



## Author's Guide to Electronic Publishing<sup>1</sup>

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basic guidelines for preparing and submitting electronic documents.

### NEW DIRECTIONS IN PUBLISHING

Computer-based systems are making it possible to distribute information with powerful and diverse new techniques. In the past, the Extension Service relied predominantly on printed publications for delivery of educational information. Currently, the Florida Cooperative Extension Service is placing emphasis on publishing electronically, which offers potential cost savings as well as other advantages in information delivery.

### Electronic Publishing Systems

Electronic publishing systems use computers to disseminate information in a digital format. The information may be saved on floppy disk, hard disk, CD-ROM, or other media. The archived information can then be translated into forms suitable for output to different devices, such as the computer monitor, a laser printer, or typesetting equipment.

Electronic publishing allows more efficient distribution of information. Instead of printing hard copy at one location and shipping printed documents to another location, pages can be printed at the point

### ABSTRACT

This document first provides an overview of electronic publishing within IFAS as implemented by the FAIRS CD-ROM series. (FAIRS is the Florida Agricultural Information Retrieval System, and CD-ROM stands for compact disc, read-only memory.) The publication then addresses issues of information design that authors encounter when writing for multiple delivery modes, both hardcopy (printed pages) and softcopy (video display from a computer monitor). In addition, this circular explains the importance of generic markup codes and gives

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of demand. Also, the number of copies printed can be tailored to immediate needs, because it is easy to print additional copies as needed.

Once a document has been keyed into a word processor, updating of information can be performed faster and less expensively than would be the case if the entire document had to be rekeyed. A mass storage device such as CD-ROM can provide a convenient archive of the latest version of documents, and authors can retrieve documents from this archive for updating.

### The IFAS Publishing System

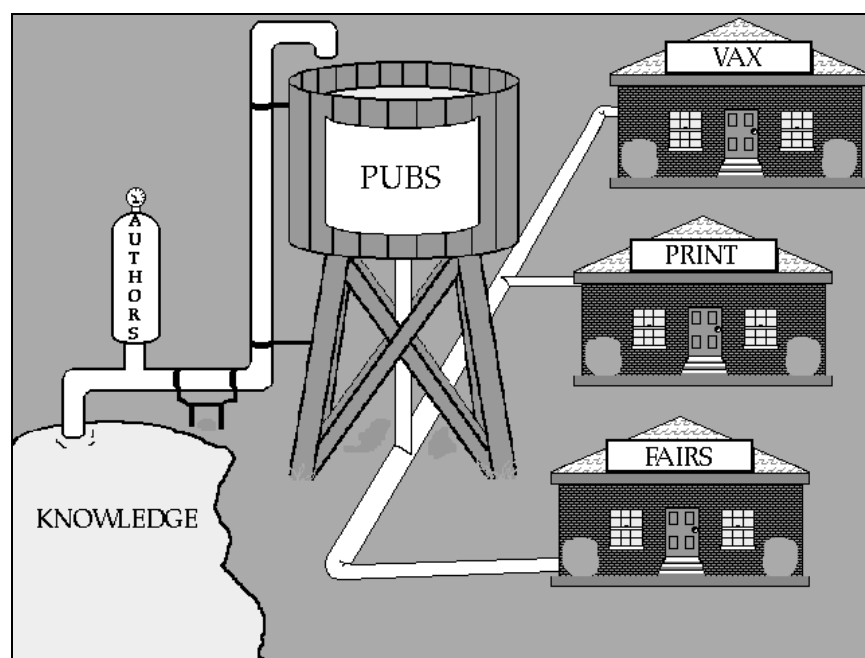
In the IFAS electronic publishing system, documents are submitted as enhanced WordPerfect files, from which versions of the document can be generated as needed for delivery through different media. Electronic information is stored in an archive that has become metaphorically known in IFAS as the "water-tower." Information delivery can be made through different "pipelines" or media (Figure 1). The media currently being used are traditional print publications; the FAIRS CD-ROM series; and on-line electronic text files available from the IFAS VAX network. Text files may also be made available through Internet.

The CD-ROM, designed for use on stand-alone personal computers, itself offers multiple delivery

modes. First, from the FAIRS CD-ROM, users can read text files and view graphics, including near-photographic-quality color images, displayed on the computer monitor. Second, copies of complete documents or excerpts can be printed on a Hewlett Packard LaserJet II-compatible printer. Third, WordPerfect files of documents can be retrieved for further use. County Extension agents can use parts of documents in local newsletters and can assemble groups of documents into handouts for workshops. Also, as has been noted, authors can use the archived files as the basis for revised documents.

