ASHS HortBase—Opportunities for Change

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SUMMARY. ASHS HortBase provides opportunities for change—change in how we author and deliver information to meet the needs of the inquirer for 24-hour access to specific, concise information for planning and decision support; change from individual autonomy to global collaboration to meet more economically the increasing needs for quality horticultural information with decreasing resources; change, by adding ASHS peer review, to meet the inquirer's need for validated information and to strengthen the educator's efforts in developing scholarly, shared information resources; change to strengthen the interaction between the educator and inquirer; change to broaden and enhance ASHS's role in providing validated, up-to-date horticultural information. HortBase is a service that ASHS is uniquely qualified to provide to its members and to worldwide horticultural inquirers. HortBase's unique characteristic is the dynamic pool of ASHS members who will serve as volunteer authors and reviewers, as well as users of HortBase. ASHS members will be the continuous infrastructure to sustain HortBase and to ensure its continuous evolution and renewal.

HortBase presents major, interrelated opportunities for change in several areas. It is said that technology leads change, or that *new technology provides the opportunity for change*.

ASHS HortBase provides opportunities to change.

- Change in how we author and deliver information to better meet the needs of the inquirer for 24-hour access to specific, concise information for use in planning and decision support (Figs. 1 and 2).
- Change from individual autonomy to global collaboration to meet the diverse, quality horticultural information needs of the inquirer economically in this time of increasing demands and decreasing resources.
- Change, by adding ASHS peer review, to meet the inquirer's need for validated information and to strengthen the educator's scholarly efforts in developing quality, shared information resources.
- Change to enhance interaction between the educator and the inquirer.
- Change to broaden and enhance ASHS' role of providing validated, up-to-date horticultural information.

Each of these five opportunities for change addresses needs and concerns that have been identified by horticultural students, educators, growers, and other users of horticultural information. As we evolve and implement HortBase, changes will be made and opportunities realized.

Change the way we author and deliver information resources to better meet the inquirer's specific information needs

With the unique capabilities of the Web compared to the printed page, the inquirer can now have round-the-clock access to up-to-date, specific, concise, validated information. *With the Web, the inquirers determine where they want to go today*—they can individually decide the level, the speed, and the direction of inquiry. They can tailor their experience, but the rapid expansion of information on the Web has made it difficult for the user to find the proverbial “needle in the haystack.” A search for the needle in the Webstack now involves sorting about 320 million Web pages. Even the best search agent indexes no more than one-third of them. And the number of Web pages is expected to grow 1,000% in the next few years, according to Lawrence and Gils (1998). They conclude that the amount of information on the Web overwhelms the current Web information management and search technology. We can and should change the way we design, author, review, and manage information resources for this new medium.

Information should be authored and designed with general, introductory information in the entry “chunk,” which will have hotlinks to definitions, illustrations, in-depth information, and related topics. An information chunk is the concise information related to the inquirer's specific question; it is the information to support the inquirer's decisions regarding the specific question and to provide links to related information. Inquirers can progress through or skip from the simple to the more complex. They can tailor the information to their individual interests and knowledge levels by following the diverse links or information branches. The background knowledge or educational level of the reader was important in preparing a printed text where the inquirer was limited to what was author-predetermined and included between-the-book covers. However, with Web chunks and links, the inquirer decides the depth and direction on this boundless Web. With HortBase, information retrieval and education is inquiry-driven by the interested learner. With quality HortBase instructional information readily available on the Web, the total quality of K to 12, posthigh-school education and lifelong learning will be enhanced.

HortBase is for the *interested* learner.

For information on authoring for the Web, creating information chunks for HortBase, and using HortBase in horticultural education and independent learning, please see Peet (1998), Kjelgren and Rupp (1998), and Gilman and Green (1998) in these proceedings.

Change from local autonomy to global collaboration in creating information resources to meet the inquirer's diverse needs for quality horticultural information economically

The university, state, geographical, and national boundaries can be transcended in forming virtual production and review teams—“dream teams”—for each specific information project.

DISTRIBUTED RESPONSIBILITY, SHARED RESOURCES. Fortunately, in this time of limited individual resources, worldwide distributed responsibility and collaboration on development, maintenance, and use of up-to-date information resources is made possible through the Web. Responsibility for creating chunks—modules or files of specific, concise information on horticultural subjects such as tree fruit production—can be distributed among production teams consisting of horticultural, communication, and library faculty at land-grant universities (LGUs). By centering the author, review, and information management at national and international professional organizations and their members, the boundaries of individual universities, agencies, states, and nations can be transcended to form specialized dream teams.

