

Optimization of cotton variety registration criteria aided with a genotype-by-trait biplot analysis

Favorite & sharing

Export BibTex

PDF Export

Report

Article (sc. journal) of Naiyin Xu, Michel Fok, Jian Li, Xiaoni Yang & Weikai Yan - 2017
[Lien externe ou de téléchargement](#)

Literature reference 2017, Naiyin Xu, Michel Fok, Jian Li, Xiaoni Yang & Weikai Yan
 Optimization of cotton variety registration criteria aided with a genotype-by-trait biplot analysis

Author Naiyin Xu, Michel Fok, Jian Li, Xiaoni Yang & Weikai Yan

English title of the work Optimization of cotton variety registration criteria aided with a genotype-by-trait biplot analysis

Title of the work Optimization of cotton variety registration criteria aided with a genotype-by-trait biplot analysis

Year of publication 2017

Author's email michel.fok@cirad.fr

Issue number of a journal, magazine... Dec 8;7(1):17237

Journal or magazine Scientific Reports

Month of publication December

URL Address <https://www.ncbi.nlm.nih.gov/pubmed/29222523>

Countries concerned China

Associated thesauruses TropicAgrif

Keywords TropicAgrif Plant Genetics
 Varietal Selection
 Varietal breeding

National Dimension

Pluri local

Partnership with users

With, farm-level research under researchers' supervision

Saved on 2017-12-21

Modified on 2017-12-21

Administrated by [Fok Michel](#)

Abstract

China is one of the largest cotton producing countries in the world thanks to high yields, on which a variety registration system has mainly focused, so that a lack of quality is nowadays acknowledged as a weak point of the cotton industry in that country. The objective of this study was to check the hypothesis that bias in cultivar selection in favor of yield has been maintained through the application of an imperfect selection index (SI), but that a better outcome is possible. Our demonstration is based on an analysis of the data from ten years of cotton variety trials using genotype-by-trait biplots, implemented both for the cultivar selection index (SI) currently applied in China and for an adjusted selection index (ASI) that more effectively took into account the antagonism between yield and quality traits. The main findings were: 1) significant negative associations between yield and fiber quality hindered their simultaneous improvement; 2) registered genotypes were mainly determined by the SI which was primarily yield-oriented; 3) no progress in fiber quality was recorded unlike yield; 4) balanced progress in yield and quality is possible through an adjusted selection index (ASI) guided by genotype-by-trait biplot analysis.

English abstract

China is one of the largest cotton producing countries in the world thanks to high yields, on which a variety registration system has mainly focused, so that a lack of quality is nowadays acknowledged as a weak point of the cotton industry in that country. The objective of this study was to check the hypothesis that bias in cultivar selection in favor of yield has been maintained through the application of an imperfect selection index (SI), but that a better outcome is possible. Our demonstration is based on an analysis of the data from ten years of cotton variety trials using genotype-by-trait biplots, implemented both for the cultivar selection index (SI) currently applied in China and for an adjusted selection index (ASI) that more effectively took into account the antagonism between yield and quality traits. The main findings were: 1)

significant negative associations between yield and fiber quality hindered their simultaneous improvement; 2) registered genotypes were mainly determined by the SI which was primarily yield-oriented; 3) no progress in fiber quality was recorded unlike yield; 4) balanced progress in yield and quality is possible through an adjusted selection index (ASI) guided by genotype-by-trait biplot analysis.

[Help](#) | [About](#) | [Contact us](#) | [Legal informations](#)

[English](#) | [Français](#)

[AfomdNET](#) | [Cantool](#) | [CIRAD](#)

© Copyright CIRAD 2010-2020