection growth can be noted for those as well, as e.g. reflected in the percentage growth of the cryptogamic groups - most of all in the 'Bryophytes' (mosses) and in the 'Lichens' (see chart 10.1). The Bryophyte collection increased by 9% in period 1995-1999, 31,3% in period 2000-2004 and 19,41% in period 2005-2009. This strong growth rate is reflected in the increased amounts of money spent on 'Bryophytes' between 1995 and 2009 (ranging from \$2.151,32 to \$5.992,58, see chart 10.2). Likewise, growth rates for the 'Lichen' collection have increased between 13% and 19,6% over the entire period investigated. Distinct trends for an increased growth of the monograph collections can further be noted for the categories 'Ferns' (6,1-7,5% growth) and 'Fungi' (7,6-8,7%). As described in chapter 9, cryptogamic groups and fungi represent a major research focus at the New York Botanical Garden since its inception (BOOM 1996a, BUCK 1996, MICKEL 1996, ROGERSON & SAMUELS 1996). This is reflected in both, the large and significant herbarium collections of bryophytes, lichens, ferns and fungi (HOLMGREN et al. 1996) as well as the Mertz Library's large monograph holdings. This example shows the parallel development of research disciplines, herbarium and library collections at NYBG very well.

Collection development in the two categories 'Geology and Paleontology' and 'Plant Ecology' indicates clear trends for an increased growth over the period 1995-2009 as well:

4,3-8,3% and 6,1-7% growth respectively (see chart 10.1). In other Q-Class categories, growth rates remain relatively stable over the whole period 1995-2009: 'Algae' (3,3-4,5%), 'Plant Anatomy' (5-6%), 'Zoology' (9,6-11%) and 'Non-Biological Sciences' (7,1-8%). A decrease in growth rates can be stated for 'Botany general' (drop from 9,5% to 6,5%), 'Plant Physiology' (drop from 4,7% to 3%) and 'Microbiology' (drop from 5,6% to 2%) which can also be followed in the decline of expenditures (see chart 10.2).

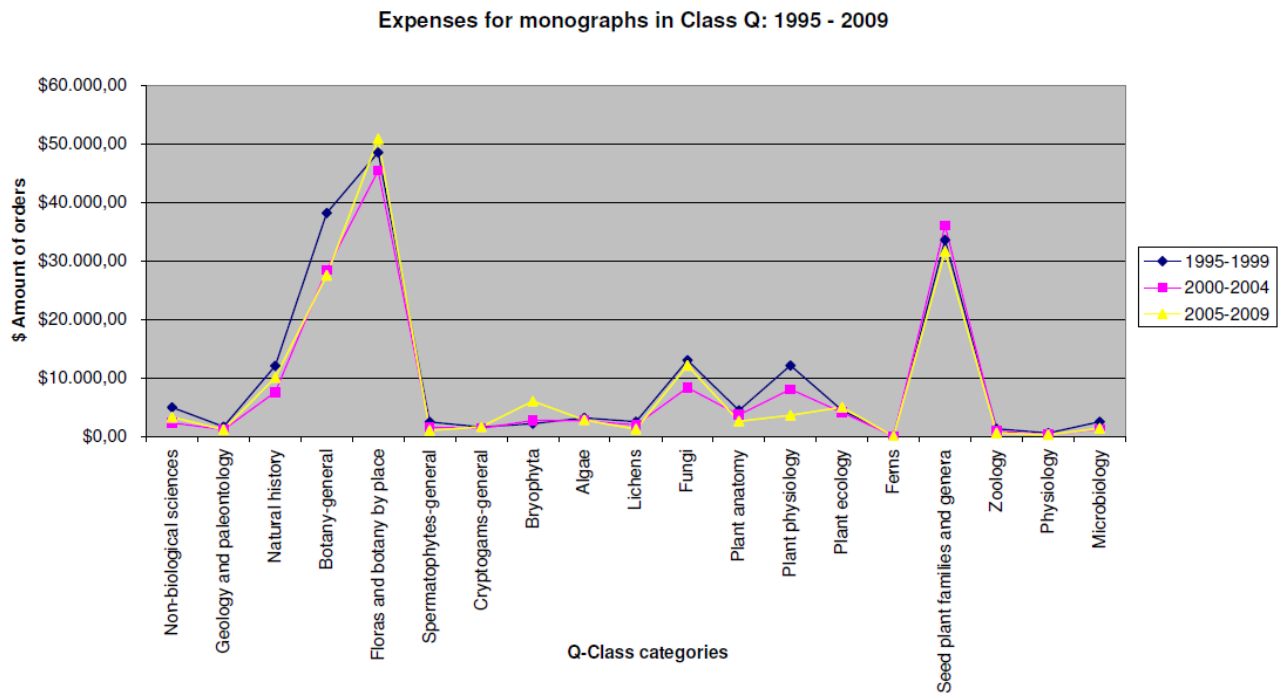


Chart 10.2 : Expenses for monographs in LC-Class Q over the time period 1995 - 2009

As described above, there is an overall tendency for a growth decrease to be stated for the S-Class collections in the period 1995-2009 (see chart 10.3 below). While in fact fewer monographs have been added to most S-Class categories in each consecutive five year period, the pattern shows that a few S-Class subjects have also increased in growth. This applies most of all to 'Forestry' where a distinct growth of item numbers can be seen: 225 items (8,5%) have been added in period 1995-1999, 387 items (13,5%) in period 2000-2004 and 528 items (16,2%) in period 2005-2009. The growth of 'Forestry' in the Mertz Library's collections has several reasons. One factor is that the New York Botanical Garden has an affiliation with the *Yale School of Forestry* (see chapter 2.4), but even more important are the programs of the *Institute of Economic Botany* on sustainable forest management as well as NYBG's health and restoration project on the garden grounds (for further information, consult this web site: <http://www.nybg.org/sustainability/horticulture.php>). However, the expenses made for Forestry-related monographs within these periods indicate the exact opposite trend: they dropped from \$4.031,79 in period 1995-1999 to \$2.802,92 in period 2005-2009, see chart 10.4 below). This may be explained by an overall increase of non-purchased monograph acquisitions (exchanges and gifts) in this category, as indicated above.

Collection Development in Class S: 1995 - 2009

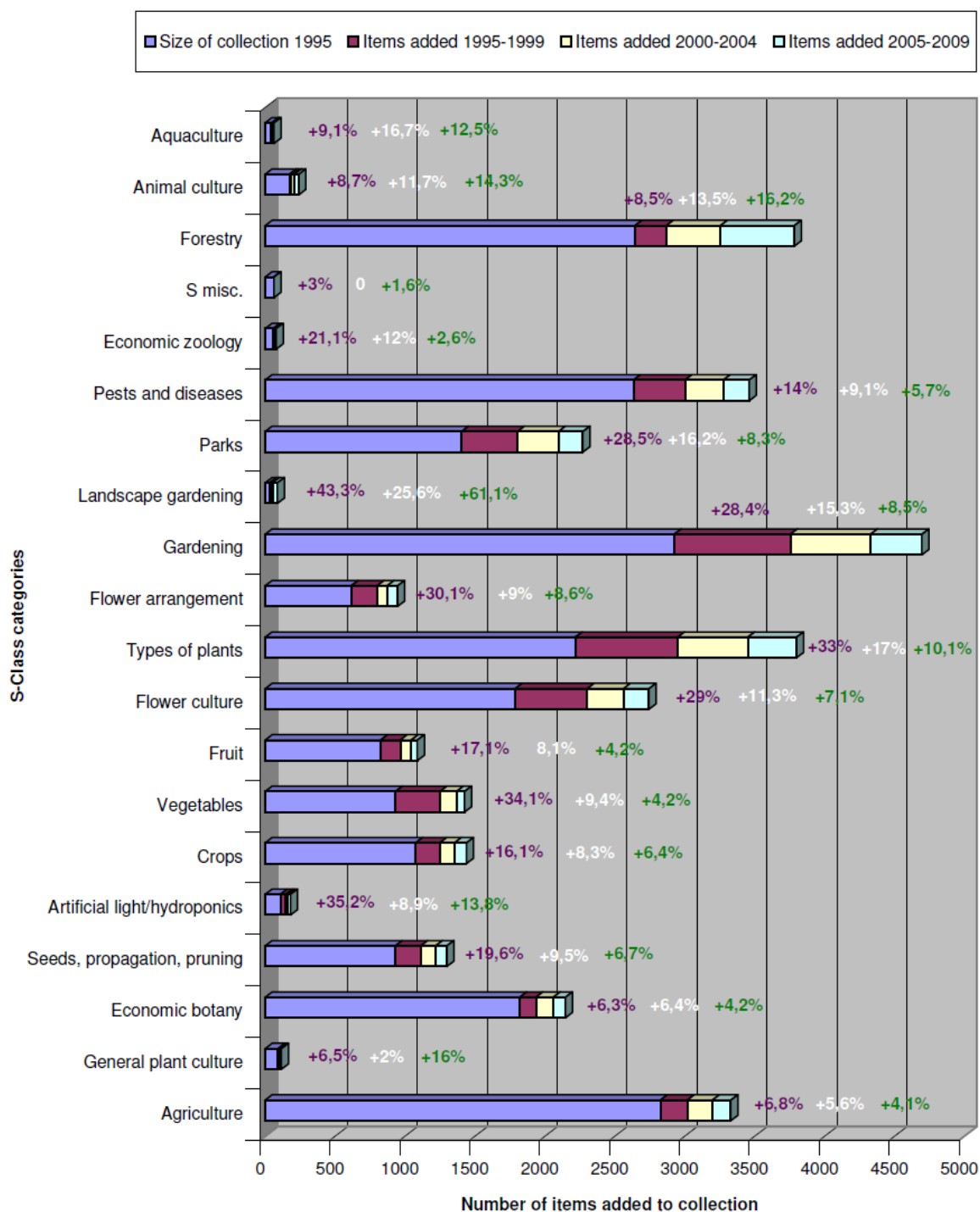


Chart 10.3 : Collection development in LC-Class S (Agriculture) in the time period 1995 – 2009

Beside ‘Forestry’, ‘Gardening’ and ‘Types of plants’ represent very strong S-Class categories as well. While the section ‘Gardening’ has increased very much in period 1995-1999 (831 items: +28,5%), the growth rate is somewhat lower in period 2000-2004 (573 items: +15,3%) and it further drops in period 2005-2009 (368 items: +8,5%). This finding

correlates with the developmental pattern seen in the expenditures on ‘Gardening’-related monographs: expenses distinctly drop from \$18.076,08 in period 1995-1999 to \$7.128,53 in period 2005-2009 (see chart 10.4 below). A similar development can be seen in ‘Types of plants’: a strong growth rate can be stated for period 1995-1999 (732 items: +33%), it is less strong in the periods 2000-2004 (501 items: +17%) and 2005-2009 (349 items: +10,1%). These findings are also reflected in the overall decrease in expenditures from \$5.937,39 to \$4.394,08 (see chart 10.4 below). In category ‘Types of plants’, the difference in the amount of money spent between 1995 and 2009 is, however, not as large as in ‘Gardening’.

The Mertz Library holds a large monograph collection in LC-subclass ‘Agriculture’ (see exact holdings in chapter 9). As indicated by the pattern in chart 10.3, fewer items have been added to the collection in more recent time and there is a tendency for a growth decrease to be seen in the entire period of time investigated: a drop from 6,8% growth in period 1995-1999 to 4,1% in period 2005-2009. This has to do with a change in research focus concerning agricultural subject areas at the New York Botanical Garden. The shift includes a reduction of general agricultural subjects and an expansion of some agricultural subdisciplines. A further reason for the growth decrease of this section is the general decline in the acquisitions budget and increased demands from other collection areas (D. WHEELER, pers. comment).

Other categories in Class S comprise large holdings as well but show a clear tendency towards a decline in each five year period investigated. These are ‘Pests and Diseases’, ‘Flower Culture’, ‘Parks’ and ‘Economic Zoology’ (see chart 10.3). In contrast to these, some other S-Class categories comprise relatively small collection sizes but show trends for an increased growth. This applies to ‘Landscape Gardening’ where growth rates range between 43,3% and 61,1% in period 1995-2009, ‘Artificial Light/Hydroponics’ (growth rate 8,9-35,2%) and ‘General Plant Culture’ (growth rate 2-16%). The growth of the section ‘Landscape Gardening’ can be explained by the addition of an important collection on landscape and garden history (the ELIZABETH REILLEY collection, donated to the Mertz Library in the year 2000) and by the development of the Landscape Design program in NYBG’s Continuing Education (D. WHEELER, pers. comment).

In the following S-Class categories, collection growth remained relatively stable over the entire investigation period: ‘Economic Botany’ has increased by 6,3% in period 1995-1999, 6,4% in period 2000-2004, somewhat less, 4,2%, in period 2005-2009; in ‘Aquaculture’ growth rates range between 9-12,5% (see chart 10.3). More or less strong tendencies towards growth decreases can be stated for the following S-Class categories over the entire period investigated: ‘Seeds, Propagation, Pruning’: 19,6% to 6,7%, ‘Crops’: 16% to 6,4%, ‘Vegetables’: 34,1% to 4,2%; ‘Fruit’: 17,1% to 4,2%, ‘Flower culture’: 29% to 7,1% and ‘Flower arrangement’: 30% to 8,6%. An interesting finding in this context is, that contrary to the rate of decline stated for category ‘Seeds, Propagation, Pruning’ in period 2005-2009, expenditures on monographs related to this subject have been quite large (see chart 10.4). In the following table, total expenditures (only purchases) spent on single Q- and S-Class categories in the period 1995-2009 are presented in a descending order (left column) compared with collection growth (item numbers added 1995-2009) in LC-Classes Q and S (right column).

| EXPENDITURES | | NUMBER OF ITEMS |
|--|-----------|--|
| Floras and Botany by place \$144.901,63 ~ \$19,1 per item | 1 | Floras and Botany by place 7.569 items added |
| Seed plant families and genera \$101.302,26 ~ \$17,7 per item | 2 | Seed plant families and genera 5.723 items added |
| Botany general \$94.188,17 ~ \$17,3 per item | 3 | Botany general 5.448 items added |
| Gardening \$40.166,64 ~ \$22,7 per item | 4 | Natural History 1.948 items added |
| Fungi \$33.428,73 ~ \$25,7 per item | 5 | Gardening 1.772 items added |
| Natural History \$29.618,18 ~ \$15,2 per item | 6 | Types of plants 1.582 items added |
| Pests and Diseases \$20.643,34 ~ \$25 per item | 7 | Bryophyta 1.438 items added |
| Flower culture \$17.116,07 ~ \$17,9 per item | 8 | Fungi 1.300 items added |
| Parks \$15.411,86 ~ \$17,8 per item | 9 | Forestry 1.140 items added |
| Seeds, Propagation, Pruning \$14.770,51 ~ \$40 per item | 10 | Flower culture 958 items added |
| Types of plants \$14.670,52 ~ \$9,3 per item | 11 | Parks 867 items added |
| Plant Ecology \$13.474,08 ~ \$28,7 per item | 12 | Pests and Diseases 827 items added |
| Forestry \$12.035,08 ~ \$10,6 per item | 13 | Geology and Paleontology 536 items added |

According to this pattern, by far the largest expenditures have been incurred for 'Floras and Botany by place' (\$144.901,63), the 'Seed plant families and genera' (\$101.302,26) and 'Botany general' (\$94.188,17). This order corresponds to that of strongest collection growths (see above, right column). For the two following categories in sequence, 'Gardening' and 'Fungi', more money has been spent in proportion to the number of items added which can be seen in the average prices per item. The averaged amounts for these two categories are \$22,7 and \$25,7 respectively. This is much more than the average price per item in the above mentioned Q-categories (\$17,3-\$19,1). The reasons for this are unclear.

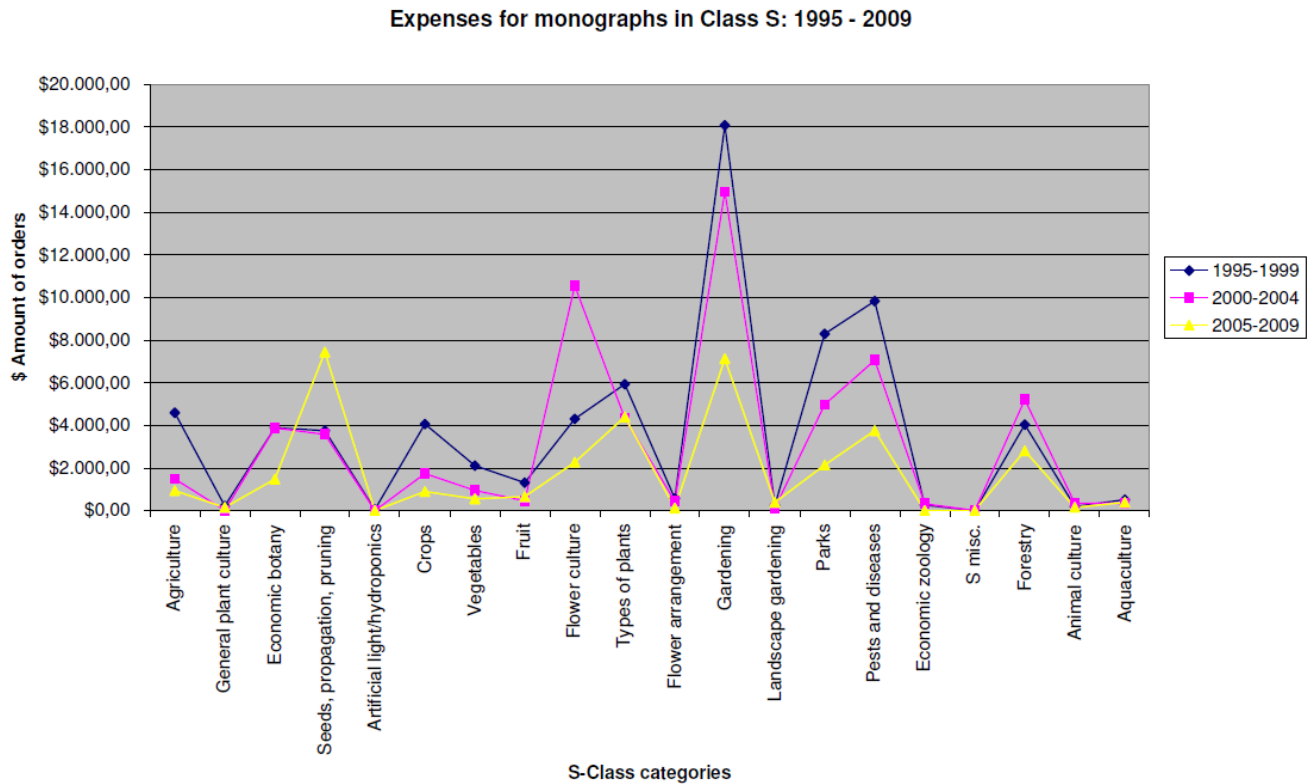


Chart 10.4 : Expenses for monographs in LC-Class S in the time period 1995 - 2009

It is possible that monographs in these categories are in fact more costly – but another explanation could be that more items have been acquired by other means than purchases, such as exchanges or donations, in those categories where overall less money has been spent. This, unfortunately, can not be reconstructed as the collection development report only provides information on total item numbers added (including purchases, exchanges and donations) and on costs from purchases. However, those are not the only costs incurred for monograph acquisitions as standing orders (see above) and exchanges (see chapter 7.2) also incur costs for the Mertz Library which are not specified here. In a few other categories listed above, expenses have also been quite high in comparison to the item numbers added to the collections. These are ‘Pests and Diseases’, ‘Seeds, Propagation, Pruning’ and ‘Plant Ecology’: here, average prices per items range between \$25-\$40. Again, this might be due to a low ratio of non-purchased items (exchanges and gifts) and/or high prices for the monographs purchased. In contrast, expenses for the S-Class category ‘Forestry’ have been low in comparison to the numbers of items purchased, the averaged price per item being only \$10,6.

10.1 Collection Development of the monograph collections in single Fern and Seed Plant Families and Genera (Subclass QL)

As mentioned above, it is important for the Mertz Library to know the exact holdings of all fern and seed plant families as well as their development over time. For this purpose a re-programming of the Integrated Library System ('Innovative Interfaces Millennium') has been implemented to focus on single plant taxa in detail. Collection development reports such as these allow the Mertz Library to precisely keep track on the collecting activity in certain taxonomic groups over certain periods of time - and to compare these to the research activities of NYBG's science departments. To accomplish this, the two former large QL-Class categories 'Ferns' and 'Seed plant families' were broken out into 24 fern families and 281 seed plant families (including some important genera as well, see table 15.4, appendix). In the original 'collection development report' created by the ILS, the succession of plant families corresponds to the '*Engler classification system*' which has been introduced for NYBG's herbarium and has also been adopted for use in classifying the individual plant families in the appropriated QL (Zoology) class in the library catalog as well. The original order of the plant families is reflected in the call numbers (LC-ranges), see table 15.4, appendix.

