

# Teaching Methods

## The Pennsylvania State University Medieval Garden: Using a Specialized Garden as an Alternative Teaching and Learning Environment

Martin R. McGann<sup>1</sup> and  
Robert D. Berghage<sup>2</sup>

**ADDITIONAL INDEX WORDS.** hands-on teaching, medieval herbals, medieval plants, period illustration

**SUMMARY.** The Pennsylvania State University Medieval Garden (PSMG) showcases varieties of medieval plants used as ornamentals, food crops, medicinal ingredients, and for household purposes in a stylized setting representing a medieval garden. Since its installation, various colleges within the university as well as community groups have used the garden as an alternative classroom for learning activities, educational demonstrations, and events related to the medieval period. This article focuses on the initial development of the garden design and how the installation and continued use as a classroom has contributed to meeting educational goals for students in the landscape contracting program at the Pennsylvania State University and the Pennsylvania Governor's School for Agricultural Sciences.

<sup>1</sup>Associate professor of landscape contracting, Department of Horticulture, The Pennsylvania State University.

<sup>2</sup>Associate professor of horticulture, Department of Horticulture, The Pennsylvania State University.

By using alternative teaching environments outside of the traditional classroom, educators can offer students a variety of learning experiences that engage and challenge. It has been determined that activity-based curricula that include hands-on experiences help students retain new knowledge and acquire new skills (McCormick et al., 1989). Horticulture provides an excellent opportunity for such hands-on learning (Skelly and Zajaicek, 1998) and the role of agriculture in development of the human race can be integrated into these programs. It has been suggested that an interdisciplinary approach, focusing on multiculturalism, allows for integration of horticulture across several disciplines (Eames-Sheavly, 1994). These disciplines can include history, medicine, art, science, and language arts. One of the most versatile environments for these multicultural and multidisciplinary programs is the garden (Skelly and Zajaicek, 1998). Specialized gardens can be employed as a teaching platform to introduce new concepts into existing curricula and also as a cooperative learning environment for students and their peers, teachers, volunteers, and parents. Integration of this interdisciplinary multicultural approach to horticulture has been used in the PSMG on the main campus of the Pennsylvania State University (Penn State) at University Park where development of a program for exceptional high school students uses this specialized garden as an outdoor classroom.

### Garden development and interpretation

The PSMG was developed to highlight different aspects of the medieval garden and landscape. The medieval period is generally considered to lie between the fall of classical antiquity and the start of the Renaissance [476 CE

(current era) to 1450 CE]. The PSMG evolved from a temporary indoor garden display presented at "Scenes and Seasons: The Medieval Landscape," a conference held at the University Park campus of Penn State in April 1999. The conference brought together members of the academic community, professional gardeners and other individuals interested in medieval landscapes and plants. A portion of the conference, to which the public was invited, was dedicated to the display of different aspects of medieval crafts, life and skills. This included longbow and crossbow demonstrations, bread baking, preparation of household potions, tool making and pottery throwing. One result of this public interaction with the exhibitors and displays was the tremendous interest from the general public in many aspects of medieval life related to horticulture. Many visitors requested information on medieval gardens, the different uses of plants, and where to acquire them. Development of a permanent medieval garden display was viewed as an avenue to address this need and provide a simultaneous, multi-faceted learning environment for undergraduates. Although an outdoor garden of this type had been desired by individuals and groups within the university for some time, the funding, the land, and methods of installation had not been available. After this conference, a coordinated effort between the Department of Horticulture and the Center for Medieval Studies was made to obtain funds, and a grant was received from AT&T (Bedminster, N.J.). The 150 × 50-ft (45.7 × 15.2-m) garden was constructed on land provided by the Department of Horticulture, and labor came from students in the department's Landscape Contracting Program.

The objective of the project was to provide a representative plant collection and to provide interpretive information to visitors, students and educators. The garden was designed to meet educational, research and aesthetic needs of students and faculty in the Department of Horticulture, the Center for Medieval Studies, other colleges and departments within the university, regional public schools (both elementary and secondary), outreach education programs outside of the region and lastly, as an inventory platform for heirloom plant varieties. A secondary benefit has been the number of tourists and visitors who seek the garden during a visit to campus.