While electronic delivery systems offer some powerful new possibilities, there is also a potential drawback: specialists can find themselves preparing iterations of the same basic work for a variety of outlets. A corollary problem is the updating of materials. When the same or similar information is located in a variety of formats, it becomes difficult to keep all versions current.

To help solve these problems, the FAIRS research and development teams have designed a system that allows a single version of a document to serve as input into all subsequent delivery forms. In order to streamline the electronic publishing system as much as possible, all electronic documents entering the system need to be prepared to certain standards. If the information is correctly prepared at the outset, the conversion processes can be automated, allowing the author to obtain multiple forms of a publication with little additional effort.



**Figure 1.** The watertower concept of electronic information distribution.

### THE FAIRS CD-ROM SERIES

Within the past few years, CD-ROM publishing within IFAS has grown from a faculty-initiated research effort to an institutionalized process for information dissemination. The IFAS CD-ROM series began in the late 1980s as a research effort in the Agricultural Engineering Department, where an ad-hoc CD-ROM Implementation Team began developing a comprehensive system of processing documents and other databases for electronic delivery. When a prototype disk was produced for evaluation, county Extension agents asked for publications to be made available on CD-ROM. Once

printed publications became a priority for CD-ROM delivery, a member of the former Editorial Department joined the research effort. In 1990 the CD-ROM project was merged with FAIRS, which had until then had focused on delivery of electronic information over the IFAS computer network, and in 1992 an administrative decision was made to place all new Extension publications on CD-ROM. Production of discs is currently being managed by FAIRS with the cooperation of publication production specialists in IFAS Educational Media and Services in preparing electronic files. Research and development teams composed of faculty and staff of the Agricultural Engineering Department and the Agricultural Education and Communication Department are concurrently working to enhance the infrastructure for information dissemination by CD-ROM.

### **Advantages of CD-ROM**

A CD-ROM is an easily portable storage device for large quantities of electronic information. A major advantage of CD-ROMs is their large storage capacity—more than 600 megabytes of information per disc. Stored information can be delivered as text, graphics, and sound, providing an electronic library of multi-media information.

The technology used for creating a CD-ROM is the same as that used for making an audio compact disc. Both store digitized information on the disc surface as microscopic pits. The information is then detected by a laser light in a specialized CD-ROM player. A CD-ROM differs from an audio CD in that it contains information to be accessed on a personal computer equipped with a CD-ROM drive. Since the CD-ROM is read by a computer, the power of the computer can be applied to locate information on the disc.

The use of optical technology distinguishes CD-ROMs from floppy disks or hard disks, which use magnetic signals to store information. The optical technology affords several advantages, in addition to the high-density storage capability. A CD-ROM has generally has a lower rate of bit error than a magnetic disk, and a CD-ROM is less fragile. CD-ROMs are not corrupted by magnetic fields, and their surfaces are not vulnerable to being scratched by a read head in the computer.

A final difference between a magnetic disk and a CD-ROM is that a CD-ROM is “read-only.” That is, users do not write revised information back to the

disc. While this is a limiting factor of the CD-ROM medium for some uses, it can be an advantage for information delivery. The information on a CD-ROM is stored in a stable form, protected from overwriting and file corruption.

### **A Library on the Desktop**

The FAIRS CD-ROM series provides microcomputer users with direct access to large and diverse databases developed by IFAS, putting a virtual electronic library on the user's desktop. Each new disc in the series provides a more comprehensive archive of IFAS publications and related information. With the release of Disc8, the FAIRS CD-ROM series delivers more than 2400 Extension publications in addition to agricultural building plans, a directory of Extension services and resources, and several interactive programs. The Citrus Selector provides information for commercial growers, while the Plant Selector and Landscape Selector programs are useful to homeowners, nurseries, and landscaping companies. A recent addition to the CD-ROM series is Rediscover Vegetables, a multi-media presentation of the history of vegetables in the New World.

The information retrieval software supplied with the FAIRS CD-ROM provides different ways to locate information. The user can search text for specific words, browse through menus, and use special connectors called hyperlinks to access related information. Effective aids to information retrieval become increasingly important as the size of the electronic library grows.

## **DESIGNING INFORMATION FOR ELECTRONIC DISTRIBUTION**

Electronic publishing brings new considerations to document preparation. Authors need to think not just in terms of a printed page but also in terms of on-screen presentation of information. This section explores some of the differences between traditional printed documents and electronic documents.

