

Book Review

Received: 9 January 2023
 Accepted: 15 January 2023
 First published online: 10 February 2023

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Plant Regeneration from Seeds: A Global Warming Perspective

Carol Baskin and Jerry Baskin. X + 312 pp. Academic Press, London, UK, 2022. ISBN: 9780128237311 (Paperback), 9780128237328 (eBook)

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Being ecologists, if you are looking for a comprehensive book that covers how global warming will impact the regeneration of plants that inhabit all the major types of vegetation on the earth, then this is the right book for you. The effects of climate change have become evident in various ecosystems and taxonomic groups around the world and are set to cause significant changes as many species are now forced to live and adapt to changing climate, and some are negatively affected. In the book *Plant Regeneration from Seeds: A Global Warming Perspective*, Professors Carol and Jerry Baskin – distinguished scholars of Seed Ecology, collated and edited the recent research advances in seed biology/ecology by inviting well-known seed researchers from around the globe, who are the leaders in the field of seed biology/ecology of diverse vegetation types ranging from tropical savanna to arctic/alpine ecosystems.

The 22 well-connected chapters within three sections (Biogeography, Special Topics and Conclusion) help us understand the effect of climate change on plant regeneration from seeds and how predicted changes in climatic factors can modify the diversity of plants and their biogeography. In the introductory preface, the editors nicely set the scene by outlining the scope, context and significance of the research being conducted by summarizing current understanding and background information on topics covered and expected changes in plant regeneration traits and vegetation structure/composition under the global warming scenario.

Section 1 has 15 chapters focusing on biogeography. From the initial chapters of this section, a vital point emerged that indicates that seed germination of arctic/alpine tundra plants could benefit from a warming temperature; however, this generalization must be considered with caution. The authors suggested that the frequency of droughts might increase during the growing season and eventually hamper the recruitment success of arctic/alpine species. Chapters on the cold/hot desert ecosystems provide a broad overview of plant life-history traits (diaspore heteromorphism, dormancy/germination, seedling survival/growth, biomass allocation, seed production, etc.) that grow there and highlight how a change in precipitation regime may control their soil seed bank dynamics, germination season and seedling establishment. Other chapters of this section covered an extensive literature review on seed ecophysiology of plants growing in ephemeral ponds or under the tree canopies of steppes, semi-deserts, grasslands, forests, savannas and Mediterranean ecosystems and how predicted climate change impacts their regeneration and survival. Authors of these subsequent chapters provided evidence of several laboratories, glasshouse or field-based experiments to support their arguments which is commendable and provides readers with much-needed information on a specific topic.

The six chapters in Section 2 cover an extensive review of the literature on specific seed-related topics. The main focus of these chapters is on how a warming climate may alter the dynamics of the soil seed bank and affect regeneration in annual crops, invasive plants, sea-grasses and recalcitrant seeded species. Overall, the contributing authors summarize worthy information on the above topics and suggest future research directions to get more insights.

Finally, in Section 3, the editors summarize all the chapters of Sections 1 and 2 under four heads, that is, seed production, seed dormancy/germination, seedling survival/growth and shifts in species composition/communities, by providing a brief account of information on how the change in temperature and moisture regimes may affect the above life-history stages of plants of diverse ecosystems. Furthermore, editors highlight future research needs by mentioning that ‘much more research remains to be done before we have a good understanding of the full impact of climate change on regeneration of plants from seeds, especially how changes in pattern and amount of precipitation will affect the timing of seed germination and survival of seedlings’.

Reviewing this book has been a good learning experience, as it contains a wealth of information, summarizing succinctly in a well-organized manner that is easily read and comprehended. We believe that researchers in plant ecology, from graduate students to senior-level researchers, will find this book very useful and an excellent addition to their bookshelves.

Although the editors accommodated all the major vegetation types or ecosystems in this well-produced book, the inclusion of a dedicated chapter on plants of wetland ecosystems could have made the book more valuable. Additionally, the book's price is at a little higher end (approx. 100 USD even as a paperback edition), which may keep it away from the bookshelf of individual

researchers from several lower-income countries. However, it is still worth recommending this book for the institutional library to have at least a reference copy.

The editors and all of the contributors deserve huge applause for their hard work from the global research community of seed science.