

Preface

Triticale is a relatively new crop species introduced in a number of countries around the world, where it usually occupies a niche market, with the exception of Poland where it takes a significant acreage. With this crop species came a hope to combine the quality attributes and agronomic performance of its respective parents, wheat and rye, which would offer a competitive advantage over crops on the market. While it seems not fulfill yet, this book reviews the current status of the research in this species and opportunities along four value chains.

The origin of hexaploid triticale and the implication in crop development are covered in the first part, made of three chapters. It starts with a review of the biology of triticale species and the biosafety of this crop in the field. This work describes triticale biology and maps the risks associated with the potential deployment of novel breeding tools which would result in regulated events. Conventional breeding and the introduction of novel breeding tools are addressed in the second chapter and takes us to foresee a technological adoption similar to its parent species, including the efforts and opportunities for a hybrid triticale. The success of triticale crop in commercial production, and its competitiveness over wheat, is to a large extent due to its tolerance level to abiotic and biotic stresses, extensively reviewed in two chapters. The third part of this book is dedicated to the genomics and biotechnology enablers. A large amount of sequence data are generated from wheat, rye, and triticale bringing considerable information at disposition of the scientific community. Triticale genomics and transcriptomics data are being developed along the traits of significance, and deployment of this knowledge could be emerging through genetic engineering and precision editing. Doubled haploid technologies have made huge progresses in triticale and could become a platform for editing an haploid genome, beside fixing the genetics of F1 hybrid offspring in a single step.

Triticale fits well with a few value propositions that have received significant attention as noted per the research efforts and volume of publications. With no doubt, triticale is a competitive grain as energy source in the livestock diet. Its use as feed is also well documented and implemented by the beef industry thanks to the large biomass and nutritional value as silage and for swath grazing practice.

The livestock feed value proposition supports existing or increased triticale acreage, and new bioindustrial opportunities emerge which would capture triticale fiber biomass. The biomaterial value proposition is reviewed and documented with numerous pictures. Triticale has also been bred for the food market, and significant progresses have been made to improve its quality, in particular its protein profile, for the bakery and the bread industries. These efforts are extensively covered in one chapter. Together, the last four chapters address in one part the current market and credible new uses in four value chains, which would be a pull for triticale crop.

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Triticale

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