The PSMG is representative of a garden of northwestern Europe during the latter Middle Ages. The selection of this time period permits use of the broadest range of period texts for plant research, teaching and garden illustrations. Although many period texts describe plants and their uses, information on specific medieval garden design, materials used and plant culture is minimal. Published garden information discusses the variety of period garden styles and designs but specifics on when certain styles were introduced, regional variations in design, plant availability or management of the garden are very limited. It was therefore necessary to adopt a stylized representative garden design using elements adapted from a variety of different period and modern illustrations and texts. In concept, the garden provides a setting that functions as a background to display medieval plants used as ornamentals, food crops, medicinal ingredients and other household purposes. In addition, the garden was also designed to serve as an outdoor classroom for students with such varied interests as horticulture and plant science, use of plants in the medieval period, medicine, fine arts and plant illustration. One of the first uses of the garden after its initial installation was by the Penn State School of Nursing; students were required to use plants to

prepare papers on alternative medicines. Subsequent uses of the garden include classes in herbaceous plant identification, plant propagation, landscape construction, fine arts: introduction to drawing, painting, photography, early German literature, medieval studies and art history.

A preliminary design plan was prepared for a three-part garden representing the formal, social, and utilitarian aspects of a medieval garden. The three main areas include a formal garden, kitchen garden, and pleasure ground (Fig. 1). Each section displays different aspects of medieval gardens and plants.

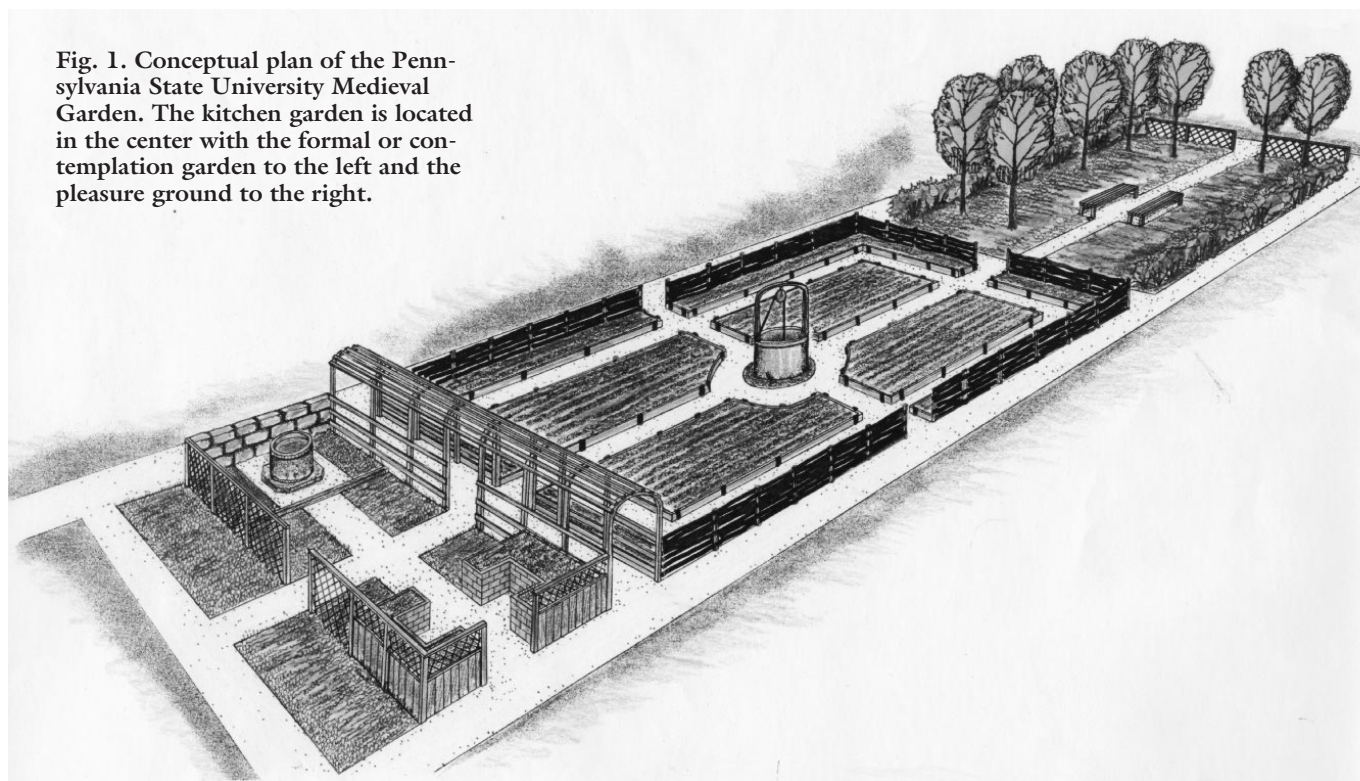
The formal garden is an enclosed garden and has an herbaceous border with plants important in romance and religion. Some of these plants include those with three leaves [e.g., strawberry (*Fragaria vesca*)] representing the Holy Trinity, fruit trees representing the Tree of Life or Tree of Knowledge, white flowers that stand for the Virgin Mary, red flowers that stand for the Blood of the Martyrs and other plants that represent important personages or events in the bible. This garden also has a raised turf bench, or exedra, that is often depicted in period illustrations (Harvey, 1981).

