

Internet resources for agriculture

By Kathleen A. Clark

Harvesting agriculture-related information

As the goals of agriculture are to feed, clothe, and shelter us, agriculture encompasses a wide array of disciplines and interests. Academic disciplines include agronomy (crops), animal science, economics, engineering, entomology (insects), environmental science, food science, forestry, horticulture, meteorology, plant pathology, and veterinary science. Interests may range from the economics or biology of farming to concerns about soil conservation, food safety, and the weather. Those interested in agricultural topics may be farmers, consumers, home gardeners, research scientists, or economists. Although this review of agricultural resources must be cursory, many "virtual library" indexes to agricultural resources have been created which focus on agricultural topics. In addition, searching the Internet for information has become much easier with the advent of search engines such as AltaVista (<http://altavista.digital.com/>). (For a listing of other Internet search engines see: http://thorplus.lib.purdue.edu/inet_resources/index.html#search.) But a word to the wise: when searching for agricultural information, look for information from government or university-maintained resources, as these will be more reputable. The United States Department of Agriculture (USDA) and its affiliates, and the many schools of agriculture around the world have made available a wealth of agricultural information on the Internet.

Government sites

- **USDA.** A long-standing mission of the

USDA has been to encourage agricultural research and to disseminate information, so it is no surprise that the USDA and its branches have many excellent Web sites on the Internet. A good starting point is the USDA homepage, which has links to many of the various USDA branches and agencies on the Internet such as the Forest Service; the Agricultural Research Service (ARS); the Cooperative State Research, Education, and Extension Service; the Economic Research Service (ERS); the Foreign Agricultural Service; the Food and Consumer Service; the National Agricultural Statistics Service (NASS); and the National Agricultural Library. *Access:* <http://www.usda.gov/>.

- **Cooperative State Research, Education, and Extension Service.** Many agricultural concerns are local in nature, tied to the regional weather, climate, and soil types. This site provides a clickable map of the United States, with links to the states' Extension homepages, their land-grant institutions, and agriculture experiment stations. *Access:* <http://www.reeusda.gov/>.

- **FDA.** Center for Food Safety & Applied Nutrition. This site has collected valuable information about food safety, toxicology, food additives, cosmetics, and biotechnology. *Access:* <http://vm.cfsan.fda.gov/list.html>.

- **Agriculture & Agri-Food Canada.** The Canadian corollary to the USDA, this site has links to Canadian agricultural information which runs the gamut from biotechnology issues to food safety and fertilizers. *Access:* <http://aceis.agr.ca/>.

- **Food and Agriculture Organization of the United Nations (FAO).** Currently, this site primarily has information about the FAO, its publications, and forthcoming meetings. In addition, it provides a link to the World Agricultural



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tural Information Center (see below). *Access:* <http://www.fao.org/>.

Library resources

• National Agricultural Library (NAL).

The NAL, a branch of the USDA's Agricultural Research Service, is the foremost agricultural library in the world; it collects books, journals, maps, audiovisuals, oral histories, and micro-computer software related to the field of agriculture. Its Web site has links to the NAL's online catalog system (ISIS), its ten information centers, and other Internet sites relating to agriculture, government, and library services. *Access:* <http://www.nal.usda.gov/>.

• **Integrated System for Information Services (ISIS) of the NAL.** ISIS is comprised of two databases: the NAL's Online Catalog (1966 to the present), and the Journal Article Citation Database (1989 to the present). The latter is a subset of the AGRICOLA database, which is the online equivalent of the NAL's Bibliography of Agriculture. Both databases are updated daily. *Access:* <http://www.nal.usda.gov/isis/>.

• **Libraries with Significant Agricultural Holdings, Worldwide.** This list of 180+ Internet-accessible libraries with significant agricultural holdings was derived primarily from a comparison of two resources: Billy Barron and Marie-Christine Mahe's "List of OPACs" (May 1994) and *Agricultural Information Resource Centers: A World Directory 1990*, edited by Rita Fisher et al. (Urbana, Ill.: IAALD, CTA, 1990). *Access:* http://thorplus.lib.purdue.edu:80/all_libraries/agriculture.html.

