Advances in Seed Priming

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Editors

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Springer

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ISBN 978-981-13-0031-8 ISBN 978-981-13-0032-5 (eBook)
https://doi.org/10.1007/978-981-13-0032-5

Library of Congress Control Number: 2018944402

Printed on acid-free paper

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

We give credit to God for granting us health, elegance, perception, strength, and act of kindness to bring about this task.

Preface

Seed is an important component of agriculture, contributing significantly to the booming production of food and feed crops across the different agro-ecological regions of the world with constant challenges with reference to production, storage, and quality control. In addition to these challenges, in the era of climate change, different stressors may lead to reduction in seed germination with poor and unsynchronized seedling emergence, poor establishment of crop stand, destruction of the root cell structure, and thus resulting in a significant decrease in the yield of agricultural crops. To conquer these confrontations, a number of seed technologies that augment germination and synchronization of seedling emergence under difficult environmental conditions have been developed. In order to encourage environmental friendly sustainable agriculture across different parts of the universe, priming technology, using inorganic chemicals, plant extract, and beneficial microorganisms, increases the yields of crops while reducing the environmental burden of disproportionate use of chemical fertilizers. As of now, it is a significant tool for hastening seed germination rate, guaranteeing consistent and homogeneous seedling emergence, and improving stand establishment and seedling vigor. The various priming options available are hydropriming, halopriming, osmopriming, thermopriming, solid matrix priming, and biopriming. Priming seeds with these divergent agents provide an innovative, cost-effective, and environmentally sound solution for improving seed quality and crop health and attaining better yields. Further, these collections will provide a much needed platform to discuss the emerging issues and problems in seed priming and will come out with a well-defined strategy to overcome the different stresses within the basic framework of sustainable development goals keeping in mind the challenges of food, environment, and livelihood security. This edited book is a comprehensive one and offers an authoritatively sound and lucid documentation of issues pertaining to priming, molecular biology, and agronomic incentives. The book is intended for use by the students, scientists, extension workers, and policy makers with an in-depth view.

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Acknowledgment

An edited book of this expense does not become possible without contributions of several willing souls. Our sincere gratitude to the colleagues and students who helped us in our endeavor to bring this book to light. We are grateful to Prof. Rattan Lal, Prof. B.D. Singh, and Prof. Panjab Singh for their mammoth impact, unwavering encouragement, and support.

Finally the production team members deserve special appreciation for guiding us through the process of publishing a new work. Last but not the least, we should thank our family, immediate and extended, who always encouraged us to continue the massive task. In spite of the best efforts, it is possible that some errors may have crept into the compilation. Each of the chapter has been the primary responsibility of the invited author/group of authors: We have also read and critiqued all the chapters with extraordinary case. We shall be highly obligated to receive constructive comments and suggestions from the readers for further improvement in the future editions.

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Harikesh Bahadur Singh is presently a Professor of Mycology and Plant Pathology at IAS, BHU. He served state agriculture university, central university, and CSIR institute in teaching, research, and extension roles. In recognition of Prof. Singh's scientific contributions and leadership in the field of plant pathology, he was honored with several prestigious awards, notable being, CSIR Prize for Biological Sciences, Vigyan Bharti Award, Prof. V.P. Bhide Memorial Award, BRSI Industrial Medal Award, Bioved Fellowship Award, Prof. Panchanan Maheshwari Award, IPS Plant Pathology Leader Award, CSIR–CAIRD Team Award, Environment Conservation Award, CST Vigyan Ratna Award, and many more. Prof. Singh has been the fellow of National Academy of Agricultural Sciences. Prof. Singh has written 2 books, several training modules and manuals, and more than 160 research publications, and has more than 18 US patents and 3 PCTs to his credit.