

FERTILIZER LATINO AMERICANO 2019

Integrating (and reconciling) traditional and precision tools to optimize soil and nutrient management

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ABSTRACT

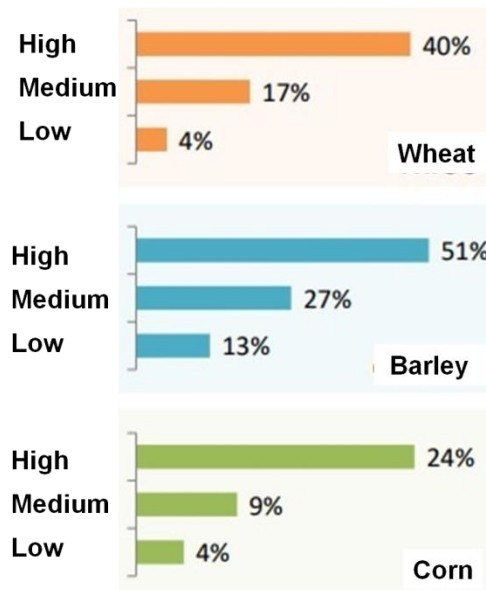
Although precision agriculture (PA) and AgTech's are positioned as the newest technological paradigm to manage agriculture systems, current PA adoption is below its potential, inclusive at the more advanced and developed countries. One of the reasons behind this situation might be explored focus on the technological adoption process. According to different studies carried out in the US and Argentina are showing a significant relationship between the adoption of traditional (e.g. soil or plant testing) and modern technologies (e.g. enhanced efficiency fertilizers, remote sensors, etc.). Hence, promotion and/or extension efforts to boost the adoption of advanced technologies should consider if farmers are using "traditional" tools for a further adoption of more sophisticated tools. This issue is particularly important to those companies interested in boosting PA or AgTech's tools either at develop or developing countries. Other factor impacting significantly on farmer's decision to adopt and/or invest in fertilization technology is the land ownership. An academic study carried out in Argentina found that those farmers that own the land tended to focus on land maintenance (i.e. applying best management practices and a more balance fertilization program), while farmers renting their land focused on profit maximization. An interesting finding from the behavioral standpoint was that the same individual farmer that applied best management practices as a land owner, when rent lands outside their own farms, adopt a low input technology strategy, prioritizing profitability rather than soil conservation or a more balanced fertilization management.

On the other hand, AgTech's tools offered at the marketplace rose sharply over recent times. For instance in Argentina, where farmers are considered very innovations and fast PA adopters; there are a huge number of AgTech's tools with a very wide range of applications and uses. However, only few of AgTech's tools add real value to farms in terms of yield improvement, reduction of environmental impact and/or optimizing overall farming operations and process. In order to help farmers to evaluate and test the available AgTech's tools offered in Argentina, a very useful web-based tool was developed by the No till Association of Argentina (AAPRESID) and can be consulted at: www.agtech.org.ar.

Regarding modern agriculture and how to integrate "traditional" and "advanced" technology, more attention should be done to study and understand the technology adoption as a process, considering behavioral features of farming decisions as well as looking at the associative relationships among technologies and other kind of factors land ownership or other local factors that may impact technological adoption. Finally, a science based technology development and adoption is the key drive for a further and strong diffusion of any PA or AgTech innovation. In this sense, conceptual models like the 4R (i.e. apply the right nutrient rate using the right source at the right place and time) is applied to either traditional and/or PA technologies, and hence it is still the best model to have in mind.

