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## Preface [to *Automation: The Future of Weed Control in Cropping Systems*]

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## Preface

[to *Automation: The Future of Weed Control in Cropping Systems*]

In both conventional and organic cropping systems, there is an immediate need to apply the latest technologies to improve the efficiency and economics of management while reducing the impacts. Never before has there been such pressure on farmers globally to produce more with less and reduce inputs in cropping systems. The main purpose of this book is to provide the current state of automation for weed control in cropping systems, which demonstrate how being more precise in our applications is possible now and into the future.

By bringing together biologists and engineers working in the same field, ideas can be stimulated on ways to change current weed management for the better. After many discussions, some lengthy, between the editors back in early 2009, a group was formed and a paper was written. The former met at Washington State University's Center for Precision Agricultural Systems and was composed of engineers, biologists, industry representatives, and local growers with one goal: strategize new ways to use automation to control weeds in organic vegetable crop production systems. I wrote the paper that was published in *Weed Science* on the use of automation for weed control in organic cropping systems, which was also a call for broader participation by the weed science community.

As a group, we wrote a proposal for the USDA SCRI program. At the same time, I organized a symposium for the 2010 Weed Science Society of America annual meetings on automation and machine guidance systems for weed control in cropping systems. The speakers presented information and research on current weed management techniques, automated mechanical and chemical weed control, market readiness of robotics and automated weed control, and international advancements in automation for weed control. The interest from the audience was limited to a small but enthusiastic group of weed scientists. Obviously, more awareness and education on this topic was needed on a wider context, which is what solidified my interest in the topic of automated weed control and fuelled my passion for completing this book.

From the group that met back in 2009, the speakers at the 2010 symposium, several other respected individuals, and my colleague, Dr. Fran Pierce, we have assembled the first book focused solely on automation and weed control in crop-

ping systems. The main themes of this book are (1) weeds in conventional and organic production systems, (2) advancements in technology and current weed control practices, (3) applications of automated weed control in cropping systems, (4) economics of organic and conventional production systems, and (5) global trends and future directions for automated weed control. The objectives are to (1) provide the first complete resource on automation and robotic weed control in conventional and organic cropping systems for the student, researcher, and grower, (2) shift the paradigm that precision technology and cropping systems cannot fit into a single, streamlined production system, and (3) stimulate thoughts and ideas for broader application of new engineering solutions to traditional agricultural-based problems, such as weed control.

The production of a book of this magnitude could have profound impacts on current and future cropping systems across the globe. To date, no other resource exists on this important and rapidly advancing topic of automated weed control. In the near future, a new approach will be needed for managing weed pests, especially with the challenges of weed resistance to herbicides; off-site movement of soil, fertilizers, and chemicals; an increasingly non-agrarian public; labor shortages; economies in recession; and the continued rural to suburban land use conversion.

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