The kitchen garden contains plants as important sources of medicines, sea-

sonings, fragrances, sauces, dyes and other household and culinary purposes (Landsberg, 1996). The variety of uses for some plants is surprising. For example mugwort, (*Artemisia vulgaris*), a common weed in the modern landscape, was used to flavor pork and drink, as a moth repellent, to protect the traveler from fatigue and sunstroke and a protection against evil spirits. Plants in the kitchen garden are located in raised beds surrounded by a wattle fence, a structure created by weaving limber saplings between upright posts. They are very quick, easy and inexpensive to construct. Typically white willow (*Salix alba*) or european hazel (*Corylus avellana*) was used in their construction (Landsberg, 1996) since these were abundant natural resources. For this garden, red maple (*Acer rubrum*) saplings were used since they were readily available. A simulated well is located in the center of this garden where it would have typically provided water for garden and household uses.

The pleasure ground has a more informal aspect with an enclosing hedge and sapling fence. In medieval times these fences and hedges acted as physical and symbolic barriers between the ordered world of the garden and the chaos of the outside world (Pearsall, 1986). Ornamental plants are located around the perimeter in planting beds

Fig. 1. Conceptual plan of the Pennsylvania State University Medieval Garden. The kitchen garden is located in the center with the formal or contemplation garden to the left and the pleasure ground to the right.



**Table 1. Partial list of plants suitable for medieval gardens.**

Common name	Scientific name
Alecost	<i>Tanacetum balsamita</i>
Alkanet	<i>Alkanna tinctoria</i>
Ambrosia	<i>Chenopodium botrys</i>
Bean, broad	<i>Vicia faba</i>
Bishop's weed	<i>Ammi majus</i>
Borage	<i>Borago officinalis</i>
Celandine	<i>Chelidonium majus</i>
Chaste tree	<i>Vitex agnus-castus</i>
Cornflowers	<i>Centaurea cyanus</i>
Deadly nightshade	<i>Atropa belladonna</i>
Dittany of crete	<i>Origanum dictamnus</i>
Dyers greenweed	<i>Gentista tinctoria</i>
Elecampane	<i>Inula helenium</i>
Fenugreek	<i>Trigonella foenum-graecum</i>
Feverfew	<i>Chrysanthemum parthenium</i>
Fumitory	<i>Fumaria officinalis</i>
Gentain	<i>Gentiana lutea</i>
Good king henry	<i>Chenopodium bonus-henricus</i>
Herb robert	<i>Geranium robertianum</i>
Hollyhocks	<i>Althaea rosea</i>
Iris, yellow flag	<i>Iris pseudacorus</i>
Ladies bedstraw	<i>Galium verum</i>
Lentil	<i>Lens culinaris</i>
Liquorice	<i>Glycyrrhiza glabra</i>
Lungwort	<i>Pulmonaria officinalis</i>
Madder root	<i>Rubia tinctorum</i>
Mandrake	<i>Mandragora officinarum</i>
Masterwort	<i>Peucedanum ostruthium</i>
Monkshood	<i>Aconitum napellus</i>
Oregano	<i>Origanum vulgare</i>
Parsnip, garden	<i>Pastinacea domestica</i>
Pimpernel	<i>Anagallis arvensis</i>
Poppy	<i>Papaver somniferum</i>
Rocket	<i>Eruca vesicaria sativa</i>
Rose, rosa mundi	<i>Rosa gallica versicolor</i>
Saffron	<i>Crocus sativus</i>
Soapwort	<i>Saponaria officinalis</i>
St. john's wort	<i>Hypericum perforatum</i>
Tansy	<i>Tanacetum vulgare</i>
Thistle, blessed	<i>Cnicus benedictus</i>
Valerian	<i>Valeriana officinalis</i>
Wallflower	<i>Cheiranthus cheiri</i>
Woad	<i>Isatis tinctoria</i>
Wormwood	<i>Artemisia absinthium</i>

