

# Seeds: The Ecology of Regeneration in Plant Communities

*Edited by Michael Fenner, Department of Biology, University of Southampton, UK*

This book provides a comprehensive overview of all aspects of seed ecology. This subject is of major concern to plant ecologists, as in higher plants, only through regeneration by seeds (as opposed to vegetative or clonal means) can natural selection have new genetic combinations on which to act. The emphasis of the book is on elucidating the process of regeneration in the field, but laboratory studies have been included where appropriate. The chapters follow in roughly chronological sequence from seed production on the parent plant through the dispersal, predation, dormancy and seed banks to germination and the establishment of seedlings in landscape. The book will be invaluable for senior students and research workers in seed science and plant ecology.

#### Contents:

- Reproductive allocation and reproductive efforts in plants *F A Bazzaz and D D Ackerly*
- Maternal effects on seeds during development *Y Gutterman*
- The ecology of seed dispersal *M F Willson*
- Animals as seed dispersers *E W Stiles*
- Fruits and frugivory *P Jordano*
- Seed predators and plant population dynamics *M J Crawley*
- Longevity, viability and dormancy *A J Murdoch and R H Ellis*
- The functional ecology of seed banks *K Thompson*
- Seed responses to light *T L Pons*
- The role of temperature in germination ecophysiology *R L Probert*
- Effect of chemical environment on seed germination *C M Karssen and H W M Hilhorst*
- The contribution of seedling regeneration to the structure and dynamics of plant communities and larger units of landscape *J P Grime and S H Hillier*

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# Barley

## Genetics, Biochemistry, Molecular Biology and Biotechnology

Edited by P R Shewry, Long Ashton Research Station, UK

The applications of molecular biology and molecular genetics have had a major impact on our understanding of the barley plant, and have opened the way to the application of biotechnology to manipulate and improve yield, quality and agronomic characters. This major book reviews our current knowledge of the genetics, biochemistry and molecular biology of barley and how biotechnology can be used to improve crop yields and their quality for feed or in the brewing industry. The book is divided into six main sections covering: origin, evolution and wild relatives; basic genetics; analysis of metabolism and development; seed development, composition, germination and utilization; pathogen resistance; and biotechnology. It will therefore represent a major reference volume for research workers in cereal chemistry, agronomy and plant biotechnology, who are interested in either the barley crop or in barley as a model biological system.

- The wild species of *Hordeum*: relationships and potential use for improvement of cultivated barley  
*Roland von Bothmer*
- Origin, evolution, population genetics and resources for breeding of wild barley, *Hordeum spontaneum*, in the fertile crescent  
*E Nevo*
- Intergenic hybrids with *Hordeum*  
*G Fedak*
- Cloned and mapped genes: current status  
*Penny von Wettstein-Knowles*
- Progress in the production of wheat/barley addition and recombinant lines and their use mapping the barley genome  
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*D A Laurie, J W Snape and M D Gale*
- Nuclear genome structure and organization  
*E Ananiev*
- Molecular analysis of barley chloroplast proteins  
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- Analysis of barley metabolism using mutant genes  
*P J Lea, R D Blackwell and R A Azevedo*
- Molecular analysis of nitrate metabolism  
*A Kleinhofs and R L Warner*
- Genetics of barley development: mutant phenotypes and molecular aspects  
*G Bossinger, W Rohde, U Lundqvist and F Salamini*
- The slender mutation of barley  
*C J Pollock, H J Ougham and J L Stoddart*
- Biochemical and molecular studies of stress tolerance in barley  
*A M Stanca, V Terzi and L Cattivelli*
- Grain structure and composition  
*C M Duffus and M P Cochrane*
- The control of protein synthesis in developing barley seeds  
*M Kreis and P R Shewry*
- Alpha-amylase-trypsin inhibitors and thionins. Possible defense proteins from barley  
*F Garcia-Olmedo et al*
- Nutritional aspects of barley seed structure and composition  
*C W Newman and R K Newman*
- Barley germination: biochemical changes and hormonal control  
*D E Briggs*
- Gibberellin responses in barley  
*P M Chandler*
- Cell wall metabolism in barley  
*G B Fincher*
- Sources and genetics of resistance to fungal pathogens  
*J H Jorgensen*
- Biochemical and molecular analyses of the response of barley to infection by powdery mildew  
*T Bryngelsson and D B Collinge*
- The molecular analysis of barley resistance to powdery mildew  
*K J Scott*
- Strategies for cloning disease resistance genes  
*S Somerville*
- Haploid production: approaches and use in plant breeding  
*R A Pickering and P Devaux*
- Regeneration, stability and transformation of barley  
*A Karp and P A Lazzari*
- The case of high lysine barley  
*L Munck*

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# Rice Biotechnology

Edited by Gurdev S Khush, International Rice Research Institute, The Philippines and  
Gary H Toenniessen, The Rockefeller Foundation, USA

Rice is the most important food crop in the developing world and rice genetic improvement through breeding has effectively benefited hundreds of millions of resource-poor people. Biotechnology can significantly strengthen rice breeding programs, enabling breeders to achieve results more quickly and efficiently and to attain goals not feasible using conventional techniques.

This book reviews progress and prospects for applying biotechnology to rice improvement. The last decade has witnessed major advances, such that today some workers consider rice to be a model plant for cereal research. The book will therefore be of interest to a wide range of plant biotechnologists and breeders in providing an authoritative review of the current state of knowledge of this subject.

- Foreword *K Lampe*
- The world rice economy: Challenges ahead *C C David (IRRI)*
- Research priorities for rice biotechnology *R W Herdt (Rockefeller Foundation)*
- Genetic diversity of wild and cultivated rice *H I Oka (National Institute of Genetics, Japan)*
- Rice karyotype, marker genes and linkage groups *G S Khush and T Kinoshita (Hokkaido University)*
- Development and use of restriction fragment length polymorphism in rice breeding and genetics *S R McCouch (IRRI) and S Tanksley (Cornell University)*
- Rice tissue culture and its application *E C Cocking et al (University of Nottingham)*
- Transformation and regeneration of rice protoplasts *T Hodges et al (Purdue University)*
- Assessment of rice genetic transformation techniques *R Wu et al (Cornell University)*
- The identification and characterization of rice nuclear genes *T Okita (Washington State University)*
- Gene expression in rice *V Walbot and D Gallie (Stanford University)*
- Potentially useful genes for rice genetic engineering *G H Toenniessen*
- Molecular probes for disease diagnosis and monitoring *J E Leach and F F White (Kansas State University)*
- Prospects for the future *G H Toenniessen and G S Khush*

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