In recent time, however, plant systematics has been in a continuous state of flux due to new results obtained from molecular investigation methods. As a consequence, former classification systems used have been questioned and plant taxa of all systematic ranks have been newly circumscribed according to these findings. In acknowledgment of these developments, the former order of seed plants according to the *Engler system* was changed in this survey - in favor of the up-to-date systematics now used for the spermatophytes. New circumscriptions of plant taxa and phylogenies are published in regular terms by the Angiosperm Phylogeny Group (APG). The last publication dates back to autumn 2009 and includes the most recent seed plant classification (APG III). The Missouri Botanical Garden provides a special APG web site where this classification can be viewed: <http://www.mobot.org/MOBOT/research/APweb/>. In this context it is important to mention that the cataloging department of the Mertz Library regularly updates names of plant taxa and enters these in authority files. Thereby, all synonyms are added – as well as plant names of higher and lower ranks in the classification. All recently updated plant family names can be seen (asterisked) in table 15.4 (appendix), but they do not yet give information on current holdings. The standard reference book used for all plant family and genera names is the 3rd edition of *David J. Mabberley's Plant Book*, 2008.

To get a picture of the main trends in the detailed collection development report of the fern and seed plant families (see table 15.4, appendix), a ranking has been created that depicts fifteen plant families with the largest collection sizes and strongest growth rates (see chart 10.5). This ranking shows families of quite different systematic groups. Orchids (Orchidaceae), true grasses (Poaceae or Gramineae), sedges (Cyperaceae), palm trees (Arecaceae or Palmae) and lilies (Lilaceae) are all large and economically important monocotyledon families. The grasses (Poaceae) are by far the leading plant family in this ranking concerning size of collection and increase of item numbers (see chart 10.5 and table 15.4, appendix). They are a worldwide distributed plant family and play an ecologically major role in savannahs, steppes and prairies – all ecosystems dominated by grasses, but they occur also in forests (e.g. bamboo). In addition to this, they are essential food plants (cereals, rice, corn, millet) and serve as a nutritional base for all humans. At the New York Botanical Garden, grasses and sedges are studied for their systematics and ecology (for further information, consult profile of NYBG scientist ROBERT NACZI:

http://www.nybg.org/science/scientist_profile.php?id_scientist=105). Grasses and sedges are becoming important ornamental plants as well. They are often used in NYBG's garden and landscape design, especially native species.

Orchidaceae represent the second strongest family in the Mertz Library's collections on seed plants (chart 10.5). They are - after the Asteraceae (Compositae) – the second largest of all plant families encompassing more than 21.000 species. Orchids play a major role as ornamental plants, they are cultivated and propagated at the New York Botanical Garden, used for garden exhibits and sales. Some orchid species are useful plants as well, serving e.g. as spices (*Vanilla planifolia*). Beside this, orchids are an ecologically very diverse plant group occurring in dry and humid habitats. In the neotropics (one of NYBG's main study areas), they are frequently found growing as epiphytes in rainforests. They are also known for their special and complicated pollination systems. Thus, literature on this important plant group is very well represented in the Mertz Library.

The palm family (Arecaceae or Palmae) is distributed in tropical and subtropical areas worldwide and comprises a large number of useful and ornamental species. Products of palm trees are essential food resources in tropical countries and are exported to all parts of the world. Among the many useful palm species are for example oil palms, coconut palms, sago palms, date palms and palmyra palms. Palm (and monocotyledon) systematics and ethnobotany represents a major research area at NYBG (for further information, see profiles and publication lists of NYBG scientists ANDREW J. HENDERSON and MICHAEL J. BALICK on the NYBG's science web site: <http://www.nybg.org/science/scientists.php>). Also, this is a reason why the New York Botanical Garden will host the fifth International Monocotyledon Conference in 2013. Thus, the Mertz Library has a considerable collection of palm-related literature which has increased by 12-13% in all five year periods investigated, see chart 10.5.

Among the numerous Dicotyledon plant families listed in table 15.4 (appendix), Rosaceae, Asteraceae (Compositae), Fabaceae (Leguminosae) and Solanaceae are the most notable concerning collection sizes and growth rates as shown in chart 10.5. Solanaceae and Fabaceae are being studied at NYBG with a special focus on floristics and systematics (for detailed information, consult profiles and publication lists of NYBG scientists MICHAEL H. NEE and BENJAMIN TORKE on NYBG's science web site, see above). Especially the Rosaceae monograph collection has strongly increased recently (+15,6% in period 2005-2009). All four families are abundant in species (Asteraceae being the largest of all seed plant families), they are distributed worldwide and encompass numerous ornamental species (especially Rosaceae, Asteraceae and Solanaceae), but also important food plants, e.g. Fabaceae (peas, beans, lentils, peanuts, soybeans, carob, tamarind) and Solanaceae (potato, tomato, paprika, chili pepper, eggplant, tobacco).

Representatives of these families contain therapeutic drugs as well. The New York Botanical Garden has long been involved in the search for plant-based remedies for disease (BOOM 1996a). NYBG Scientists conduct research in different parts of the world to identify new plant species with healing properties that could be used for example as painkillers, anticancer agents, blood thinners or antibiotics. In their projects the scientists investigate the use of herbal therapies prescribed by ethnic healers. Research on medical plants at NYBG was fostered by the foundation of the *Institute of Economic Botany* in 1981 and - somewhat later in 1988 - the collaboration with the National Cancer Institute (PRANCE 1996). Literature on medical plants is therefore intensely collected.

Collection Development in 15 strongest seed plant families

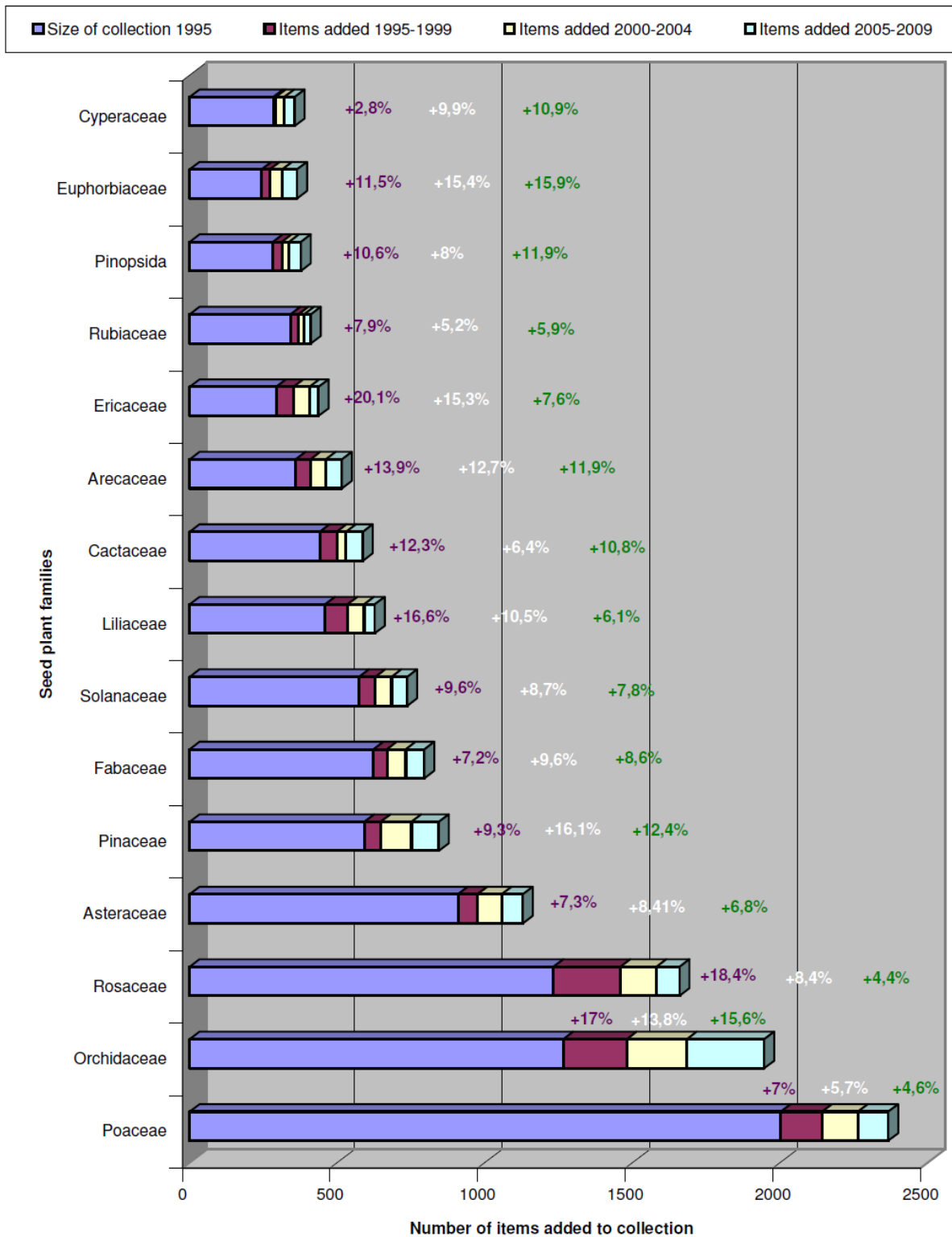


Chart 10.5 : Collection development in the fifteen strongest seed plant families in Subclass QL in the period 1995 - 2009

Ericaceae, the heather family, represents a research focus at NYBG. Species of this family are restricted to poor, nutrient-deficient and acidic soils growing in bogs and heathlands in temperate climate zones but also in tropical rainforests, especially in mountainous areas. As mycorrhizal plants they are ecologically very diverse and adaptable. At NYBG, Ericaceae are studied for their systematics (for detailed information, consult profile and publication list of Ericaceae specialist PAOLA PEDRAZA on NYBG's science web site, see above). Many ornamental species are planted on the garden grounds, especially species of *Rhododendron* (including azaleas), *Calluna* and *Erica*. Therefore, the Ericaceae collection in the Mertz Library has reached a considerable size and has increased much, especially within the periods 1995-1999 and 2000-2004.

In correlation with the results on the largest monograph holdings in seed plant families presented above (chart 10.5), the largest expenditures have been incurred for Orchidaceae, Rosaceae and Poaceae (chart 10.6). The order has changed in so far that most costs have been spent on Orchidaceae, especially in the most recent period 2005-2009 where expenses nearly doubled (\$11.730,55) in comparison to the periods before (\$6.815,11 and \$6.627,86 respectively), see chart 10.6. This is quite in contrast to most other plant families shown for which less money has been spent in period 2005-2009 than in the periods before. Except for Orchidaceae, Rosaceae, Poaceae and Asteraceae, no expenditures incurred on monograph purchases exceeded \$3.200 for any other plant family at any time period investigated.

Expenses for monographs in 15 seed plant families: 1995 - 2009

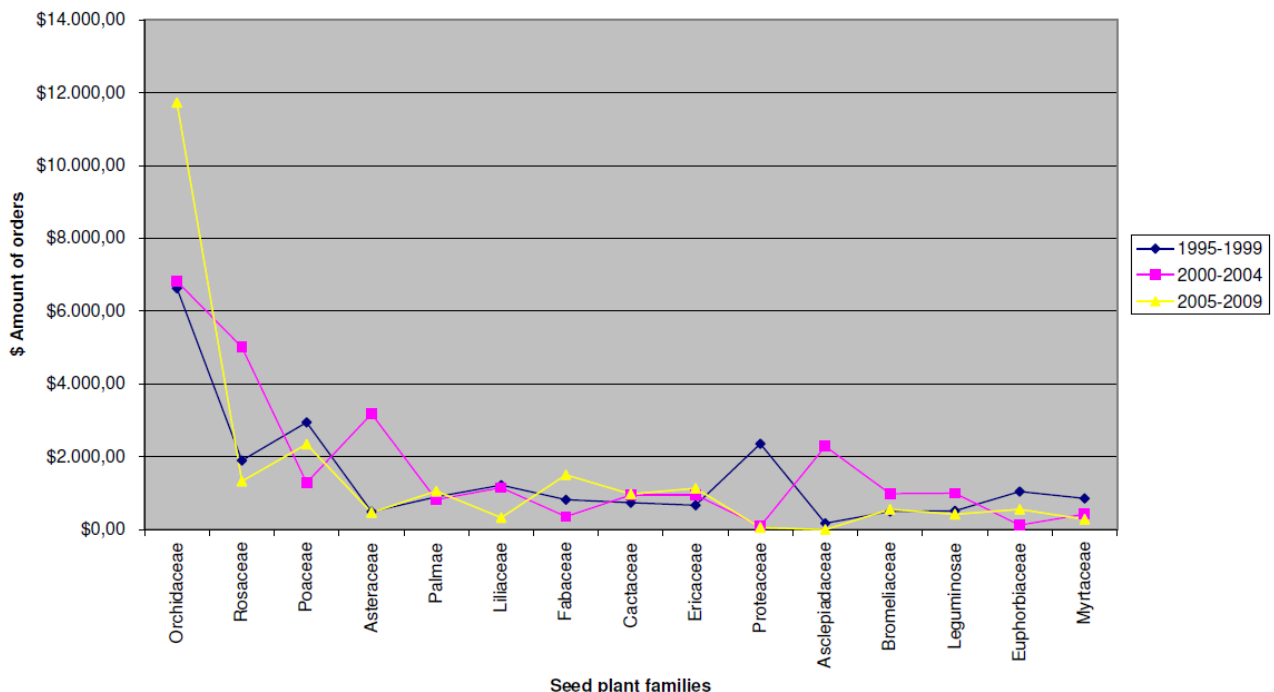


Chart 10.6 : Expenses for monographs in fifteen seed plant families in Subclass QL in the period 1995 - 2009

Collection development of other important plant families under study at the New York Botanical Garden are broken out in table 15.4 (appendix) but are not included in the above

illustrated ranking of 15 strongest plant families (chart 10.5). Among those are pteridophyte families (ferns) and gymnosperm families in particular. While the total number of items added to the fern section in the entire period 1995-2009 amounts to only 56, there have been almost no costs incurred for those (see chart 15.4, appendix). This indicates that the fern section has totally grown through gifts or exchanges. The gymnosperm collection has continuously grown in all periods, as can be seen in the number of items added, while the overall costs for purchases have decreased over time. Again, this pattern might to some extent be explained as items received as gifts or donations. NYBG has a strong focus on systematic research in both ferns and gymnosperms.

10.2 'Age of Collection Analysis' of the Mertz Library's 'core collections' focusing on publication dates of monographs in the time period 1909 - 2009

This analysis describes the Mertz Library's monograph collections in the Library of Congress Classes Q (chart 10.7) and S (chart 10.8) according to their age, as measured by the publication dates of all monograph items accessioned. It is based on data originating from an 'age of collection report' created by the Mertz Library's Integrated Library System (ILS) in November 2009, providing information on the age distribution of monographs in each Q- and S-Class category for certain time ranges designated. In charts 10.7 and 10.8, monographs of LC-Classes Q and S have been categorized according to publication dates in periods of ten years and are shown in proportion to the total holdings. All details of this analysis are given in table 15.5 (appendix).

When looking at the single Q-Class categories represented in chart 10.7, the age pattern of monographs looks quite heterogenous. However, one characteristic shared by most categories is the large proportion of monographs published before 1909 in the total holdings. Q-Class categories with the largest proportions of monographs dating from this earliest period are 'Cryptogams general' (41,7%), 'Botany general' (39,9%), 'Ferns' (37,8%), 'Algae' (30,3%), 'Plant Anatomy' (33,0%), 'Geology and Paleontology' (28,2%), 'Bryophyta' (24,5%) and 'Floras and Botany by place' (28,8%).

This can be explained by the origins and history of the NYBG library and the herbarium collections (CALLERY 1995, HOLMGREN et al. 1996). As described by CALLERY (1995), library and herbarium collections of the New York Botanical Garden have developed in parallel over a long time, as particularly during the first 50 years of the institution, collections of library materials were acquired along with herbaria specimens. NYBG's main research areas developed early with the foundation of the science programs between 1891 and the mid-1930s (BOOM 1996a). Floristic and systematic botany of angiosperms, fungi, bryophytes (including lichens), pteridophytes and economic botany were the disciplines then central to NYBG, and they remain so today. As described in chapter 2.1, NYBG's initial large library and herbarium collections assembled by the founding director of the Garden, N.L. BRITTON, comprised (among others) Columbia university's large botany collection (including paleobotany) from the years 1896-1904, collections of the New York Academy of Medicine (1899) and the New York Academy of Sciences (1901) and LUCIEN M. UNDERWOOD'S cryptogamic library (and his herbarium) in 1914 (CALLERY 1995). In addition to these the NYBG was able to purchase over 760 duplicate monographs from the Jardin Botanique de la Ville de Genève in 1923. This explains why the NYBG library has large holdings of monographs published in times before 1909 in the above mentioned Q-Class disciplines.

Another general trend to be seen in chart 10.7 is that monographs published between 1910 and 1959 make up a comparatively small part of the total Q-Class collections. Although this ~50 year time period covers a considerable part of the total time range in focus, the ratio of monograph holdings from this period ranges only between minimum 12,4% ('Natural History') and maximum 31,5% ('Spermatophytes-general'). A possible explanation for this might be the generally lower publication rate in plant sciences and related science disciplines in times of World War I and II (MEIER 2002). Obviously larger numbers of monographs have been acquired later as reflected in the large proportion of publications dating from the 1950s and 1960s (chart 10.7). Since the end of World War II science programs have generally grown stronger and diversified. As a consequence, publications in the sciences have grown exponentially (MEIER 2002, see also chapter 8). Some of the original science disciplines

identified as essential by the NYBG founders have then become more specialized. As described by BOOM (1996a), a diversification of NYBG's basic program occurred between the late 1930's and the mid 1950s and plant physiology, pathology, biochemistry, and genetics became part of the NYBG program. This development was fostered by the establishment of the Harding Laboratory in 1956 providing new facilities for pioneering research on antibiotics, plant tissue culture, fungal hormone chemistry, and genetics (BOOM 1996a). The new development of science disciplines is not precisely reflected in the data presented here, as they are part of larger categories (e.g. 'Genetics' being part of 'Botany general', 'Pathology' partly integrated in 'Fungi') and not broken out in detail in this 'age of collection report'. However, the age pattern of monograph collections illustrated in charts 10.7 and 10.8 indicates a distinct increase in the NYBG library's acquisition activity for this period (though the publication dates presented here must be interpreted carefully in this respect - as they are not acquisition dates).

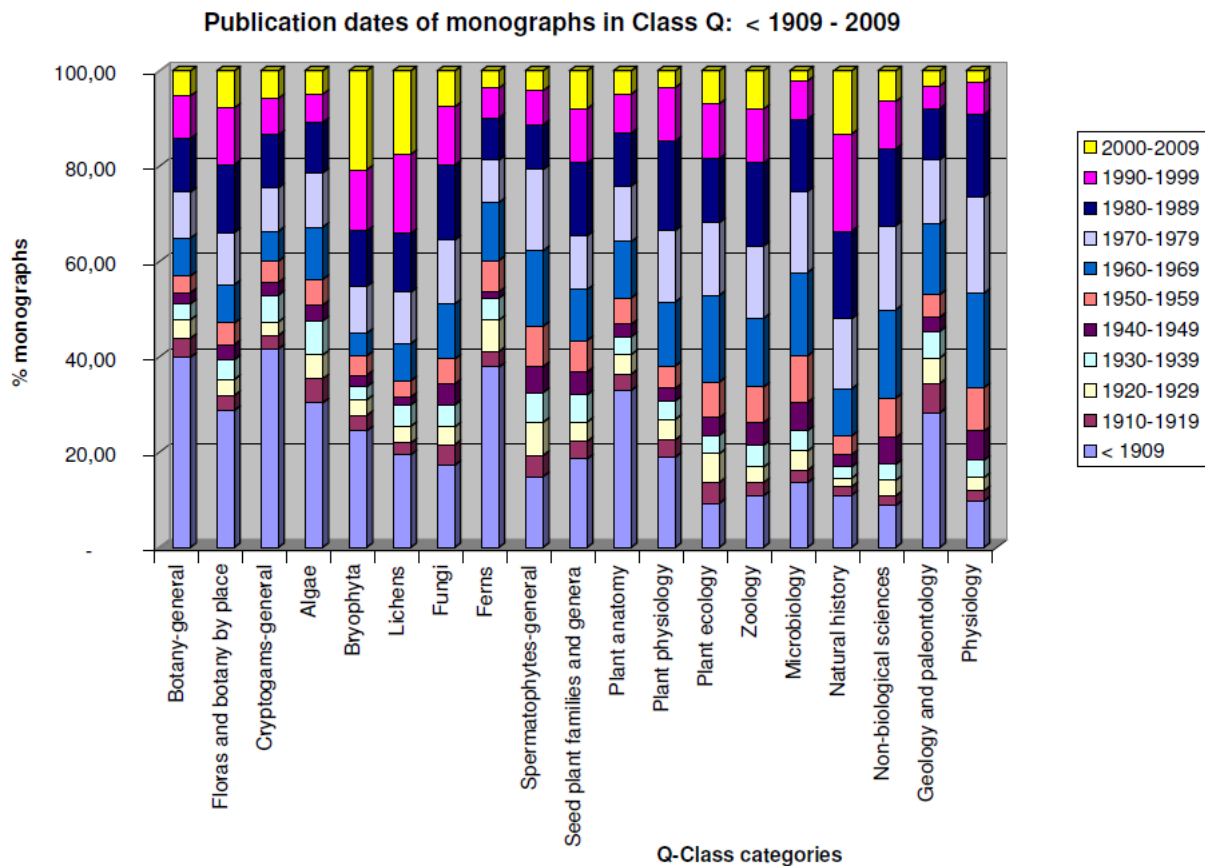


Chart 10.7 : Publication dates of monograph collections in LC-Class Q: < 1909 - 2009

This trend still continues in the 1970s and 1980s according to publication dates represented in most Q-Class categories (chart 10.7). Monographs published in the 1970s make up a proportion of 8,9-20,1% of the total Q-Class collections; monographs of the 1980s a proportion of 8,9-18,8%. Particularly notable is the high percentage of 'Plant Physiology'-related monographs in time period 1980-1989 (chart 10.7). This reflects both the strong influence and expansion of this science discipline in the 1980s and NYBG's stronger focus on laboratory research explained above. Aside from plant physiology, NYBG has also increased

research in plant ecology since the establishment of a new ecology department in this time (the *Institute of Ecosystem Studies*). Furthermore, in 1981 the *Institute of Economic Botany* was created to search for new foods, fuels, fibers, and medicines from the plant world and NYBG's research became more overtly engaged in solving some of society's most pressing problems (BOOM 1996a). This explains the monograph holdings in the S-Class category 'Economic Botany' from the 1980s as well (see chart 10.8).

