

A Comprehensive New Resource: Handbook of Precision Agriculture

by Bruce Erickson

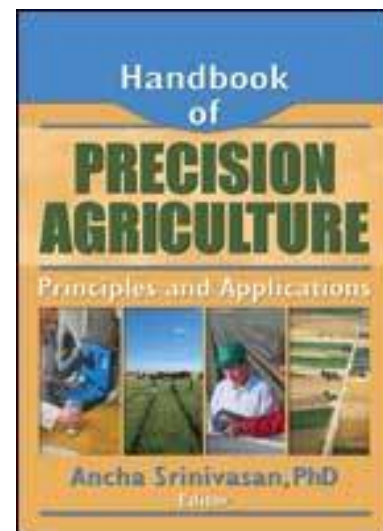
Assembling a comprehensive guide of the principles and applications of a broad array of technologies applied in countless crops and cropping systems worldwide would seem nearly an impossible task. Those who try to define precision agriculture usually include statements such as “to more precisely apply crop inputs” or “managing spatial and temporal variability”, and while the field is broad, editor Ancha Srinivasan notes that there are often three common threads in PA: information, technology, and management. After a decade, precision agriculture continues to struggle with its identity.

The Handbook of Precision Agriculture covers far more information, technology, and management in its 684 pages than any other text to which it might be compared (see Other Resources, below). The 50 contributing authors will be recognized by many precision-seasoned readers as the long-time influencers in this area. The text is logically divided into three major sections roughly addressing the issues according to the technologies, crops, and then geographies, as follows:

Part I. Principles, Technologies, and Management Issues. Provides an overview and perspective, then a series of chapters delves into specific technological areas such as soil sensing, grain quality measurement and management, nutrient and water management, and the site-specific aspects of weeds, diseases, and nematodes.

Part II. Applications In Crops And Cropping Systems Various researchers give their perspectives and discuss their results in different crops and cropping systems.

Part III. Current Status An overview of the situations in various geographies, including Africa, Asia, Australia, Europe, and South America.



Chapters 1 and 2, the overview and current status sections, provide the framework for the rest of the chapters, and would be especially insightful for newcomers. The chapters of Part I provide one of the best collections of basics as can be found anywhere. But notably missing is a section on precision insect control, which would complement the pest-related sections on weeds, diseases, and nematodes. With insect’s greater mobility, presumably less work has been done in precision insect control. There is also no specific section of guidance technologies, currently one of the fastest growing segments of technology change in precision agriculture, nor a section on remote sensing, long a component of the precision agricultural scene.

Individuals working in specific crops can key in on their interests in Part II, Applications, where researchers who have spent careers working in a particular system share their experiences. As those finding the greatest success in crop production are often those who find the means to



assemble varied components into systems where the whole can exceed the individual parts, this section assembles these within crops and cropping systems. Most of the crops most scrutinized worldwide from a precision aspect are covered in Part II, including vineyards, but missing is any discussion of precision in fruits, vegetables, or some other high value crops, where there is much interest and current application.

Many readers will find the most interesting section to be Part III, Current Status. For someone who has been working with precision technologies for a while, seeing how things are done in other parts of the world becomes a series of interesting case studies, where one or several factors are tweaked to see how technologies, adoption, and research results respond to these different conditions—an exercise in understanding some of the real driving forces behind these technologies.

At its level of understanding, this book isn't for the beginner—the greatest utility seems for academics or those in agricultural businesses invested in precision technologies to gain a better understanding of the science and practical uses of precision technologies. The book is written by those who are veterans in the business, in such a way to be interpreted by those who also have some experience working in this field.

The array of 22 chapters composed by 50 contributors is simultaneously the greatest strength and also a weakness of this book. Precision

Other Resources

A number of precision and site-specific compilations exist, many of them collections of presentations and papers from meetings. Just a few have attempted to assemble into more comprehensive guides—please see reference and access information below:

Precision Agriculture in the 21st Century, 1997.

Committee on Assessing Crop Yield: Site-Specific Farming, Information Systems, and Research Opportunities, National Research Council, National Academy Press, Washington, D.C. Available at: <http://www.nap.edu> and <http://www.amazon.com>

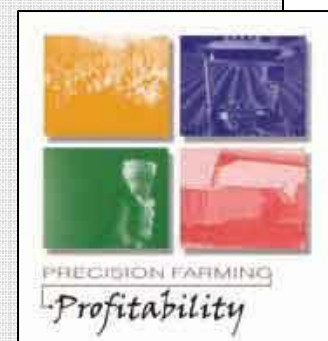
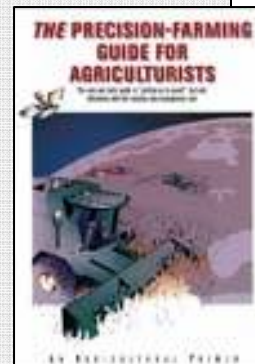
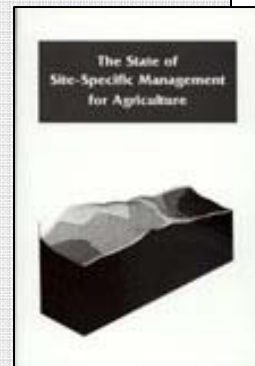
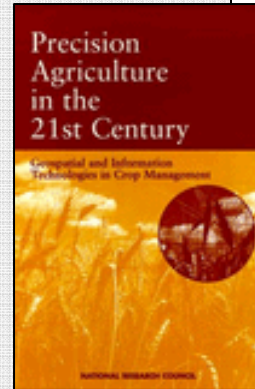
The State of Site-Specific Management for Agriculture, 1997. Pierce, F. J., and E. J. Sadler (eds). 1997. ASA Misc. Publ., ASA, CSSA, and SSSA, Madison, WI. (out of print)

The Precision Farming Guide for Agriculturists,

1997. John Deere Publishing, Moline, IL. 117 p. Available at: <http://www.amazon.com>

Precision Farming Profitability, 2001. Jess Lowenberg-DeBoer, (Editor), SSM - 3, Purdue University, West Lafayette, Indiana, 47907.

Available at: <https://secure.agriculture.purdue.edu/store>



agriculture means different things to different people, and each contributor offers their own unique experiences to share. But often this diversity leads to a lack of cohesion or at least parallel treatment of discussion among chapters. For instance, precision agriculture in rice is the focus of Chapter 10, and while the topic is well-presented it is largely about measuring spatial and temporal yield variability. Precision management of corn/soybean systems is the focus of Chapter 11, but it focuses largely on the experiences of a group of researchers at some central Iowa sites. The information is very good, but it borders on becoming a collection of related works such as meeting proceedings vs. a text that can somehow put all of the pieces together.

But diversity is the nature of precision agriculture, in being such a broad assembly of individuals, using a range of tools and working in a wide variety of crops and geographies to try to basically accomplish what farmers have been working toward for years—to do the right things, at the right place and the right time. The end goals are the same—to help the producer to increase returns through increasing yields, improving salability, decreasing costs, reducing risks, while protecting the environment.

To Order Handbook of Precision Agriculture

A bound, hard copy of Handbook of Precision Agriculture may be ordered from Haworth Press at: <http://www.haworthpress.com/store/product.asp?sku=5627> or by calling 1-800-HAWORTH (429-6784), or (607) 722-5857.

To see a sample of the book: <http://www.haworthpress.com/store/SampleText/5627.pdf>



Agricultural de Precision, Integrando conocimientos para una agricultura moderna y sustentable, a Spanish version of Handbook of Precision Agriculture is available free of charge for downloading:
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