FEATURE

Involving Alumni in Curriculum Evaluation

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A horticulture curriculum requires regular evaluation because of changing student needs. Traditionally, faculty have reviewed the curriculum and have made changes depending on their own observations. In recent years, an attempt has been made to improve this process by consulting others. For example, task forces in horticulture have been formed at the national level to assess groups representing education, government, business, and industry to determine student needs and establish curricular priorities (2).

However helpful task force recommendations may be, faculty ultimately must make the decisions regarding the curriculum for their institution. Alumni are in an advantageous position to judge the focus, quality, and adequacy of their education (1, 4, 5). The purpose of our investigation was to ask our horticulture graduates to evaluate—through the use of a survey—the curriculum to which they had been exposed.

SURVEY METHODS

A survey questionnaire requesting demographic data and opinions about their horticultural education and employment since graduation was mailed to 351 BS horticultural graduates from the Univ. of Missouri-Columbia. All horticultural graduates between 1979 and 1985 were included. We received 162 interpretable responses to our survey, for a 47% return rate. Since the responses were anonymous by design, no follow-up contacts were made.

The survey was divided into two sections: 1) demographic questions that were forced-choice blanks and short-answer questions, and 2) survey of opinion questions that employed the Likert Scale (3), with choices ranging from strongly agree to strongly disagree. About one-half of the Likert Scale questions were presented positively and half negatively. To verify opinion on key topics, two Likert Scale questions—each worded differently and separated in the survey—were asked concerning the same topic. We drew our conclusions from a tally of the data, converted to percentages. In addition, there were several short-answer opinion questions to elicit suggestions or anecdotal comments.

Our survey sought to determine attitude toward four general topics: 1) balance between theory and practical learning in horticulture courses, 2) problem-solving ability, 3) importance of science courses, and 4) importance of business courses.

RESPONSES

Two questions were formulated to determine alumni attitudes toward educational balance. Sixty-two percent of the respondents indicated they thought their education was well-balanced between basic theory and practical, applied learning (Table 1, survey question no. 2). This opinion was verified by the response to a second question on the same topic (Table 1, survey question no. 27).

Our survey results indicated that a majority (82%) of the respondents felt their horticulture educational experience helped them to analyze and solve problems (Table 1, survey question no. 29). This opinion was not dependent on cumulative grade point average, background, or current working status (horticultural vs. non-horticultural position). The responses indicated that skillful problem solving is an important factor for successful career preparation.

Using chemistry to exemplify a basic science, our survey queried graduates concerning the importance of such courses for career success. Chemistry was important to 53%, while it was not to 36% (Table 1, survey question no. 9). Opinions concerning this matter were related to the number of chemistry courses taken. Those who took four or more chemistry courses were nearly unanimous in their perception of chemistry's elevated importance. Presumably, alumni pursuing science-oriented careers may have taken more chemistry courses and thus hold chemistry in higher regard.

A large majority (70%) of the respondents considered business courses to be important for their career success (Table 1, survey question no. 19). Just as with chemistry, the more business courses taken, the higher their perceived importance. Regardless of the number of such courses taken, the majority of our respondents wished they had taken more.

CONCLUSIONS

Our survey results have provided valuable feedback that helped our department evaluate and analyze curriculum concerns in a meaningful manner. Our initial concern questioned curricular balance between theory and practical learning. Our alumni thought the blend was good. A decision was made to retain our current balance of practical hands-on and theory-oriented courses.

Our second concern centered around problem-solving. A large majority of our alumni indicated their horticultural education enhanced their ability to solve problems. This feedback substantiated our decision to continue stressing analytical proficiency in both

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Table 1. Summary of selected survey questions and responses.

Survey question		Response[z]				
		Strongly agree	Agree	No opinion	Disagree	Strongly disagree
2)	I feel that my horticultural education was well-balanced between theory and practical learning.	14	48	10	26	2
4)	Insufficient coursework in the basic sciences (e.g., chemistry) is hindering me now.	7	11	12	55	15
9)	I consider chemistry courses to be very important for my career success.	15	38	11	31	5
12)	My courses in horticulture were *not* intellectually challenging.	6	16	8	53	17
19)	I consider undergraduate business courses to be very important for my career business.	31	39	17	10	3
27)	I feel that my horticulture courses placed too much emphasis on practical, applied learning.	2	10	10	46	32
29)	My educational experience in horticulture has enabled me to analyze and solve problems better.	29	53	10	7	1

[z]Percentage response of total.

curriculum selection and course content.

