Department of Horticulture
Outcomes Assessment and Curricular Revision
Updated December 2002

· **INTENDED LEARNING OUTCOMES OF THE PROGRAM:**

GOALS:
The general goal of the proposed horticulture curriculum is to provide students a unique education that is a liberal, science-based, effective in personal developing skills, and that will prepare them for management-level positions in nurseries, seed companies, landscaping firms, greenhouses, garden centers, orchards, food processing companies, vegetable farms, or positions where a problem-solving approach is needed. This horticulture curriculum will provide graduates with the education and training necessary for them to become effective professionals and leaders in horticulture, their community, their country and the world. Students will accrue knowledge, grow in wisdom, and develop their skills relative to:

1. ***TECHNICAL KNOWLEDGE.*** The curriculum will provide graduates with the theoretical and practical scientific knowledge needed for continued efficient and sustainable production of horticulture crops, i.e. fruits, vegetables, spices, turf, and ornamentals as well as the information and subject-matter mastery required for the exercise of wise judgement in dealing with complex issues in resource management. Business education is essential to effectiveness of the otherwise competent professional horticulturist, and it must be instilled in the student that education is a life-long pursuit.

   Student Expectations:

   · Understand the scope of horticulture and its relationships to other disciplines (e.g., biological, physical, and social sciences) and professions.

   · Develop a basic understanding of plant, soil, water, and environmental principles in both controlled environments and field conditions.

   · Understand basic technical principles and methods related to production of horticultural crops: plant nutrition, soils and artificial substrates, propagation, breeding, establishment and maintenance of permanent planting, preparation and planting practices of annual and perennial crops, cropping systems and cultivation practices, efficient and environmental sound fertilization, pest control strategies, harvesting and marketing strategies and assessment of quality standards for horticultural crops.

   · Understand basic strategies for efficient and abundant production, harvest, and storage of high-quality food, flowers, turf and herbaceous/woody ornamental crops.

   · Be able to recognize common biotic and abiotic stresses, their potential effects on plants at various stages of plant development, and options for reduction of stresses with minimal disturbance to the environment, and human beings.

   · Understand formulation and management of soil-based and artificial (soilless) substrates used in horticultural production. Understand how pest control affects environment and human concerns.

   · Be able to identify plants commonly used in the subdiscipline of the graduate.

2. ***PROFESSIONAL SKILLS.*** Students will develop the personnel management and technical skills needed to function in the forefront of an increasingly complex and global society. Oral and written communication, computer and leadership skills, and the critical, integrative thinking capacity that develops competent problem-solving and decision-making is emphasized. Skills development will be integrated into horticulture courses.

Student Expectations:

Communications

· Be able to present an effective oral report.

· Be able to orally answer questions extemporaneously in an organized and understandable way.

· Be able to write a concise, grammatically correct report.

· Be able to debate issues in a professional manner.

Leadership

· Possess the management skills necessary to motivate and organize a group of peers and subordinates in defining and solving a problem.

· Be able to work effectively in a team situation either as leader or participant.

· Possess high standards of achievement.

Computer

· Be able to productively use word processing, spreadsheet and presentation software.

· Be able to use the computer effectively to organize and interpret information.

· Be competent in electronic communications, including assessing and use of databases, the Internet, electronic bulletin boards, etc.

Problem solving

· Given a situation, be able to define the problem, identify the resources needed to solve it and propose alternative solutions based on the resources and/or needs of the client and the extended global community.

· Be able to analyze and interpret simple research data, understand the mean and probability.

· Be aware of need for continuing education through short courses, seminars, conferences.

General Professional

· Have a holistic perspective of the ecosystem, both rural and urban, and the interface between them.

· Understand basic business concepts: how to interpret a financial statement, calculate a profit or loss and return on investment, to construct a budget.

· Be able to use libraries, electronic repositories of information, and other information sources in support of further personal and professional growth.

- Be able to perform mathematical calculations appropriate to the profession, and interpret graphical and tabular information.

- Understand and use terminology appropriate to the field of expertise.

- Be able to interpret laws and regulations as they relate to agricultural production and products.

- Be able to prepare a resume and prepare for job and internship interviews.

