Seed dormancy in grasses

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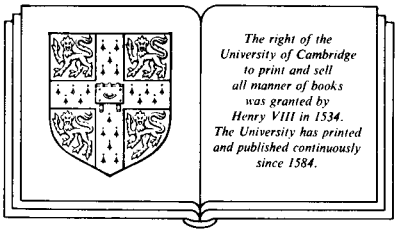

CAMBRIDGE UNIVERSITY PRESS
Cambridge
New York *Port Chester*
Melbourne *Sydney*

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521372886

First published 1990
This digitally printed version 2007

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data

Simpson, G. M.
Seed dormancy in grasses / G. M. Simpson.
p. cm.
Bibliography: p.
Includes index.
ISBN 0 521 37288 7
1. Grasses–Seeds–Dormancy. I. Title.
QK495.G74S613 1990
584′.90446–dc20 89-17255 CIP

ISBN 978-0-521-37288-6 hardback
ISBN 978-0-521-03930-7 paperback

Contents

Preface

A number of books have been published recently on the subject of germination physiology of seeds. They often have a chapter or two about seed dormancy, either to demonstrate the diversity of mechanisms among seed plants, or to try and simplify the complexity of dormancy mechanisms by establishing general models. A somewhat different approach is used here. Firstly, the subject is confined to seed dormancy in grasses. Secondly, experimental evidence is considered in depth for a single species, the wild oat (*Avena fatua* L.), probably the most widely studied species for understanding seed dormancy in the plant kingdom. The evidence for this member of the family Gramineae is compared with other examples among the Gramineae to reach some general conclusions about the nature of seed dormancy in grasses.

There are several reasons for confining the book to grasses. The grass family is one of the largest (25 tribes and 600 genera) and most diverse in the plant kingdom. From a human nutrition perspective it is the most important family. Grasses are the principal plant life form covering more than 70% of the land surface of the globe and they are of critical importance to the stability of the fragile arid and semi-arid zones. While seed dormancy is of great adaptive significance for survival in nearly all plant species with seeds, it is also the main reason why grass species cause the most serious weed problems in cultivated crops around the globe. It is paradoxical that one of the great achievements of the Neolithic Age was selection against seed dormancy, so that planted crops would germinate quickly and uniformly. Today we are only beginning to understand the nature of dormancy in seeds and how we might use this knowledge to better advantage. Finally, cereal grass seeds in our present age are the main source of diet for the majority of the human race. It is therefore for reasons of great practical, economic and human survival interest that we should fully

understand the trait of seed dormancy because it is a primary means for survival of populations, indeed of species, in the plant kingdom.

This book is dedicated to the memory of my colleague for 25 years, the late Prof. J. M. Naylor, who was a pioneer in the field of seed dormancy studies. I am indebted to my students and research colleagues who contributed to our present understanding of seed dormancy in *A. fatua*. The pathway to our understanding has not been along a straight line but something akin to a much compressed helix with much energy spent in going around the circles.

Acknowledgements

Permission for reproduction was granted by Annals of Botany Company and the editors of *Annals of Botany* (Figs. 3.1, 3.13); Association of Applied Biologists and editors of *Annals of Applied Biology* (Fig. 2.8*(a)*); Cambridge University Press, editors of *BioEssays* and Dr. A. J. Trewavas (Fig. 4.1); Crop Science Society of America and editors of *Crop Science* (Fig. 2.6); Editorial Office of *Physiologia Plantarum* (Figs. 3.6, 3.7, 3.12, 3.15); editors of *New Phytologist* (Fig. 3.8); editor of *Phytochemistry* (Table 2.3); editors of *Proceedings of the Association of Official Seed Analysts* (Figs. 2.8*(b)*, 2.8*(c)*); editors of *Seed Science and Technology* (Fig. 3.11); John Wiley and Sons, New York Ltd., (Symbols of Prof. H. T. Odum in Figs. 5.7, 5.8); National Research Council of Canada and editor of *Canadian Journal of Botany* (Figs. 2.1, 2.2*(a)*, 2.10, 3.2, 3.3, 3.14, 3.16); Professor I. N. Morrison (Fig. 2.7*(b)*) and Professor M. V. S. Raju (Fig. 2.2*(b)*). I am particularly grateful to Mr. J. Diduck for help with the figures, to Dr. F. Turel for editorial asistance and to my wife Margarete for patience with me during preparation of the manuscript.