

Short Communication

Pasto Certo[®] version 2.0 - An application about Brazilian tropical forage cultivars for mobile and desktop devices

Pasto Certo[®] version 2.0 – Una aplicación sobre cultivares brasileños de especies forrajeras tropicales para dispositivos móviles y de escritorio

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Abstract

A brief outline of the second version of Pasto Certo[®], released by Embrapa and partners in February 2019, is presented. It is an improved and updated version of Pasto Certo[®] 1.0, an application that describes Brazilian commercial tropical forage cultivars. The application helps the user to identify and differentiate cultivars, provides recommendations and information on use restrictions of each cultivar, and compares different cultivars in terms of a number of characteristics. In comparison with the first version (published in 2017), new features of Pasto Certo[®] 2.0 are: (1) 7 cultivars of forage legumes (genera *Arachis*, *Cajanus* and *Stylosanthes*) were added to the original 16 grass cultivars (*Urochloa* spp. and *Megathyrsus maximus*); (2) the user can choose between Portuguese, Spanish and English languages; (3) information on commercial seed sources in Brazil is included; (4) a guide to selecting the most suitable cultivar for specific conditions is provided; and (5) the application is available for different platforms (Android, iOS and WEB - www.pastocerto.com).

Keywords: Grasses, legumes, *Megathyrsus maximus*, pastures, software, *Urochloa*.

Resumen

Como una ayuda para la selección y manejo de cultivares brasileños de forrajeras, dirigida a productores ganaderos, técnicos, agrónomos, zootecnistas y el comercio de semilla en zonas tropicales, en Febrero 2019 la Empresa Brasileira de Pesquisa Agropecuária (Embrapa) con la colaboración de entidades asociadas, puso a disposición la aplicación Pasto Certo[®] 2.0, una versión mejorada y actualizada de Pasto Certo[®] 1.0. La aplicación asiste en la selección de cultivares comerciales, proporciona recomendaciones para cada uno de ellos y suministra información sobre posibles restricciones de uso, teniendo en cuenta las características de los diferentes cultivares. En comparación con la primera versión,

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publicada en 2017, nuevas funcionalidades de Pasto Certo® 2.0 son: (1) la inclusión de siete cultivares de leguminosas forrajeras de los géneros *Arachis*, *Cajanus* y *Stylosanthes*, al total de 16 cultivares de gramíneas (*Urochloa* spp. y *Megathyrsus maximus*); (2) el usuario puede seleccionar para consulta entre los idiomas portugués, español e inglés; (3) se presenta información sobre fuentes comerciales de semilla en Brasil; (4) se incorporó una herramienta de selección de cultivares para diferentes condiciones específicas; y (5) la aplicación está disponible para varias plataformas (Android, iOS y WEB - www.pastocerto.com).

Palabras clave: Gramíneas, leguminosas, *Megathyrsus maximus*, pasturas, software, *Urochloa*.

Background and Development

Brazil is the world's leader in tropical forage seed production and exports, with a local market of about US\$ 600 million/year. Cultivars of *Urochloa* and *Megathyrsus maximus* represent more than 90% of this market and consequently the cultivated pasture area in Brazil, which covers roughly 100 million hectares (José 2012). Despite this unquestionable significance there is no easily accessible platform for farmers, technicians, agronomists, veterinarians and seed dealers, plus other users, which describes the main characteristics of *Urochloa* and *Megathyrsus maximus* cultivars, either released by Embrapa or in the public domain. While this information exists, it is scattered in various types of publications, such as Embrapa series (Valle et al. 2004, 2017; Jank et al. 2017), folders (various Embrapa cultivar information folders) and several scientific articles, but generally relates to a single cultivar. There are other excellent forage platforms, such as Tropical Forages (tropicalforages.info/) and Feedipedia (feedipedia.org/), which describe various species and provide considerable related information. However Pasto Certo® offers an electronic software platform composed of a web tool and a mobile application for users, which allows quick and integrated access to the characteristics of the main tropical forage cultivars released by Embrapa and others in the public domain.