### **Preparing for Multiple Display Formats**

The laser-printed page and the computer screen are the major information delivery modes available from CD-ROM. An obvious difference between the two is the aspect ratio (height-to-width) of the display area. Authors need to consider the limits of both media when designing information.

## Printed Pages

Documents can be printed on demand from the FAIRS CD-ROMs to a Hewlett Packard LaserJet II-compatible printer, using standard 8½ x 11 inch paper. Text is printed in a two-column format, the same format used for traditional printed documents produced by IFAS. Laser-printed pages formatted for CD-ROM can be used also as camera-ready master copy for duplication.

## Video Display

In preparing a FAIRS CD-ROM, a copy of each document is reformatted for display on a computer screen. Text and tables appear on the computer screen in boxes called windows, which typically display a few paragraphs of text at a time. Although sections of text can be scrolled vertically through the window, scrolling through long sections is inconvenient for users. Therefore, documents are broken into topical segments for on-screen viewing from the CD-ROM.

**First Looks.** The initial window for displaying a CD-ROM document contains the document title, authors' names, and the introductory text, followed by a list of top-level headings for the remainder of the document. The first paragraph(s) of the document will give the computer user a first look at the document, and these paragraphs should provide an informative overview of the document. This section should function as an abstract, introduction, or summary that helps users decide whether they want to read further in the document. The list of headings provides access to other sections of the document, as each section title is a hyperlink that makes the contents of that section available.

## Building Information Networks

Electronic libraries offer an unprecedented capability for connecting and integrating knowledge. In a hypermedia database, such as is used on the FAIRS CD-ROM, information is organized as a network of nodes and links. Each document on the CD-ROM can become part of a vast web of information. Links can be used to make connections not only with other parts of the same document but also with other databases that are available on the CD-ROM, such as a gallery of digitized color photographs. To build appropriate links between nodes, authors need to flag potential connections to related information, both within their own documents and to documents from other authors. This is done

by marking "hyperlinks" phrases to be highlighted on the computer screen to form links to other information.

## Providing Information Modules: Nodes in the Hypermedia Network

With hypertext retrieval systems, traditional rhetorical conventions about linear ordering of text become less important. When users search document databases for on-screen delivery of information, they typically are seeking information that will answer a specific question. Accordingly, they want to go directly to the part of a document that seems most likely to answer their question. What William K. Horton has written about online help is true of other documents also:

Traditional rhetoric decrees that a work have a beginning, middle, and end. But an on-line . . . document can have many beginnings, and it ends as soon as the user is satisfied or gives up (*Designing and Writing Online Documentation*, John Wiley and Sons, New York, 1990, p. 216).

This information-seeking strategy poses new challenges for the design of information delivered in electronic formats. Authors need to consider users who are "reading to do" (looking for just enough information to successfully complete a task) as well as those who are "reading to learn" (seeking to broaden their knowledge in a more general way). When information is provided in modules—short segments of self-contained information with appropriate headings—users have the best chance of finding what they want before they give up in their search for information.

## Applying Modular Thinking to Entire Documents

Information modules come in various sizes: for example, sentences, paragraphs, topical sections of documents, and entire documents. Just as lengthy sections of documents can be broken up into subsections for easier location of topics, so long documents can often be divided into smaller modules. Long bulletins and manuals can be divided into chapters or broken up into a series of fact sheets for electronic delivery and printing on demand. Conversely, a set of fact sheets or other materials on a subject can be grouped together to form an electronic handbook to facilitate information retrieval.

Short documents are better suited to the print-on-demand option offered by the FAIRS CD-ROMs than are long documents. With FAIRS Disc8, when the print option is chosen, a complete document is printed on a laser printer. The print command on a FAIRS CD-ROM copies a binary printer file of the document to the printer, so that the entire document is printed, not just the portion visible on the screen. County agents are asking for the ability to print just a pertinent segment of information rather than having to print entire documents. This capability will be available on future discs, but the fact that such a request was made highlights the desirability of keeping documents brief and focused on relatively narrow subjects. Many users want information that is concise and to the point, and of course printing costs are lower when only the needed pages are printed.

### **Avoiding Spatial References**

Spatially-oriented references (such as “as shown below” or “as explained previously”) have little meaning to a reader who is not following a strict linear order for text. The solution is to replace spatially-oriented phrases with references to specific subsections of the document, which will make sense in hypertext.

*For example, instead of writing:*

Review the headings in accordance with the guidelines given above.

