
The Readability of Current and Classic Horticulture Texts Used at Three United States Land-Grant Universities

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Abstract

The readability level of 24 modern horticulture texts published after 1978 and 7 classic horticulture texts published prior to 1957 were compared using the Gunning-FOG test. Classic texts generally were more difficult to read and would not be suitable for use in most of today's university classes. The mean reading difficulty for modern horticulture texts was 14, making them generally suitable for use in undergraduate horticulture classes. Books that were written for use as handbooks by the general public generally were easier to read than those written specifically for use as texts.

Introduction

Appropriately selected textbooks are a crucial element in the student learning process, yet many university educators have little or no experience evaluating the readability of texts used in their courses. Instead, we often base text selection, with little thought as to the readability of the material, on what has been used traditionally in courses such as ours, or on the recommendations of both colleagues and publishers. Similar views have been expressed by Wood and Rosati (1990). Hitchner et al (1992) reported that readability of agriculture texts used at Mississippi State University did not correspond with the theoretical reading level of students, since both freshman and junior classes used texts written at a second semester freshman level and sophomore and senior classes used first semester junior-level texts.

Chavez et al (1983) reported that reading levels of texts used in community college-level agriculture courses generally exceeded the abilities of students to comprehend them. A similar finding was reported by Zimmerman et al (1995) for an Ohio technical college. Hitchner et al (1992) reported that the overall readability of undergraduate agriculture texts used in courses at Mississippi State University during the Fall 1990 semester was appropriate, measuring 14.79 on the Gunning-FOG scale. They further reported that there was some discrepancy in text readability levels among various curricula. Agriculture and extension education texts had a mean read-

ability level of 13.91, while those for landscape architecture and horticulture texts were 14.31 and 14.59 respectively. Weed science texts were the most difficult to read, with means of 15.19. These were appropriate for use in first semester junior classes.

It is not always true that students beginning their college career should be able to read at the thirteenth grade level. Incoming freshmen at a two year agricultural college in Ohio had an average reading level of tenth grade students (Zimmerman and Houston 1994). Half of the students involved in the study could not comprehend major newspapers, general interest magazines, or high school texts.

Graveel and Fribourg (1987) used various tests to analyze the readability of dozens of texts published between 1960 and 1985 and used in classes taught in the Department of Plant and Soil Science at the University of Tennessee. With one exception, they grouped all horticulture books into a class appropriate for use in lower division undergraduate courses. They found that sections of a single book written by different authors had different readability levels and that the level of readability depended upon what material was being discussed. For example, a discussion of genetics usually includes more difficult material and so is more difficult to read.

The purpose of this study was to determine the level of readability of horticulture texts currently used in some universities around the United States and to determine whether general text readability levels have declined over the years by examining "classic" horticulture texts used a generation of more ago.

Materials and Methods

We solicited lists of horticulture textbooks and the numbers of the courses in which they were used during the 1995 Fall semester at the University of Maine, the University of Rhode Island, Virginia Polytechnic Institute and State University, and Montana State University. We generated a list of "classic" texts using our own expertise and the suggestions of colleagues. Three passages were excerpted randomly from the beginning, the middle, and the end of each text. Each passage contained at least 425 words and most more than 500 words. Symbols such as %, /, and = were deleted from the text, as were subheadings, equations, incomplete sentences, and other abbreviations. Readability was evaluated using the Gunning-FOG test, the formula for which is:

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$R = 0.4$ (mean number of words/sentence + the % of words with 3 or more syllables per passage)

Derived R is the equivalent grade level based on a ten month academic year, so that a value of $R = 15.2$ would indicate a readability difficulty theoretically appropriate for the second month of the fifteenth grade (junior year).

Results

It was not our purpose to compare various tests to determine reading level of texts. We therefore used only a single popular test for our study.

Readability levels of current horticulture texts, as determined by Gunning-FOG analysis, are presented in Table 1. Overall, we found that texts were appropriately written based on the average score for each text. The grand mean for all modern texts was about 14. However, such scores do not indicate that all sections of the text have comparable levels of difficulty. The ranges of difficulty level varied substantially for some texts around the mean score. For example, passages in texts by Westwood, Dirr, and several others varied in difficulty by more than three grade levels, while the readability of other texts, such as those by Janick and Teskey and Shoemaker, was relatively consistent throughout.

