A digital interactive decision dashboard to analyze, store and share year-to-year crop genotype yield.

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**Abstract**

The lag time between data collection and sharing is a critical bottleneck in order to make impactful decision at farmer field-scale. Following this line, there is a need for developing a digital interactive decision dashboard for sharing results of crop trials, in parallel to establish a database for storing data. These crop trials, invaluable for farmers seeking to determine the optimal genotype for their crops, are at risk of becoming obsolete due to the current format and the lack of more near real-time sharing of results. This study aims to provide a web-based digital interactive decision dashboard with nearly real-time functionality, developed to facilitate the analysis of all the stored data effectively. Moreover, this solution ensures the centralization of all data in one accessible location. The development of the user interface involved Python programming with the Dash framework, while data manipulations were executed through Pandas library. Hosting the tool on the Google Cloud Platform was instrumental in ensuring both the accessibility and efficiency of data storage and retrieval, contributing to the overall functionality of the system. The tool empowers users to assess genotype yield trends year-to-year, incorporating location data for informed decision-making. This feature caters to farmers, providing valuable insights for strategic planning. Additionally, the user-friendly interface facilitates data input, enabling non-programmers to analyze personal data effortlessly. However, the tool presently faces data format variations, necessitating a future standardization process for streamlined automation of new data inputs. To broaden the tool's utility, the database will be expanded to include trials from diverse states. This envisioned enhancement ensures a more comprehensive and inclusive repository for agricultural research and decision-making. This study holds critical relevance in modernizing and democratizing the access to critical information to take timely agricultural decisions. By providing a user-friendly digital interactive decision dashboard, it bridges the gap between technological advancements and the practical needs of farmers and researchers. The envisioned standardization and expansion of the database will amplify the impact of this study, fostering a more collaborative and informed approach to crop trial experiments on a broader geographical scale.

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