*write:*

Review the headings in accordance with the guidelines given in the section, “The Importance of Good Outlining.”

The reference to the section title will then be used as a hypertext link.

### **Providing Definitions**

In print documents, an abbreviation or a technical term may be explained the first time it is used. With electronic delivery, there can be no assumption that the reader has already seen the definition for a particular term. Therefore, definitions need to be available every time a term requiring explanation is used. This can be done by creating hypertext links for abbreviations, words defined in a glossary, and other terms requiring expansion. Definitions or other information needed to make the segment of

information complete can then appear in pop-up windows in the on-screen version of the document.

### **Using a Standard Vocabulary**

Use of a standardized vocabulary both in headings and in the text may facilitate electronic information retrieval, in that users will be able to conduct a full-text search with fewer entries. Standard terminology also benefits translators and readers whose first language is not English, and who may think that a synonym signals a variance in meaning. There is no need to collapse all references to a subject to a single term; for example, there is no need to replace all references to “lawns” with references to “turfgrasses.” However, do not seek synonyms to use just to avoid repeating common terminology. The most common term is the one that information seekers are most likely to use in a search procedure.

### **HEADINGS GUIDE THE WAY**

The headings in a document are like road signs, guiding readers through information, calling attention to points of interest, and in general, helping readers get where they want to go. Three strategies will help you write effective headlines:

1. Use informative wording;
2. Provide enough headings to keep the reader oriented; and
3. Observe the rules for headings given in this publication.

### **Use Informative Wording**

Document headings that are straightforward and informative will facilitate computerized information retrieval. The best headings contain keywords pertaining to the section that follows. Headings that contain keywords will be especially important if computerized searches prioritize targeted words when found in titles over the same words found in the text of a document.

Wishing to add human interest to documents, authors are sometimes tempted to use humorous phrases in document titles and section headings. Unfortunately, computer searches cannot interpret puns and other humorous references in a helpful way. Authors should therefore refrain from attempts at cuteness and use of cryptic phrases intended to pique the reader's curiosity. Headings should provide information, not raise questions. Human interest can

<b>Incorrect</b>	<b>Correct</b>	<b>Correct</b>
<u>Fleas in Florida</u>	<u>Fleas in Florida</u>	<u>Fleas in Florida</u>
1. Introduction	1. Introduction	1. Introduction
2. Biology of the Pest	2. Biology of the Pest	2. Biology of the Pest
3. Control Methods	3. Control with Pesticides	3. Control Methods
a. Pesticides	4. Conclusions	a. Pesticides
4. Conclusions		b. Other methods
		4. Conclusions

**Figure 2.** Incorrect and correct ways to structure the hierarchy of headings.

be added to headings by using verb phrases rather than noun labels.

### Provide Enough Heads

For video display, it is important to provide enough heads to identify topic changes. The video display holds much less text than printed page, and readers need frequent headings to enable them to maintain a sense of orientation in the stream of information. When a document is constructed as a series of relatively short sections with frequent headings, readers can move easily from one topic to another.

The initial window for displaying a CD-ROM document will contain the title, authors' names, and abstract or introductory text, followed by a list of top-level headings. The list of headings serves as an on-screen table of contents for the document, and it needs to be comprehensive enough to guide the reader to appropriate sections of the document.

Authors should also keep in mind that headings determine where text will be divided into sections for on-screen display. Segmenting of documents is performed by software that starts a new text segment with each new heading in a document. In the on-screen display, a new window will be opened to display the pertinent segment as each new heading level is selected.

### Observe the Rules

The following rules govern the construction of headings in IFAS documents.

**Rule 1:** *There should be a heading at the beginning of the text, following the authors' names.* The initial text should be an introduction or abstract, and should be labeled as such. (The title "Introduction" will be

omitted from the on-screen display, but will appear in the print-on-demand document.)

#### **Rule 2:** *Text should immediately follow each heading.*

If one heading appears directly beneath another, a short paragraph should be written to follow the first heading. A two-sentence overview of the section will suffice. If a heading is followed by a list with no intervening text, the author should either add a sentence introducing the list, or should convert both heading and list into a chart (a type of figure created with text) or a table.

**Rule 3:** *Whenever a section is divided into subsections, at least two subheadings of the same level should be used.* There are two ways to repair a construction that violates this rule.

- *Eliminate a head*—incorporate a lone subhead into the higher level heading.
- *Add a head*—break the section into more subsections and add at least one additional subhead.

Figure 2 shows an example of an incorrect hierarchy for document headings with the solutions implemented.