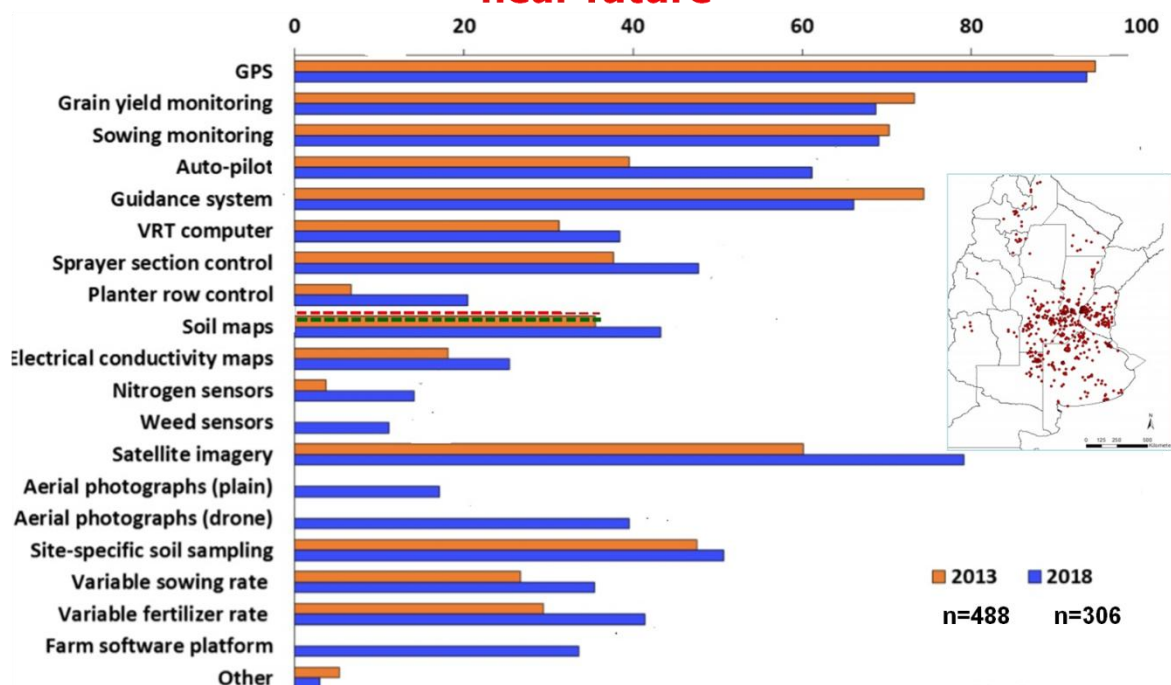
FEATURED VISUALS

Soil sampling by technological level in cereal crops



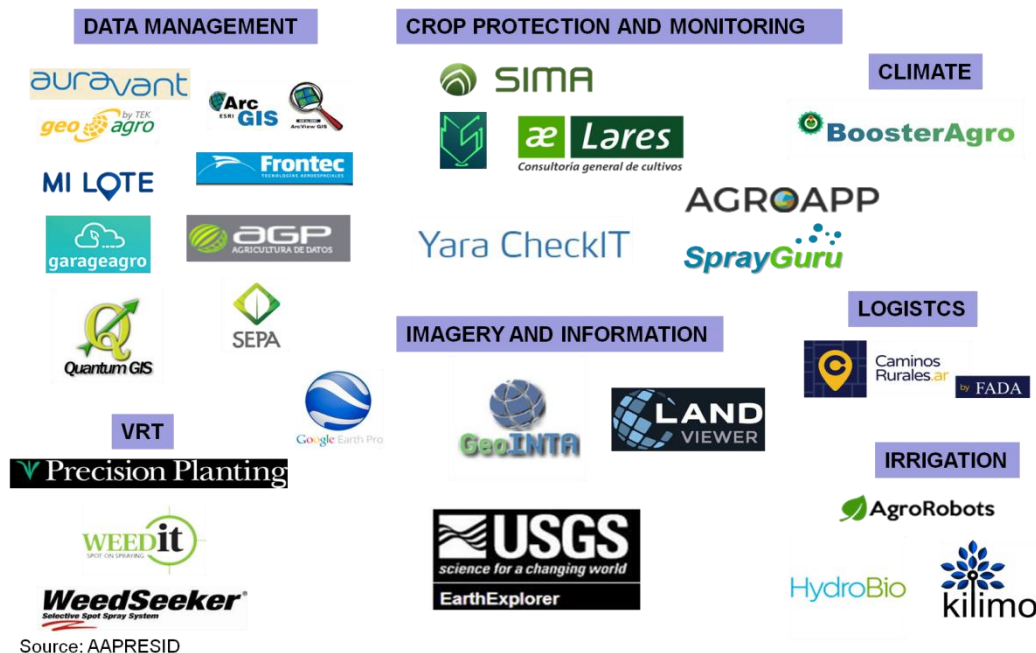
Source: Bolsa de Cereales de Buenos Aires, ReTAA

Recent trends in PA adoption in Argentina: challenges for near future



Melchiori & García (2018)