According to publication dates of the most recent time periods 1990-1999 and 2000-2009 fewer monographs have been added to some Q-Class categories (chart 10.7). Particularly in the categories 'Geology and Paleontology', 'Physiology', 'Microbiology' and 'Ferns' the proportion of monographs dating from the last two decades is low in comparison to the total holdings. However, this does not apply to the categories 'Bryophyta', 'Lichens' and 'Natural History' where monographs published between 1990 and 2009 make up a comparatively high proportion of the total holdings (between 19,8% and 34,1%).

Recent developments in the 1990s led to further changes in science disciplines and research programs at the New York Botanical Garden. A new department was established with the *Lewis B. and Dorothy Cullman Program* for Molecular Systematic Studies, bringing modern tools and techniques of molecular biology to bear on questions of plant diversity and evolution (BOOM 1996a). Strong efforts are made, in collaboration with industrial partners, to discover new foods, fibers, fuels, fragrances, and medicines. Though the Mertz Library intensely collects in such modern disciplines as molecular systematics, they can not be exactly traced in the data presented here. The Library of Congress has not yet assigned particular LC classes to newly developing disciplines such as molecular phylogenetics or even a subject heading. Monographs published in recent time periods associated with the modern disciplines are categorized in such large categories as 'Botany general' (including also systematics, taxonomy and molecular phylogenetics, see table 15.1, appendix) or in the single taxonomic groups.

In chart 10.8 some overall similar trends can be seen in the monograph collections of Class S. This concerns for example the low ratio of monographs published in the years 1910-1959. There are only few exceptions to this. For instance, in the categories 'Flower arrangement' and 'General Plant Culture' the proportion of monographs published in the period 1950-1959 is somewhat larger than in all other S- and Q-Class categories investigated: 17,5% and 13,6% respectively. Considering monographs of the earliest time period before 1909 holdings are overall much lower in Class S in comparison to Class Q. Exceptions to this are S-Class categories 'Economic Botany' and 'Fruit' where monographs from the years before 1909 represent a larger proportion of the total holdings: 29,3% and 26,4% respectively.

As explained above, 'Economic Botany' represents a major research area since the Garden's inception (BOOM 1996a), and therefore holdings in this category have been strong ever since. In general, all science disciplines associated with agriculture were important at this time and intense research was conducted on cultivation methods, nutrient supply for crop plants, or pest and disease control in agriculture and forestry. Some scientific subjects assigned to Class Q, such as plant physiology, plant anatomy or fungi systematics and taxonomy, are originally tightly connected to agriculture (HENDRICKS 1969, BAKER 1969). Thus, also on behalf of agriculture (Class S) these subjects have always been collected at intense levels at the NYBG Library. Likewise, NYBG's focus on horticulture and gardening has been strong since the beginning. Garden founder N.L. BRITTON encouraged field research

- for floristic and taxonomic studies - but also in terms of finding new exotic species suited for garden cultivation as described by SASTRE & SANTIAGO-VALENTIN (1996).

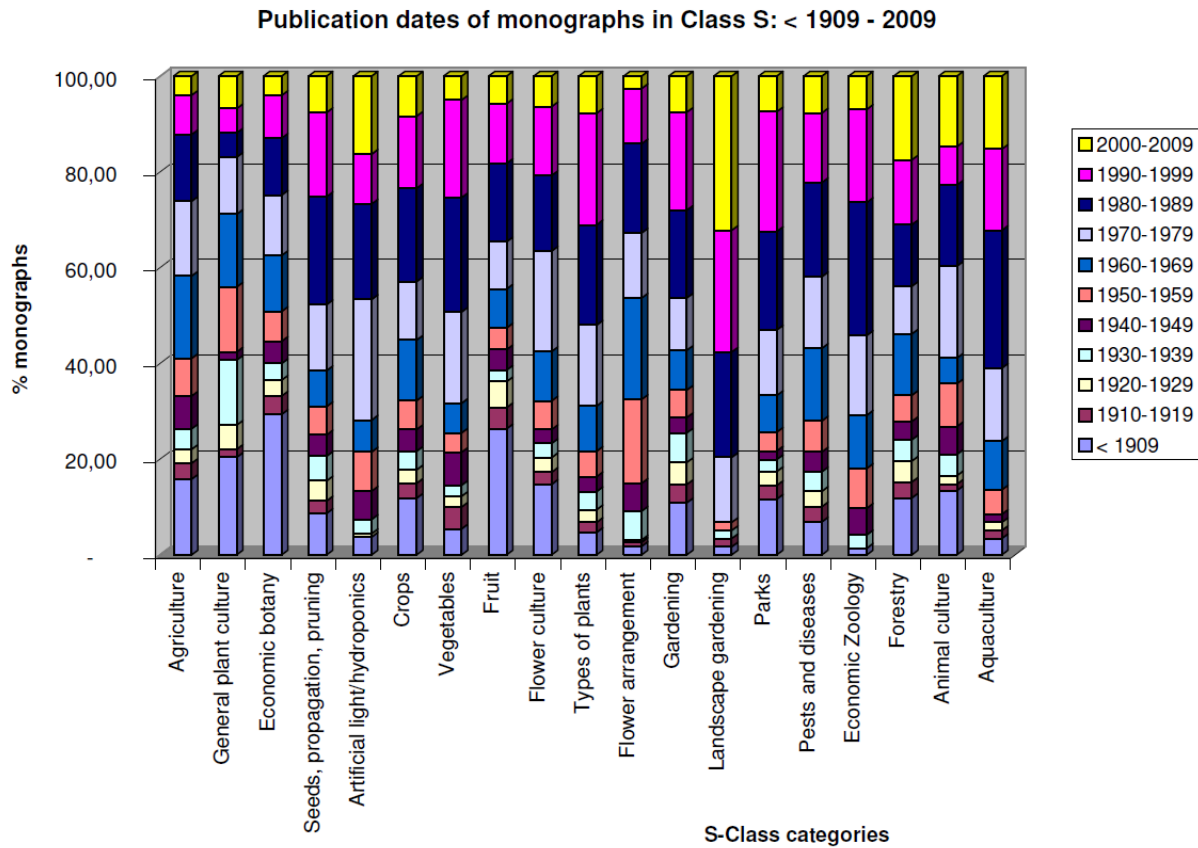


Chart 10.8 : Publication dates of monograph collections in LC-Class S: < 1909 - 2009

The ratio of monographs published in the years 1970-1979 and 1980-1989 is comparatively high in most S-Class categories, even more so than stated for Class Q. For example, in the S-Class categories ‘Artificial Lights/Hydroponics’, ‘Aquaculture’ and ‘Economic Zoology’ monographs published in the period 1970 and 1989 represent more than 44% of the total holdings. This may have to do with the fact that these are rather modern disciplines.

Monographs published in more recent time, in periods 1990-1999 and 2000-2009, add up to a larger proportion of total holdings in Class S more than in Class Q (see charts 10.7 + 10.8). This applies most of all to S-Class category ‘Landscape Gardening’ (in which more than 80% of the total holdings are comprised of monographs published after year 1980), but also to ‘Parks’ and ‘Types of Plants’, ‘Forestry’, ‘Aquaculture’ and ‘Economic Zoology’ where monographs published within the last two decades make up between 26-32% of the total collections.

Within the framework of this master thesis, the organizational structure, the acquisition practice, the collection profile and collection development of the LuEsther T. Mertz Library of the New York Botanical Garden have been analyzed and described. The collection assessment conducted in this survey illustrates the library's up-to-date collection profile (according to data compiled in November 2009) and points out strengths and weaknesses of the collections. According to the 'strength of collection analysis' (chapter 9), 54,4% of the Mertz Library's total monograph holdings are represented by the Library of Congress Class Q (Science) and 15% by the Library of Congress Class S (Agriculture). The remaining 30,6% of the total holdings are shared by the periodicals (20%) and all other LC-Classes (10,6%) represented in the library. Thus, the bulk of the Mertz Library's collections, ~70%, are represented by the 'core collections' (LC-Classes Q + S). In the LC-Class Q (Science), three major categories with strongest monograph holdings can be pointed out, these are 'Floras and Botany by place' (12,9%), 'Botany general' (11,8%) and 'Seed plant families and genera' (10,8%) (the percentages shown are part of the Library's total collection). Further strong holdings were noted for the Cryptogamic groups (Algae, Bryophytes, Lichens, Ferns) and Fungi, adding up to 6,4% of the Mertz Library's total holdings. In LC-Class S (Agriculture), monograph holdings are more evenly distributed across the single disciplines than in LC-Class Q. The strongest categories in LC-Class S (compared to the library's total holdings) are 'Gardening' (2,1%), 'Types of plants' (1,7%) and 'Forestry' (1,7%). The results of this 'strength of collection analysis' are in accordance with the Mertz Library's mission and the study focus of the NYBG departmental programs. They also reflect the collecting goals set in the collection development policy (chapter 7.1) proposing a comprehensive collecting level for all publications specific to plant taxa under study at NYBG, as well as all publications relating to floristics, plant systematics and taxonomy. Further, the collection strength shown for LC-Class S reflects the Mertz Library's collecting activity on a research level for most disciplines assigned to this class.

The collection development analysis (according to data compiled in April 2010, see chapter 10) of the Mertz Library's core collections focuses primarily on the collection growth and expenditures in single disciplines of LC-Classes Q and S over the time period 1995-2009. A comparison of growth rates in the core collections shows that the monograph collections have overall grown continuously in LC-Class Q over the entire period investigated (growth rates between 8,4-9,5% in all five-year-periods) while in LC-Class S growth rates have decreased in each five-year-period (a drop from 19,3% to 8%). Considering item numbers, the ratio of monographs added to Class Q in comparison to Class S was approximately 2 : 1 in period 1995-1999 – and 3,8 : 1 (Q : S) in period 2005-2009. These results show a general decrease in monograph acquisitions for LC-Class S over the period 1995-2009 which is also reflected in the expenditures incurred for single S-Class categories. While the overall expenditures incurred for LC-Class Q have declined to some extent as well, the total number of monographs added has, however, not considerably decreased which may be explained by other ways of acquisitions, gifts and exchanges.

The focus on collection growth in single disciplines of LC-Classes Q and S shows that overall most monograph items have been added to 'Floras and Botany by place', 'Seed plant families and genera' and 'Botany general'. This result reflects the pattern stated for the 'strength of collection analysis' in LC-Class Q. In the category 'Natural History' a comparatively strong growth rate can be noted for the entire time period investigated as well, although this discipline is collected only at a study level. The large category 'Seed plant

families and genera' has been broken out for a more detailed analysis of monograph holdings and growth rates according to single plant taxa. From all 24 fern families and 281 seed plant families analyzed, the largest holdings and the strongest increase in item numbers can be noted for the plant families Poaceae, Orchidaceae and Rosaceae. This correlates with the expenditures for monographs related to these plant families in the period 1995-2009, whereby the largest amount of US Dollars has by far been spent on orchid publications (especially in the recent period 2005-2009). Relatively strong growth rates could also be noted for the Cryptogamic collections in the entire time period investigated, especially for the Bryophytes. In accordance with the results obtained from the 'strength of collection analysis', collection growth in LC-Class S was strongest in the categories 'Gardening', 'Types of Plants' and 'Forestry' whereby the growth rates were largest in the first period 1995-1999, still strong in period 2000-2004 but much smaller in the last period 2005-2009 (except in 'Forestry'). This pattern is well reflected in the development of expenditures for these S-Class categories in the period of time investigated (chapter 10).

The 'age of collection analysis' illustrates the age distribution of the Mertz Library's monograph holdings in the core collections based on publication dates. The data analyzed for LC-Class Q show that a relatively large proportion (~25-40% in 8 disciplines) of monograph holdings were published before 1909. This pattern reflects to some extent the origins and history of some larger collections acquired in the early times of the NYBG library. A further trend to be noted is that monographs published between 1910 and 1959 make up a comparatively small part of the total holdings both in LC-Classes Q and S which may relate to the economically difficult times during World War I and II and the aftermath. Larger amounts of monographs have been acquired again in the 1950s and 1960s according to the proportion of items held in the Mertz Library's collections published in this period. This development correlates with a diversification of NYBG's science programs and reflects the increased research activity in modern science disciplines such as plant physiology, biochemistry and genetics. According to the large proportion of monograph holdings in LC-Classes Q and S dating from the 1970s and 1980s the increase of monograph acquisitions continues during this period. The 1980s in particular brought many changes to the New York Botanical Garden, as e.g. expressed in the foundation of two new departments: the Institute of Economic Botany and the Institute of Ecosystem Studies. New research programs established in the course of this development increased the focus on economic aspects of botany relating to foods, medicines and fibres derived from plants, as well as on ecological subjects - which is also reflected in the proportion of monographs held from these subjects. Monographs published in the most recent periods 1990-1999 and 2000-2009 make up a somewhat smaller proportion of the total LC-Class Q collection than the periods before (except for the Bryophytes and Lichens collections). This is different in LC-Class S where the ratio of monographs published in recent times is overall larger than in LC-Class Q.

As the data shown in this age pattern represents publication dates and not acquisition dates, no interpretations of the library's acquisition activity at certain times can be made on the basis of this (or only to a very limited degree) - because monographs published in early time periods could also be acquired much later. Therefore this age distribution pattern can not be compared to the collection development pattern. However, the age pattern presented here roughly provides information on the development of science disciplines in certain periods of time and when these disciplines were of interest to NYBG scientists and the Mertz Library's constituency.

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- Fig. 1, chapter 2: Library Building at the New York Botanical Garden
(H. Janka, 11/2009)
- Fig. 2, chapter 2.1: Reference Room at the Mertz Library (H. Janka, 11/2009)
- Fig. 3, chapter 2.1: Shelby White and Leon Levy Reading Room at the Mertz Library
(H. Janka, 11/2009)

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List of Web Sites

AGRICOLA: <http://agricola.nal.usda.gov/>

AMERICAN INSTITUTE FOR CONSERVATION: <http://www.conservation-us.org/>

ANGIOSPERM PHYLOGENY GROUP (hosted by Missouri Botanical Garden):
<http://www.mobot.org/MOBOT/research/APweb/>

BALOGH: <http://www.balogh.com/>

BIODIVERSITY HERITAGE LIBRARY (BHL): <http://www.biodiversitylibrary.org/>

BIOONE: <http://www.bioone.org/>

BOTANICAL GARDEN INFORMATION SYSTEM:
http://www.biologie.uni-ulm.de/systax/infgard/index_d.html

COUNCIL ON BOTANICAL AND HORTICULTURAL LIBRARIES (CBHL): <http://www.cbhl.net/>

EBSCO: <http://www.ebsco.com/>

HARASSOWITZ: <http://www.harrassowitz.de/>

INDEX HERBARIORUM: <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>

ISI WEB OF KNOWLEDGE: <http://isiwebofknowledge.com/>

JSTOR BIOLOGICAL SCIENCES COLLECTION: <http://www.jstor.org/>

KOELTZ SCIENTIFIC BOOKS: <http://www.koeltz.com/>

LIBRARY OF CONGRESS CLASSIFICATION OUTLINE – CLASS Q (SCIENCE):
http://www.loc.gov/aba/cataloging/classification/lcco/lcco_q.pdf

LIBRARY OF CONGRESS CLASSIFICATION OUTLINE – CLASS S (AGRICULTURE):
http://www.loc.gov/aba/cataloging/classification/lcco/lcco_s.pdf

LIBRARY OF CONGRESS, DEFINITION OF COLLECTING LEVELS:
<http://www.loc.gov/acq/devpol/cpc.html>

NHBS – ENVIRONMENT BOOKSTORE: <http://www.nhbs.com/>

OCLC (ONLINE COMPUTER LIBRARY CENTER): <http://www.oclc.org/>

OCLC FIRST SEARCH: <http://www.oclc.org/firstsearch/>

PLANT GENOMICS CONSORTIUM: <http://nybg.bio.nyu.edu/>

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SOCIETY OF AMERICAN ARCHIVISTS (SAA): <http://www.archivists.org/>

SPRINGER: <http://www.springer.com/>

THE LUESTER T. MERTZ LIBRARY: <http://library.nybg.org/>

THE NEW YORK BOTANICAL GARDEN: <http://www.nybg.org/>

THE NEW YORK BOTANICAL GARDEN – FOREST MANAGEMENT PLAN:
<http://www.nybg.org/sustainability/horticulture.php>

THE NEW YORK BOTANICAL GARDEN – SCIENCE: <http://www.nybg.org/science/scientists.php>

THE NEW YORK BOTANICAL GARDEN PRESS: <http://www.nybgpress.org/>

Table 15.1 : Collecting Levels (based on definitions of the Library of Congress)

| Library of Congress Classes | Subject | Level of collection activity | Comments |
|---|---|-------------------------------|---|
| QE 001 – QE 999 | Geology and Paleontology | RESEARCH | |
| QH 001 – QH 300* | Natural History | STUDY | |
| QH 301 – QK 105 | Plant systematics and taxonomy, (incl. molecular phylogenetics and evolution), morphology, conservation, botany (general works) | COMPREHENSIVE (all languages) | Particular collection intensity in certain taxonomic groups included in research projects at the Institute of Systematic Botany (ISB) ¹ |
| QK 106 - QK 474.5 | Floristics (world and regional floras), phytogeography and geographical distribution | COMPREHENSIVE (all languages) | Collection of floras worldwide, but with particular strengths in the literature about the Western Hemisphere, the focus of the Garden's research program: North, Central and South America, Caribbean |
| QK 474.8 – QK 504 = Spermatophytes general; (+ QL 18 – QL 999* = single seed plant families) | Spermatophytes, seed plants (Angiosperms and Gymnosperms) | COMPREHENSIVE (all languages) | Special focus on literature on selected seed plant families for monographic research in the Garden ¹ |
| QK 505 – QK 599 + QK 636 – QK 639* = Cryptogams (+ QL 001 – QL 017* = single fern families) | Cryptogams (Bryophytes, Lichens, Ferns) | COMPREHENSIVE (all languages) | Literature on all cryptogamic groups is collected with respect to taxonomy, systematics, ecology, morphology, anatomy and biogeography |
| QK 600 – QK 635 | Fungi | COMPREHENSIVE (all languages) | Literature on all fungi groups is collected with respect to taxonomy, systematics, ecology, morphology, anatomy and biogeography |
| QK 640 – QK 709 | Plant anatomy | RESEARCH | |
| QK 710 – QK 899 | Plant physiology | RESEARCH | |
| QK 900 – QK 999 | Plant ecology | RESEARCH | |
| QM 001 – QM 999 | Zoology | STUDY | |
| QN 001 – QP 999 | Physiology | STUDY | |
| QR 001 – QR 999 | Microbiology | STUDY | |

Table 15.1 (continued) : Collecting Levels

| Library of Congress Classes | Subject | Level of collection activity | Comments |
|-----------------------------|---|--|---|
| S 001 – S 999 | Agriculture | RESEARCH | Literature on agriculture is collected selectively, e.g. on certain plant taxa under study at the Institute of Systematic Botany (ISB) and the Institute of Economic Botany (IEB) |
| SB 001 – S 039 | General plant culture | RESEARCH (primarily English, major works in French, Spanish and German) | Plant breeding (including germ plasm) |
| SB 113 – SB 125 | Seeds, propagation, pruning | RESEARCH (primarily English, major works in French, Spanish and German) | Seed research, seedling establishment |
| SB 126 – SB 129 | Artificial light / Hydroponics | STUDY | |
| SB 130 – SB 319 | Crops | RESEARCH (primarily English, major works in French, Spanish and German) | All tropical and sub-tropical annual and perennial fruit crops are of interest; emphasis on fruit production systems, crop physiology and varietal evaluation |
| SB 320 – SB 353.5 | Vegetables | RESEARCH (primarily English, major works in French, Spanish and German) | All tropical and sub-tropical annual and perennial vegetables are of interest; emphasis on vegetable production systems, crop physiology and varietal evaluation |
| SB 354 – SB 401 | Fruit and fruit culture (pomology) | RESEARCH (primarily English, major works in French, Spanish and German) | All fruit and nut species relevant for horticulture, with special emphasis on fruit crop physiology |
| SB 402 – SB 450.87 | Flowers and flower culture, ornamental plants | RESEARCH (primarily English, major works in French, Spanish and German) | Popular literature is collected very selectively; substantial and technically sound literature, especially encyclopedias and handbooks are purchased comprehensively |

Table 15.1 (continued) : Collecting Levels

| Library of Congress Classes | Subject | Level of collection activity | Comments |
|-----------------------------|--|--|---|
| SB 450.9 – SB 467 | Gardening | RESEARCH (primarily English, major works in French, Spanish and German) | Literature on general horticultural practices, techniques and equipment |
| SB 468 – SB 469 | Landscape gardening (arboriculture, landscape construction, landscape maintenance), Landscape architecture | RESEARCH (primarily English) | Substantial and technically sound literature in English is collected; popular literature only selectively |
| SB 470 – SB 485 | Parks | STUDY (primarily English) | Literature on park management (planning, developing, and managing public and private landscaped areas) |
| SB 486 – SB 989 | Pests and diseases | STUDY | Literature on plant pathology, entomology (pests) |
| SB 990 – SB 999* | Economic Botany (incl. Ethnobotany) | COMPREHENSIVE (all languages) | Literature on useful plants; plants used by different ethnic groups (NYBG field research focuses mainly on tropical regions ²); conservation of biological diversity, natural resource management |
| SD 001- SD 999 | Forestry | RESEARCH | |
| SF 001 – SF 999 | Animal culture | OUT OF SCOPE | Not collected any more |
| SH 001 – SH 999 | Aquaculture | STUDY | |

*Some LC-Classes used at the Mertz Library do not correspond thoroughly to the classes of the Library of Congress Classification Schedule (LCCS). They have partly been changed as the LCC-System is, in some areas of botany, not large or precise enough. The LC-Class QL (Zoology) has been changed completely into a taxonomic botany class which here represents the fern and seed plant families.