**NOTE:** Paragraph heads can be exempted from Rule 3. Paragraph heads, which put a bold label on text at the beginning of a paragraph, can be used without regard for parallel construction.

## THE ROLE OF TAGS IN ELECTRONIC PUBLISHING

When text is prepared for modern publishing systems, codes for formatting the text are inserted into an electronic text file. Codes are used, for example, to signal specific font changes and to enter

commands such as “center a line” or “justify left.” Different sets of codes are needed for different kinds of output devices, such as desktop laser printers or commercial typesetting systems.

A common problem in electronic publishing is that formatting codes may be meaningful only to certain hardware and software systems. Such codes become obsolete when offices upgrade software and/or hardware, and the codes may be useless when document files are shared with other agencies using different equipment. On the other hand, if generic codes are used, electronic publishing software can translate these codes into a variety of system-specific codes. Generic codes are therefore becoming prevalent in electronic publishing systems to facilitate publishing across different platforms.

Many government agencies and private companies have adopted the international standard set by Standard Generalized Markup Language (SGML). In an SGML system, generic codes are inserted into electronic document files as tags—that is, information about document structure that is separated from the document content by some kind of delimiter.

Tags identify document elements specified in a document type definition (DTD). The DTD describes elements that may appear in a document (for example, title, author's name, publishing agency, section title, figure, table, or footnote). The DTD also specifies how elements may relate to each other. For example, a Level Two subhead can be an optional element under a Level One subhead, but a Level One subhead is not a permissible element under a Level Two subhead.

The IFAS standard word processor, WordPerfect, does not yet directly support SGML. However, it is possible to use the WordPerfect Styles feature to enter codes that serve as precursors to SGML tags.

WordPerfect styles serve a twofold purpose in IFAS document preparation. First, they reference a specific set of WordPerfect codes for producing pages from a laser printer. But more importantly, the style codes identify elements specified in the IFAS DTD. The style codes thereby serve as a way to introduce generic markup codes into a document. The WordPerfect style codes are converted to SGML codes which, in turn, are used to process the text for delivery to different media (CD-ROM, typesetting

equipment, or computer networks such as provided by the IFAS VAX and Internet).

## **PREPARING THE MASTER DOCUMENT FILE WITH FAST-WP**

The master document file in the IFAS system is a WordPerfect file containing standardized style codes. The print-on-demand document is only one way in which the information can be delivered. It is not sufficient, therefore, that the pages conform to a certain format description. Rather, the format must be created through use of predefined tags that identify document elements. These tags are essential for automatic processing and distribution of the document through other media.

To assure that standardized codes are used, and to make it easy to enter these codes, an electronic toolkit has been developed for use in IFAS document preparation. This set of software tools is called FAST-WP (Florida's Authoring System Tools for WordPerfect). FAST-WP consists of a standard set of fonts, WordPerfect styles, macros, and a custom menu to run the macros.

FAST-WP is distributed by the IFAS Software Support office, (904) 392-7853. The current release of FAST-WP is version 3.1 for use with WordPerfect 5.1. FAST-WP does not change the operation of WordPerfect; it just makes it easier to add various WordPerfect codes to a document. With a minimum of keystrokes, users can enter the codes needed to format pages and tag document elements.

## **ADDING TABLES**

In designing tables, authors need to consider the limits both of the laser-printed page and of the computer screen, the two major information delivery modes available from CD-ROM. The IFAS stylesheet for printed pages includes certain standards for table size, and display of tables on a computer screen introduces additional limiting factors.

Laser-printed documents use a standard 8.5 x 11-inch page. Recommended table widths are 3.3 inches (one column), 4.5 inches (1.3 columns), or 7 inches (two full columns). If necessary, tables can be printed in landscape page orientation with a width of 9.5 inches. Length is not a limiting factor for printed pages, as tables can continue across pages if necessary.

When information from the FAIRS CD-ROMs is displayed on a computer screen, larger characters are used, and less information can be displayed at one time. Also, the width-to-height ratio of a video display window is different from that of the printed page. A video display window is not as long as a printed page, and its width is limited to about 75 characters. Tables longer than a window can be scrolled vertically through the window. The FAIRS information retrieval software also provides a horizontal scroll option, so that tables wider than 75 characters can be viewed like spreadsheets. Nevertheless, it is generally less satisfactory to view part of a table in a window than to see small, complete units of information. Authors need to consider the relative advantages and disadvantages of using large tables with those of breaking tables into smaller units of information.