GEOGRAPHICALLY DISPERSED TEAMS. Production team members may be at diverse

Fig. 1. Old linear, sequential process for creation-distribution of printed information.

geographical locations, but they work as a virtual team via electronic communication. For example, individual LGU libraries in the Agriculture Network Information Center (AgNIC) Alliance of the National Agricultural Library (NAL) may distribute the workload. Individuals will specialize in developing embedded metadata tags and objects, archiving, and other aspects of Web information management for various horticultural crops, subjects, and programs. For example, the New Mexico State University library collaborator will focus on *Capsicum* information resources on hot peppers. The Washington State University library collaborator will focus on managing Web information resources pertaining to tree fruit production. The tree fruit production horticulturists at The Pennsylvania State University, North Carolina State University, and other universities might work with the library collaborator at Washington State University. Likewise, the design, video,

and other graphic illustrations accompanying the tree fruit file might be developed by communication faculty at Oregon State University in collaboration with the library collaborator from Washington State University and the tree fruit horticulturists from the various universities. Centering HortBase at our national societies and organizations enhances formation of geographically dispersed information production teams with project-specific skills and interests.

DISTRIBUTED FUNDING. Similar to the individual researcher determining which research he or she will do based on several factors including personal interest and available funding, so too will the educator develop information resources related to his or her personal interests and available funding. Funding for regional and national collaborative development of informational resources, like funding for research, is available from various sources including the USDA Challenge and Distance Education grant programs. Funding for developing specific informational resources is available from horticultural commodity commissions and associations, plant societies, interested individuals and private corporations, grant programs within the universities, etc. For further information, see "Funding Opportunities" at <http://www.forages.css.orst.edu/HortBase/>.

By sharing responsibility and avoiding redundancy in developing information resources, each of us can contribute a few quality information chunks for multiple and wide use. Wide distribution of a workload for obtaining development funds and for creating the specific electronic information files contrasts with redundant creation-printing of each specific informa-

tion document (fact sheet, bulletin, class handout, etc.) county-by-county and state-by-state. With collaboration we can expand the range and quality of available information. Developing quality information resources is usually expensive, but the expense per user is low when the information resource is widely used. The work of California Institute of Technology Chemist Nathan Lewis is an example of an expensive information resource that can be distributed and used widely. Says Lewis, "The hardest topics for me to get across are the things that I can see in my head that the students don't have a clue about. We want to put those things on a screen for them." Lewis's efforts involve a team of communicators led by a Hollywood special effects producer. Their 10-minute video will show complex processes in 3-D; at the end of the \$2-million project, "You'll be able to watch atomic orbitals dance with Jurassic Park-style special effects" (Culotta, 1994). *However, we don't each need to spend \$2 million to make the atomic orbitals dance!* For additional explanation and perspective on changing from individual autonomy to global collaboration on developing, maintaining, and delivering information for decision support, see Eastwood (1998) and Gomez (1997).

Change to provide peer review of information used in classroom, extension, and lifelong learning to meet the needs of the inquirer for validated information

"...educators and publishers have started to worry about a time when the Web might become clogged with programs that are mediocre or, even worse, filled with inaccuracies" (Service, 1994). Stix (1994) stated, "Some academics fear that the sheer volume of literature and a growing inability to distinguish the good from the bad in what gets published (on the Internet) may lead to an overall decline in standards." Society, facing the paradox of a shortage and a redundancy of information (the information explosion), demands selective dispersion of validated information. HortBase provides peer-reviewed information created in linked chunks for quick retrieval of specific, concise information.

HortBase is based on national and international ASHS peer review of educational information. The peer review of educational information for HortBase is similar to the current peer-review

Fig. 2. New 3-dimensional creation, international peer review, revision of educational information for electronic dissemination includes three major innovations. 1) World wide distribution of the workload. 2) Information created in linked-chunks for quick retrieval of specific, concise information and to facilitate inquiry-driven information retrieval to meet individual needs. 3) International author and reviewer criteria developed by collaborating academic groups, e.g., ASHS, Agriculture Network Information Center (AgNIC), and Agricultural Communicators in Education (ACE).

process applied to reports of original research before publication. Information will be peer-reviewed for horticultural technical content, communication ability, and library storage, search, and retrieval aspects before linkage to HortBase. The HortBase Committee is working closely with members of our related professional groups such as Agricultural Communicators in Education (ACE) and the National Agricultural Library (NAL) and related Agriculture Network Information Center (AgNIC) to develop authoring and reviewing guidelines and a style manual for HortBase. These professionals have an invaluable role in developing and handling printed information, they also have an invaluable role in developing and delivering information via electronic media. We are working with our library colleagues through the AgNIC Alliance of land grant university library faculty, and ASHS is a member of this alliance. We are collaborating to identify critical elements, such as embedded metadata, that will allow effective and rapid storage, search, and retrieval of the specific information chunk to use or revise. We are working with our colleagues in communication to use effectively the unique multimedia communication aspects of the Web to select appropriate media, information sequence, and electronic document design. We are communicating with other professional societies, such as the Entomological Society of America, the International Society of Arboriculture, and others, on developing peer review of educational information resources related to their areas of expertise. Peer review ensures accurate up-to-the-minute information and use of state-of-the-art communication and information management techniques. Peer review enhances networking and continuous professional development of the horticultural, communication, and library authors and reviewers.