¹Taxonomic groups currently under study at NYBG: Fungi, Cryptogams; Gymnosperm family: Cycads; Dicotyledon families: Anacardiaceae, Burseraceae, Caesalpiniaceae, Ericaceae, Fabaceae, Lecythidaceae, Menispermaceae, Mimosaceae, Rubiaceae, Rutaceae, Simaroubaceae, Solanaceae, Scrophulariaceae, Vochysiaceae; Monocotyledon families: Arecaceae, Cyperaceae.

²The projects and field activities of the Institute of Economic Botany (IEB) currently include work in Belize, Bolivia, Brazil, Columbia, Dominican Republic, Ecuador, French Guiana, Guatemala, Guyana, Honduras, Indonesia, Martinique, Panama, Paraguay, Peru, Thailand, the United States, and the Virgin Islands.

Table 15.1 : Definition of the Collecting Levels

The general definitions of the collecting levels used by the Library of Congress, based on the Conspectus of the Research Libraries Group (RLG), are:

1. Out-of-Scope: The Library does not collect in this area.
2. Minimal Level: A subject area in which few selections are made beyond very basic works. For foreign law collections, this includes statutes and codes.
3. Basic Information Level: A collection of up-to-date general materials that serve to introduce and define a subject and to indicate the varieties of information available elsewhere. It may include dictionaries, encyclopedias, selected editions of important works, historical surveys, bibliographies, handbooks, a few major periodicals, in the minimum number that will serve the purpose. A basic information collection is not sufficiently intensive to support any courses of independent study in the subject area involved. For law collections, this includes selected monographs and loose-leaf titles in American law and case reports and digests in foreign law.
4. Instructional Support (Study) Level: A collection that in a university is adequate to support undergraduate and most graduate instruction, or sustained independent study; that is, adequate to maintain knowledge of a subject required for limited or generalized purposes, of less than research intensity. It includes a wide range of basic monographs, complete collections of works of more important writers, selections from the works of secondary writers, a selection of representative journals, and reference tools and fundamental bibliographical apparatus pertaining to the subject. In American law collections, this includes comprehensive trade publications and loose-leaf materials, and for foreign law, periodicals and monographs.
5. Research Level: A collection that includes the major published source materials required for dissertations and independent research, including materials containing research reporting, new findings, scientific experimental results, and other information useful to researchers. It is intended to include all important reference works and a wide selection of specialized monographs, as well as a very extensive collection of journals and major indexing and abstracting services in the field. Older material is retained for historical research. Government documents are included in American and foreign law collections.
6. Comprehensive Level: A collection which, so far as is reasonably possible, includes all significant works of recorded knowledge (publications, manuscripts, and other forms), in all applicable languages, for a necessarily defined and limited field. This level of collecting intensity is one that maintains a 'special collection'. The aim, if not achievement, is exhaustiveness. Older material is retained for historical research. In law collections, this includes manuscripts, dissertations, and material on non-legal aspects.

Table 15.2 : Total Holdings of the LuEsther T. Mertz Library in November 2009

| Main classes of the Library of Congress Classification | LC-Ranges | Description | Number of items | Strength of single areas | collection in main classes |
|--|---------------------|--------------------------------------|-----------------|--------------------------|----------------------------|
| A - General works | A 001 - AZ 999 | General encyclopedias & dictionaries | 772 | 0,35% | 0,35% |
| B - Philosophy, Psychology, Religion | B 001 - BZ 999 | Philosophy and religion | 357 | 0,16% | 0,16% |
| C - Auxiliary Sciences of History | C 001 - CZ 999 | Auxiliary history fields | 326 | 0,15% | 0,15% |
| D - World History | D 001 - DZ 999 | History and description | 1.125 | 0,51% | 0,51% |
| E - History of the Americas | E 001 - EZ 999 | American history | 630 | 0,29% | 0,29% |
| F - History of the Americas | F 001 - F 115.9 | Local history | 2.137 | 0,97% | 1,10% |
| | F 116 - F 130.9 | New York history | 293 | 0,13% | |
| G - Geography, Anthropology | G 001 - GB 999 | Geography and folded maps | 1.116 | 0,51% | 0,96% |
| | GC 001 - GE 999 | Environmental geography | 157 | 0,07% | |
| | GF 001 - GF 999 | Human ecology | 281 | 0,13% | |
| | GG 001 - GM 999 | GG-GM, GO-GZ | 336 | 0,15% | |
| | GN 001 - GN 999 | Anthropology | 230 | 0,10% | |
| H - Social Sciences | HB 001 - HB 999 | Statistics | 60 | 0,03% | 0,82% |
| | HC 001 - HD 999 | Economic history | 1.315 | 0,60% | |
| | HE 001 - HD 999 | Transportation/communication | 35 | 0,02% | |
| | HF 001 - HF 999 | Commerce | 95 | 0,04% | |
| | HG 001 - HJ 999 | Finance | 28 | 0,01% | |
| | HM 001 - HZ 999 | Sociology | 265 | 0,12% | |
| I - * | I 001 - IZ 999 | Miscellaneous | 258 | 0,12% | 0,12% |
| J - Political Science | J 001 - JZ 999 | International relations | 48 | 0,02% | 0,02% |
| K - Law | K 001 - KZ 999 | Law | 207 | 0,09% | 0,09% |
| L - Education | L 001 - LZ 999 | Education | 136 | 0,06% | 0,06% |
| M - Music | M 001 - MZ 999 | Music | 750 | 0,34% | 0,34% |
| N - Fine Arts | N 001 - NZ 999 | Visual arts | 1.386 | 0,63% | 0,63% |
| O - * | O 001 - OZ 999 | Miscellaneous | 16 | 0,01% | 0,01% |
| P - Language and Literature | P 001 - PZ 999 | Language and literature | 1.116 | 0,51% | 0,51% |
| Q - Science | Q 001 - QD 999 | Non-biological sciences | 2.036 | 0,93% | 54,44% |
| | QE 001 - QE 999 | Geology and paleontology | 3.486 | 1,59% | |
| | QH 001 - QH 300.9 | Natural history | 5.919 | 2,69% | |
| | QH 301 - QK 105.9 | Botany-general | 26.077 | 11,86% | |
| | QK 106 - 474.599 | Floras and botany by place | 28.429 | 12,93% | |
| | QK 474.6 - QK 493.9 | Spermatophyta | 1.862 | 0,85% | |
| | QK 494 - QK 494.9 | Gymnospermae | 42 | 0,02% | |
| | QK 495 - QK 504.9 | Angiospermae | 279 | 0,13% | |
| | QK 505 - QK 531.9 | Cryptogams-general | 1.829 | 0,83% | |
| | QK 532 - QK 563.9 | Bryophyta | 3.387 | 1,54% | |
| | QK 564 - QK 580.59 | Algae | 2.720 | 1,24% | |
| | QK 580.6 - QK 599.9 | Lichens | 1.387 | 0,63% | |
| | QK 600 - QK 635.9 | Fungi | 6.244 | 2,84% | |
| | QK 640 - QK 709.9 | Plant anatomy | 1.931 | 0,88% | |
| | QK 710 - QK 899.9 | Plant physiology | 4.133 | 1,88% | |
| | QK 900 - QK 999 | Plant ecology | 2.738 | 1,25% | |
| | QL 001 - QL 17.9 ** | Ferns | 357 | 0,16% | |
| | QL 18 - QL 999 ** | Seed plant families and genera | 23.643 | 10,76% | |
| | QM 001 - QM 999 ** | Zoology | 1.602 | 0,73% | |
| | QN 001 - QP 999 | Physiology | 449 | 0,20% | |
| | QR 001 - QR 999 | Microbiology | 1.122 | 0,51% | |

APPENDICES

Table 15.2 (continued) : Total Holdings of the LuEsther T. Mertz Library in November 2009

| Main classes of the Library of Congress Classification | LC-Ranges | Description | Number of items | Strength of single areas | collection in main classes |
|--|---------------------|------------------------------------|-----------------|--------------------------|----------------------------|
| R - Medicine | R 001 - RA 999 | Public medicine | 407 | 0,19% | 0,89% |
| | RB 001 - RL 999 | Medical specialties | 231 | 0,11% | |
| | RM 001 - RM 999 | Therapeutics, pharm., botanic med. | 611 | 0,28% | |
| | RS 153 - RS 441.9 | Materia medica | 711 | 0,32% | |
| S - Agriculture | S 001 - SA 999 | Agriculture | 3.313 | 1,51% | 14,97% |
| | SB 001 - SB 039.9 | General plant culture | 115 | 0,05% | |
| | SB 040 - SB 112.9 | Economic botany | 2.139 | 0,97% | |
| | SB 113 - SB 125.9 | Seeds, propagation, pruning | 1.293 | 0,59% | |
| | SB 126 - SB 129.9 | Artificial light/hydroponics | 178 | 0,08% | |
| | SB 130 - SB 319.9 | Crops | 1.430 | 0,65% | |
| | SB 320 - SB 353.9 | Vegetables | 1.419 | 0,65% | |
| | SB 354 - SB 401.9 | Fruit | 1.079 | 0,49% | |
| | SB 402 - SB 419.9 | Flower culture | 2.723 | 1,24% | |
| | SB 420 - SB 439.9 | Types of plants | 3.750 | 1,71% | |
| | SB 440 - SB 450.89 | Flower arrangement | 901 | 0,41% | |
| | SB 450.9 - SB 467.9 | Gardening | 4.652 | 2,12% | |
| | SB 468 - SB 469.9 | Landscape gardening | 84 | 0,04% | |
| | SB 470 - 485.9 | Parks | 2.225 | 1,01% | |
| | SB 486 - SB 989.9 | Pests and diseases | 3.437 | 1,56% | |
| | SB 990 - SB 999 | Economic zoology | 78 | 0,04% | |
| | SC 001 - SC 999 | S misc. | 63 | 0,03% | |
| | SD 001 - SD 999 | Forestry | 3.737 | 1,70% | |
| | SE 001 - SF 999 | Animal culture | 237 | 0,11% | |
| | SH 001 - SH 999 | Aquaculture | 63 | 0,03% | |
| T - Technology | T 001 - TA 418.9 | T misc. | 1.445 | 0,66% | 1,23% |
| | TA 419 - TA 424.9 | Wood | 124 | 0,06% | |
| | TD 001 - TD 999 | Environmental technology | 365 | 0,17% | |
| | TK 7885 - TK 7895.9 | Computer technology | 3 | 0,00% | |
| | TP 248 - TP 248.9 | Biotechnology | 83 | 0,04% | |
| | TX 001 - TX 999 | Home economics, cookery | 680 | 0,31% | |
| U - W Miscellaneous * | U 001 - WZ 999 | U-W misc. | 74 | 0,03% | 0,03% |
| X - Periodicals | X 001 - XZ 999 | Periodicals | 44.350 | 20,18% | 20,18% |
| Z - Bibliography, Library Science | Z 001 - ZZ 999 | Library studies and bibliography | 4.623 | 2,10% | 2,10% |
| | | No call numbers | 53 | 0,02% | 0,02% |
| Totals | | | 219.823 | 100,00% | 100,00% |

*Areas established by the Mertz Library **LC-Subclasses appropriated for other subjects

Table 15.3 : Collection development in LC-Classes Q (Science) and S (Agriculture) in the period 1995 - 2009

| Collection Development 1995-2009 | | | | | | | | | | | | | | |
|----------------------------------|-------------------------|--------------------|-----------------------|-------------------------------|-------------------------|--------------------|-----------------------|-------------------------------|-------------------------|--------------------|-----------------------|-------------------------------|-------------------------|-----------------------|
| Class Q | Size of collection 2009 | 2005-2009 % growth | 2005-2009 Items added | 2005-2009 \$ Amount of orders | Size of collection 2005 | 2000-2004 % growth | 2000-2004 Items added | 2000-2004 \$ Amount of orders | Size of collection 2000 | 1995-1999 % growth | 1995-1999 Items added | 1995-1999 \$ Amount of orders | Size of collection 1995 | Total amount \$ spent |
| Non-biological sciences | 2048 | 7,39 | 141 | \$3.271,91 | 1907 | 7,13 | 127 | \$2.311,71 | 1780 | 8,01 | 132 | \$4.941,58 | 1648 | \$10.525,20 |
| Geology and paleontology | 3499 | 8,29 | 268 | \$1.143,17 | 3231 | 4,60 | 142 | \$1.138,79 | 3089 | 4,25 | 126 | \$1.664,17 | 2963 | \$3.946,13 |
| Natural history | 5990 | 13,43 | 709 | \$10.028,14 | 5281 | 11,93 | 563 | \$7.533,16 | 4718 | 16,72 | 676 | \$12.056,88 | 4042 | \$29.618,18 |
| Botany-general | 26235 | 6,48 | 1597 | \$27.536,60 | 24638 | 8,28 | 1883 | \$28.457,73 | 22755 | 9,47 | 1968 | \$38.193,84 | 20787 | \$94.188,17 |
| Floras and botany by place | 28692 | 9,97 | 2602 | \$50.862,53 | 26090 | 11,40 | 2670 | \$45.474,10 | 23420 | 10,87 | 2297 | \$48.565,00 | 21123 | \$144.901,63 |
| Spermatophytes-general | 2191 | 6,77 | 139 | \$989,19 | 2052 | 5,18 | 101 | 1.535,64 | 1951 | 6,90 | 126 | \$2.463,61 | 1825 | \$4.988,44 |
| Cryptogams-general | 1833 | 8,78 | 148 | \$1.601,85 | 1685 | 8,01 | 125 | \$1.357,20 | 1560 | 7,88 | 114 | \$1.587,57 | 1446 | \$4.546,62 |
| Bryophyta | 3464 | 19,41 | 563 | \$5.992,58 | 2901 | 31,33 | 692 | \$2.725,37 | 2209 | 9,03 | 183 | \$2.151,32 | 2026 | \$10.869,27 |
| Algae | 2727 | 3,89 | 102 | \$2.799,92 | 2625 | 4,50 | 113 | \$2.681,80 | 2512 | 3,33 | 81 | \$3.140,64 | 2431 | \$8.622,36 |
| Lichens | 1405 | 16,31 | 197 | \$1.199,45 | 1208 | 19,60 | 198 | \$1.950,08 | 1010 | 13,10 | 117 | \$2.488,30 | 893 | \$5.637,83 |
| Fungi | 6327 | 7,57 | 445 | \$12.108,77 | 5882 | 8,68 | 470 | \$8.311,55 | 5412 | 7,66 | 385 | \$13.008,41 | 5027 | \$33.428,73 |
| Plant anatomy | 1940 | 5,55 | 102 | \$2.550,16 | 1838 | 5,88 | 102 | \$3.668,93 | 1736 | 5,47 | 90 | \$4.416,83 | 1646 | \$10.635,92 |
| Plant physiology | 4147 | 3,01 | 121 | \$3.572,13 | 4026 | 3,58 | 139 | \$8.065,86 | 3887 | 4,74 | 176 | \$12.120,49 | 3711 | \$23.758,48 |
| Plant ecology | 2757 | 7,03 | 181 | \$4.979,22 | 2576 | 6,14 | 149 | \$4.075,21 | 2427 | 6,12 | 140 | \$4.419,65 | 2287 | \$13.474,08 |
| Ferns | 359 | 7,49 | 25 | \$0,00 | 334 | 4,70 | 15 | \$42,99 | 319 | 5,63 | 17 | \$79,35 | 302 | \$122,34 |
| Seed plant families and genera | 23646 | 8,18 | 1788 | \$31.615,73 | 21858 | 10,11 | 2007 | \$36.088,04 | 19851 | 10,76 | 1928 | \$33.598,49 | 17923 | \$101.302,26 |
| Zoology | 1615 | 9,64 | 142 | \$552,86 | 1473 | 10,42 | 139 | \$892,90 | 1334 | 11,35 | 136 | \$1.266,93 | 1198 | \$2.712,69 |
| Physiology | 449 | 2,51 | 11 | \$263,51 | 438 | 2,58 | 11 | \$278,55 | 427 | 4,91 | 20 | \$546,58 | 407 | \$1.088,64 |
| Microbiology | 1125 | 1,99 | 22 | \$1.357,76 | 1103 | 3,18 | 34 | \$1.221,33 | 1069 | 5,63 | 57 | \$2.482,31 | 1012 | \$5.061,40 |
| Total | 120.449 | 8,37% | 9303 | \$162.425,48 | 111.146 | 9,5% | 9680 | \$157.810,94 | 101.466 | 9,5% | 8769 | \$189.191,95 | 92.697 | \$509.428,37 |

