

Horticulture: an essential life science

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We live in a time when horticultural industry is producing an increasingly diverse and valuable array of products and services to humankind, and when we can credibly argue that horticulture and horticultural research contributes more to achieve the goal of improved human health and life quality than many other realms of knowledge and science. Unfortunately, and despite these successes, we are failing to hold our own in terms of power and prestige within the academic community.

At issue at many universities, particularly in countries with 'advanced' economies where agriculture employs relatively few people and food is plentiful and cheap, is whether horticultural science should continue as an *academic* specialization. Student enrolment in university departments of horticultural science is indeed declining, as is the case with other agricultural science specializations. Some would argue that any negative impact of this trend on society at large is tempered by the fact that the needs for skilled professionals in horticulture industry can be met by technologists receiving one or two years of training at a college or institute. I have even heard it argued that a four-year university degree in horticultural science may have less value to the recipient, in terms of future employment in horticulture industry, than a more practically focused course of training.

Considering the situation in North America as both illustrative and predictive of what is likely to happen in Poland and elsewhere, the number of university departments of horticultural science has declined steadily in recent decades. This has largely been driven by

declining student numbers, which in turn relates to the steady reduction in the number of families involved in farming. Often the first adjustment by university administration is to combine horticulture with agronomy or forestry to form departments of plant or crop science. Inevitably there is a decline in the number of faculty members and the number of courses specifically addressing horticultural science.

I have documented this trend by comparing the 1970 and 2000 membership directories of the American Society for Horticultural Science. Contact information for ASHS members in the 1970 directory indicated that courses in horticultural science were offered in 80 universities departments in the United States and Canada. There were 61 Departments of Horticulture or Horticultural Science (including words like pomology, floriculture, vegetable crops, viticulture, etc. as equivalent to horticulture). By 2000, 25 of these 61 departments no longer included the word horticulture (or equivalent) in the department name.

Some examples: the Department of Horticulture at the University of Arizona became the Department of Plant Sciences; the Department of Horticulture at the University of Guelph became the Department of Plant Agriculture; the Department of Horticulture at the University of Illinois became the Department of Crop Science; and the Department of Horticulture at Mississippi State University became the Department of Plant and Soil Sciences. Even some previously combined departments underwent further amalgamation. For example, the Department of Plant Sciences at the University of Idaho became the Department of Plant, Soil and Environmental Sciences.

On the positive side, the 2000 ASHS Directory provided evidence that some courses in horticultural science can be found within 85 university departments in the USA and Canada, an increase of about 6% over those 30 years. It is also important to point out that there are still

34 departments at 30 American universities that include the words horticulture (or equivalent) in their title.

Significantly, over that same period there seems to have been no decline in the number of institutions offering technical training courses designed to serve horticulture industry. In British Columbia, a Canadian province with fewer than 4 million people, it is possible to find horticulture technology courses, ranging in length from six weeks to two-years, at seven different colleges. Most of these courses are designed to serve the nursery and landscape trades.

Clearly, there remains a high demand in North America for horticulturists. However, I cannot avoid the conclusion that the *profession* of horticultural science is slowly being eroded or fragmented. To use an apple fruit quality example with which I am familiar, we are experiencing a degree of internal breakdown! The core of our profession, the cadre of people holding university degrees in horticultural science and most able to understand and defend our full potential, is less healthy than the fruit as a whole.

The forces driving this trend for universities to combine departments and reduce the staff complement specifically linked to horticultural science are of course at one level economic - lower student numbers lead to staff reductions and the need for management efficiencies. However, I would argue that there are other societal forces, within the university and without, driving this devaluation of horticultural science as an academic discipline. University departments are very cognizant of prestige, and will go to considerable lengths to show that their graduates hold influential (or high paying) positions within society. In recent decades, horticultural science departments, along with other disciplines strongly linked to agriculture, have fared poorly in this competition. The parents and peers who influence the choices of our prospective students are increasingly of the opinion that horticulture is not a prestigious

choice. Unfortunately, this view is encouraged by professors in some other 'life sciences' faculties. Horticulture science, *in toto*, has largely failed to acknowledge, let alone address the extent to which it is being marginalized within the university community.

We are not helped by another reality of university politics - the great reluctance of department chairs and deans to recognize when a faculty is no longer able to offer a high quality education in horticultural science. In many cases we would be better served if universities or governmental jurisdictions could work together to develop regional or national centers of excellence in horticultural science education.