and are also planted in the turf. Several fruit trees are located within this garden for flowers, fruit and shade. The pleasure ground was a space used for recreation and could vary in size from <1 acre (0.4 ha) to several hundred acres (Van Buren, 1986). Enjoyments found in these gardens included musicians, lawn games, archery, chess, reading, and romantic liaisons. Space on one side of the garden has been left for field crop plots while on another end a small orchard of period fruit trees has been planned. The entire garden is accessed by gravel paths, both on the

interior and exterior, with planting beds arranged so that plant material is readily available to study or harvest.

The PSMG is situated within the grounds of the Penn Sate Horticultural Trial Gardens, close to campus and adjacent to a major arterial roadway making it visually prominent and very accessible. Garden construction was accomplished by two successive senior level classes of students in the Landscape Contracting program in the Department of Horticulture. The first class was responsible for construction of the kitchen and pleasure garden. The second class constructed

the formal garden. Except for the initial ground clearing, students prepared garden details for construction, surveyed and laid out the improvements, and were responsible for general excavation, spreading walk materials, working with reinforcement bars, pouring concrete, and digging and setting posts. The initial construction of the garden was accomplished in 27 h of class time using 22 students during spring semester 2000. A similar period of time was required during spring semester 2001 using 12 students for the subsequent installation. Student participation and the quality of the work were evaluated during the entire length of the project by their professors. Individual participation counted towards the student's final grade as did the quality of the finished product in terms of on-time completion, adherence to the construction plans, quality of the work and site clean-up. To enhance the effect of the PSMG setting, period structures and features have been used whenever possible, including the wattle enclosure, a diamond pattern sapling fence installation, building an arbor from saplings, construction of benches from rough lumber, and building a masonry wellhead.

### **Pennsylvania Governor's School for Agricultural Sciences**

The PSMG was an ideal resource for experiential and hands-on teaching for the Pennsylvania Governor's School for Agricultural Sciences (PGSAS). The PGSAS is a summer course of study for academically talented sophomore and junior high school students who have expressed a strong interest in agricultural issues. Students are selected based on their academic performance, leadership abilities, and interest in pursuing science and related issues beyond the classroom. Each year up to 64 applicants are selected to be student scholars for the PGSAS and are required to pursue an Independent Study Project (ISP) in addition to core program of courses offered. The medieval plants ISP, designed for PGSAS in 2000, incorporated the use of the PSMG and exposed the student scholars to medieval arts and technologies, while requiring them to perform literature research and illustration. The literature research included investigating the historical and contemporary uses of plants within the context of the latter medieval period, folklore

Fig. 2. Sample data sheet used to display information on medieval plants grown in the Pennsylvania State University Medieval Garden.

**Date Entered:** July 18, 2000—Britta Strong

**Common Name:** Chives

**Genus:** Allium

**Species:** schoenoprasum

**Family:** Liliaceae

**AKA:** none

**Historical uses:** Culinary, medicinal

**Description:** 1) *Culinary:* chives have been used to accompany food for about 5000 years; John Gerard, and early English herbalist, called chives a “good sawce and pot-herb.” 2) *Medicinal:* chives were said to aid digestion.