Table 15.3 (continued) : Collection development in LC-Classes Q (Science) and S (Agriculture) in the period 1995 - 2009

| Collection Development 1995-2009 | | | | | | | | | | | | | | |
|----------------------------------|-------------------------|--------------------|-----------------------|-------------------------------|-------------------------|--------------------|-----------------------|-------------------------------|-------------------------|--------------------|-----------------------|-------------------------------|-------------------------|-----------------------|
| Class S | Size of collection 2009 | 2005-2009 % growth | 2005-2009 Items added | 2005-2009 \$ Amount of orders | Size of collection 2005 | 2000-2004 % growth | 2000-2004 Items added | 2000-2004 \$ Amount of orders | Size of collection 2000 | 1995-1999 % growth | 1995-1999 Items added | 1995-1999 \$ Amount of orders | Size of collection 1995 | Total amount \$ spent |
| Agriculture | 3330 | 4,13 | 132 | \$936,15 | 3198 | 5,93 | 179 | \$1.486,85 | 3019 | 6,83 | 193 | \$4.596,66 | 2826 | \$7.019,66 |
| General plant culture | 116 | 16,00 | 16 | \$141,41 | 100 | 2,04 | 2 | \$15,06 | 98 | 6,52 | 6 | \$218,48 | 92 | \$374,95 |
| Economic botany | 2146 | 4,23 | 87 | \$1.471,86 | 2059 | 6,41 | 124 | \$3.878,05 | 1935 | 6,32 | 115 | \$3.887,38 | 1820 | \$9.237,29 |
| Seeds, propagation, pruning | 1299 | 6,65 | 81 | \$7.444,01 | 1218 | 9,53 | 106 | \$3.570,86 | 1112 | 19,57 | 182 | \$3.755,64 | 930 | \$14.770,51 |
| Artificial light/hydroponics | 181 | 13,84 | 22 | \$0,00 | 159 | 8,90 | 13 | \$0,00 | 146 | 35,19 | 38 | \$49,27 | 108 | \$49,27 |
| Crops | 1440 | 6,43 | 87 | \$894,08 | 1353 | 8,33 | 104 | \$1.732,03 | 1249 | 16,08 | 173 | \$4.064,31 | 1076 | \$6.690,42 |
| Vegetables | 1426 | 4,24 | 58 | \$550,94 | 1368 | 9,44 | 118 | \$944,73 | 1250 | 34,12 | 318 | \$2.114,11 | 932 | \$3.609,78 |
| Fruit | 1088 | 4,21 | 44 | \$649,49 | 1044 | 8,07 | 78 | \$461,43 | 966 | 17,09 | 141 | \$1.312,48 | 825 | \$2.423,40 |
| Flower culture | 2744 | 7,10 | 182 | \$2.261,36 | 2562 | 11,25 | 259 | \$10.548,86 | 2303 | 28,95 | 517 | \$4.305,85 | 1786 | \$17.116,07 |
| Types of plants | 3799 | 10,12 | 349 | \$4.394,08 | 3450 | 16,99 | 501 | \$4.339,05 | 2949 | 33,02 | 732 | \$5.937,39 | 2217 | \$14.670,52 |
| Flower arrangement | 947 | 8,60 | 75 | \$119,13 | 872 | 9,00 | 72 | \$446,62 | 800 | 30,08 | 185 | \$573,07 | 615 | \$1.138,82 |
| Gardening | 4696 | 8,50 | 368 | \$7.128,53 | 4328 | 15,26 | 573 | \$14.962,03 | 3755 | 28,42 | 831 | \$18.076,08 | 2924 | \$40.166,64 |
| Landscape gardening | 87 | 61,11 | 33 | \$380,70 | 54 | 25,58 | 11 | \$121,37 | 43 | 43,33 | 13 | \$253,75 | 30 | \$755,82 |
| Parks | 2272 | 8,29 | 174 | \$2.141,80 | 2098 | 16,23 | 293 | \$4.980,32 | 1805 | 28,47 | 400 | \$8.289,74 | 1405 | \$15.411,86 |
| Pests and diseases | 3461 | 5,65 | 185 | \$3.755,71 | 3276 | 9,13 | 274 | \$7.054,62 | 3002 | 13,97 | 368 | \$9.833,01 | 2634 | \$20.643,34 |
| Economic zoology | 79 | 2,60 | 2 | \$0,00 | 77 | 11,59 | 8 | \$322,51 | 69 | 21,05 | 12 | \$264,62 | 57 | \$587,13 |
| S misc. | 63 | 1,61 | 1 | \$0,00 | 62 | - | 0 | \$0,00 | 62 | 3,33 | 2 | \$0,00 | 60 | \$0,00 |
| Forestry | 3783 | 16,22 | 528 | \$2.802,92 | 3255 | 13,49 | 387 | \$5.200,37 | 2868 | 8,51 | 225 | \$4.031,79 | 2643 | \$12.035,08 |
| Animal culture | 240 | 14,29 | 30 | \$147,75 | 210 | 11,70 | 22 | \$340,73 | 188 | 8,67 | 15 | \$193,12 | 173 | \$681,60 |
| Aquaculture | 63 | 12,50 | 7 | \$380,05 | 56 | 16,67 | 8 | \$329,23 | 48 | 9,09 | 4 | \$509,12 | 44 | \$1.218,40 |
| Total | 33.260 | 8% | 2.461 | \$35.599,97 | 30.799 | 11,3% | 3132 | \$60.734,72 | 27.667 | 19,3% | 4470 | \$72.265,87 | 23.197 | \$168.600,56 |

Table 15.4 : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single fern families 1995 - 2009 | | | | | | | | | | | | | | | | |
|---|------|------------------|------------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|
| Pteridophyta | Cat. | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Ferns | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| LC ranges | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| QL 1 - QL 1.999 | 86 | Hymenophyllaceae | 19 | - | 0 | 19 | \$0,00 | - | 0 | 19 | \$0,00 | 5,61 | 1 | 18 | \$0,00 | \$0,00 |
| QL 2 - QL 2.999 | 87 | Cyatheaceae | 6 | - | 0 | 6 | \$0,00 | 20,00 | 1 | 5 | \$0,00 | 25,25 | 1 | 4 | \$0,00 | \$0,00 |
| QL 3 - QL 3.129 | 88 | Polypodiaceae | 46 | 4,55 | 2 | 44 | \$0,00 | 2,33 | 1 | 43 | \$34,24 | 2,33 | 0 | 43 | \$0,00 | \$34,24 |
| QL 3.13 - QL 3.149 | 89 | Pteridaceae | 28 | 12,00 | 3 | 25 | \$0,00 | - | 0 | 25 | \$0,00 | 4,43 | 2 | 23 | \$0,00 | \$0,00 |
| QL 3.15 - QL 3.199 | 90 | Aspleniaceae | 51 | 30,77 | 12 | 39 | \$0,00 | 5,41 | 2 | 37 | \$8,75 | 3,28 | 5 | 32 | \$0,00 | \$8,75 |
| QL 3.2 - QL 3.399 | 91 | Blechnaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | 100,00 | 0 | 1 | \$0,00 | \$0,00 |
| QL 3.4 - QL 3.449 | 92 | Nephrolepidaceae | 4 | - | 0 | 4 | \$0,00 | 300,00 | 3 | 1 | \$0,00 | 100,00 | 0 | 1 | \$0,00 | \$0,00 |
| QL 3.45 - QL 3.499 | 93 | Dennstaedtiaceae | 7 | - | 0 | 7 | \$0,00 | 16,67 | 1 | 6 | \$0,00 | 16,67 | 0 | 6 | \$0,00 | \$0,00 |
| QL 3.5 - QL 3.799 | 94 | Grammitidaceae | 13 | 8,33 | 1 | 12 | \$0,00 | - | 0 | 12 | \$0,00 | 9,18 | 1 | 11 | \$65,38 | \$65,38 |
| QL 3.8 - QL 5.999 | 95 | Thelypteridaceae | 10 | 42,86 | 3 | 7 | \$0,00 | 16,67 | 1 | 6 | \$0,00 | 16,67 | 0 | 6 | \$0,00 | \$0,00 |
| QL 6 - QL 6.999 | 96 | Schizaeaceae | 7 | 16,67 | 1 | 6 | \$0,00 | 50,00 | 2 | 4 | \$0,00 | 25,00 | 0 | 4 | \$0,00 | \$0,00 |
| QL 7 - QL 7.999 | 97 | Matoniaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | 101,00 | 1 | 1 | \$0,00 | \$0,00 |
| QL 8 - QL 8.999 | 98 | Osmundaceae | 8 | - | 0 | 8 | \$0,00 | 14,29 | 1 | 7 | \$0,00 | 14,29 | 0 | 7 | \$0,00 | \$0,00 |
| QL 9 - QL 9.499 | 99 | Azollaceae | 8 | - | 0 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | 12,50 | 0 | 8 | \$0,00 | \$0,00 |
| QL 9.5 - QL 9.999 | 100 | Salviniaceae | 7 | - | 0 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | 14,29 | 0 | 7 | \$0,00 | \$0,00 |
| QL 10 - QL 10.999 | 101 | Marsileaceae | 16 | - | 0 | 16 | \$0,00 | - | 0 | 16 | \$0,00 | 6,25 | 0 | 16 | \$0,00 | \$0,00 |
| QL 11 - QL 11.999 | 102 | Marattiaceae | 5 | 25,00 | 1 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | 25,00 | 0 | 4 | \$0,00 | \$0,00 |
| QL 12 - QL 12.999 | 103 | Ophioglossaceae | 20 | - | 0 | 20 | \$0,00 | 11,11 | 2 | 18 | \$0,00 | 6,87 | 3 | 15 | \$0,00 | \$0,00 |
| QL 13 - QL 13.999 | 104 | Equisetaceae | 29 | - | 0 | 29 | \$0,00 | - | 0 | 29 | \$0,00 | 3,45 | 0 | 29 | \$0,00 | \$0,00 |
| QL 14 - QL 14.099 | 105 | Lycopodiaceae | 21 | - | 0 | 21 | \$0,00 | - | 0 | 21 | \$0,00 | 5,05 | 1 | 20 | \$0,00 | \$0,00 |
| QL 15 - QL 15.999 | 106 | Huperziaceae | 1 | - | 0 | 1 | \$0,00 | 100,00 | 1 | 0 | \$0,00 | 100,00 | 0 | 0 | \$0,00 | \$0,00 |
| QL 16 - QL 16.999 | 107 | Psilotaceae | 9 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | 11,11 | 0 | 9 | \$0,00 | \$0,00 |
| QL 17 - QL 17.999 | 108 | Selaginellaceae | 13 | 18,18 | 2 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | 11,33 | 2 | 9 | \$13,97 | \$13,97 |
| QL 18 - QL 18.899 | 109 | Isoetaceae | 28 | - | 0 | 28 | \$0,00 | - | 0 | 28 | \$0,00 | 3,57 | 0 | 28 | \$0,00 | \$0,00 |
| Total Ferns | | | 359 | 7,49% | 25 | 334 | \$0,00 | 4,69% | 15 | 319 | \$42,99 | 5,61% | 17 | 302 | \$79,35 | \$122,34 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|------|---------------|------------|-----------|-----------|------------|-----------|-----------|-----------|------------|------------|-----------|-----------|------------|------------|------------|
| Spermatophyta | Cat. | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Gymnosperms | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| LC ranges | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Cycadophyta | | | | | | | | | | | | | | | | |
| QL 18.9 - QL 18.899 | 110 | Cycadaceae | 63 | 26,00 | 13 | 50 | \$337,73 | 19,05 | 8 | 42 | \$0,00 | 35,48 | 11 | 31 | \$297,61 | \$635,34 |
| QL 18.9 - QL 18.999 | 111 | Zamiaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| Ginkgophyta | | | | | | | | | | | | | | | | |
| QL 19 - QL 19.999 | 112 | Ginkgo biloba | 18 | - | 0 | 18 | \$0,00 | 20,00 | 3 | 15 | \$0,00 | 36,36 | 4 | 11 | \$112,12 | \$112,12 |
| Pinophyta | | | | | | | | | | | | | | | | |
| QL 20 - QL 20.999 | 113 | Pinopsida | 377 | 11,87 | 40 | 337 | \$139,82 | 8,01 | 25 | 312 | \$443,48 | 10,64 | 30 | 282 | \$331,50 | \$914,80 |
| QL 21 - QL 21.099 | 114 | Pinaceae | 844 | 12,38 | 93 | 751 | \$73,54 | 16,07 | 104 | 647 | \$527,44 | 9,29 | 55 | 592 | \$556,62 | \$1.157,60 |
| QL 21.1 - QL 21.199 | 115 | Taxodiaceae | 124 | 8,77 | 10 | 114 | \$33,17 | 7,55 | 8 | 106 | \$55,77 | 10,42 | 10 | 96 | \$283,01 | \$371,95 |
| QL 21.2 - QL 21.499 | 116 | Cupressaceae | 83 | 16,90 | 12 | 71 | \$313,37 | 20,34 | 12 | 59 | \$0,00 | 1,72 | 1 | 58 | \$0,00 | \$313,37 |
| QL 21.5 - QL 21.999 | 117 | Araucariaceae | 17 | 13,33 | 2 | 15 | \$0,00 | 7,14 | 1 | 14 | \$0,00 | 7,69 | 1 | 13 | \$70,00 | \$70,00 |
| Gnetophyta | | | | | | | | | | | | | | | | |
| QL 22 - QL 22.999 | 118 | Gnetaceae | 23 | 4,55 | 1 | 22 | \$0,00 | - | 0 | 22 | \$0,00 | 15,79 | 3 | 19 | \$0,00 | \$0,00 |
| Total Gymnosperms | | | 1.551 | 12,4% | 171 | 1.380 | \$897,63 | 13,2% | 161 | 1.219 | \$1.026,69 | 10,42% | 115 | 1.104 | \$1.650,86 | \$3.575,18 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|--|------------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|
| Spermatophyta | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Angiosperms (1) | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| Monocotyledons (1) | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Alismatales | | | | | | | | | | | | | | | | |
| QL 30 - QL 31.999 | 128 | Alismataceae | 19 | 5,56 | 1 | 18 | \$0,00 | 5,88 | 1 | 17 | \$0,00 | - | 0 | 17 | \$0,00 | \$0,00 |
| QL 28 - QL 28.999 | 126 | Aponogetonaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 38 - QL 38.999 | 134 | Araceae | 97 | 4,30 | 4 | 93 | \$130,50 | 22,37 | 17 | 76 | \$415,48 | 15,15 | 10 | 66 | \$204,87 | \$750,85 |
| QL 39 - QL 40.999 | 135 | Lemnaceae | 13 | 8,33 | 1 | 12 | \$0,00 | 9,09 | 1 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | \$0,00 |
| | | (incl. in Araceae) | | | | | | | | | | | | | | |
| QL 26.4 - QL 26.999 | 124 | Cymodoceaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 32 - QL 33.999 | 129 | Hydrocharitaceae | 9 | 12,50 | 1 | 8 | \$0,00 | 14,29 | 1 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | \$0,00 |
| QL 27 - QL 27.999 | 125 | Najadaceae (incl.in Hydrocharitaceae) | 5 | - | 0 | 5 | \$0,00 | - | 0 | 5 | \$0,00 | - | 0 | 5 | \$0,00 | \$0,00 |
| QL 29 - QL 29.999 | 127 | Juncaginaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 26 - QL 26.099 | 121 | Potamogetonaceae | 27 | 17,39 | 4 | 23 | \$0,00 | 9,52 | 2 | 21 | \$0,00 | 16,67 | 3 | 18 | \$46,00 | \$46,00 |
| QL 26.3 - QL 26.399 | 123 | Zosteraceae* | | | | | | | | | | | | | | |
| Dioscoreales | | | | | | | | | | | | | | | | |
| QL 57 - QL 57.999 | 157 | Taccaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 58 - QL 58.999 | 158 | Dioscoreaceae | 36 | 16,13 | 5 | 31 | \$76,38 | 6,90 | 2 | 29 | \$0,00 | 7,41 | 2 | 27 | \$23,74 | \$100,12 |
| QL 64 - QL 65.999 | 166 | Burmanniaceae | 8 | - | 0 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | \$0,00 |
| Pandanales | | | | | | | | | | | | | | | | |
| QL 24 - QL 25.999 | 120 | Pandanaceae | 35 | 2,94 | 1 | 34 | \$0,00 | 3,03 | 1 | 33 | \$0,00 | - | 0 | 33 | \$0,00 | \$0,00 |
| QL 37 - QL 37.999 | 133 | Cyclanthaceae | 6 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | \$0,00 |
| QL 52 - QL 52.999 | 146 | Stemonaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 56 - QL 56.999 | 156 | Velloziaceae | 5 | - | 0 | 5 | \$0,00 | 66,67 | 2 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |

* recently established systematic category

APPENDICES

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|--|------------|-----------|-----------|------------|-------------|-----------|-----------|------------|------------|-----------|-----------|------------|------------|-------------|
| Spermatophyta | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Angiosperms (2) | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| Monocotyledons (2) | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Liliales | | | | | | | | | | | | | | | | |
| QL 53 - QL 53.249 | 147 | Liliaceae | 627 | 6,09 | 36 | 591 | \$328,49 | 10,47 | 56 | 535 | \$1.150,73 | 16,56 | 76 | 459 | \$1.222,39 | \$2.701,61 |
| QL 53.38 - QL 53.499 | 151 | Colchicaceae | 3 | 50,00 | 1 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 53.5 - QL 53.999 | 152 | Smilacaceae | 8 | - | 0 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | \$0,00 |
| Asparagales | | | | | | | | | | | | | | | | |
| QL 53.25 - QL 53.299 | 148 | Alliaceae (incl. in Amaryllidaceae) | 1 | | 1 | 0 | \$85,50 | | 0 | 0 | \$0,00 | | 0 | 0 | \$0,00 | \$85,50 |
| QL 55.3 - QL 55.499 | 155 | Asparagaceae* | | | | 0 | | | | 0 | | | | 0 | | \$0,00 |
| QL 53.3 - QL 53.309 | 149 | Agavaceae (incl. in Asparagaceae) | 7 | - | 0 | 7 | \$0,00 | 40,00 | 2 | 5 | \$64,34 | - | 0 | 5 | \$0,00 | \$64,34 |
| QL 55.5 - QL 55.999 | 155 | Agave | 53 | 12,77 | 6 | 47 | \$282,78 | 11,90 | 5 | 42 | \$132,50 | 16,67 | 6 | 36 | \$173,26 | \$588,54 |
| QL 53.31 - QL 53.379 | 150 | Asphodelaceae | 4 | - | 0 | 4 | \$0,00 | 33,33 | 1 | 3 | \$28,41 | 50,00 | 1 | 2 | \$0,00 | \$28,41 |
| QL 55 - QL 55.299 | 154 | Amaryllidaceae | 157 | 10,56 | 15 | 142 | \$74,68 | 11,81 | 15 | 127 | \$85,68 | 11,40 | 13 | 114 | \$125,22 | \$285,58 |
| QL 59 - QL 59.999 | 159 | Iridaceae | 260 | 7,88 | 19 | 241 | \$268,81 | 4,78 | 11 | 230 | \$117,38 | 14,43 | 29 | 201 | \$702,60 | \$1.088,79 |
| QL 66 - QL 66.999 | 167 | Orchidaceae | 1946 | 15,56 | 262 | 1684 | \$11.730,55 | 13,71 | 203 | 1481 | \$6.815,11 | 16,98 | 215 | 1266 | \$6.627,86 | \$25.173,52 |
| Arecales | | | | | | | | | | | | | | | | |
| QL 36 - QL 36.999 | 132 | Palmae (Arecaceae) | 516 | 11,93 | 55 | 461 | \$1.060,93 | 12,71 | 52 | 409 | \$821,94 | 13,93 | 50 | 359 | \$902,92 | \$2.785,79 |
| Commelinales | | | | | | | | | | | | | | | | |
| QL 48 - QL 48.999 | 142 | Commelinaceae | 20 | - | 0 | 20 | \$0,00 | 5,26 | 1 | 19 | \$0,00 | 5,56 | 1 | 18 | \$0,00 | \$0,00 |
| QL 50 - QL 50.999 | 144 | Philydraceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 54 - QL 54.999 | 153 | Haemodoraceae | 6 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | 20,00 | 1 | 5 | \$24,54 | \$24,54 |
| QL 49 - QL 49.999 | 143 | Pontederiaceae | 11 | - | 0 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | \$0,00 |

* recently established systematic category

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 – 2009 | | | | | | | | | | | | | | | | |
|--|-----|----------------|------------|-----------|-----------|------------|-------------|-----------|-----------|------------|-------------|-----------|-----------|------------|-------------|-------------|
| Spermatophyta | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Angiosperms (3) | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| Monocotyledons (3) | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Poales | | | | | | | | | | | | | | | | |
| QL 23 - QL 23.999 | 119 | Typhaceae | 9 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | \$0,00 |
| QL 34 - QL 34.999 | 130 | Poaceae | 2366 | 4,55 | 103 | 2263 | \$2.345,98 | 5,65 | 121 | 2142 | \$1.285,99 | 6,99 | 140 | 2002 | \$2.944,94 | \$6.576,91 |
| QL 35 - QL 35.999 | 131 | Cyperaceae | 356 | 10,90 | 35 | 321 | \$466,48 | 9,93 | 29 | 292 | \$41,54 | 2,82 | 8 | 284 | \$195,11 | \$703,13 |
| QL 41 - QL 42.999 | 136 | Restionaceae | 8 | - | 0 | 8 | \$0,00 | 33,33 | 2 | 6 | \$68,46 | 20,00 | 1 | 5 | \$20,27 | \$88,73 |
| QL 43 - QL 43.999 | 137 | Mayacaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 44 - QL 44.999 | 138 | Xyridaceae | 23 | 4,55 | 1 | 22 | \$0,00 | 10,00 | 2 | 20 | \$0,00 | 11,11 | 2 | 18 | \$0,00 | \$0,00 |
| QL 45 - QL 45.999 | 139 | Eriocaulaceae | 19 | 11,76 | 2 | 17 | \$66,00 | 13,33 | 2 | 15 | \$0,00 | 15,38 | 2 | 13 | \$53,10 | \$119,10 |
| QL 46 - QL 46.999 | 140 | Rapateaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 47 - QL 47.999 | 141 | Bromeliaceae | 192 | 9,09 | 16 | 176 | \$558,89 | 20,55 | 30 | 146 | \$990,66 | 21,67 | 26 | 120 | \$501,25 | \$2.050,80 |
| QL 51 - QL 51.999 | 145 | Juncaceae | 36 | 16,13 | 5 | 31 | \$0,00 | 3,33 | 1 | 30 | \$0,00 | 15,38 | 4 | 26 | \$0,00 | \$0,00 |
| Zingiberales | | | | | | | | | | | | | | | | |
| QL 60 - QL 60.099 | 160 | Zingiberales | 89 | 2,30 | 2 | 87 | \$0,00 | 4,82 | 4 | 83 | \$12,71 | 10,67 | 8 | 75 | \$369,89 | \$382,60 |
| QL 60.1 - QL 60.299 | 161 | Strelitziaceae | 3 | 50,00 | 1 | 2 | \$20,35 | 100,00 | 1 | 1 | \$10,62 | - | 0 | 1 | \$0,00 | \$30,97 |
| QL 60.3 - QL 60.999 | 162 | Heliconiaceae | 7 | 40,00 | 2 | 5 | \$0,00 | 66,67 | 2 | 3 | \$0,00 | 50,00 | 1 | 2 | \$0,00 | \$0,00 |
| QL 61 - QL 61.999 | 163 | Zingiberaceae | 37 | 27,59 | 8 | 29 | \$304,95 | 31,82 | 7 | 22 | \$0,00 | 15,79 | 3 | 19 | \$70,38 | \$375,33 |
| QL 62 - QL 62.999 | 164 | Cannaceae | 4 | - | 0 | 4 | \$0,00 | 33,33 | 1 | 3 | \$28,58 | - | 0 | 3 | \$0,00 | \$28,58 |
| QL 63 - QL 63.999 | 165 | Marantaceae | 10 | - | 0 | 10 | \$0,00 | 11,11 | 1 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | \$0,00 |
| Total Monocots | | | 7.053 | 9,08% | 587 | 6.466 | \$17.801,27 | 9,78% | 576 | 5.890 | \$12.070,13 | 11,38% | 602 | 5.288 | \$14.208,34 | \$44.079,74 |