In this ongoing battle for recognition and respect, horticultural science could learn some things from the success of veterinary science faculties around the world. Here is a profession with roots clearly in both animal biology and agriculture. It is acknowledged worldwide to have clear relevance to, and a stable relationship with animal agriculture *and* the largely urban phenomenon of keeping animals for recreational or 'life quality' purposes. However, it is now largely within the urban realm that veterinarians earn their living and have achieved the respect they enjoy within society at large. There is no talk about closing or downsizing faculties of veterinary science. Everyone agrees that this is an 'essential' life science.

And allow me to point out, in passing, that schools offering degrees in veterinary science cannot function without a full complement of professors and teaching labs addressing all sub-disciplines. Thus, they are very expensive and relatively few in North America, about one such college for every two States or Provinces (31 in total). The demand for positions within each of these colleges is high, even higher than for medical schools. This, of course, allows for very high enrolment standards.

I believe that horticultural science has the potential to achieve a comparable stature within society. I support the belief that humans are as strongly influenced by the plants in their

environment and gain as much pleasure from the culture, consumption, and creative uses of plants as they are connected to, dependent on, or pleased by domesticated animals. In addition to meeting our dietary needs, there are deep spiritual needs and primordial forces at play in our relationship with plants. A number of modern-day thinkers within the realm of socio-biology, such as Prof. E. O. Wilson of Harvard University (author of 'Biophilia' and other very important books), have already, at least in my mind, laid the groundwork for horticulture to be recognized across society as an essential life science.

My experience as a scientist developing plant growth regulator technology for the world's fruit producers has convinced me that our research is highly valued by our traditional industry partners and that there will continue to be jobs for our graduates in horticultural industry. However, I have also concluded that the urban community views these links to production agriculture suspiciously. This community, the bulk of the tax-paying public, is more likely to support the branches of horticultural science that serve them directly - landscape design, arboriculture, master gardening programs, research on food safety and quality, etc. The challenge for our profession is to develop and embrace an expanded philosophical framework that recognizes the needs and interests, and allays the fears, of society at large.

I would like to see us begin to emphasize two elements of a modern philosophy for horticultural science that, if widely understood and accepted, could help move us toward the 'essential life science' level of respect we deserve.

The first would have us fully embrace the concept that the people-plant relationship is hugely important in understanding human health and well being. I realize that this concept could be and has been championed by others, but what group of professionals is better equipped than horticulturists to describe, explain, and demonstrate the enormity of this relationship? Our partners in articulating this concept to students within the university at large

might come from departments like Nutrition, Pharmacology, Physical Education and Human Ecology, but we are clearly positioned to be the leader.

A second, and related element of an expanded philosophy for our profession would be to accept that this profound need for plants in our environment can be informed by experimentation, by *qualitative* as well as by quantitative research methods.

I would remind you that we are not presently famous for our contributions within the realm of qualitative research! There are exceptions, of course, and I should mention the important work in horticultural therapy, landscape architecture, and the creative specializations within ornamental horticulture.

By taking ownership of this interesting area of responsibility within the life sciences I believe that we will be positioned to better serve the great majority of citizens who have no direct connection to production agriculture. Let me give you one example of a new role we could play as educators if we were to fully occupy our place as experts on the people-plant relationship.

I take it as a given that humans are now fully capable of causing irreparable damage to earth's environment. It follows that if humankind is to continue to live on this planet (or others!), every citizen needs some appreciation of what other life forms (on which we depend) need to remain healthy and productive. Thus, a component of every university education in the future, an essential component, should be a course that addresses plant health and productivity. Think of this as a 'reality check' that would begin to repair the immense naïvete amongst present-day university graduates (at least those in North America) about the inputs required to produce the plants needed to feed, clothe and house even the present world's population.

Everyone needs an appreciation of how plant health and sustainable productivity is affected by nutrition, competition with other plants, light and water, climate and air quality, and managing pests, diseases, and disorders. The content of this course could be created in cooperation with ecologists, economic botanists, and perhaps political geographers, but horticultural scientists are the ultimate integrators of knowledge about plants and their environment. Why, other than through lack of self-confidence or philosophical grounding, would we choose not to claim ownership of this important educational responsibility?

The American Universities web site currently lists 1570 degree-granting universities in North America but the editor of that web site estimates the total number to be nearer 2500. Think of the impact that we could have if every university was to require such a course!

