

cisions relative to hyphenation. Output capacity of the phototypesetter is approximately 40 lines of justified left and right margin copy on a 12 pica (2 inch) measure per minute.

Considerable saving of time can be effected by utilizing this system of preparing an index. Fewer keystrokes have to be made by an operator in setting the text of the index. Over 70,000 keystrokes were contained within the combined author, subject, and book review indexes of *HortScience*, Vol. 11. Because a punched tape could be generated by the computer that could be directly inputted through the phototypesetter, no further typesetting nor proofreading was necessary. Camera-ready copy was given to the editor to dummy pages. These savings will be especially apparent in the cumulative indexes.

Conclusion

The resulting index appears to be easily scanned, additive, and inexpensively produced. It also seems to be adaptable to successive indexers and varied computer facilities. Keywords should be revised at the beginning of each cumulation so that the indexes will record the changing science of horticulture.

We recommend that a standardized format for the index be mandated by the ASHS Publication Committee. Authors should be advised to submit the currently recommended keywords as well as more specialized, perhaps merely topical, keywords with their manuscript. Each indexer should expect to produce a cumulative index at the end of his term of office. The system, however, requires a combination of horticultural and computer competency.

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Titling Biological Papers for Proper Storage and Retrieval¹

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The title you give your paper is as important as the content. A good title helps the reader to know whether he should take the time to read your paper. The first significant word in a good title also informs the librarian where to file and how to index and cross reference your paper. The title must label the end product for storage and retrieval in a computer system or on microfilm. And if the label is minus a detail or two, the product cannot be adequately stored, much less retrieved.

Using the exact title to describe the area of research covered in your paper, to precisely define it in terms that cannot possibly be misunderstood, even by a computer, should be your goal. A title should be *an abstract in miniature*. In addition, although everybody knows, I hope, that scientific reputations are built on quality of performance, the title of your paper will draw the kind of readers you want to understand it or that you need for recognition of your work. Also, do not be misled into underestimating the power of a computer system. Each title should be prepared so that the keywords will emerge under usable headings that can be selected by a machine indexer without inappropriate or even laughable results.

You must avoid such no-account words as *study, effect, result, evaluation, factor, and test* plus all their plural forms. Such words are useless for indexing purposes since it goes without saying that if you conduct experimental work, you will make *studies*, observe *effects* and *results*, make *tests, evaluations, and observations*, and be concerned with *factors*.

By analyzing 10 good and bad titles, perhaps we can clear up some of the troubles that authors experience in choosing a title. Let us begin with Title 1, **Results of Tests Using Tepas**. This is about as poor a title as you will find anywhere. It contains only 1 key word that is suitable for indexing – *Tepas*. Thus, 4 out its 5 words are useless. It also contains a grammatical error very

often present in titles – the word *Using*, a verbal, modifies nothing but the air it hangs on. In addition, though the experimental work involved a problem in entomology, the author neglected to give the name of the insect tested; in this particular work, the test organism was the house fly.

How do we fix up a title like this one? How do we make sure that the author will get the full value from the words he uses? Remembering 3 rules will help:

1. Tell all.
2. Tell it economically.
3. Tell it artfully.

Let's apply these rules to Title 1. A quick perusal of the paper shows that the results of the work, as demonstrated in the tables, are concerned with the numbers of eggs the flies laid (fecundity), the numbers of eggs that hatched, and the percentages of test flies that died (mortality) the first 10 days after they were treated with *tepa* (a chemical that sexually sterilizes insects). So in addition to *tepa* we now have several more keywords – *fecundity, hatch of eggs, mortality, and house flies*. Let's put these words together, as follows: **Fecundity, Hatch of Eggs, and Mortality of House Flies Treated with Tepas**.

Title 2, **Studies on the Importance of pH in Tests with Chemosterilants**, also contains a grammatical error, one that turns up again and again. You can't make *studies* on anything, unless, perhaps, you customarily conduct your research from the top of a flagpole. The proper phrase is "*Studies of,*" that is, if you are going to use this phrase at all. Any research involves *studies, experiments, tests, and trials*. Then why use them and waste good space?

Have you noticed that in composing Title 2 the author again forgot to mention his test organism? In our inspection of the actual content of his paper, we discover that he fed 2 chemosterilants, *tepa* and *metepa*, to the house fly and that the effectiveness of the treatment depended on the pH level of the mixture fed. Thus, let's modify this title as follows: **Activity of the Chemosterilants, Tepas and Metepa Fed to House Flies at Different pH Levels**.

Title 3, **Observations on Reproduc-**

¹Excerpted by Charlotte Pratt from *Bul. Ent. Soc. Amer.* 12:370-373, 1966.

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tion of Some Insects Treated with Chemosterilants, could no doubt take a prize for ambiguity. There is that preposition *on* again! You make observations *of*, please! In mending this title we must ask ourselves some questions. The tests were concerned with the reproduction of what insects? Treated with what chemosterilants? The word reproduction implies that the author will deal with the reproductive process of the test insects. In scanning the paper we find that he obtained data pertaining to hatch of eggs, but was not at all concerned with the reproductive process per se, and that he used 3 chemosterilants (tepa, metepa, and apholate) to treat 5 different insects that attack cotton. Our new title emerges from the mending process as follows: Hatch of Eggs from Five Cotton Insect Pests Treated with Tapa, Metepa, and Apholate.

