

Integration of technology in Argentina and Colombia's agriculture

Agriculture is an activity that has to rely on a variety of natural factors that cannot be controlled and can cause damages to productivity, cultivation area, and economy of the country. But, with current technology, farmers can increase their cultivation potential or prevent and alleviate the damage that may occur from natural disasters more effectively. The following are some examples of integration of technology that Argentina and Colombia use in agriculture in their countries;

Argentina uses drones to explore rice fields to find where to apply herbicide.



Currently, farmers tend to spray chemicals throughout their rice fields to remove weed which results in higher production costs and damages in environment. In addition, weeds usually do not grow dispersedly, but often grow as bushes in specific areas. Therefore, spraying chemicals throughout the area is not an effective method. For

this reason, researchers from the Weed Center of the Faculty of Agricultural Sciences, National University of the Northeast (UNNE), in collaboration with the Ministry of Production of Corrientes Province, present this new method of "Prescription Map" with the integration of drone technology for exploration, in order to limit the area of application of herbicide to only the problematic areas.

The exploration of weed growing areas in rice fields, in order to make this multi-spectral diagram, involves the software called "eMotion2" to help create flight plan of the VANT eBee drone that comes with RGB and NIR cameras with a resolution of 12 MPx. The drone fly at the height of 125 meters. Then, "Pix 3D" software will be used to analyze the image data collected. And when the image data is obtained, the portable GPS technology will be integrated to compare maps with the real area. To identify the areas with weed problems and need to be sprayed, the Normalized Difference Vegetation Index (NDVI) will be used.

However, such system still requires a development in data collection system. Because, the information obtained is too vast for rice farmers. The development plan involves the experiment of flying drones at different heights.

Dr. Gabriela Lopez, director of the Weed Center, said that this new technology will help increase the benefits for the country's agricultural economy, reduce the use of herbicides, and conserve the environment too.

GeoFarmer: application to collect and share climate data for agriculture in Colombia.



When the El Niño phenomenon began to cause drought in the area, the farmers were the first group to recognize the severe impacts of the climate condition. The delayed coordination and data submission resulted in incapacity of the organizations or governments to create a responsive plan or reach out to help in a timely manner. However, with the GeoFarmer application, thousands of Colombian farmers,

including many other African countries, have been able to send important information about climate problems to relevant authorities quickly and efficiently.

GeoFarmer application has been developed by the cooperation between the International Center for Tropical Agriculture (CIAT) and Salzburg University in Austria. It enables farmers to collect and transmit geospatial data on climate, soil type and their cultivation. It also helps to control the use of technology to increase productivity and resistance to climate change.

Currently, the function of this application is to send data into cloud system so that the information can be accessible online on the website. The application allows farmers to send pictures or messages about their cultivation into the system. In the future, discussion and vote functions will be added so that farmers can get the best solution for their problems.

The application is praised by Computers and Electronics in Agriculture journal as a speaker for farmers. It can effectively reduce the communication gap between people in the agricultural development community, researchers for technology invention, and farmers. This development allows them to have a better understanding on farmers' needs and make them able to be prepared to deal with the challenges that may occur in the future in a timely manner.

Colombia invests in artificial intelligence technology for soil condition analysis.



Ministry of Information Technology and Communication, in collaboration with AGROSAVIA, a state-owned agriculture-related research company, has adopted the Artificial Intelligence or AI technology to provide soil condition analysis before cultivation services which allow more than 3,000 farmers and livestock operators in Colombia to obtain advices on ground condition

improvement, fertilization and cultivation that is suitable for their farms more precisely and quickly.

The Colombian government has invested more than 950 million Colombian pesos to develop the processes in laboratory to be able to deliver results of ground fertility analysis, as

requested by farmers, more quickly. Also, it tends to facilitate the farmers with more access to research results through a website, where they can view the status, inspection results of their samples, and suggestions. The investment has included a processing system to the software so that the data can be automatically displayed in order to reduce the use of Microsoft Excel and paper.

The integration of artificial intelligence technology for fertilization plan is part of the forecasting data processing system developed by Green Services. The system employs the IBM Watson's AI technology to analyze massive amounts of data and to generate advices with a database of over 10,000 preset advices.

At present, this tool can forecast data for more than 200 kinds of crops and has been delivered excellent results. The government expects that the use of AI technology to analyze soil condition will help develop and strengthen the agricultural sector of the country and restore the country's economic sector.

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