**Contemporary uses:** Culinary, medicinal, household

**Description:** 1) *Culinary:* the mild onion flavor of fresh chives is used in potato and fish dishes, along with many others, and can be used in flavoring vinegar and as a garnish. 2) *Medicinal:* chives are a good source of Vitamin C; used as a digestive and appetizer; and though to be good of anemia, although not commonly used as a treatment. 3) *Household:* chive tea sprayed on gooseberries prevents mildew; grown next to roses, chives fight black spot; next to carrots, they prevent carrot fly; near fruit trees, chives prevent fruit scab; chive oil has antibacterial uses.

**Origin:** Europe, Asia

**Plant type:** perennial

**Form:** upright, spreading clump

**Height:** up to 10 inches

**Flower color:** pinkish-mauve

**Soil type:** rich soil with a fair amount of water

**pH:** 6–8

**Flowering Period:** June–July

**Physical description:** Chives appear to be small rushes and are grass-like in appearance; the leaves are hollow, the flowering stems are not.

**Sun requirements:** full sun or partial shade.

**Propagation:** by seed, or more commonly, by splitting an older clump and replanting.

**Lore:** Romanian gypsies used chives in fortune-telling; clumps were hung from ceilings and bedposts to ward off disease and evil spirits.

**Cautions:** Although chives must be cut low to the ground to prevent the production of tough stems, take care not to cut them too close or else the growth centers may be damaged – otherwise, they may be cut year-round.

**Miscellaneous:** Chive flowers attract honeybees and butterflies; there is also a variety of chives called garlic chives or chinese chives, which are used in many oriental dishes.

related to the plant, astrological lore, and cultural notations including habitat, soils, sunlight and other growth factors. The ISP culminated in the preparation of a hand-bound herbal that included all the students' work. Currently there are between 100 and 120 different period plants in the PSMG for students to select for their research project, out of a total of 508 researched plants appropriate to the period (Table 1).

Students were initially introduced to the medieval period by a combination of lectures and video presentations that established the backdrop for future discussions and activities. These lectures and presentations brought all students to the same level of understanding regarding this particular historical period. From discussions with the students, initial differences in basic knowledge were attributable to differences in courses taught and teaching methods

at the high school level. General themes related to political, social and cultural changes were covered with more detailed discussion on development of early botanical and horticultural knowledge, garden themes, plant use, and development of herbals as instruments of plant knowledge. Key personalities related to plant science such as Theophrastus, Dioscorides, Ibn Sina, Peter Schoffer, Gerard, Clusius, and Dodens were reviewed, along with a discussion of the differences between science and folklore that appear in these works. Slides and PowerPoint (Microsoft Corp., Redmond, Wash.) presentations were especially useful in demonstrating differences between hand-drawn, wood cuts, and copperplate illustrations. Many early hand-drawn illustrations prepared for individual folios provide detail not included in later woodcuts that were often hastily prepared copies used

for mass publication. Copperplates, a later duplication technique, were able to provide additional details of the plants due to finer etching tools used. To supplement the basic core of information provided by the instructors, medieval reenactors were also used to present different aspects of the uses of plants. These demonstrations covered household and medicinal uses, plants as symbols, and their use in art and literature. As part of these sessions, PGSAS students harvested specific plant parts from lavender and comfrey to create lotions and salves; they also poured their own floral-themed pilgrim medallions using hot tin and precarved slate molds.

The PGSAS scholars also made maximum use of the PSMG since it served as their alternative classroom, observation and demonstration area. Students were responsible for re-