Title 4, Colorimetric Method for the Determination of the Dimethoate Residues, although better than many, still leaves the reader guessing as to the exact content of the paper. In reading this paper, we discover that the author conducted tests with 4 different kinds of materials — soils, fodder, meat, and milk — to determine whether they contained any dimethoate and that he used colorimetry. Armed with this information, we can thus reconstruct the title as follows: Dimethoate in Soils, Fodder, Meat, and Milk: A Colorimetric Determination. Note the use of the colon in this title. More and more authors are employing this punctuation to provide an emphasis that cannot be achieved any other way. Later on (for Title 10) we will discuss another way to use the colon.

Title 5, Control of Insects and Mites on Fruit Trees by Trunk Injections, appears at first glance to be fairly good, but a closer look discloses that some valuable information is missing. For instance, the words insects and mites give us a wrong impression. We are led to think that several species of insects and mites are involved. But it turns out that

the author was actually working with only 2 species, an aphid and a mite. And what were the materials he injected into the trunks of the fruit trees? We find that they consisted of about 35 antibiotics. And what happened during the tests? By examining the data, we find that results of the tests are given entirely in percentages of mortality obtained at different intervals after treatment. This title, then, emerges from the wash looking somewhat better than new: Mortality of the Apple Aphid and Two-Spotted Spider Mite on Apple Trees Injected with Antibiotics.

Title number 6, believe it or not, is given just as it was published: "Outdoor Observations of Activity during Sunset, Dispersal, and Nocturnal Resting Places of the Face Fly, with Special Reference to a Mechanical Means of Capturing Same. The author attempted to cram 2 papers into 1. The author should start over, separate the observational data from the how-to-do-it information, and prepare 2 reports entitled: 1) Outdoor Activity of the Face Fly during Sunset and Its Dispersal to Nocturnal Resting Places. 2) A Device for Capturing Face Flies.

Title 7, Effects of Attractants, like the original Title 1, is so uninspired, so uninformative, as to be better not written at all. The author's paper turns out to be one of these reviews so hard to write and just as hard to find a title for. If he did manage to hit on a good one, he probably discovered that someone else had already used it.

Depending on place of publication and readership, one solution to his dilemma was, The Role of Insect Sex Attractants in Reproduction of the Species (written for scientists only). Another was, Recent Research At Beltsville on Insect Sex Attractants (written for a mixed audience of scientists and laymen). And still another, Why the Chemist Wants to Synthesize Sex Attractants (written for the layman).

Title 8, Why is biological Control of Insects Necessary? is very good. It has only one slight drawback. Because it is

stated as a question it is going to cause a problem since some computer systems reject questions. Better write a title like this in the form of a direct statement, as follows: Why Biological Control of Insects is Necessary.

Title 9, Pink Bollworm Mating Studies Based on Presence of Spermatophores, is another one that is ambiguously stated. The phrase *based on* is misplaced in the sentence and the entire syntax needs combing out. Restated, the title makes much more sense and in addition the most significant key word now comes at the beginning: Mating of Pink Bollworms Determined by Presence of Spermatophores in the Spermatheca.

Title 10, Experiments on the Control of Insect Populations with Light Traps, is a good example to end with. In choosing this title the authors quite simply did not do justice to the contents of their paper. In overhauling, we must go through the familiar process of acquainting ourselves with the results of the research, as given in the tables. We find that the authors deal with 4 different subjects: 1) design of traps, 2) their placement at certain distances from the center of the test area, 3) the mortality of insects to be expected when the traps are placed at these distances, and 4) the possible uses of such traps along with other means of control. How may we best present this information in the title?

Probably the best way to handle Title 10 is to compose a main title, set the main title off with a colon, and then follow with a subtitle, as shown: Light Traps for Controlling Insects: Design, Placement, Expected Mortality at Given Distances, and Possible Uses with Other Control Measures.

This title indexes very well indeed. Each word in the subtitle leads easily back to the main title. It also has the virtue of leaving no doubt in the reader's mind as to what the paper is about. Although somewhat long, it is neatly and concisely stated with parallel construction and proper emphasis.

SCHEDULE OF FUTURE MEETINGS OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE

Name & Date of Meeting	Location	Comments
74th Annual ASHS Meeting October 9–15, 1977	Salt Lake City, Utah Hotel Utah	Horticultural tours will be scheduled October 10–11; Program Sessions October 12–14.
75th Anniversary Meeting July 16–20, 1978	Boston, Massachusetts Sheraton—Boston Hotel	Program will feature 75th anniversary observance and tours; hosted by the ASHS Northeast Region.
76th Annual ASHS Meeting Summer 1979	Ohio State University Columbus Campus	Program will feature joint sessions with the American Society of Plant Physiologists.