APPENDICES

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|-------------------|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (4) Dicotyledons (1): Basal orders | | | 2009 | | added | 2005 | | | added | 2000 | | | added | 1995 | | |
| Nymphaeales | | | | | | | | | | | | | | | | |
| QL 106 – QL 106.999 | 205 | Nymphaeaceae | 54 | 14,89 | 7 | 47 | \$26,21 | 2,17 | 1 | 46 | \$0,00 | 6,98 | 3 | 43 | \$0,00 | \$26,21 |
| Austrobaileyales | | | | | | | | | | | | | | | | |
| QL 113.7 – QL 113.799 | 215 | Illicium anisatum | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 113.8 – QL 113.999 | 216 | Schisandraceae | 2 | - | 0 | 2 | \$0,00 | 100,00 | 1 | 1 | \$0,00 | | 1 | 0 | \$0,00 | \$0,00 |
| Magnoliales | | | | | | | | | | | | | | | | |
| QL 113 – QL 113.199 | 212 | Magnoliaceae | 35 | 20,69 | 6 | 29 | \$13,90 | 31,82 | 7 | 22 | \$254,09 | 15,79 | 3 | 19 | \$96,16 | \$364,15 |
| QL 116 – QL 116.999 | 219 | Annonaceae | 36 | 12,50 | 4 | 32 | \$0,00 | 33,33 | 8 | 24 | \$0,00 | 14,29 | 3 | 21 | \$122,98 | \$122,98 |
| QL 117 – QL 118.999 | 220 | Myristicaceae | 16 | 6,67 | 1 | 15 | \$0,00 | 7,14 | 1 | 14 | \$71,00 | 27,27 | 3 | 11 | \$36,00 | \$107,00 |
| QL 113.3 – QL 113.699 | 214 | Degeneriaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| Lurales | | | | | | | | | | | | | | | | |
| QL 114 – QL 115.999 | 217 | Calycanthaceae | 7 | - | 0 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | \$0,00 |
| QL 119 – QL 119.999 | 221 | Monimiaceae | 13 | 18,18 | 2 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | \$0,00 |
| QL 120 – QL 120.999 | 222 | Lauraceae | 96 | 4,35 | 4 | 92 | \$0,00 | 22,67 | 17 | 75 | \$0,00 | 7,14 | 5 | 70 | \$57,85 | \$57,85 |
| QL 121 – QL 121.999 | 223 | Sparattanthelium | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| Canellales | | | | | | | | | | | | | | | | |
| QL 113.2 – QL 113.299 | 213 | Winteraceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | 100,00 | 1 | 1 | \$0,00 | \$0,00 |
| Piperales | | | | | | | | | | | | | | | | |
| QL 68 – QL 68.999 | 169 | Saururaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 69 – QL 70.999 | 170 | Piperaceae | 86 | 8,86 | 7 | 79 | \$196,53 | 8,22 | 6 | 73 | \$180,50 | 8,96 | 6 | 67 | \$13,06 | \$390,09 |
| QL 91 – QL 91.999 | 191 | Aristolochiaceae | 19 | 18,75 | 3 | 16 | \$0,00 | 23,08 | 3 | 13 | \$0,00 | 18,18 | 2 | 11 | \$36,00 | \$36,00 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|------------------|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (5) Dicotyledons (2): Basal orders + Eudicots | | | 2009 | | | 2005 | | | | 2000 | | | | 1995 | | |
| Chloranthales | | | | | | | | | | | | | | | | |
| QL 71 - QL 71.999 | 171 | Chloranthaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| Ceratophyllales | | | | | | | | | | | | | | | | |
| QL 107 - QL 108.999 | 206 | Ceratophyllaceae | 5 | 25,00 | 1 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| Eudicot orders | | | | | | | | | | | | | | | | |
| Ranunculales | | | | | | | | | | | | | | | | |
| QL 109 - QL 109.199 | 207 | Ranunculaceae | 235 | 7,31 | 16 | 219 | \$198,56 | 8,96 | 18 | 201 | \$892,26 | 9,84 | 18 | 183 | \$291,36 | \$1.382,18 |
| QL 110 - QL 110.999 | 209 | Lardizabalaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 111 - QL 111.999 | 210 | Berberidaceae | 22 | 15,79 | 3 | 19 | \$0,00 | 18,75 | 3 | 16 | \$37,46 | 14,29 | 2 | 14 | \$5,18 | \$42,64 |
| QL 112 - QL 112.999 | 211 | Menispermaceae | 14 | 27,27 | 3 | 11 | \$0,00 | 57,14 | 4 | 7 | \$7,70 | 16,67 | 1 | 6 | \$0,00 | \$7,70 |
| QL 122 - QL 122.999 | 224 | Papaveraceae | 63 | 8,62 | 5 | 58 | \$117,56 | 5,45 | 3 | 55 | \$115,10 | 7,84 | 4 | 51 | \$208,97 | \$441,63 |
| QL 123 - QL 123.999 | 225 | Fumariaceae | 9 | 28,57 | 2 | 7 | \$25,36 | - | 0 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | \$25,36 |
| Proteales | | | | | | | | | | | | | | | | |
| QL 83 - QL 83.999 | 183 | Proteaceae | 88 | 11,39 | 9 | 79 | \$61,61 | 11,27 | 8 | 71 | \$93,58 | 36,54 | 19 | 52 | \$2.356,74 | \$2.511,93 |
| QL 143 - QL 144.999 | 244 | Platanaceae | 8 | - | 0 | 8 | \$0,00 | 33,33 | 2 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | \$0,00 |
| Buxales | | | | | | | | | | | | | | | | |
| QL 175 - QL 175.099 | 272 | Buxaceae | 13 | 8,33 | 1 | 12 | \$0,00 | 20,00 | 2 | 10 | \$11,25 | 11,11 | 1 | 9 | \$15,00 | \$26,25 |
| Core Eudicots | | | | | | | | | | | | | | | | |
| Saxifragales | | | | | | | | | | | | | | | | |
| QL 109.2 - QL 109.999 | 208 | Paeoniaceae | 52 | 8,33 | 4 | 48 | \$166,61 | 37,14 | 13 | 35 | \$122,92 | 20,69 | 6 | 29 | \$175,13 | \$464,66 |
| QL 134 - QL 135.999 | 235 | Crassulaceae | 70 | 9,38 | 6 | 64 | \$337,58 | 10,34 | 6 | 58 | \$73,52 | 13,73 | 7 | 51 | \$53,81 | \$464,91 |
| QL 136 - QL 136.099 | 236 | Saxifragaceae | 99 | 11,24 | 10 | 89 | \$106,90 | 5,95 | 5 | 84 | \$100,26 | 10,53 | 8 | 76 | \$124,34 | \$331,50 |
| QL 136.3 - QL 136.999 | 238 | Grossulariaceae | 23 | 4,55 | 1 | 22 | \$0,00 | 4,76 | 1 | 21 | \$0,00 | - | 0 | 21 | \$0,00 | \$0,00 |
| QL 142 - QL 142.999 | 243 | Hamamelidaceae | 17 | 30,77 | 4 | 13 | \$26,21 | 8,33 | 1 | 12 | \$0,00 | - | 0 | 12 | \$0,00 | \$26,21 |
| QL 252 - QL 253.999 | 333 | Haloragaceae | 11 | - | 0 | 11 | \$0,00 | 37,50 | 3 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | \$0,00 |

APPENDICES

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|------------------|-------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------------------------|-----------------------|-----------------------------|-------------------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection 2009 | 2005-2009 % growth | 2005-2009 Items added | Size of Collection 2005 | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection 2000 | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection 1995 | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Vitales | | | | | | | | | | | | | | | | |
| QL 196 - QL 196.999 | 290 | Vitis | 318 | 2,58 | 8 | 310 | \$54,10 | 4,73 | 14 | 296 | \$0,00 | 5,71 | 16 | 280 | \$41,65 | \$95,75 |
| Zygophyllales | | | | | | 0 | | | | 0 | | | | 0 | | \$0,00 |
| QL 162 - QL 162.999 | 258 | Zygophyllaceae | 11 | 10,00 | 1 | 10 | \$0,00 | - | 0 | 10 | \$0,00 | 11,11 | 1 | 9 | \$0,00 | \$0,00 |
| QL 171.1 - QL 171.199 | 268 | Krameriaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| Celastrales | | | | | | 0 | | | | 0 | | | | 0 | | \$0,00 |
| QL 184 - QL 185.999 | 279 | Celastraceae | 21 | 10,53 | 2 | 19 | \$0,00 | - | 0 | 19 | \$0,00 | - | 0 | 19 | \$0,00 | \$0,00 |
| Oxalidales | | | | | | 0 | | | | | | | | | | |
| QL 138 - QL 138.999 | 240 | Brunelliaceae | 5 | - | 0 | 5 | \$0,00 | 25,00 | 1 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 139 - QL 140.999 | 241 | Cunoniaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 148 - QL 148.999 | 248 | Connaraceae | 9 | - | 0 | 9 | \$0,00 | 28,57 | 2 | 7 | \$12,60 | - | 0 | 7 | \$0,00 | \$12,60 |
| QL 155 - QL 155.999 | 253 | Oxalidaceae | 15 | 7,14 | 1 | 14 | \$0,00 | 7,69 | 1 | 13 | \$0,00 | 8,33 | 1 | 12 | \$0,00 | \$0,00 |
| QL 170 - QL 170.999 | 266 | Tremandraceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 197 - QL 199.999 | 291 | Elaeocarpaceae | 5 | - | 0 | 5 | \$0,00 | 150,00 | 3 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| Malpighiales | | | | | | | | | | | | | | | | |
| QL 72 - QL 72.999 | 172 | Salicaceae | 191 | 7,91 | 14 | 177 | \$30,22 | 10,63 | 17 | 160 | \$0,00 | 6,67 | 10 | 150 | \$92,83 | \$123,05 |
| QL 92 - QL 92.099 | 192 | Rafflesiaceae | 13 | 8,33 | 1 | 12 | \$0,00 | 33,33 | 3 | 9 | \$110,72 | - | 0 | 9 | \$0,00 | \$110,72 |
| QL 132 - QL 132.999 | 233 | Podostemaceae | 16 | 14,29 | 2 | 14 | \$0,00 | - | 0 | 14 | \$0,00 | 7,69 | 1 | 13 | \$0,00 | \$0,00 |
| QL 146 - QL 147.999 | 247 | Chrysobalanaceae | 13 | 8,33 | 1 | 12 | \$0,00 | - | 0 | 12 | \$0,00 | - | 0 | 12 | \$0,00 | \$0,00 |
| QL 157 - QL 157.999 | 255 | Linaceae | 35 | 2,94 | 1 | 34 | \$0,00 | 3,03 | 1 | 33 | \$0,00 | 3,13 | 1 | 32 | \$0,00 | \$0,00 |
| QL 158 - QL 158.999 | 256 | Humiriaceae | 2 | 100,00 | 1 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 1 | 0 | \$0,00 | \$0,00 |
| QL 159 - QL 159.999 | 257 | Erythroxylaceae | 31 | 10,71 | 3 | 28 | \$0,00 | 12,00 | 3 | 25 | \$0,00 | 8,70 | 2 | 23 | \$0,00 | \$0,00 |
| QL 167 - QL 167.999 | 263 | Malpighiaceae | 62 | 6,90 | 4 | 58 | \$69,40 | 18,37 | 9 | 49 | \$27,00 | 25,64 | 10 | 39 | \$18,00 | \$114,40 |
| QL 168 - QL 168.999 | 264 | Trigoniaceae | 3 | 50,00 | 1 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|--|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (7) Dicotyledons (4): Core Eudicots | | | | | | | | | | | | | | | | |
| Malpighiales (continued) | | | | | | | | | | | | | | | | |
| QL 172 - QL 172.999 | 269 | Dichapetalaceae | 6 | 100,00 | 3 | 3 | \$34,75 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$34,75 |
| QL 173 - QL 173.999 | 270 | Euphorbiaceae | 364 | 15,92 | 50 | 314 | \$561,16 | 15,44 | 42 | 272 | \$126,30 | 11,48 | 28 | 244 | \$1.046,04 | \$1.733,50 |
| QL 208 - QL 208.999 | 298 | Ochnaceae | 8 | 33,33 | 2 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | \$0,00 |
| QL 209 - QL 209.999 | 299 | Caryocaraceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 213 - QL 213.999 | 303 | Guttiferae | 48 | 11,63 | 5 | 43 | \$0,00 | 13,16 | 5 | 38 | \$89,63 | 2,70 | 1 | 37 | \$0,00 | \$89,63 |
| QL 215 - QL 215.999 | 305 | Elatinaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 223 - QL 223.999 | 312 | Violaceae | 91 | 3,41 | 3 | 88 | \$0,00 | 7,32 | 6 | 82 | \$151,55 | 10,81 | 8 | 74 | \$43,80 | \$195,35 |
| QL 224 - QL 225.999 | 313 | Flacourtiaceae (incl. in Salicaceae) | 17 | - | 0 | 17 | \$0,00 | 6,25 | 1 | 16 | \$0,00 | - | 0 | 16 | \$0,00 | \$0,00 |
| QL 226 - QL 227.999 | 314 | Turneraceae (incl. in Passifloraceae) | 4 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | 100,00 | 2 | 2 | \$0,00 | \$0,00 |
| QL 228 - QL 229.999 | 315 | Passifloraceae | 28 | 16,67 | 4 | 24 | \$0,00 | 9,09 | 2 | 22 | \$62,06 | 15,79 | 3 | 19 | \$43,04 | \$105,10 |
| QL 246 - QL 246.999 | 327 | Rhizophoraceae | 13 | - | 0 | 13 | \$0,00 | - | 0 | 13 | \$0,00 | - | 0 | 13 | \$0,00 | \$0,00 |
| Cucurbitales | | | | | | | | | | | | | | | | |
| QL 186 - QL 186.999 | 280 | Coriariaceae | 1 | - | 1 | 0 | \$0,00 | - | 0 | 0 | \$0,00 | - | 0 | 0 | \$0,00 | \$0,00 |
| QL 232 - QL 232.999 | 318 | Datisceae | 2 | - | 0 | 2 | \$0,00 | - | 2 | 0 | \$0,00 | - | 0 | 0 | \$0,00 | \$0,00 |
| QL 233 - QL 234.999 | 319 | Begoniaceae | 145 | 5,07 | 7 | 138 | \$26,21 | 6,15 | 8 | 130 | \$138,68 | 13,04 | 15 | 115 | \$256,05 | \$420,94 |
| QL 306 - QL 306.999 | 386 | Cucurbitaceae | 138 | 5,34 | 7 | 131 | \$0,00 | 14,91 | 17 | 114 | \$62,29 | 22,58 | 21 | 93 | \$233,20 | \$295,49 |
| Fabales | | | | | | | | | | | | | | | | |
| QL 149 - QL 149.999 | 249 | Mimosaceae* | | | | | | | | | | | | | | |
| QL 150 - QL 151.999 | 250 | Leguminosae | 343 | 5,86 | 19 | 324 | \$422,51 | 16,97 | 47 | 277 | \$1.000,78 | 7,78 | 20 | 257 | \$519,23 | \$1.942,52 |
| QL 152 - QL 153.999 | 251 | Fabaceae | 795 | 8,61 | 63 | 732 | \$1.508,42 | 9,58 | 64 | 668 | \$359,95 | 7,22 | 45 | 623 | \$824,71 | \$2.693,08 |
| QL 171 - QL 171.099 | 267 | Polygalaceae | 26 | 4,00 | 1 | 25 | \$0,00 | 4,17 | 1 | 24 | \$0,00 | - | 0 | 24 | \$0,00 | \$0,00 |

* recently established systematic category

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|---------------------------------------|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (8) Dicotyledons (5): Core Eudicots | | | 2009 | | added | 2005 | | | added | 2000 | | | added | 1995 | | 1995-2009 |
| Fagales | | | | | | | | | | | | | | | | |
| QL 67 - QL 67.999 | 168 | Casuarinaceae | 7 | 16,67 | 1 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | 20,00 | 1 | 5 | \$89,38 | \$89,38 |
| QL 76 - QL 77.999 | 174 | Juglandaceae | 79 | 2,60 | 2 | 77 | \$0,00 | 18,46 | 12 | 65 | \$0,00 | 12,07 | 7 | 58 | \$33,44 | \$33,44 |
| QL 78 - QL 78.999 | 175 | Betulaceae | 95 | 14,46 | 12 | 83 | \$0,00 | 20,29 | 14 | 69 | \$125,25 | 15,00 | 9 | 60 | \$57,10 | \$182,35 |
| QL 79 - QL 79.999 | 176 | Fagaceae | 323 | 16,61 | 46 | 277 | \$421,13 | 20,43 | 47 | 230 | \$27,36 | 10,05 | 21 | 209 | \$27,36 | \$475,85 |
| QL 73 - QL 75.999 | 173 | Myricaceae | 5 | 66,67 | 2 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| Rosales | | | | | | | | | | | | | | | | |
| QL 80 - QL 80.099 | 177 | Ulmaceae | 52 | 1,96 | 1 | 51 | \$0,00 | 24,39 | 10 | 41 | \$323,58 | 7,89 | 3 | 38 | \$0,00 | \$323,58 |
| QL 80.1 - QL 80.999 | 178 | Barbeyaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 81 - QL 81.099 | 179 | Moraceae | 169 | 6,29 | 10 | 159 | \$10,00 | 8,90 | 13 | 146 | \$244,89 | 4,29 | 6 | 140 | \$0,00 | \$254,89 |
| QL 81.1 - QL 81.999 | 180 | Cannabaceae | 97 | 5,43 | 5 | 92 | \$179,86 | 4,55 | 4 | 88 | \$82,49 | 14,29 | 11 | 77 | \$121,98 | \$384,33 |
| QL 82 - QL 82.099 | 181 | Urticaceae | 30 | 7,14 | 2 | 28 | \$0,00 | 16,67 | 4 | 24 | \$29,71 | - | 0 | 24 | \$0,00 | \$29,71 |
| QL 82.1 - QL 82.999 | 182 | Cecropiaceae (incl. in Urticaceae) | 5 | 150,00 | 3 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 145 - QL 145.099 | 245 | Rosaceae | 1659 | 4,93 | 78 | 1581 | \$1.326,64 | 8,36 | 122 | 1459 | \$5.009,67 | 18,43 | 227 | 1232 | \$1.900,61 | \$8.236,92 |
| QL 195 - QL 195.999 | 289 | Rhamnaceae | 26 | 8,33 | 2 | 24 | \$20,98 | 9,09 | 2 | 22 | \$0,00 | 4,76 | 1 | 21 | \$0,00 | \$20,98 |
| QL 240 - QL 240.999 | 323 | Elaeagnaceae | 16 | 14,29 | 2 | 14 | \$43,18 | 27,27 | 3 | 11 | \$0,00 | - | 0 | 11 | \$0,00 | \$43,18 |
| Geraniales | | | | | | | | | | | | | | | | |
| QL 154 - QL 154.999 | 252 | Geraniaceae | 138 | 13,11 | 16 | 122 | \$43,42 | 17,31 | 18 | 104 | \$196,64 | 19,54 | 17 | 87 | \$268,07 | \$508,13 |
| QL 193 - QL 193.999 | 287 | Melanthaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| Myrtales | | | | | | | | | | | | | | | | |
| QL 169 - QL 169.999 | 265 | Vochysiaceae | 13 | - | 0 | 13 | \$0,00 | 18,18 | 2 | 11 | \$0,00 | 10,00 | 1 | 10 | \$0,00 | \$0,00 |
| QL 237 - QL 238.999 | 321 | Penaeaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 241 - QL 241.999 | 324 | Lythraceae | 16 | 6,67 | 1 | 15 | \$0,00 | - | 0 | 15 | \$0,00 | 25,00 | 3 | 12 | \$0,00 | \$0,00 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|------------------|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (9) Dicotyledons (6): Core Eudicots | | | | | | | | | | | | | | | | |
| Myrtales (continued) | | | | | | | | | | | | | | | | |
| QL 244 - QL 244.999 | 325 | Punica | 2 | 100,00 | 1 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 247 - QL 247.999 | 328 | Myrtaceae | 236 | 10,28 | 22 | 214 | \$279,46 | 6,47 | 13 | 201 | \$431,04 | 9,24 | 17 | 184 | \$858,56 | \$1.569,06 |
| QL 248 - QL 248.999 | 329 | Combretaceae | 18 | 5,88 | 1 | 17 | \$0,00 | 21,43 | 3 | 14 | \$0,00 | 16,67 | 2 | 12 | \$18,24 | \$18,24 |
| QL 249 - QL 249.999 | 330 | Melastomataceae | 67 | 13,56 | 8 | 59 | \$0,00 | 18,00 | 9 | 50 | \$0,00 | 4,17 | 2 | 48 | \$0,00 | \$0,00 |
| QL 250 - QL 250.999 | 331 | Onagraceae | 187 | 4,47 | 8 | 179 | \$24,85 | 5,29 | 9 | 170 | \$0,00 | 9,68 | 15 | 155 | \$27,52 | \$52,37 |
| QL 251 - QL 251.999 | 332 | Trapa | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| Crossosomatales | | | | | | | | | | | | | | | | |
| QL 187 - QL 187.999 | 281 | Staphyleaceae | 3 | 50,00 | 1 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| Brassicales | | | | | | | | | | | | | | | | |
| QL 98 - QL 99.999 | 199 | Bataceae | 4 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 124 - QL 125.999 | 226 | Cruciferae | 205 | 3,54 | 7 | 198 | \$290,72 | 5,88 | 11 | 187 | \$300,60 | 7,47 | 13 | 174 | \$503,71 | \$1.095,03 |
| QL 126 - QL 126.999 | 227 | Capparidaceae | 12 | - | 0 | 12 | \$0,00 | 20,00 | 2 | 10 | \$53,00 | 25,00 | 2 | 8 | \$0,00 | \$53,00 |
| QL 127 - QL 127.999 | 228 | Resedaceae | 5 | - | 0 | 5 | \$0,00 | - | 0 | 5 | \$0,00 | - | 0 | 5 | \$0,00 | \$0,00 |
| QL 128 - QL 128.999 | 229 | Moringaceae | 2 | 100,00 | 1 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 156 - QL 156.999 | 254 | Tropaeolaceae | 9 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | \$0,00 |
| QL 178 - QL 178.999 | 275 | Limnanthaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 230 - QL 230.999 | 316 | Caricaceae | 12 | 9,09 | 1 | 11 | \$0,00 | 83,33 | 5 | 6 | \$10,78 | - | 0 | 6 | \$0,00 | \$10,78 |
| Malvales | | | | | | | | | | | | | | | | |
| QL 145.1 - QL 145.999 | 246 | Neuradaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 200 - QL 200.999 | 292 | Tiliaceae | 37 | - | 0 | 37 | \$0,00 | 8,82 | 3 | 34 | \$0,00 | 3,03 | 1 | 33 | \$0,00 | \$0,00 |
| QL 201 - QL 202.999 | 293 | Malvaceae | 291 | 6,59 | 18 | 273 | \$20,98 | 10,08 | 25 | 248 | \$308,30 | 8,30 | 19 | 229 | \$270,09 | \$599,37 |
| QL 203 - QL 203.999 | 294 | Bombacaceae | 33 | 6,45 | 2 | 31 | \$37,74 | 10,71 | 3 | 28 | \$60,84 | 7,69 | 2 | 26 | \$47,75 | \$146,33 |
| QL 204 - QL 205.999 | 295 | Sterculiaceae | 95 | 4,40 | 4 | 91 | \$114,56 | 4,60 | 4 | 87 | \$72,46 | 2,35 | 2 | 85 | \$0,00 | \$187,02 |
| QL 214 - QL 214.999 | 304 | Dipterocarpaceae | 53 | 3,92 | 2 | 51 | \$67,71 | 8,51 | 4 | 47 | \$187,32 | 38,24 | 13 | 34 | \$110,50 | \$365,53 |