Change to put renewed emphasis on the role of educator to prepare the interested inquirer for lifelong learning

The chunks or modules on the Web can be linked and used

as building blocks in various dynamic (continuously updated) curricula and educational programs for use by students and as on-the-job training. Individual educators will no longer expend the great amount of time previously required to assemble, update, and purvey information. They will rely on the curricula's links to dynamic chunks on the Web that are kept up-to-date by the distributed efforts of colleagues. The emphasis will shift from being the information provider to being an interactive educator. Emphasis will shift from lecture delivery of information and testing retrieval of that information. Emphasis will be placed on developing the students' skills in identifying the major questions or issues, in information gathering and evaluation, and in decisionmaking and implementation. Rather than giving the student a fish, the educator will teach them the skills needed for fishing. The responsibility for keeping the lake stocked with fish (current information) will be distributed among educators worldwide.

Educators will interact with students to develop student skills and habits for lifelong learning. The lines of division among information used in lifelong learning, extension education, extended or distance education, and on-campus education are rapidly blurring as individuals are empowered via the Web to become their own information gatherers. According to Cetron and Owens Davies (1994), "...indi-

viduals will learn more on their own, the 'places' of learning will be more dispersed, and the age at which things are learned will depend on individual ability, not tradition. Education is becoming more individualized as interactive computer/videodisc systems and other new media permit students to learn according to their needs and abilities. Corporations now invest some \$85 billion per year in employee education and retraining. That will double by 2001."

By reducing the time individually expended on information functions, the individual educator will have more time to interact with the information users (industry professionals, entry-level employees, students, extension clientele, etc.). "Teachers are coming out from behind their lecterns to interact more with their students... deploying new high-tech tools to reach their students, ranging from using comput-

Fig. 3. Alliances among the USDA CSREES, AgNIC-NAL and the national professional societies are emerging. ASHS HortBase is one of the Global Information Systems for Decision Support. Additional GISDSs Web information systems similar to HortBase will likely be developed for other United States Department of Agriculture Cooperative State Research, Extension and Education Service (USDA CSREES) subjects/programs/commodities (SPCs).

ers to help them visualize the abstract laws of physics to performing chemistry experiments on their computer screens. But as much fun as these new tools are to use, they're no substitute for a faculty member's presence..." (Gibbons, 1994). HortBase will not decrease the need for educators, but will decrease the time spent individually on information management by distributing that responsibility. Educators will thereby be empowered to spend more time interacting with the information users.

Change to broaden and enhance the informational role of ASHS

HortBase is a service that ASHS is uniquely qualified to provide to its members, especially those in Extension, Education, and Industry Divisions, and to worldwide horticultural inquirers. HortBase's unique characteristic is the dynamic pool of ASHS members who will be volunteer authors and reviewers and users of HortBase. ASHS members will be the continuous infrastructure to sustain HortBase and to ensure its continuous evolution and renewal.

We are familiar and comfortable with ASHS peer review of research reports and international publication of the approved reports. This peer review enhances distribution, acceptance, and use of the research results by the researcher's peers. This is evidence of *scholarly accomplishment—knowledge developed, shared, and used by colleagues*. The peer-reviewed research reports have been important in promotion, tenure, and scholarly achievement discussions. Through HortBase, educational information resources will be peer-reviewed by international peers. Printed publications such as the *Journal of the American Society for Horticultural Science*, *HortScience*, and *HortTechnology* provide international distribution, awareness, and use of the individual's peer-reviewed publication. Likewise, HortBase will provide Web distribution and worldwide awareness and use of the individual's peer-reviewed information resource (Lineberger, 1998). *International distribution*

and use of the peer-reviewed information resource of HortBase will provide evidence of scholarly accomplishment and professional contribution of the author.

ASHS is a leader in developing Web-based, peer-reviewed educational resources (Fig. 3). On 22 July 1997, the ASHS Board of Directors established HortBase as a standing committee of the society charged to implement and maintain HortBase. ASHS, a member of the initial steering committee for AgNIC, is the only professional society that is a member of the AgNIC Alliance. For details regarding current state of implementation, please see "Full implementation authorized by the ASHS Board of Directors" at <http://www.forages.css.orst.edu/HortBase/>. For additional information on the role of ASHS in HortBase, see Albrecht (1998), Emely (1998), and Neff (1997). If you would like to serve on one of the HortBase Task Forces or to be an editor, reviewer, or author for an information resource center or if you have suggestions and comments regarding ASHS HortBase, contact one of the people identified in the implementation document or J. Green at greenjl@bcc.orst.edu.

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