



Agricultural Journals

Czech Journal of

GENETICS AND PLANT BREEDING

[home](#) [page](#) [about us](#) [contact](#)

[us](#)

Table of Contents

IN PRESS

CJGPB 2014

CJGPB 2013

CJGPB 2012

CJGPB 2011

CJGPB 2010

CJGPB 2009

CJGPB 2008

CJGPB 2007

CJGPB 2006

CJGPB 2005

CJGPB 2004

CJGPB 2003

CJGPB 2002

CJGPB

Home

Editorial Board

For Authors

- **Authors
Declaration**
- **Instruction
to Authors**
- **Guide for
Authors**
- **Copyright
Statement**
- **Submission**

For Reviewers

- **Guide for
Reviewers**
- **Reviewers
Login**

Subscription

Czech J. Genet. Plant Breed.

The effect of friabilin on wheat grain hardness: a review

Czech J. Genet. Plant Breed., 43 (2007): 35-43

A wheat marketing system established the primary classification of hexaploid wheat based on the endosperm texture, i.e. hardness or softness of the grain. Hardness affects a range of characters including the milling (tempering, milling yield, flour particle size, shape and density of flour particles), baking and end-use properties. Wheat grain hardness is largely controlled by genetic factors but it can also be affected by the environmental and other factors. The endosperm texture is primarily associated with the *Hardness (Ha)* locus on the short arm of chromosome 5D. It is regulated by friabilin. This 15 kDa starch surface protein complex is present in larger amounts in soft wheats compared to hard ones and consists of three major polypeptides: puroindoline a (*Pina*), puroindoline b (*Pinb*) and grain softness

protein 1 (*Gsp-1*). The soft grain texture in wheat is a result of both puroindoline genes being in the wild type active form and bound to starch. When one of the puroindolines is either absent or altered by mutation, then the result is a hard texture. Gene sequence variation and mutation of both puroindoline genes account for the majority of variation in the wheat grain texture. The latter may serve as the potential for improvement of milling and baking wheat quality. However, many wheat varieties have the intermediately (mixed) hard endosperm and there is a wide variation between soft and hard grain texture. Grain hardness is affected by a number of factors beyond genetics including N management, tillage system, pest infestations, environment (location of growth, temperature and rainfall during the growing season) and their interactions, and factors such as moisture, gliadin composition, and content of lipids, starch and pentosans.

Keywords:

friabilin; grain softness protein (*Gsp-1*); puroindoline a (*Pina*); puroindoline b (*Pinb*)

[Fulltext]

© 2011 Czech Academy of Agricultural
Sciences

XHTML1.1 VALID

CSS VALID