The point I am trying to make is that there are avenues available to us that can lead horticultural science to greater prominence and security within the modern-day family of life sciences. We are in the best position of any plant science discipline to bridge the needs of production agriculture and the interests of today's largely urban society.

During my term as ISHS President I will challenge my fellow Board members and the Executive Committee of the Society (the leaders of our science sections and commissions) to identify and act on initiatives that will move international horticultural science to a position of greater awareness of, and relevance to the needs and interests of urban society. Our prestige will grow in direct relationship to the extent we are viewed by society at large as an "essential" life science.

Let me conclude with a few remarks about the International Society for Horticultural Science and specifically about its quadrennial International Horticultural Congress. These Congresses provide our best opportunity to discuss and demonstrate the richness of modern-day horticultural science.

When planning the Congress held just one year ago in Toronto, the organizing committee struggled with the challenge of giving some exposure to all of the traditional faces of horticultural science. However, an even greater challenge involved authenticating our theme - "Horticulture: Art and Science for Life".

I believe that we succeeded with the plenary address by Ismail Serageldin and the remarks of Pedro Sanchez (winner of the 2002 World Food Prize) who forcefully reminded us that horticulture has a pivotal role to play in nurturing and nourishing the world's poor. Professor E.O. Wilson, Julie Moir Messervy and Katy Moss Warner talked about the deep-rooted importance of the garden in human life. Our potential to influence a mass audience by creating, interpreting and communicating new knowledge was addressed by Sir Ghillean Prance, Peter Scott and Robert Sternberg. Our position on the front lines of plant biology was illustrated by Stephen Goff, Pamela Green and Sue Rhee speaking about "Plant Genomics: A Revolution in Plant Biology and Horticulture." Our role in ensuring a safe food supply was brilliantly espoused by horticulturists Doug Powell, Jim Gorny and Larry Beuchat, and other contributions to human health were highlighted by scientists grounded in horticulture but now internationally renowned for their work discovering new medicinal plants (ethno-botanist Paul Cox), understanding the health promoting properties of plant-based foods (biochemist and food scientist Joe Mazza), and improving interior air quality with plants (space biologist Michael Dixon). Astronaut Robert Thirsk, space biologist and futurist Robert McKay, and NASA payload specialist Ray Wheeler discussed the place for plants and horticultural science in present and future space exploration. Finally, the three contributors to "Small is Beautiful: The Art and Science of the Miniature" brought horticultural science back to the enrichment of our near environment.

I viewed the Toronto Congress as a rare opportunity to remind a large international audience of colleagues about the scope and the present and potential impact of modern horticultural science. It was an opportunity to build pride in our profession. Discussions with many colleagues following the Congress lead me to believe that we accomplished these aims. It is now up to those organizing future Congresses to continue to champion the message that “life without horticulture would be no life at all!”

Aside from these Congresses, all of us given the opportunity to speak to policy makers and to the public at large must continue to point out that the products and practice of horticulture have universal relevance. They are valued by citizens of all cultures and races, rich or poor, educated or illiterate. For the smallholder farmer in Tanzania, horticulture nourishes her family and provides some much needed cash as she struggles to emerge from a life of poverty. For the urban rich, horticulture is an essential part of a ‘quality’ life, of an urban life style, and for which they spend billions!

My message today is about taking full advantage of this broad base of support for our profession. We can achieve the “essential life science” level of respect by developing a *shared understanding* of what is horticultural science within the family of life science professions, *confidently celebrating* the unique role we play within society, and using every opportunity to *proudly champion* the contributions of horticultural science and industry.

The ISHS and national societies like the Polish Society for Horticultural Science exist to promote our profession, build and recognize professionalism within our ranks, and to develop leaders who can guide us to this position of self confidence and societal respect. We must not lose sight of these important roles.

Today marks the start of the First National Congress of the Polish Society for Horticultural Science and you have chosen as your theme “Contemporary Horticulture and the

Standard of Human Life”. It is clear to me that your leaders fully understand the importance of calling attention to our profound contributions to improving human life quality. The topics on which you will focus - horticulture and human health, amenity and ornamental horticulture, product quality and attractiveness, etc., are precisely the topics of interest to the larger audience we must serve if we are to remain a force at institutions of higher learning.

I am very pleased to be a part of this conference. I look forward to meeting many of you and hearing your suggestions about how the International Society for Horticultural Science can help to strengthen the Polish Society for Horticultural Science and serve each of you better.