3. ***PERSPECTIVE.*** The graduate should have a holistic perspective of horticulture. Students must be able to visualize integrated systems that operate within a political environment and on a global scale. Students must be able to visualize what makes the whole system work, and understand the responsibilities of the horticulturist within the system with respect to production and utilization of horticultural corps, in both rural and urban settings.

   Student Expectations:
   - Possess an awareness of the rural and urban influence of horticulture, in the U.S. and around the world.

   - Know the basic elements of the metric system of weights and measures.

   - Possess a general familiarity with horticultural practices used in other regions of the world and how, for political, cultural and economic reasons, they differ from those of the Midwestern U.S.

4. ***ETHICS/VALUES.*** The curriculum should lead students in development of an appreciation of ethical resource management responsibilities in regional, national and world social and economic contexts. It must instill an awareness for sustainable management of energy, soil, water, wildlife and other natural resources. Horticulture courses should provide opportunities for ethical debate and value judgment that expand one's tolerance and appreciation for the complexities of societal issues. The horticulture curriculum will foster development of a personal, professional code of ethics.

   Student Expectations
   - Be able to recognize and deal appropriately with moral, ethical, and legal conflicts: Recognize a conflict-of-interest situation involving oneself and one's client or employer; differentiate between the public good and personal goal.

   - Appreciate the responsibility of the individual in sustainable management of energy, soil, water, and plants.

5. ***DIVERSITY.*** For society to function effectively and justly for each person, graduates must appreciate the richness that our diverse backgrounds and philosophies bring to the whole. Tolerance of the opinions and practices of others is the hallmark of an educated person.

   Student Expectations
   - Appreciate that our cultural diversity, as expressed through the humanities and arts, adds richness to our lives.

   - Have tolerance of different beliefs and practices.

- Apply fundamental concepts of economics and the social sciences to human interaction and organization.

Student outcomes established for the new horticulture curriculum are essential to the mission of the Horticulture Department and the College of Agriculture to provide modern, high quality undergraduate academic programs that develop global leaders, advance horticulture, and promote urban development. Student outcomes reflect the general educational goals of the university which help students develop an appreciation of science and technology, an understanding of humane and ethical values, and a global appreciation of human, cultural, and biological diversity in our society. Our student outcomes also reflect more specific discipline expectations related to the scientific and technical background, and problem solving, management, business, and computer skills we believe are essential components of a well-educated horticulturist.

INTENDED STUDENT OUTCOMES FOR THE GENERAL EDUCATION COMPONENTS OF CURRICULA WITHIN THE COLLEGE OF AGRICULTURE

The intended student outcomes described below are consistent with the goals for undergraduate educational programs of Iowa State University which are characterized by: "Enhanced liberal educational components that ensure all undergraduate students, regardless of disciplinary major, literacy in science and technology; environmental awareness; communication and analytical skills; humane and ethical values; knowledge of the intellectual, historic, and artistic foundations of our culture; and international and multi-cultural awareness and sensitivity." (The Strategic Plan for Iowa State University, 1990).

Expectations of College of Agriculture Graduates:

Communications
Be able to speak and write clearly and persuasively.

Demonstrate the skills necessary to prepare effective visual presentation.

Be able to receive information effectively through reading, listening and observation.

Problem-Solving/Critical Thinking
Be able to work effectively with others on complex, issue-laden problems requiring holistic problem-solving approaches.

Demonstrate an ability to:
- -distinguish verifiable facts from value claims
- -determine the accuracy of statements
- -identify assumptions and detect bias
- -distinguish relevant from irrelevant information
- -prioritize needs

Be able to summarize, analyze, and interpret simple research data.

Ethics
Develop an ethical perspective and sense of moral responsibility and values.
Be able to discuss contemporary ethical and moral issues in professional and private life.
Be able to critically evaluate their own arguments and those of others.

Environmental Awareness
Understand the physical and biological properties of the environment and how these properties are interlinked within ecological systems.

Understand how human activities, such as modern agricultural practices, impact on the environment and how societies are affected by environmental change.

International/Multi-Cultural Awareness
Have an awareness and understanding of cultural diversity within our own nation and around the world.

Develop a global perspective on agricultural, environmental, economic, and natural resource issues.