The third area of concern dealt with the number of basic science courses (i.e., chemistry) to require. Our department opted to increase its chemistry requirement, despite the doubt our alumni expressed for the need of additional courses in this area. This decision reflected the conviction that a solid foundation in the basic sciences will become increasingly important for horticultural career success.

Our final concern centered around business courses. Most respondents to our survey expressed a desire to have taken additional business courses. Many indicated they were involved in a business-related aspect of horticulture. Because of these responses, our department has placed new emphasis on the incorporation of additional business courses into each student's program of study.

Because they are products of the particular institution involved, alumni are in a unique position to provide helpful feedback when analyzing and evaluating horticultural curricula. Decisions to add or delete courses, to expand or consolidate courses, or to adjust basic curricular philosophy can all be facilitated by alumni input.

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FEATURE

Policy Issues Regarding Property Rights in Biological Inventions

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Advances in biotechnology have led to the development of biological innovations that have been difficult to categorize and regulate under existing institutions. Considerable attention has been given to environmental issues regarding the release of organisms or materials into the environment, but more subtle issues concerning ownership and use of inventions pose additional challenges. Existing property-rights legislation is not completely amenable to recent inventions. Proposed and expected changes may lead to adjustments in breeding programs and market structure. Changed legislation also may present plant breeders and nurseries with opportunities for increased profits or may cause existing operations to become unprofitable. Scientists, breeders, and growers have varied but significant reasons for participating in the structuring of new property-rights legislation.

The most important property-rights legislation for scientific inventions is patent law. Since 1790, American patent law has recognized the rights of inventors to practice their inventions to the exclusion of others, and subsequent state and federal legislation has created a complex system of intellectual property rights. Recent interpretations of this legislation, judicial acceptance of utility patents for living subject matter, and proposed legislation before the U.S. Congress raise several significant issues that affect the rights of scientists and inventors and may be expected to have an impact on future research. What institutional devices have an impact on scientific discovery? What property interests should American law grant to inventors? How may scientists assist in the differentiation and delineation of new organisms and the enforcement of property rights in protected organisms? Legal provisions governing American intellectual property rights, recent institutional developments, and broad policy issues important to the horticultural industry and scientific community are briefly outlined in this article.

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Intellectual property rights

Intellectual property rights is a collective term used to refer to rights granted under various state, federal, and international laws to persons who develop or create new ideas, processes, or inventions. Society grants innovators rights to encourage discovery and invention. Patents, certificates of plant variety protection, trademarks, trade names, and trade secrets constitute the most important devices for horticulturists in creating intellectual property rights.

Patents establish proprietary rights for an inventor by providing for the exclusive control over making, using, and selling the subject material for 17 years. Two Federal Patent Acts are important for horticultural inventions: the general Patent Act (PA), and the Plant Patent Act of 1930 (PPA). Novel, useful, and unobvious subject material may be patented under PA (13). New asexual plants, including cultivated sports, mutants, hybrids, and newly found seedlings may be patented under PPA (14). Both patent acts are administered by the U.S. Patent and Trademark Office.

Congress has also enacted the Plant Variety Protection Act of 1970 (PVPA) for the protection of the rights of inventors of new and distinct cultivars of sexually produced plants (11). The PVPA enables inventors of seed plants to apply for certificates of plant variety protection that provide inventors patent-like protection of the plant and seed for 18 years. The PVPA is administered by the Plant Variety Protection Office of the USDA. Since PVPA does not involve patents, it is not part of U.S. Patent law, although some people use the term "patent law" in a generic sense to include PVPA.

A third major device establishing property rights that is important in the horticultural industry is a trademark. A trademark includes any words, names, symbols, or devices adopted and used by a manufacturer or merchant to identify and distinguish goods from those manufactured or sold by others and to indicate the source of the goods (15). Trademarks exist under state law, but federal registration is the most likely apparatus employed to effectively preclude producers of similar products from adopting another's trademark in the same geographic market. Brand names, although not defined by federal trademark law, are colloquial terms generally used as a synonym for trademark (4).

Trademark also is used as a general term to refer to two other types of mark: certification marks and collective marks (15). Certification marks may be registered by qualified nonproducers of a product; i.e., nations, states, municipalities, or other groups who exercise legitimate control over the use of the mark sought to be registered. Certification marks certify the product's origin, quality, or characteristics that distinguish the product from others. Collective marks are marks used by the members of a cooperative business organization or other collective group or organization.