APPENDICES

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|---|------------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|
| Spermatophyta | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Angiosperms (10) | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| Dicotyledons (7): | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Core Eudicots | | | | | | | | | | | | | | | | |
| Malvales (continued) | | | | | | | | | | | | | | | | |
| QL 219 - QL 219.999 | 309 | Cistaceae | 15 | - | 0 | 15 | \$0,00 | - | 0 | 15 | \$0,00 | - | 0 | 15 | \$0,00 | \$0,00 |
| QL 220 - QL 220.999 | 310 | Bixaceae* | | | | 0 | | | | 0 | | | | 0 | | \$0,00 |
| QL 221 - QL 221.999 | 311 | Cochlospermaceae | 7 | - | 0 | 7 | \$0,00 | 75,00 | 3 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 239 - QL 239.999 | 322 | Thymelaeaceae | 17 | 6,25 | 1 | 16 | \$26,21 | 33,33 | 4 | 12 | \$144,68 | - | 0 | 12 | \$0,00 | \$170,89 |
| Sapindales | | | | | | | | | | | | | | | | |
| QL 162 - QL 162.999 | 259 | Rutaceae | 247 | 4,66 | 11 | 236 | \$320,53 | 7,27 | 16 | 220 | \$38,48 | 7,84 | 16 | 204 | \$254,53 | \$613,54 |
| QL 163 - QL 164.999 | 260 | Simaroubaceae | 10 | 11,11 | 1 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | \$0,00 |
| QL 165 - QL 165.999 | 261 | Burseraceae | 20 | 5,26 | 1 | 19 | \$0,00 | - | 0 | 19 | \$0,00 | 26,67 | 4 | 15 | \$54,39 | \$54,39 |
| QL 166 - QL 166.999 | 262 | Meliaceae | 63 | 14,55 | 8 | 55 | \$48,82 | 25,00 | 11 | 44 | \$137,95 | 15,79 | 6 | 38 | \$410,31 | \$597,08 |
| QL 179 - QL 179.999 | 276 | Anacardiaceae | 113 | 6,60 | 7 | 106 | \$0,00 | 11,58 | 11 | 95 | \$13,02 | 25,00 | 19 | 76 | \$60,96 | \$73,98 |
| QL 189 - QL 189.999 | 283 | Aceraceae (Incl. in Sapindaceae) | 81 | 9,46 | 7 | 74 | \$49,92 | 13,85 | 9 | 65 | \$168,33 | 16,07 | 9 | 56 | \$74,92 | \$293,17 |
| QL 190 - QL 190.999 | 284 | Hippocastanaceae | 6 | - | 0 | 6 | \$0,00 | 50,00 | 2 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 191 - QL 191.999 | 285 | Sapindaceae | 52 | 4,00 | 2 | 50 | \$145,12 | 16,28 | 7 | 43 | \$62,76 | 13,16 | 5 | 38 | \$0,00 | \$207,88 |
| Santalales | | | | | | | | | | | | | | | | |
| QL 84 - QL 84.099 | 184 | Loranthaceae | 49 | 11,36 | 5 | 44 | \$76,50 | 15,79 | 6 | 38 | \$256,11 | 8,57 | 3 | 35 | \$53,95 | \$386,56 |
| QL 84.1 - QL 84.199 | 185 | Viscaceae (incl. in Santalaceae) | 10 | 42,86 | 3 | 7 | \$0,00 | 16,67 | 1 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | \$0,00 |
| QL 84.2 - QL 85.999 | 186 | Eremolepidaceae (incl. in Santalaceae) | | | | | | | | 0 | | | | | | |
| QL 86 - QL 87.999 | 187 | Santalaceae | 18 | - | 0 | 18 | \$0,00 | 5,88 | 1 | 17 | \$0,00 | 6,25 | 1 | 16 | \$35,91 | \$35,91 |
| QL 88 - QL 88.999 | 188 | Opiliaceae | 2 | - | 0 | 2 | \$0,00 | | 2 | 0 | \$0,00 | | 0 | 0 | \$0,00 | \$0,00 |
| QL 89 - QL 89.999 | 189 | Olacaceae | 4 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 90 - QL 90.999 | 190 | Balanophoraceae | 8 | - | 0 | 8 | \$0,00 | - | 0 | 8 | \$0,00 | 14,29 | 1 | 7 | \$0,00 | \$0,00 |

* recently established systematic category

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|--|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (11) Dicotyledons (8): Core Eudicots | | | | | | | | | | | | | | | | |
| Caryophyllales | | | | | | | | | | | | | | | | |
| QL 94 - QL 94.999 | 194 | Polygonaceae | 77 | 5,48 | 4 | 73 | \$0,00 | 7,35 | 5 | 68 | \$35,12 | - | 0 | 68 | \$0,00 | \$35,12 |
| QL 95 - QL 95.999 | 195 | Chenopodiaceae (incl. in Amaranthaceae) | 160 | 6,67 | 10 | 150 | \$45,00 | 7,91 | 11 | 139 | \$37,90 | 2,96 | 4 | 135 | \$0,00 | \$82,90 |
| QL 96 - QL 96.999 | 196 | Amaranthaceae | 33 | 6,45 | 2 | 31 | \$0,00 | 14,81 | 4 | 27 | \$0,00 | 17,39 | 4 | 23 | \$0,00 | \$0,00 |
| QL 97 - QL 97.099 | 197 | Nyctaginaceae | 10 | - | 0 | 10 | \$0,00 | 25,00 | 2 | 8 | \$0,00 | 33,33 | 2 | 6 | \$35,34 | \$35,34 |
| QL 97.1 - QL 97.999 | 198 | Didiereaceae | 6 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | 20,00 | 1 | 5 | \$13,42 | \$13,42 |
| QL 100 - QL 100.999 | 200 | Phytolaccaceae | 7 | - | 0 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | 16,67 | 1 | 6 | \$0,00 | \$0,00 |
| QL 101 - QL 101.999 | 201 | Aizoaceae | 42 | 7,69 | 3 | 39 | \$0,00 | 11,43 | 4 | 35 | \$67,71 | 6,06 | 2 | 33 | \$79,80 | \$147,51 |
| QL 102 - QL 102.999 | 202 | Portulacaceae | 27 | 12,50 | 3 | 24 | \$0,00 | 9,09 | 2 | 22 | \$36,70 | 15,79 | 3 | 19 | \$41,67 | \$78,37 |
| QL 103 - QL 104.999 | 203 | Basellaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 235 - QL 236.999 | 320 | Cactaceae | 587 | 10,75 | 57 | 530 | \$979,17 | 6,43 | 32 | 498 | \$952,69 | 12,93 | 57 | 441 | \$743,16 | \$2.675,02 |
| QL 105 - QL 105.999 | 204 | Caryophyllaceae | 177 | 3,51 | 6 | 171 | \$84,06 | 3,01 | 5 | 166 | \$78,95 | 9,21 | 14 | 152 | \$91,42 | \$254,43 |
| QL 130 - QL 130.999 | 231 | Nepenthes | 6 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | - | 0 | 6 | \$0,00 | \$0,00 |
| QL 131 - QL 131.999 | 232 | Droseraceae | 20 | 17,65 | 3 | 17 | \$0,00 | 6,25 | 1 | 16 | \$20,74 | 23,08 | 3 | 13 | \$47,47 | \$68,21 |
| QL 175.1 - QL 176.999 | 273 | Simmondsiaceae | 23 | - | 0 | 23 | \$0,00 | 4,55 | 1 | 22 | \$0,00 | - | 0 | 22 | \$0,00 | \$0,00 |
| QL 216 - QL 216.999 | 306 | Frankeniaceae | 3 | 50,00 | 1 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 217 - QL 217.999 | 307 | Tamaricaceae | 8 | - | 0 | 8 | \$0,00 | 14,29 | 1 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | \$0,00 |
| QL 268 - QL 268.999 | 348 | Plumbaginaceae | 13 | - | 0 | 13 | \$0,00 | 8,33 | 1 | 12 | \$32,86 | - | 0 | 12 | \$0,00 | \$32,86 |
| Cornales | | | | | | | | | | | | | | | | |
| QL 133 - QL 133.999 | 234 | Hydrostachyaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 136.1 - QL 136.299 | 237 | Hydrangeaceae | 6 | - | 0 | 6 | \$0,00 | 20,00 | 1 | 5 | \$0,00 | - | 0 | 5 | \$0,00 | \$0,00 |
| QL 231 - QL 231.999 | 317 | Loasaceae | 13 | 8,33 | 1 | 12 | \$0,00 | 20,00 | 2 | 10 | \$40,00 | - | 0 | 10 | \$0,00 | \$40,00 |
| QL 256 - QL 256.099 | 336 | Cornaceae | 24 | 14,29 | 3 | 21 | \$29,96 | 31,25 | 5 | 16 | \$0,00 | 6,67 | 1 | 15 | \$0,00 | \$29,96 |
| QL 256.3 - QL 256.999 | 338 | Nyssaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | 100,00 | 1 | 1 | \$48,00 | \$48,00 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|---------------------------------------|------------|-----------|-----------|------------|------------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|------------|
| Spermatophyta | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Angiosperms (12) | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| Dicotyledons (9): | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Core Eudicots | | | | | | | | | | | | | | | | |
| Ericales | | | | | | | | | | | | | | | | |
| QL 92.1 - QL 93.999 | 193 | Mitrastemonaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 129 - QL 129.999 | 230 | Sarraceniaceae | 17 | 6,25 | 1 | 16 | \$76,74 | 23,08 | 3 | 13 | \$110,72 | 44,44 | 4 | 9 | \$62,64 | \$250,10 |
| QL 177 - QL 177.999 | 274 | Empetraceae (incl. in Ericaceae) | 3 | 50,00 | 1 | 2 | \$0,00 | 100,00 | 1 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 180 - QL 182.999 | 277 | Cyrtillaceae | 1 | - | 0 | 1 | \$0,00 | | 1 | 0 | \$0,00 | | 0 | 0 | \$0,00 | \$0,00 |
| QL 194 - QL 194.999 | 288 | Balsaminaceae | 14 | - | 0 | 14 | \$0,00 | 16,67 | 2 | 12 | \$25,99 | 20,00 | 2 | 10 | \$52,15 | \$78,14 |
| QL 206.1 - QL 207.999 | 297 | Actinidiaceae | 18 | 28,57 | 4 | 14 | \$0,00 | 27,27 | 3 | 11 | \$0,00 | 120,00 | 6 | 5 | \$0,00 | \$0,00 |
| QL 212 - QL 212.199 | 301 | Theaceae | 210 | 2,94 | 6 | 204 | \$0,00 | 7,37 | 14 | 190 | \$310,98 | 14,46 | 24 | 166 | \$478,46 | \$789,44 |
| QL 212.2 - QL 212.999 | 302 | Bonnetiaceae* | | | | | | | | | | | | | | |
| QL 218 - QL 218.999 | 308 | Fouquieriaceae | 4 | - | 0 | 4 | \$0,00 | 100,00 | 2 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 245 - QL 245.999 | 326 | Lecythidaceae | 32 | 10,34 | 3 | 29 | \$0,00 | 3,57 | 1 | 28 | \$0,00 | 16,67 | 4 | 24 | \$0,00 | \$0,00 |
| QL 210 - QL 211.999 | 300 | Marcgraviaceae | 4 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | 33,33 | 1 | 3 | \$0,00 | \$0,00 |
| QL 257 - QL 257.999 | 339 | Clethraceae | 3 | 50,00 | 1 | 2 | \$0,00 | 100,00 | 1 | 1 | \$0,00 | | 1 | 0 | \$0,00 | \$0,00 |
| QL 258 - QL 258.999 | 340 | Pyrolaceae (incl. in Ericaceae) | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 259 - QL 259.999 | 341 | Monotropaceae (incl. in Ericaceae) | 2 | 100,00 | 1 | 1 | \$0,00 | | 1 | 0 | \$0,00 | | 0 | 0 | \$0,00 | \$0,00 |
| QL 261 - QL 261.999 | 343 | Ericaceae | 437 | 7,64 | 31 | 406 | \$1.136,27 | 15,34 | 54 | 352 | \$952,65 | 20,14 | 59 | 293 | \$671,13 | \$2.760,05 |
| QL 264 - QL 264.999 | 344 | Diapensiaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 265 - QL 265.999 | 345 | Myrsinaceae | 21 | 5,00 | 1 | 20 | \$0,00 | - | 0 | 20 | \$0,00 | 5,26 | 1 | 19 | \$0,00 | \$0,00 |
| QL 266 - QL 266.999 | 346 | Theophrastaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 267 - QL 267.999 | 347 | Primulaceae | 142 | 7,58 | 10 | 132 | \$33,75 | 8,20 | 10 | 122 | \$134,28 | 10,91 | 12 | 110 | \$72,91 | \$240,94 |
| QL 270 - QL 270.999 | 350 | Ebenaceae | 20 | 11,11 | 2 | 18 | \$0,00 | 20,00 | 3 | 15 | \$0,00 | 25,00 | 3 | 12 | \$0,00 | \$0,00 |

* recently established systematic category

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 - 2009 | | | | | | | | | | | | | | | | |
|--|-----|--|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (13) Dicotyledons (10): Core Eudicots | | | | | | | | | | | | | | | | |
| Ericales (continued) | | | | | | | | | | | | | | | | |
| QL 271 - QL 271.999 | 351 | Styracaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 272 - QL 272.999 | 352 | Symplocaceae | 4 | 33,33 | 1 | 3 | \$0,00 | 50,00 | 1 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 280 - QL 280.999 | 362 | Polemoniaceae | 54 | 10,20 | 5 | 49 | \$0,00 | 2,08 | 1 | 48 | \$0,00 | 2,13 | 1 | 47 | \$0,00 | \$0,00 |
| Garryales | | | | | | | | | | | | | | | | |
| QL 256.1 - QL 256.299 | 337 | Garryaceae | 2 | - | 0 | 2 | \$0,00 | | 2 | 0 | \$0,00 | | 0 | 0 | \$0,00 | \$0,00 |
| Gentianales | | | | | | | | | | | | | | | | |
| QL 275 - QL 275.099 | 354 | Loganiaceae | 31 | 34,78 | 8 | 23 | \$0,00 | 76,92 | 10 | 13 | \$0,00 | - | 0 | 13 | \$0,00 | \$0,00 |
| QL 275.2 - QL 275.999 | 356 | Fagraea | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| QL 276 - QL 276.999 | 357 | Gentianaceae | 62 | 6,90 | 4 | 58 | \$134,26 | 16,00 | 8 | 50 | \$319,15 | 8,70 | 4 | 46 | \$0,00 | \$453,41 |
| QL 277 - QL 277.999 | 358 | Apocynaceae | 116 | 1,75 | 2 | 114 | \$0,00 | 12,87 | 13 | 101 | \$207,17 | 9,78 | 9 | 92 | \$201,32 | \$408,49 |
| QL 278 - QL 278.999 | 359 | Asclepiadaceae (incl. in Apocynaceae) | 97 | 2,11 | 2 | 95 | \$0,00 | 5,56 | 5 | 90 | \$2.288,45 | 7,14 | 6 | 84 | \$177,58 | \$2.466,03 |
| QL 301 - QL 301.999 | 381 | Rubiaceae | 411 | 5,93 | 23 | 388 | \$430,25 | 5,15 | 19 | 369 | \$603,58 | 7,89 | 27 | 342 | \$362,25 | \$1.396,08 |
| Lamiales | | | | | | | | | | | | | | | | |
| QL 174 - QL 174.999 | 271 | Callitrichaceae (now Plantaginaceae) | 3 | 50,00 | 1 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 273 - QL 274.999 | 353 | Oleaceae | 98 | 6,52 | 6 | 92 | \$223,68 | 17,95 | 14 | 78 | \$59,89 | 8,33 | 6 | 72 | \$0,00 | \$283,57 |
| QL 275.1 - QL 275.199 | 355 | Buddleia | 2 | - | 0 | 2 | \$0,00 | | 2 | 0 | \$0,00 | | 27 | 27 | \$362,25 | \$362,25 |
| QL 283.1 - QL 283.199 | 365 | Verbenaceae | 93 | 2,20 | 2 | 91 | \$48,75 | 2,25 | 2 | 89 | \$0,00 | 2,30 | 2 | 87 | \$26,00 | \$74,75 |
| QL 283.2 - QL 283.999 | 366 | Dicrastylidaceae (incl. in Lamiaceae) | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 285 - QL 285.999 | 367 | Labiatae (Lamiaceae) | 207 | 5,08 | 10 | 197 | \$65,78 | 13,87 | 24 | 173 | \$295,41 | 13,82 | 21 | 152 | \$418,84 | \$780,03 |
| QL 288 - QL 288.999 | 370 | Scrophulariaceae | 183 | 7,65 | 13 | 170 | \$127,62 | 6,92 | 11 | 159 | \$244,35 | 3,92 | 6 | 153 | \$157,25 | \$529,22 |
| QL 289 - QL 289.999 | 371 | Lentibulariaceae | 27 | 3,85 | 1 | 26 | \$0,00 | 18,18 | 4 | 22 | \$0,00 | 22,22 | 4 | 18 | \$35,07 | \$35,07 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 – 2009 | | | | | | | | | | | | | | | | |
|--|-----|-------------------------------------|------------|-----------|-----------|------------|-----------|-----------|-----------|----------|------------|-----------|-----------|---------|------------|------------|
| Spermatophyta Angiosperms (14) Dicotyledons (11): Core Eudicots | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| | | | Collection | % growth | Items | Collection | % growth | Items | \$ Amount | % growth | Collection | \$ Amount | % growth | Items | Collection | \$ Amount |
| | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Lamiales (continued) | | | | | | | | | | | | | | | | |
| | 372 | Orobanchaceae | 35 | 16,67 | 5 | 30 | \$17,81 | 11,11 | 3 | 27 | \$0,00 | 3,85 | 1 | 26 | \$55,90 | \$73,71 |
| | 373 | Gesneriaceae | 115 | 9,52 | 10 | 105 | \$211,13 | 7,14 | 7 | 98 | \$0,00 | 15,29 | 13 | 85 | \$24,19 | \$235,32 |
| | 374 | Bignoniaceae | 28 | 7,69 | 2 | 26 | \$0,00 | 13,04 | 3 | 23 | \$15,07 | 9,52 | 2 | 21 | \$10,66 | \$25,73 |
| | 375 | Pedaliaceae | 11 | 22,22 | 2 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | \$0,00 |
| | 376 | Globulariaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| | 377 | Acanthaceae | 36 | - | 0 | 36 | \$0,00 | 20,00 | 6 | 30 | \$80,56 | - | 0 | 30 | \$0,00 | \$80,56 |
| | 378 | Mendonciaceae (now Acanthaceae) | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| | 379 | Myoporaceae | 5 | 25,00 | 1 | 4 | \$155,93 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$155,93 |
| | 380 | Plantaginaceae | 21 | 10,53 | 2 | 19 | \$0,00 | - | 0 | 19 | \$0,00 | 5,56 | 1 | 18 | \$0,00 | \$0,00 |
| Solanales | | | | | | | | | | | | | | | | |
| | 349 | Convolvulaceae | 152 | 5,56 | 8 | 144 | \$0,00 | 6,67 | 9 | 135 | \$0,00 | 2,27 | 3 | 132 | \$7,63 | \$7,63 |
| | 360 | Cuscutaceae (now Convolvulaceae) | 11 | 22,22 | 2 | 9 | \$0,00 | 28,57 | 2 | 7 | \$0,00 | 16,67 | 1 | 6 | \$0,00 | \$0,00 |
| | 368 | Nolanaceae (now Solanaceae) | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| | 369 | Solanaceae | 737 | 7,75 | 53 | 684 | \$465,76 | 8,74 | 55 | 629 | \$402,70 | 9,58 | 55 | 574 | \$393,50 | \$1.261,96 |
| Aquifoliales | | | | | | | | | | | | | | | | |
| | 278 | Aquifoliaceae | 47 | 6,82 | 3 | 44 | \$0,00 | 12,82 | 5 | 39 | \$44,96 | 11,43 | 4 | 35 | \$63,54 | \$108,50 |
| Asterales | | | | | | | | | | | | | | | | |
| | 361 | Menyanthaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| | 387 | Campanulaceae | 42 | 16,67 | 6 | 36 | \$25,81 | - | 0 | 36 | \$0,00 | 12,50 | 4 | 32 | \$35,69 | \$61,50 |
| | 388 | Goodeniaceae | 1 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | - | 0 | 1 | \$0,00 | \$0,00 |
| | 389 | Stylidiaceae | 5 | 25,00 | 1 | 4 | \$17,44 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$17,44 |