The software platform was constructed by students of the Computer Science College (FACOM) of the Federal University of Mato Grosso do Sul under the auspices of the Association for the Promotion of Research in Forage Breeding (UNIPASTO). It followed the steps of computational requirements, inclusion of forage technical information, software architecture design, construction of the software itself and finally validation by Embrapa employees. At the completion of these steps, the platform was created, validated and the mobile application (version 1.0, initially available only for Android operating systems) was released to users in March 2017 (Barrios et al. 2017).

Since its release, the application gained great acceptance by users and several suggestions for improvements were

received, which motivated the development team to release version 2.0. Both the brand and the software Pasto Certo® - versions 1 and 2 are the property of Embrapa at the 'Instituto Nacional da Propriedade Industrial' (INPI) in Brazil. Representatives of the co-operating institutions agreed that Pasto Certo® would be an open-source software with BSD (Berkeley Software Distribution) license. The application can be downloaded at Google Play and Apple Store or accessed directly at www.pastocerto.com.

Description

Version 2.0 of Pasto Certo® is comprised of 23 forage cultivars (10 of *Urochloa*, 6 of *Megathyrsus maximus*, 3 of *Arachis*, 2 of *Cajanus* and 2 of *Stylosanthes*) and more than 160 variables, which describe these cultivars, grouped into 6 categories: identity, morphology, agronomy, performance under grazing, use in integrated systems and images of the plant from germination to adult stages. The cultivars are arranged in rectangular cards, represented by a photograph and the respective common and scientific names. To access data on a cultivar, either tap on the photograph or type the cultivar's common name (or part thereof) (Figure 1A).

Three useful interactive features are available on Pasto Certo® 2.0: Firstly, a comparison between cultivars for different variables, where the user can select up to 4 cultivars to compare simultaneously for as many variables as are of interest (Figure 1B); Secondly, the feature 'choice of forage cultivars for pasture establishment', where the user answers 8 technical questions and is presented with cultivar suggestions for his/her specific needs (available only for *Urochloa* and *Megathyrsus maximus* cultivars) (Figure 2); and Thirdly, a contact list of more than 30 partner companies in Brazil, indicating where to obtain seeds of these tropical forage cultivars. Several of these companies have subsidiaries in Latin American countries.

The application is user-friendly, has Portuguese, Spanish and English versions and is automatically updated where an internet connection is available once the application is opened and usage starts. However, Pasto Certo® 2.0 is designed to work both online and offline, i.e. does not require internet connection.