**Table 2. Title and synopsis of selected references on medieval plants and gardens.**

Author, year	Synopsis
Bayard, 1997	Although related specifically to the medieval gardens at the Cloisters (Metropolitan Museum of Art, Fort Tryon Park, New York) this work provides a concise introduction to gardening and uses of herbs in the Middle Ages. Each of the gardens at the Cloisters is discussed in detail and a plant list is provided for each. A companion work to Freeman (1997).
Blunt and Raphael, 1979	This book explores illustrated manuscripts and herbals from the Middle Ages and early Renaissance and provides an insight into the development of botanical and medical knowledge and the evolution of botanical illustration.
Freeman, 1997	This book provides information on the uses of medieval plants for cooking, healing, poisoning pests, and fragrance. Each plant listed is accompanied by a description of its medieval function or value and most are also shown in period illustrations. A brief introduction provides an interesting overview of period works related to medicine, cookery and the general use of plants. A companion work to Bayard (1997).
Gerard, 1975	This is a reprint edition of the complete 1633 edition as revised and enlarged by Thomas Johnson. The work contains descriptions of 2850 plants and has 2700 original illustrations. The text is Elizabethan English that may take some adjustment by the reader however it provides a wonderful example of the information available at this period in history. Due to the date of publication some plants from the new world are included however it is an excellent source of information on medieval plants.
Harvey, 1981	This is a scholarly work by an author that has produced many articles on period gardens and plants. This book concentrates on examining British gardens of the Middle Ages however much of the information presented has a much broader application to other medieval gardens. Besides historical development, the author includes much information about plants used for medicine, food, and decorations. The many illustrations make it easier to understand the development and use of the gardens and their components.
Innes and Perry, 1997	This book explores the symbolism and significance of ornamental plants during the Middle Ages. Besides their obvious aesthetic value, many plants also had deeply religious or romantic symbolism that is examined in this text. The author also provides information on rituals and festivals in which flowers played a part during different seasons of the medieval year. Detailed color photographs and specific information on the medical, cosmetic and herbal uses of 78 plants are also included.
Landsberg, 1996	An excellent work on medieval gardens that provides information on historical background, period design and appropriate plant materials. The author has designed several re-created medieval gardens that are used as case studies complete with color photographs and hand-drawn illustrations. Different gardens and garden components are discussed that include orchards, monastic gardens, flowery meads, vineyards, kitchen gardens, seats, plants and fountains.
Talbot and Whiteman, 1997	Based on the series about a 12 <sup>th</sup> century monk, this book recreates Brother Cadfael's world centered on the monastic gardens at Shrewsbury. The book makes heavy use of references to the Cadfael series but provides an excellent index of medieval plants and herbs complete with astrological, medicinal, culinary and miscellaneous uses.



**Fig. 3. Sample plant illustration prepared as part of the Pennsylvania Governor's School for Agricultural Sciences herbal project.**

searching and compiling information on plants selected from the list of period plants being grown in the garden. This was generally between five and eight plants per student. The students were responsible for compiling information on these plants including historical uses, contemporary uses, horticultural data and folklore (Fig. 2). A literature review was carried out using standardized methods expected for any similar scholarly work. References available to the students included contemporary works and also reprinted and original period works (Table 2). Besides research on individual plants, PGSAS scholars also observed their particular plants within the medieval garden and prepared hand-

drawn illustrations to accompany their research work (Fig. 3). These individual research works were then compiled into an herbal representing the culmination of the ISP. The completed work on each plant developed by all students was reproduced on a parchment-like paper. Each scholar was then instructed on how to stitch and bind the folios together to make the body of the herbal. Illustrated faceplates were provided as well as an index of plants. Instruction was also provided on how to prepare a hard fabric cover for the herbal.

Students were also required to prepare and give a presentation to the other ISP participants that demonstrated their familiarity with at least one of the plants they selected. The presentation included a talk on the origin, history and medieval uses of the plant along with period documentation, contemporary photos and their hand drawn illustration. The students also prepared a physical demonstration on one particular aspect of how the plant was prepared and used.

Individual plant research data sheets prepared by the scholars are currently being used as a revolving series of informational sheets located in the PSMG. These sheets are mounted on movable plaques and explain historic and current uses of the plants as well as associated folklore and physical attributes. They are changed on a regular basis to highlight different plants during the growing season.

### Conclusion

The PSMG offers many unique educational and outreach programs. Besides its use as an outdoor classroom for horticulture, the PSMG has served as a site for on-campus educational courses, a location of hands-on experiential education for pre-school and elementary classes, and a classroom for other colleges in the university. The continued use of this space for extra-classroom activities yields many benefits for the users including increased

student creativity, self-expression and interest (Byers, 1999). Future plans for this garden include expansion of the collections to include less common plants, increased use of collection plants for teaching purposes and development of additional programs for education outreach.

The attraction of this garden as a multicultural teaching environment is that it offers a unique glimpse into a different age and presents plants on a distinctive historical platform. This aids in an understanding of how plants had an integral and pervasive role in the lives of civilizations during the Middle Ages and how that has evolved to the present day.

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