Databases

• **AgDB: Agriculture-Related Information Systems, Databases, and Datasets.** From AgNIC (Agriculture Network Information Center), this is a carefully annotated, comprehensive resource for more than 400 agriculture-related databases, datasets, and information systems. At this time, only databases with primary content are included, not bibliographic databases such as AGRICOLA, for example. Although not all the datasets described are available on the Internet, Web links have been established to those that are available. Among the Internet-accessible databases listed: Agricultural Waste Database; Breeds of Livestock; Crop Index; Culinary Herb FAQ; EXTOTNET—EXTension TOXicology NETWORK; EthnobotDB—worldwide plant uses; Families of Flowering

Plants: Descriptions and Illustrations; Foodborne Pathogenic Microorganisms and Natural Toxins; Guide to Gardens of the USA; Medicinal Plants of Native America; Pesticide Information Profiles; U.S. State Fact Sheets (USDA); Water Quality Database; World Cheese Index. *Access:* http://www.agnic.org/agdb/erdcalf.html#a_txt.

• **Current Research Information System (USDA/CSREES/SERD) Web Site.** Contains information on ongoing and recently completed research projects sponsored by the USDA and the Canadian Agri-Food Research Council; also includes human nutrition research projects conducted or sponsored by the USDA, the NIH, and other federal agencies. CRIS is free-text and field-searchable, with up to 200 retrievals at a time. This is a splendid resource for researchers who want to become acquainted with a topic before they begin a research project, or to identify colleagues who are doing research in a particular field. *Access:* <http://cris1.nal.usda.gov:8080/>. Many universities also have access to this database via the Community of Science: <http://cos.gdb.org/best/fedfund/usda/usda-intro.html>.

Agricultural statistics

• **USDA Economics and Statistics System.** In cooperation with the USDA, the Mann Library at Cornell University has mounted a Web site which provides access to agricultural economic and statistical information. Data are updated daily, based on files received from the USDA's Economic Research Service and National Agricultural Statistics Service. Many of the files are in specific file formats, so, for example, if your applications folder in Netscape is set up correctly, spreadsheet files will open up and display immediately in Lotus 123 or Excel. Other files are in flat ASCII format. *Access:* <http://usda.mannlib.cornell.edu/usda/>.

• **Census of Agriculture: 1982, 1987, 1992.** As part of the Government Information Sharing Program, Oregon State University has mounted the Census of Agriculture, providing information that is searchable by county, state, or zip codes on such topics as number of acres, farms, crops, and livestock. *Access:* <http://sasquatch.kerr.orst.edu/ag-stateis.html>. Another site which provides graphical (GIS maps) presentation of data may be found at http://www.cast.uark.edu/products/CATALOG/NATIONAL/HTML/AgCensus_Main.html.

• **World Agricultural Information Center (WAICENT).** This branch of the Food and

Agriculture Organization of the United Nations provides statistical information on world agriculture, fisheries, forestry, nutrition, and rural development. *Access:* <http://www.fao.org/WAICENT/Agricul.htm>.

Agricultural organizations

- **Webpages of Scholarly Societies.** From the University of Waterloo Electronic Library Scholarly Societies Project, search under "agricultural and food science," "biology," "environmental sciences," or "health sciences" for societies with Internet access. *Access:* <http://www.lib.uwaterloo.ca/society/webpages.html>.

- **U.S. State Agricultural Sites.** A good starting point if you're looking for access to state agricultural resources. *Access:* <http://agrinet.tamu.edu/universi/default.htm>.

- **Agricultural Societies and Organizations.** Maintained by the Oklahoma Cooperative Extension Service, this site lists both scholarly and nonscholarly agricultural organizations; a long list of farm "journals" is also maintained. *Access:* http://www.okstate.edu/OSU_Ag/agedcm4h/bobslist.htm.