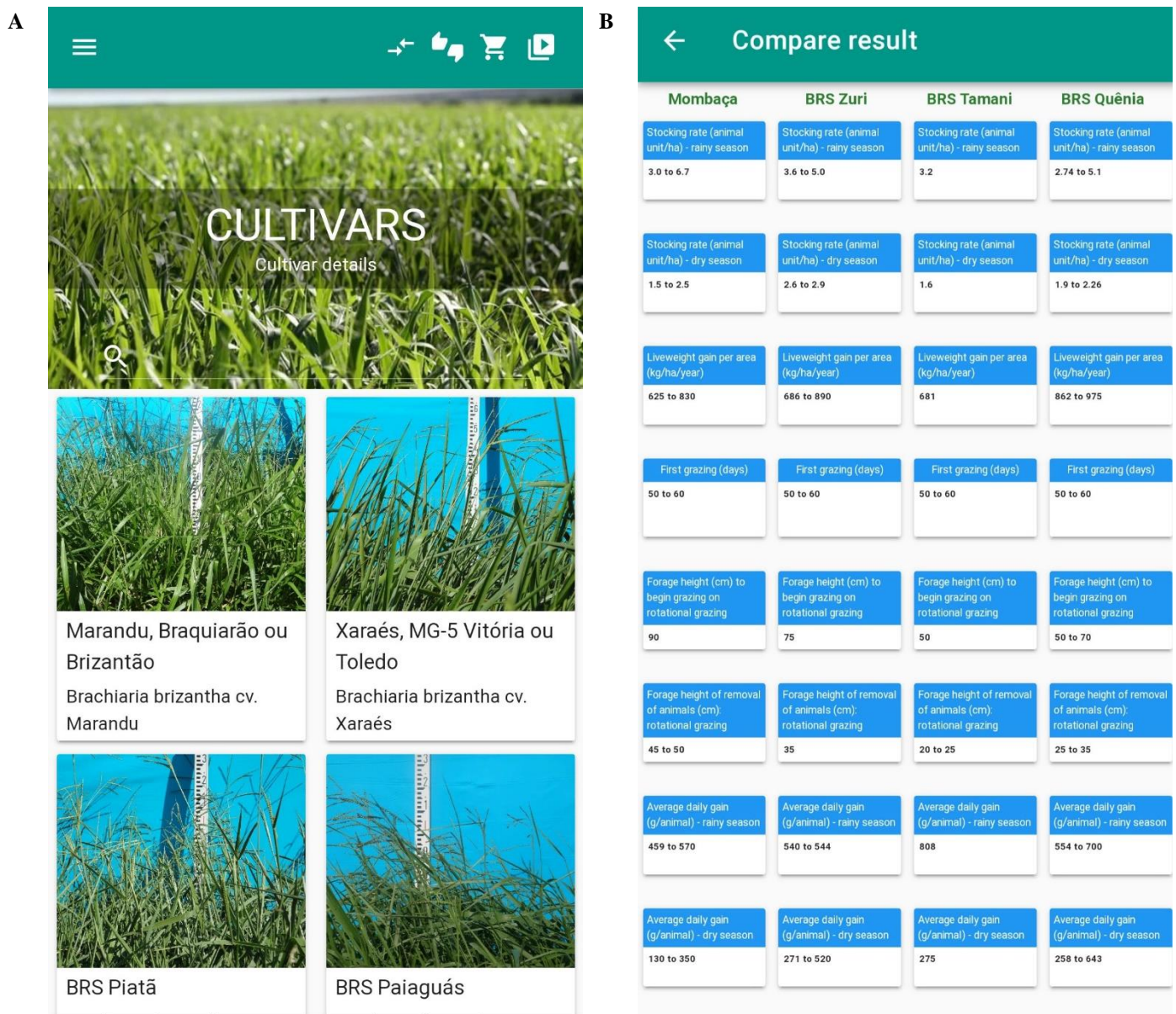


Figure 1. **A)** Main screen of Pasto Certo® with figure cards indicating the different cultivars in the app. At the left top is the MENU and at the right top are the interactive functions: compare cultivars; choice of forage cultivars for pasture establishment; where to buy tropical forage seeds in Brazil; and video gallery. **B)** Screen showing the comparison between *Megathyrus maximus* cvv. Mombaça, BRS Zuri, BRS Tamani and BRS Quênia for several variables.

The application can be accessed free of charge and is available on 3 different platforms (Android, iOS and WEB - www.pastocerto.com). Pasto Certo® is thus an efficient tool to assist users in the comparison, choice, establishment and management of tropical pastures.

Moreover, the application provides the capability for the user to send questions and suggestions to the administrative team responsible for Pasto Certo®, and thus to contribute to the continuous improvement of the package.

