advocated throughout the book, they believe it is essential to adopt a systems approach. They also call for more effective coordination between agronomic and plant breeding experiments.

A 12-page index enhances the usefulness of the book. Literature citations in each chapter are thorough and current.

The contributors to this book bring many years' experience to the challenge of genotype × environment interaction. The result is a valuable synthesis for plant breeders and research directors working in large or diverse geographical regions.

S.K. St. Martin
Dep. of Horticulture and Crop Science,
Ohio State Univ.,
2021 Coffey Rd.,
Columbus, OH 43210-1086
(stmartin +@osu.edu)


As Evans mentions in the preface this may be "a megalomaniac book" for one author to cover such a broad range of subject matter, but he gives a comprehensive coverage of the fascinating subject of the yield of crops in very readable prose. The author has an excellent background for writing this book—he is author, co-author, or editor of 51 references involving crop physiology, published between 1965 and 1989, that are cited in the book.

The introductory chapter provides an "executive summary" (31 pages) for those who might wish to read an overview of the whole field without having to read all of the book.

In the second chapter the societal aspects of crop yields in relation to world food supply are covered. Food production, the importance of crops, and components of production are treated. The history essential to considering crop yields is dealt with in Chapter 3. The why, when, where, and how of the domestication of crop plants is covered.

Adaptation and the ecology of yield can be found in Chapter 4: adaptation of crop plants to daylength, temperature, irradiance, and water stress; ecology of yield in relation to latitude, solar radiation, temperature, and rainfall.

Chapter 5 covers the physiological aspects of crop improvement. This is Evans' forte and takes up one-fourth of the text in the book. The reader is taken through an excellent coverage of sources-sinks, leaf photosynthesis, respiratory losses, growth rates, translocation-partitioning, harvest index, and yield components.

In Chapter 6, trends and limits in yield increases are presented. There is a section on genetic yield potential and its improvement with direct estimates for a number of crops. Evans concludes that "taken overall, there is no indication that the genetic potential of any of the major crops is reaching its limit". Whereas the previous chapter related to plant breeding, Chapter 7 considers inputs and the efficient use of resources in relation to agronomy and crop management. Fertilizers, irrigation, crop protection, and energy input are covered. The important aspect of soil management—sustainability is not considered.

In the last chapter, Evans briefly covers the future of crop yield in 26 pages. The book was completed in 1993 but it is not out-of-date. Evans touches only lightly on the implications of biotechnology and genetic engineering. The reader is left the opportunity to weave that information into the fabric of the future evolution of crop yields.

The book has a number of tables and figures throughout the text. It is well documented with 93 pages of references. An extensive index provides access to specific topics.

R. I. BUZZELL
Agriculture and Agri-Food Canada,
Research Centre,
Harrow, ON N0R 1G0, Canada
(huzzoosp@win.hookup.net)


This book addresses the concept of quality assessment of cereal grains in general with individual chapters devoted to the detailed descriptions of various specific quality considerations. It is intended to be a first point of reference for understanding cereal grain quality with the expectation that the comprehensive literature reviews in individual chapters would serve as resources for pursuing a topic in depth. The authors of each chapter were chosen for their expertise in particular areas.

Part One consists of seven chapters describing the major cereals: wheat, rice, maize, barley, sorghum and millets, oats, rye, and triticale. Included in each chapter are descriptions of primary end-use as well as the major definitive quality factors for each cereal. One of the greatest strengths of the book is that a clear definition of what constitutes quality for each cereal is described as well as the details of the experimental analyses necessary for those characterizations.

Part Two is comprised of three chapters relating specifically to the biochemical aspects of cereal grain quality. Two chapters in this section are devoted to cereal grain proteins and carbohydrates respectively, and a third is devoted to lipids, inorganic substances, vitamins, and toxic or anti-nutritional substances in cereals. The two chapters devoted to cereal proteins and carbohydrates are particularly valuable and well written. The prolamin proteins of barley, wheat, rice, oats, rye, and maize are especially well characterized with several electrophoretic gels as well as diagrams of structures included. Another feature of this chapter that is especially pertinent is the description of storage protein synthesis and deposition in protein bodies. The chapter on carbohydrates includes information on the structures of various carbohydrates found in cereals and descriptions of the structural organization and functions of those polymers. One of the most valuable sections in this chapter is dedicated to starch and consists of information on the structure of starch in the granule as well as molecular models of amylose and amylopectin. Undoubtedly, another useful section in this chapter is the one on carbohydrates in cereal technology. This section discusses carbohydrates in relationship to breadmaking, germination, malting and brewing, and some general processes involving modified starches in both food and non-food uses.

Part Three of the book is essential for anyone involved in direct quality assessment of cereal grains. The two chapters that comprise this section address general approaches to improving quality in cereals. The first deals specifically with breeding strategies and philosophies for all cereals and provides an excellent lead into the second chapter which deals solely with molecular approaches to cereal quality improvement. The first chapter in Part Three provides a broad understanding of the procedures used and characteristics examined in breeding programs. The tables that describe quality characteristics commonly tested for in wheat and barley breeding programs are especially valuable. These tables include the type of material required for testing, the methods or equipment required and references for the procedures. The second chapter provides a general understanding of the rapidly expanding area of molecular biology as it relates...