- **Agricultural Conferences, Meetings, Seminars Calendar.** Maintained by the Agriculture Network Information Center (AgNIC). *Access:* <http://www.agnic.org/mtg/>.

Electronic journals and magazines

- **Electronic Journals.** This site provides a large, linked, searchable listing of electronic journals in all disciplines. Some societies, such as the American Society of Animal Science, are providing their members with electronic access to their journals. Other journals, such as the *Journal of Extension*, are available free to all. *Access:* <http://www.edoc.com/ejournal/>.

- **Ag Pubs.** About 50 journals, magazines, and newsletters are listed at "Bob's Awesome List." *Access:* http://www.okstate.edu/OSU_Ag/agedcm4h/bobslist.htm#D.

Lists and newsgroups

A large number of discussion groups concern agricultural topics, e.g., AGECON-L (agricultural economics), AGRIC-L (general agriculture), AGWOMEN-L, BEEF-L, DAIRY-L, FARM-MGT, EAF-L (EcoAgroForestry), FOOD-NET (food safety), MULCH-L, NEWCROPS (minor crops), RUSAG-L (Russian agriculture), SLA-FAN (food and agriculture librarians), SUSTAG-L (sustainable agriculture), SWINE-L, VETMED-L, etc. Subscript information about these lists can be

found via several searchable indexes to discussion groups, by searching for "agriculture," "food," "animal," "farming," etc. Among the best of these indexing sites are:

- **Kovacs' WWW View of Directory of Scholarly and Professional E-Conferences.**

Access: <http://n2h2.com/KOVACS/>.

- **Liszt: Directory of E-Mail Discussion Groups.** *Access:* <http://www.liszt.com/>

- **tile.net/Lists.** *Access:* <http://www.tile.net/tile/listserv/index.html>.

Both research scientists and farmers are finding the agricultural Usenet groups of interest. A sampling of the nonscholarly groups include: alt.agriculture.fruit, alt.agriculture.misc, alt.sustainable.agriculture, rec.gardens.roses, sci.agriculture, sci.agriculture.beekeeping, sci.bio.conservation, sci.bio.food-science. Scholarly groups can be found under the heading "bionet." and include such topics as grasses, agroforestry, plants, mycology (fungi), nitrogen fixation, virology, and molecular biology. The BIOSCI bionet Newsgroup Archives is both searchable and postable. *Access:* <http://net.bio.net/>.

Weather

- **WeatherNet.** Weather is always very important to farmers and other agriculturists! Sponsored by the Weather Underground at the University of Michigan, this site has gathered links to most of the major weather resources on the Internet. Use it to find local, regional, and international weather forecasts, radar photographs, weather maps, travel conditions, and ski reports. *Access:* <http://cirrus.sprl.umich.edu/wxnet/>.

- **State Weekly Crop-Weather Reports.** Issued for most states, these reports give timely information on the progress of crops (planting, growth, harvesting), local weather conditions, soil moisture, calving, etc. *Access:* <http://www.usda.gov/nass/pubs/staterpt.htm>.

Major guides to agricultural resources

- **Not Just Cows: A Guide to Internet/Bitnet Resources in Agriculture.** Wilfred Drew's now-classic list! This Web version provides links to and information about agricultural gopherholes, Web sites, bulletin boards, databases, listservs, almanacs, Usenet groups, and electronic newsletters and magazines. *Access:* <http://www.lib.isu.edu/sci.njc.html>.

- **Aggregator, from the Institute of Food and Agricultural Sciences at the University**

of Florida. Agricultural resources are grouped by their source: e.g., international, commercial, U.S. state, U.S. federal, or marketing services. A comprehensive guide to upcoming agricultural conferences is also maintained. *Access:* <http://www.ifas.ufl.edu/www/agator/htm/ag.htm>.

- **Bob's Awesome List: Oklahoma Cooperative Extension's Guide to Agricultural Web Sites.** Especially rich in links to agricultural publications, organizations, gardening sites, and information about horses. Focus is on sites with reference value. *Access:* http://www.okstate.edu/OSU_Ag/agedcm4h/bobslst.htm.