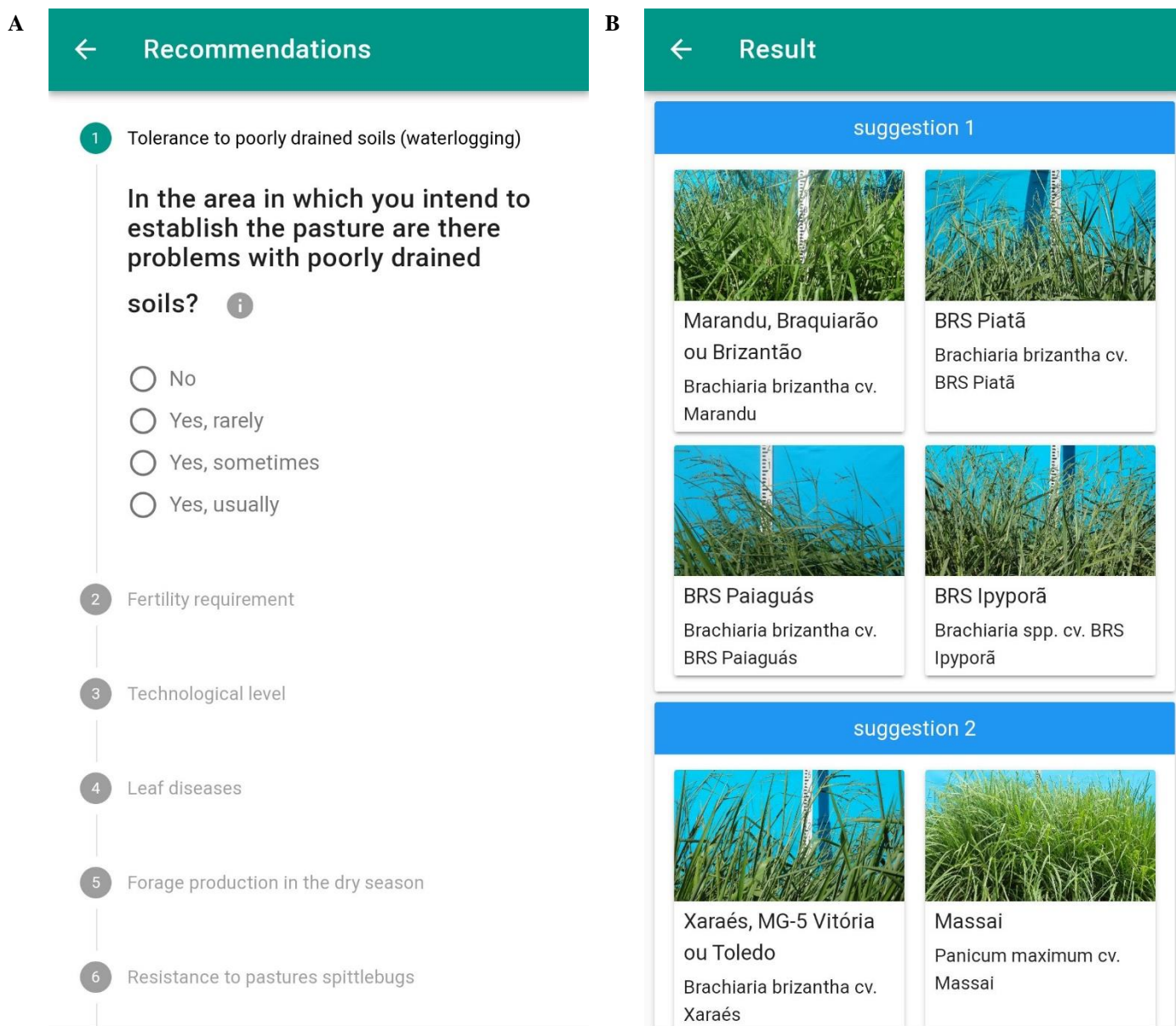


Figure 2. **A)** Main screen of “choice of forage cultivars for pasture establishment” function. Six of the 8 questions (tolerance of waterlogging, fertility requirement, technological level, leaf diseases, forage production in the dry season, resistance to pasture spittlebugs, frost tolerance and rainfall) are shown on the screen. This function is currently available only for *Urochloa* and *Megathyrsus maximus* cultivars. **B)** Screen showing an example of output from the “choice of forage cultivars for pasture establishment” function, based on the input (responses) of a user.

Perspectives

Pasto Certo® 2.0 has had a broad public acceptance, confirmed by the positive evaluation of the application and number of downloads surpassing 30 thousand. Moreover, improvements and adjustments have been requested by users, which will be incorporated into version 3.0. This new version is already under construction and the following items will be incorporated:

inclusion of other forage genera (*Andropogon*, *Paspalum* and *Cenchrus*); and 2 new interactive functions.

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