

# From scientific literature to the end user: democratizing access to data products through interactive applications

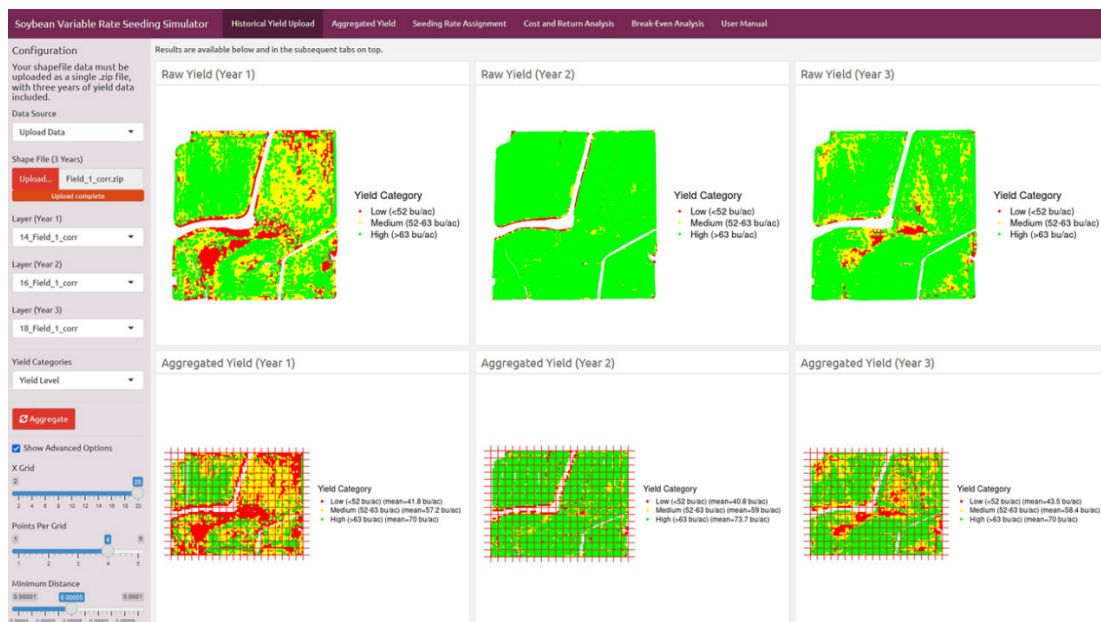
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## Introduction

In recent years, the sustained advance in the creation of powerful programming libraries is allowing not only the creation of complex models with predictive capabilities but also revolutionizing visualization processes and the deployment of interactive applications. Some of these tools, such as Streamlit or Shiny frameworks in languages such as Python or R, allow us to create from simple applications with friendly interfaces to complex tools. These interactive digital decision dashboards allow the possibility of accessing databases and data processing in the cloud that simplify processes with minimal computer knowledge.

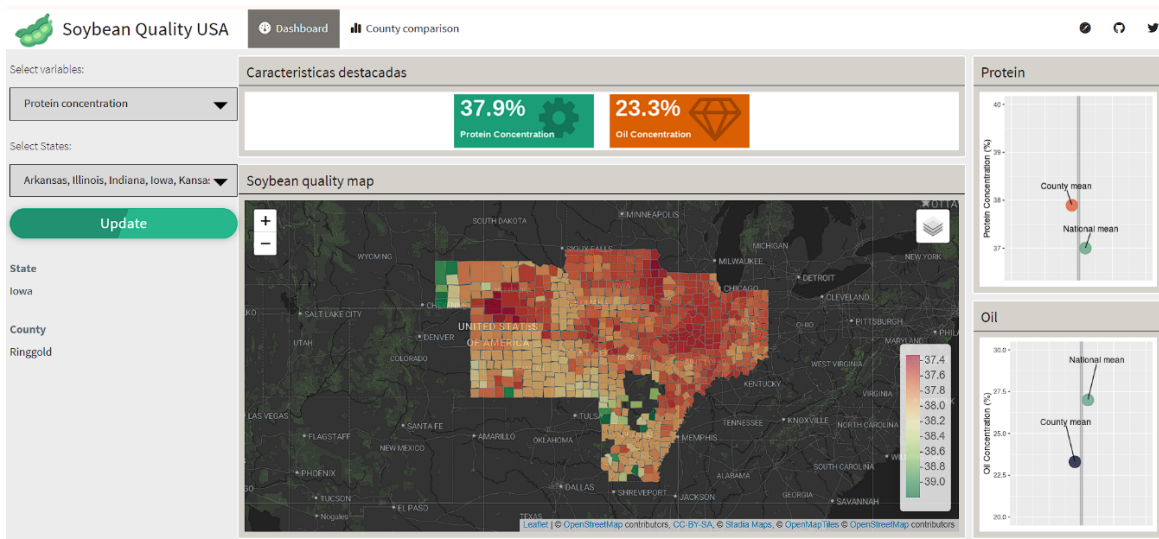
## Scientific research to usable outcomes.

In this sense, the creation of interactive digital decision dashboards that allow models and data products to be deployed could be an option when it comes to extending the results obtained in scientific publications. In the Figure 1 is possible to see an example of a scientific research translated in a web application showing the impact of use variable seeding rate in soybean and its impact in the economic revenue (Correndo et al., 2022).



**Figure 1:** Soybean variable rate seeding calculator that allows the user to test and simulate spatial variability in soybean seeding rate and then apply an economic analysis using yield map from last years. The web app can be found in <https://analytics.iasoybeans.com/cool-apps/SoybeanVRSsimulator/>

In many cases the results obtained in the scientific bibliography have a high level of complexity for end users or decision makers. In these cases, it is highly recommended to embed the data products or predictive models obtained in user-friendly applications. In this sense, Figure 2 shows the data obtained by Hernandez et al., 2023 in a way that is easy to interpret and use. Additionally, this is also facilitated by new web application creation tools that are easily implementable by scientists or data analysts with minimal programming knowledge.



**Figure 2:** Soybean seed quality predicted through machine learning and remote sensing. The web app can be found in <https://ciampittilab.shinyapps.io/SoybeanQualityUS/>

## References

- Correndo, A., McArtor, B., Prestholt, A., Hernandez, C., Kyveryga, P. M., & Ciampitti, I. A. (2022). Interactive soybean variable-rate seeding simulator for farmers. *Agronomy Journal*, 114(6), Article 6.
- Hernandez, C. M., Correndo, A., Kyveryga, P., Prestholt, A., & Ciampitti, I. A. (2023). On-farm soybean seed protein and oil prediction using satellite data. *Computers and Electronics in Agriculture*, 212, 108096.