- **AgriWeb Canada.** From Agriculture and Agri-Food Canada's Electronic Information Service (ACEIS), this is a directory of Canadian agriculture and agri-food resources on the Internet. *Access:* <http://aceis.agr.ca/agriweb/agriweb.htm>.

- **INFOMINE: Comprehensive Biological, Agricultural, and Medical Internet Resource Collection.** Annotated, searchable, subject-delineated site; each listing is cross-listed to provide access to additional, related resources. *Access:* <http://lib-www.ucr.edu/bioag/>.

- **World Wide Web Virtual Library.** Virtual libraries are maintained in Agricultural Economics, Agriculture, Animal Health, Bio Sciences, Biological Control, Biotechnology, Environment, Fish, Entomology, Forestry, Gardening, Irrigation and Hydrology, Landscape Architecture, Livestock, Plant Biology, Poultry Science, Recreation, Sustainable Development, and Veterinary Medicine (NetVet and the Electronic Zoo). Each virtual library is maintained by independent organizations or people with expertise in the field. *Access:* <http://www.w3.org/hypertext/DataSources/bySubject/Overview.html>.

- **Yahoo: Agriculture.** Yahoo is a fine starting point, but it doesn't have the depth of many of the agriculture-specific resource lists. *Access:* <http://www.yahoo.com/Science/Agriculture/>.

Clip art and agricultural image sites

These sites offer graphics that are useful for extension agents and other educators.

- **Texas Department of Agricultural Communication (DAC) Art a la Carte Collection.** *Access:* http://leviathan.tamu.edu:70/1m/clipart/taex_alacarte/.

- **Agricultural Images (from National**

Agricultural Library of the USDA). *Access:* <http://www.inform.umd.edu:8080/EdRes/Topic/AgrEnv/AgrImg/>.

Other interesting sites

- **The Time-Life Gardening Library.** Includes the Life Time Electronic Encyclopedia, with photos and information for growing plants from more than 1,400 genera, and the House Plant Pavilion, with information on identifying and caring for house plants. *Access:* http://pathfinder.com/@m52R*PFR4gIAQCWD/vg/TimeLife/. Gardeners should also check out the WWW Virtual Library on Gardening at <http://www.gardenweb.com/vl/>.

- **Weed Control Notes: Weed Identification Series.** Both cultural and chemical means for controlling 50 of the most common weeds are provided, along with clear drawings of each weed in its vegetative and flowering stages. *Access:* <http://www.sasknet.sk.ca/saskgov/SAF/weeds/tablecon.htm>. For excellent photographs of weeds, look at Rutgers' Weed Images and Descriptions site at <http://cook-college.rutgers.edu/www/rce/weeds.htm>.

- **Homestead: Build Your Own Web Page!** Sponsored by @griculture Online, this site makes putting up a Web page easy, and it's free! So far about 400 agriculturists have taken this opportunity to make a space for themselves in cyberspace. *Access:* <http://www.agriculture.com/homested/>.

- **Quiz from Iowa State University Extension (ISUE).** Each week a staff person from ISUE presents a challenging quiz on an interesting consumer-oriented topic. *Access:* <http://www.exnet.iastate.edu/Quiz/Current/homepage.html>.

- **Pedro's BioMolecular Research Tools.** Not strictly an agricultural resource, this site indexes the tools necessary for the agricultural molecular biologist. Included are molecular biology search and analysis tools, bibliographic and Web tools, guides, tutorials, and lists of journals and newsletters. *Access:* http://www.public.iastate.edu/~pedro/research_tools.html.

- **NetVet Veterinary Resources & the Electronic Zoo.** Find here a gold mine of information about animal health care and animal-related organizations, discussion groups, government regulations, education, etc. In addition, the author, Ken Boschert, has collected homepages for nearly every conceivable type and breed of pet. *Access:* <http://netvet.wustl.edu/welcome.htm>. ■

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