Some texts, with reading levels appropriate for high school upperclassmen (grades 10-12), were prepared for use as handbooks for the general public or for growers. We suspect use of books such as those by Whitson and Splittstoesser as college texts is ancillary to the primary goal of the authors to prepare good handbooks. It is appropriate, then, that their reading level be lower and more in line with that of the general public. Perhaps their use as primary texts for some college courses should be reevaluated.

Current texts that scored about 16 should be reevaluated for suitability of use in undergraduate classes. Turfgrass Management, by Turgeon, should be used in senior and graduate level classes, and Horticultural Sciences, by Janick, a book generally used in introductory classes, may not be appropriate for use in undergraduate classes at all. With the exception of these two, all other modern texts were written at the theoretically appropriate level.

Classic horticultural texts, however, were written on a somewhat more difficult level (Table 1). The grand mean of 16.04 for this group places them about 2 grade levels higher than modern texts. Without question these books are more difficult to read and comprehend than many used today. However, they were popular texts during the middle third of this century. As in the case of some modern texts, the classic text

Table 1. Mean Levels of Readability of Horticulture Textbooks Published After 1978 and Evaluated Using Gunning-FOG Index.

Authors	Title	Year	Range	Mean
Modern				
Ball, V.	Ball Red Book, 14th ed.	1985	9.94-14.50	11.60
Bridwell, F.M.	Landscape Plants: Their Identification, Culture and Use	1994	12.97-14.69	13.93
Childers, N.F.	Modern Fruit Science, 9th ed.	1983	11.00-13.18	12.29
Davidson, H., R. Mecklenburg and C. Peterson	Nursery Management, 3rd ed.	1994	13.74-20.00	16.50
Dirr, M.A.	Manual of Woody Landscape Plants, 4th ed.	1990	10.73-18.06	14.46
Emmons, R.	Turfgrass Science and Management, 2nd ed.	1995	13.00-17.00	15.10
Harris, R.W.	Arboriculture, 2nd ed.	1992	11.66-13.78	12.90
Hartman, H.T., D.E. Kester and F.T. Davies	Plant Propagation: Principles and Practice, 5th ed.	1990	14.80-16.50	15.60
Janick, J.	Horticultural Science, 4th ed.	1986	17.03-18.81	17.82
Joiner, J.N.	Foliage Plant Production	1981	15.02-16.90	16.16
Larson, R.A.	Floriculture, 2nd ed.	1992	12.33-15.40	14.00
Manaker, G.H.	Interior Plantscapes: Installation, Maintenance and Management	1987	12.30-15.29	13.69
Nelson, P.V.	Greenhouse Operation and Management	1991	10.27-12.83	11.40
Splittstoesser, W.E.	Vegetable Growing Handbook	1979	9.64-13.32	10.99
Still, S.M.	Manual of Herbaceous Ornamentals, 4th ed.	1994	9.20-11.70	10.70
Teskey, B.J.E. and J.S. Shoemaker	Tree Fruit Production, 3rd ed.	1978	14.05-15.64	14.60
Turgeon, A.J.	Turfgrass Management, 3rd ed.	1991	15.80-17.84	17.09
Westwood, M.N.	Temperate Zone Pomology, 3rd ed.	1993	11.59-15.41	13.97
Whitson, T.D.	Weeds of the West	1991	9.32-12.23	10.93
				Mean = 13.9
"Classic"				
Card, F.W.	Bush-fruit	1917	12.29-15.44	14.30
Chandler, W.H.	Deciduous Orchards, 3rd ed.	1957	15.46-18.16	16.48
Gardner, V.R., F.C. Bradford and H.D. Hooker	The Fundamentals of Fruit Production, 3rd ed.	1952	18.80-20.69	19.75
Gourley, J.H. and F.S. Howlett	Modern Fruit Production	1941	15.30-18.70	17.55
Knott, J.E.	Vegetable Growing	1935	11.52-13.20	12.11
Lloyd, J.W.	Studies in Horticulture	1924	12.40-16.80	14.75
Schilletter, J.C. and H.W. Richey	Textbook of General Horticulture	1940	16.90-19.10	17.90
				Mean = 16.12

by Knott scored at a level appropriate for twelfth grade but was meant to be used by growers as a handbook as well as by students.

This study suggests that, in general, horticulture textbooks used in universities today are written at a level or reading difficulty theoretically appropriate for use in undergraduate classes. The difficulty with this finding is that reading levels of today's college students is often far below what is appropriate. It is also suggested that students of a generation or more ago were better equipped to comprehend more difficult texts, ones that might be unfathomable to most of today's undergraduate students.

We hope these findings will be of some help to our colleagues teaching horticulture classes across the country.

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