In some cases, information contained in long tables is best presented on CD-ROM by using a record-oriented database, such as dBASE or Paradox. For example, certain IFAS documents contain lengthy tables of plants suitable for particular temperature zones, soils, shade conditions, and other conditions. With the FAIRS CD-ROMs, such information can be presented more dynamically, as was done with the Plant Selector on FAIRS Disc4. The Plant Selector database and retrieval program allows the user to conduct searches for plants that meet specified criteria, read descriptive text about plants meeting the criteria, and view color photographs of the plants. FAIRS database experts can advise on converting other lengthy tables to interactive databases. (Call 904-392-3196 to arrange a consultation.)

Tables for electronic publishing must be structured in WordPerfect's Columns/Table mode. The process of constructing tables is explained in the Extension Circular 1069, *FAST-WP: Florida's Authoring System Tools for WordPerfect* and Circular 1099, *Preparing Tables for Electronic Publishing*. Tables can be created either in WordPerfect, using FAST-WP to assure correct tagging, or created in spreadsheets such as Lotus 1-2-3 and Quattro, after which tables can be imported into the word processing file, again using FAST-WP.

### ADDING GRAPHICS

Various kinds of graphics may be included in electronic documents: graphs and other drawings produced in computer graphics programs; scanned artwork; digitized photographs, including color photos

or slides; complex equations created in WordPerfect's Equation Editor; and text charts treated as figures. Details of preparing graphics for use in electronic publications are given in the Extension Circular 1100, *Preparing Graphics for Electronic Publishing*. The following information is an overview of the requirements for graphics.

Illustrations in IFAS documents should conform to one of the following widths for figure boxes: 3.3 inches (one column), 4.5 inches (1.3 columns), or 7 inches (two columns). If text labels are to be used as part of a graphics file, the size of lettering used should be appropriate for the final size of the illustration.

Graphics that were not created electronically must be digitized, typically by scanning. Hand drawings or printed illustrations should be scanned at 300 dpi into the PCX file format. If figures are scanned from printed publications, permission must be obtained to use copyrighted materials.

Before figures are imported into WordPerfect, it is advisable to convert PCX files to WPG format through the WordPerfect GRAPHCV utility. Converting graphics files to the WPG format reduces their size, which in turn reduces document size and alleviates memory management problems.

**NOTE:** Although the WPG files (or a copy of the PCX files) are incorporated into WordPerfect documents, authors should reserve a copy of the PCX files for use in the video screen display from CD-ROM. These PCX files are needed along with the word processing file for CD-ROM publication.

### TRANSMITTING DOCUMENTS FOR CD-ROM

Extension Service publications that can be placed on CD-ROM include Extension Service Fact Sheets, Bulletins, Circulars, the SP series, and the SS series. Research Bulletins, Circulars, and Monographs may also be prepared for CD-ROM.

Extension documents for electronic publication are submitted to the office of the appropriate program area dean with the Extension transmittal form for plan of work projects (IFAS Form 2840). Research documents for electronic publication are submitted to the Office of the Dean for Research, using form AES-2132. The deans forward approved



materials to the Publications Coordinator in IFAS Educational Media and Services.

The following materials should be submitted for CD-ROM publication: (1) a hard copy of the document; (2) the WordPerfect file, formatted in accordance with the guidelines provided in the FAST-WP user's guide; and (3) separate electronic files of any graphics files used in the document (e. g., scanned artwork and equations). Graphics files for on-screen display must be prepared in accordance with detailed guidelines provided in the Extension Circular 1100, *Preparing Graphics for Electronic Publishing*. If color slides are to be digitized for on-screen display, original 35-mm slides, not duplicates, should be provided.

### **FURTHER INFORMATION ON DOCUMENT PREPARATION**

The following publications provide further information on electronic document preparation. These publications give detailed instructions on entering codes in word processing files, preparing graphics and tables in the required formats, and updating document styles.

Cilley, Mary L., and Dennis G. Watson. *FAST-WP: Florida's Authoring System Tools for WordPerfect*. Circular 1069, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences (IFAS), University of Florida, Gainesville, Florida. Revised edition: in press.

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Cilley, Mary L., and Dennis G. Watson. *Preparing Tables for Electronic Publishing*. Circular 1099, Florida Cooperative Extension Service, IFAS, University of Florida, Gainesville, Florida. In press.

Cilley, Mary L., and Dennis G. Watson. *Updating Electronic Documents with FAST-WP*. Circular 1101, Florida Cooperative Extension Service, IFAS, University of Florida, Gainesville, Florida. April 1994.