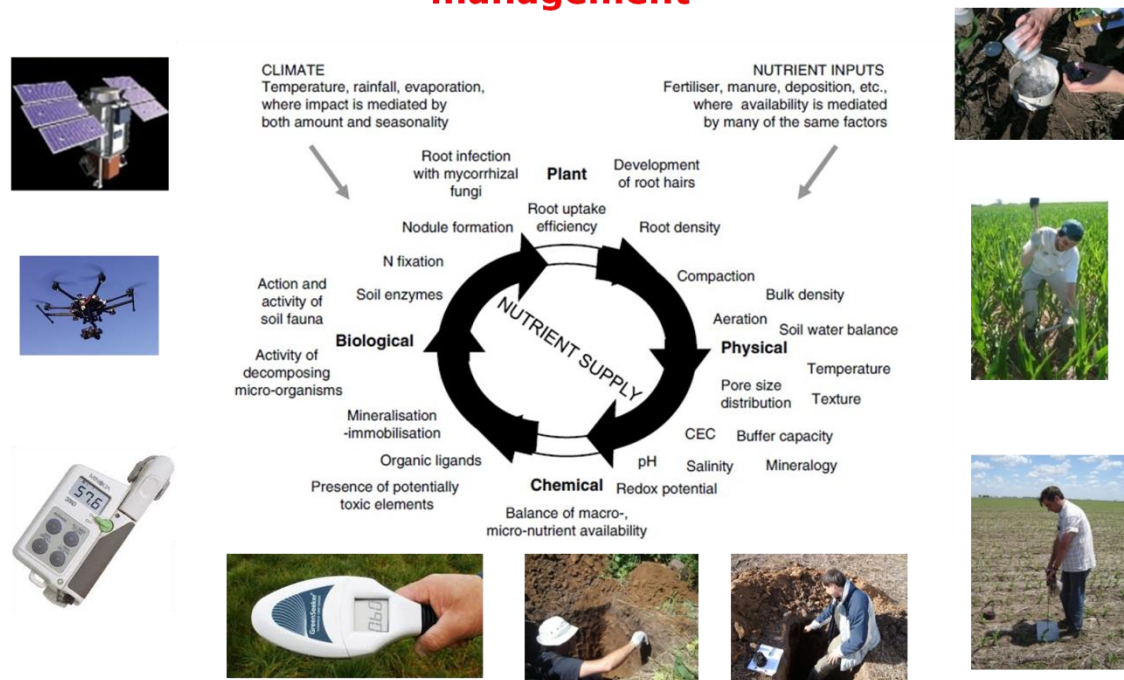
Some AgTechs available in Argentina



How to choose the accurate AgTech?. An example of a web-based tool being use in Argentina

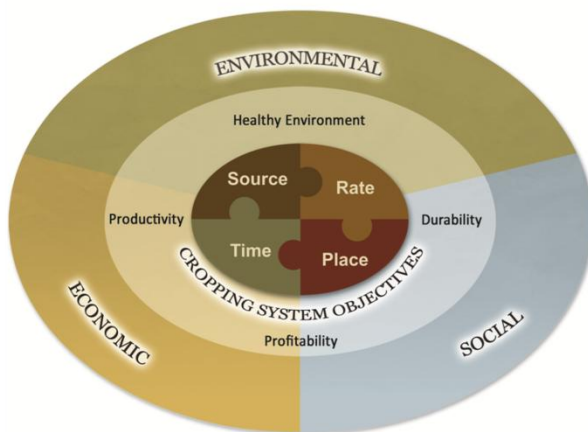


Integrating traditional and PA tools to optimize nutrient management



Adapted from Stockdale et al. (2013)

The "4R" conceptual model integrates traditional and precision agriculture concepts!!



IPNI-net/4R

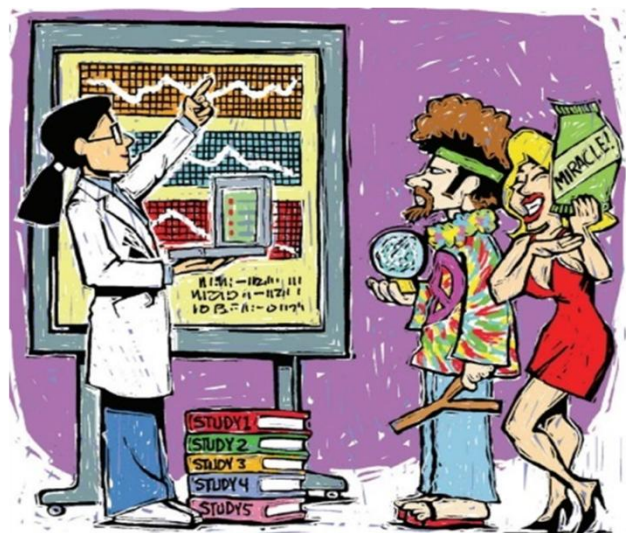


Imagen tomada de R. Norton (IPNI New Zealand, 2013)