Sensors in agriculture: the current situation

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Abstract

The modern agriculture has a lot of challenges. The main focus is to make agriculture production more efficient, reliable and eco-friendly. This requires development and application of new technologies in agriculture. Smart farming, a novel agriculture trend, combines novel research achievements and technologies to optimize efficiency of agriculture production. The smart farming requires novel methods distantly control all the processes.

Due to significant standards in agriculture, recently the classical laboratory methods are used to analyse samples from soil, plants, water or other materials from the field. These methods are highly precise and they provide full set of information about the tested agriculture object. Some disadvantages of these methods are complexity of the equipment and time delay between probe selection and measurements. Sensor technologies are alternatives for the standard laboratory methods, being exposed in the field and giving in-situ response.

The sensors can be exposed in the field, attached to agriculture technique or drones. Sensors provide fast response and on time decision making, being key factors for smart farming and enhanced efficiency.

The sensors might not give as precise signal as the standard methods. Therefore, smart farming has to combine novel sensors and the standard methods as reference for calibration.

UkraVit is one of the biggest companies in Ukraine, providing analytical services to farmers. We have certified laboratories, equipped with standard methods, such as HPLC, atomic absorption spectroscopy, UV-Vis spectrophotometers, etc. Based, in our experience and work in the field, we consider the growing needs in low cost, fast and portable methods for testing agriculture probes outside of the laboratories. In our presentation, we make a spot on the needs of the sensors in agriculture, recent use of the sensors and future potential of combining sensors with standard methods for development of smart farming.

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