Table 15.4 (continued) : Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - growth of monograph collection in single seed plant families and genera 1995 – 2009 | | | | | | | | | | | | | | | | |
|--|-----|----------------------------|-----------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------------------|--------------------------------|
| Spermatophyta | Cat | Description | Size of Collection | 2005-2009 % growth | 2005-2009 Items added | Size of Collection | 2005-2009 \$ Amount of orders | 2000-2004 % growth | 2000-2004 Items added | Size of Collection | 2000-2004 \$ Amount of orders | 1995-1999 % growth | 1995-1999 Items added | Size of Collection | 1995-1999 \$ Amount of orders | Total \$ spent 1995-2009 |
| Angiosperms (15) Dicotyledons (12): Core Eudicots | | | | | | | | | | | | | | | | |
| Asterales (continued) | | | | | | | | | | | | | | | | |
| QL 312 - QL 312.999 | 390 | Calyceraceae | 4 | - | 0 | 4 | \$0,00 | 33,33 | 1 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 313 - QL 9999 | 391 | Compositae (Asteraceae) | 1.129 | 6,81 | 72 | 1.057 | \$468,89 | 8,41 | 82 | 975 | \$3.184,61 | 7,26 | 66 | 909 | \$496,33 | \$4.149,83 |
| Bruniales | | | | | | | | | | | | | | | | |
| QL 141 - QL 141.999 | 242 | Bruniaceae | 1 | - | 0 | 1 | \$0,00 | | 1 | 0 | \$0,00 | | 0 | 0 | \$0,00 | \$0,00 |
| Dipsacales | | | | | | | | | | | | | | | | |
| QL 302 - QL 302.999 | 382 | Caprifoliaceae | 31 | 6,90 | 2 | 29 | \$0,00 | 11,54 | 3 | 26 | \$0,00 | 8,33 | 2 | 24 | \$0,00 | \$0,00 |
| QL 303 - QL 303.999 | 383 | Adoxaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 304 - QL 304.999 | 384 | Valerianaceae | 18 | 5,88 | 1 | 17 | \$0,00 | 6,25 | 1 | 16 | \$0,00 | - | 0 | 16 | \$0,00 | \$0,00 |
| QL 305 - QL 305.999 | 385 | Dipsacaceae | 9 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | - | 0 | 9 | \$0,00 | \$0,00 |
| Apiales | | | | | | | | | | | | | | | | |
| QL 137 - QL 137.999 | 239 | Pittosporaceae | 8 | - | 0 | 8 | \$0,00 | 14,29 | 1 | 7 | \$0,00 | - | 0 | 7 | \$0,00 | \$0,00 |
| QL 254 - QL 254.999 | 334 | Araliaceae | 93 | 3,33 | 3 | 90 | \$0,00 | 13,92 | 11 | 79 | \$0,00 | 23,44 | 15 | 64 | \$250,01 | \$250,01 |
| QL 255 - QL 255.999 | 335 | Apiaceae | 176 | 6,02 | 10 | 166 | \$532,64 | 6,41 | 10 | 156 | \$21,57 | 6,12 | 9 | 147 | \$213,84 | \$768,05 |

APPENDICES

Table 15.4 (continued): Collection development in single fern and seed plant families (subclass QL) in the period 1995 - 2009

| Collection development - Growth of monograph collection in single seed plant families and genera 1995 – 2009 | | | | | | | | | | | | | | | | |
|--|-----|-----------------|------------|-----------|-----------|------------|-------------|-----------|-----------|------------|-------------|-----------|-----------|------------|-------------|-------------|
| Spermatophyta | Cat | Description | Size of | 2005-2009 | 2005-2009 | Size of | 2005-2009 | 2000-2004 | 2000-2004 | Size of | 2000-2004 | 1995-1999 | 1995-1999 | Size of | 1995-1999 | Total \$ |
| Angiosperms (16) | | | Collection | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | % growth | Items | Collection | \$ Amount | spent |
| Dicotyledons (13): | | | 2009 | | added | 2005 | of orders | | added | 2000 | of orders | | added | 1995 | of orders | 1995-2009 |
| Core Eudicots | | | | | | | | | | | | | | | | |
| Taxa with uncertain placement | | | | | | | | | | | | | | | | |
| QL 188 - QL 188.999 | 282 | Icacinaceae | 4 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 192 - QL 192.999 | 286 | Sabiaceae | 2 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | - | 0 | 2 | \$0,00 | \$0,00 |
| QL 206 - QL 206.099 | 296 | Dilleniaceae | 3 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | - | 0 | 3 | \$0,00 | \$0,00 |
| QL 260 - QL 260.999 | 342 | Lennoaceae | 4 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | - | 0 | 4 | \$0,00 | \$0,00 |
| QL 281 - QL 281.999 | 363 | Hydrophyllaceae | 20 | - | 0 | 20 | \$0,00 | 11,11 | 2 | 18 | \$0,00 | - | 0 | 18 | \$0,00 | \$0,00 |
| QL 282 - QL 283.099 | 364 | Boraginaceae | 68 | 7,94 | 5 | 63 | \$74,00 | 8,62 | 5 | 58 | \$0,00 | - | 0 | 58 | \$0,00 | \$74,00 |
| Total Dicots | | | 14.666 | 7% | 1.029 | 13.637 | \$12.916,83 | 10,3% | 1273 | 12.364 | \$22.991,22 | 11,1% | 1.237 | 11.127 | \$17.719,83 | \$53.627,88 |

Table 15.5 : Age of collection analysis (based on publication dates) in LC-Classes Q (Science) and S (Agriculture) < 1909 - 2009

| Age of collection: publication dates of monographs in Class Q < 1909-2009 | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Class Q | < 1909 | < 1909 | 1910-1919 | 1910-1919 | 1920-1929 | 1920-1929 | 1930-1939 | 1930-1939 | 1940-1949 | 1940-1949 | 1950-1959 | 1950-1959 | 1960-1969 | 1960-1969 | 1970-1979 | 1970-1979 | 1980-1989 | 1980-1989 | 1990-1999 | 1990-1999 | 2000-2009 | 2000-2009 | Total |
| | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items |
| Botany-general | 7937 | 39,86 | 801 | 4,02 | 772 | 3,88 | 668 | 3,35 | 461 | 2,32 | 701 | 3,52 | 1577 | 7,92 | 1926 | 9,67 | 2239 | 11,24 | 1781 | 8,94 | 1050 | 5,27 | 19913 |
| Floras and botany by place | 4266 | 28,77 | 466 | 3,14 | 495 | 3,34 | 617 | 4,16 | 469 | 3,16 | 671 | 4,53 | 1191 | 8,03 | 1624 | 10,95 | 2115 | 14,26 | 1762 | 11,88 | 1152 | 7,77 | 14828 |
| Cryptogams-general | 484 | 41,65 | 33 | 2,84 | 33 | 2,84 | 65 | 5,59 | 31 | 2,67 | 52 | 4,48 | 73 | 6,28 | 106 | 9,12 | 129 | 11,10 | 89 | 7,66 | 67 | 5,77 | 1162 |
| Algae | 621 | 30,31 | 104 | 5,08 | 102 | 4,98 | 147 | 7,17 | 68 | 3,32 | 110 | 5,37 | 225 | 10,98 | 233 | 11,37 | 217 | 10,59 | 121 | 5,91 | 101 | 4,93 | 2049 |
| Bryophyta | 591 | 24,46 | 78 | 3,23 | 79 | 3,27 | 66 | 2,73 | 59 | 2,44 | 97 | 4,01 | 115 | 4,76 | 238 | 9,85 | 282 | 11,67 | 309 | 12,79 | 502 | 20,78 | 2416 |
| Lichens | 222 | 19,46 | 28 | 2,45 | 40 | 3,51 | 51 | 4,47 | 19 | 1,67 | 39 | 3,42 | 89 | 7,80 | 123 | 10,78 | 141 | 12,36 | 189 | 16,56 | 200 | 17,53 | 1141 |
| Fungi | 743 | 17,27 | 185 | 4,30 | 161 | 3,74 | 198 | 4,60 | 190 | 4,42 | 224 | 5,21 | 498 | 11,58 | 576 | 13,39 | 676 | 15,71 | 527 | 12,25 | 324 | 7,53 | 4302 |
| Ferns | 115 | 37,83 | 10 | 3,29 | 20 | 6,58 | 14 | 4,61 | 4 | 1,32 | 20 | 6,58 | 37 | 12,17 | 27 | 8,88 | 27 | 8,88 | 19 | 6,25 | 11 | 3,62 | 304 |
| Spermatophytes-general | 229 | 14,88 | 68 | 4,42 | 107 | 6,95 | 96 | 6,24 | 84 | 5,46 | 130 | 8,45 | 244 | 15,85 | 262 | 17,02 | 145 | 9,42 | 110 | 7,15 | 64 | 4,16 | 1539 |
| Seed plant families and genera | 3483 | 18,57 | 693 | 3,69 | 758 | 4,04 | 1067 | 5,69 | 912 | 4,86 | 1234 | 6,58 | 2004 | 10,68 | 2114 | 11,27 | 2876 | 15,33 | 2127 | 11,34 | 1493 | 7,96 | 18761 |
| Plant anatomy | 491 | 32,95 | 51 | 3,42 | 61 | 4,09 | 56 | 3,76 | 39 | 2,62 | 82 | 5,50 | 176 | 11,81 | 174 | 11,68 | 165 | 11,07 | 122 | 8,19 | 73 | 4,90 | 1490 |
| Plant physiology | 656 | 18,94 | 126 | 3,64 | 148 | 4,27 | 134 | 3,87 | 91 | 2,63 | 164 | 4,74 | 465 | 13,43 | 518 | 14,96 | 651 | 18,80 | 388 | 11,20 | 122 | 3,52 | 3463 |
| Plant ecology | 206 | 9,25 | 98 | 4,40 | 134 | 6,01 | 86 | 3,86 | 82 | 3,68 | 167 | 7,50 | 406 | 18,22 | 339 | 15,22 | 300 | 13,46 | 256 | 11,49 | 154 | 6,91 | 2228 |
| Zoology | 148 | 10,83 | 38 | 2,78 | 44 | 3,22 | 63 | 4,61 | 65 | 4,75 | 102 | 7,46 | 197 | 14,41 | 207 | 15,14 | 239 | 17,48 | 154 | 11,27 | 110 | 8,05 | 1367 |
| Microbiology | 134 | 13,56 | 26 | 2,63 | 40 | 4,05 | 42 | 4,25 | 59 | 5,97 | 96 | 9,72 | 173 | 17,51 | 168 | 17,00 | 150 | 15,18 | 79 | 8,00 | 21 | 2,13 | 988 |
| Natural history | 539 | 10,96 | 87 | 1,77 | 89 | 1,81 | 116 | 2,36 | 127 | 2,58 | 193 | 3,92 | 486 | 9,88 | 725 | 14,74 | 902 | 18,34 | 1003 | 20,39 | 652 | 13,25 | 4919 |
| Non-biological sciences | 136 | 8,77 | 32 | 2,06 | 50 | 3,23 | 52 | 3,35 | 87 | 5,61 | 128 | 8,26 | 288 | 18,58 | 273 | 17,61 | 250 | 16,13 | 154 | 9,94 | 100 | 6,45 | 1550 |
| Geology and paleontology | 776 | 28,21 | 171 | 6,22 | 147 | 5,34 | 153 | 5,56 | 82 | 2,98 | 130 | 4,73 | 408 | 14,83 | 371 | 13,49 | 294 | 10,69 | 133 | 4,83 | 86 | 3,13 | 2751 |
| Physiology | 32 | 9,76 | 7 | 2,13 | 9 | 2,74 | 12 | 3,66 | 20 | 6,10 | 30 | 9,15 | 65 | 19,82 | 66 | 20,12 | 57 | 17,38 | 22 | 6,71 | 8 | 2,44 | 328 |

Table 15.5 (continued) : Age of collection analysis (based on publication dates) in LC-Classes Q (Science) and S (Agriculture) < 1909 - 2009

| Age of collection: publication dates of monographs in Class S < 1909 - 2009 | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Class S | < 1909 | < 1909 | 1910-1919 | 1910-1919 | 1920-1929 | 1920-1929 | 1930-1939 | 1930-1939 | 1940-1949 | 1940-1949 | 1950-1959 | 1950-1959 | 1960-1969 | 1960-1969 | 1970-1979 | 1970-1979 | 1980-1989 | 1980-1989 | 1990-1999 | 1990-1999 | 2000-2009 | 2000-2009 | Total |
| | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items | % of collection | number of items |
| Agriculture | 435 | 15,81 | 91 | 3,31 | 81 | 2,94 | 118 | 4,29 | 188 | 6,83 | 217 | 7,89 | 473 | 17,19 | 430 | 15,63 | 383 | 13,92 | 227 | 8,25 | 109 | 3,96 | 2752 |
| General plant culture | 12 | 20,34 | 1 | 1,69 | 3 | 5,08 | 8 | 13,56 | 1 | 1,69 | 8 | 13,56 | 9 | 15,25 | 7 | 11,86 | 3 | 5,08 | 3 | 5,08 | 4 | 6,78 | 59 |
| Economic botany | 426 | 29,34 | 56 | 3,86 | 48 | 3,31 | 50 | 3,44 | 68 | 4,68 | 90 | 6,20 | 170 | 11,71 | 183 | 12,60 | 173 | 11,91 | 130 | 8,95 | 58 | 3,99 | 1452 |
| Seeds, propagation, pruning | 89 | 8,65 | 27 | 2,62 | 43 | 4,18 | 53 | 5,15 | 46 | 4,47 | 61 | 5,93 | 77 | 7,48 | 142 | 13,80 | 232 | 22,55 | 181 | 17,59 | 78 | 7,58 | 1029 |
| Artificial light/hydroponics | 5 | 3,70 | 0 | - | 1 | 0,74 | 4 | 2,96 | 8 | 5,93 | 11 | 8,15 | 9 | 6,67 | 34 | 25,19 | 27 | 20,00 | 14 | 10,37 | 22 | 16,30 | 135 |
| Crops | 140 | 11,83 | 37 | 3,13 | 33 | 2,79 | 46 | 3,89 | 54 | 4,56 | 71 | 6,00 | 150 | 12,68 | 144 | 12,17 | 231 | 19,53 | 178 | 15,05 | 99 | 8,37 | 1183 |
| Vegetables | 62 | 5,42 | 52 | 4,55 | 26 | 2,27 | 26 | 2,27 | 79 | 6,91 | 46 | 4,02 | 71 | 6,21 | 218 | 19,07 | 273 | 23,88 | 233 | 20,38 | 57 | 4,99 | 1143 |
| Fruit | 233 | 26,36 | 39 | 4,41 | 48 | 5,43 | 21 | 2,38 | 38 | 4,30 | 40 | 4,52 | 72 | 8,14 | 87 | 9,84 | 145 | 16,40 | 110 | 12,44 | 51 | 5,77 | 884 |
| Flower culture | 288 | 14,72 | 49 | 2,50 | 60 | 3,07 | 58 | 2,96 | 57 | 2,91 | 117 | 5,98 | 202 | 10,32 | 411 | 21,00 | 309 | 15,79 | 281 | 14,36 | 125 | 6,39 | 1957 |
| Types of plants | 127 | 4,70 | 56 | 2,07 | 72 | 2,66 | 103 | 3,81 | 83 | 3,07 | 144 | 5,32 | 256 | 9,46 | 457 | 16,89 | 567 | 20,96 | 631 | 23,33 | 209 | 7,73 | 2705 |
| Flower arrangement | 13 | 1,77 | 6 | 0,82 | 4 | 0,54 | 44 | 5,98 | 43 | 5,84 | 129 | 17,53 | 156 | 21,20 | 100 | 13,59 | 137 | 18,61 | 85 | 11,55 | 19 | 2,58 | 736 |
| Gardening | 379 | 10,87 | 133 | 3,82 | 160 | 4,59 | 216 | 6,20 | 112 | 3,21 | 200 | 5,74 | 290 | 8,32 | 381 | 10,93 | 638 | 18,30 | 715 | 20,51 | 262 | 7,52 | 3486 |
| Landscape gardening | 1 | 1,69 | 1 | 1,69 | 0 | - | 1 | 1,69 | 0 | - | 1 | 1,69 | 0 | - | 8 | 13,56 | 13 | 22,03 | 15 | 25,42 | 19 | 32,20 | 59 |
| Parks | 200 | 11,63 | 49 | 2,85 | 50 | 2,91 | 43 | 2,50 | 31 | 1,80 | 68 | 3,95 | 131 | 7,62 | 236 | 13,72 | 354 | 20,58 | 430 | 25,00 | 128 | 7,44 | 1720 |
| Pests and diseases | 195 | 6,86 | 91 | 3,20 | 91 | 3,20 | 116 | 4,08 | 117 | 4,12 | 185 | 6,51 | 430 | 15,14 | 426 | 14,99 | 558 | 19,64 | 413 | 14,54 | 219 | 7,71 | 2841 |
| Economic zoology | 1 | 1,39 | 0 | - | 0 | - | 2 | 2,78 | 4 | 5,56 | 6 | 8,33 | 8 | 11,11 | 12 | 16,67 | 20 | 27,78 | 14 | 19,44 | 5 | 6,94 | 72 |
| Forestry | 385 | 11,89 | 107 | 3,30 | 143 | 4,42 | 143 | 4,42 | 125 | 3,86 | 176 | 5,44 | 416 | 12,85 | 322 | 9,94 | 417 | 12,88 | 438 | 13,53 | 566 | 17,48 | 3238 |
| Animal culture | 30 | 13,39 | 3 | 1,34 | 4 | 1,79 | 10 | 4,46 | 13 | 5,80 | 20 | 8,93 | 12 | 5,36 | 43 | 19,20 | 38 | 16,96 | 18 | 8,04 | 33 | 14,73 | 224 |
| Aquaculture | 2 | 3,39 | 1 | 1,69 | 1 | 1,69 | 0 | - | 1 | 1,69 | 3 | 5,08 | 6 | 10,17 | 9 | 15,25 | 17 | 28,81 | 10 | 16,95 | 9 | 15,25 | 59 |