위키피디아에서 정의하는 정밀농업
How the Wikipedia defined the Precision Agriculture

홍길동[1]   김유신[2]   이순신[1,3§]
Gil-Dong Hong[1]   **Yu Sin Kim[2]**   **Sunshin Lee[3]**

[1]한국대학교 농업생명과학대학 정밀농업공학전공
[2]한국대학교 농업생명과학대학 농업공학전공
[3]한국대학교 농업생명과학대학 정밀농업연구소
[1]Major in precision agricultural engineering, College of agriculture & life sciences, Hankook university, Sejong, 56789, Rep. Korea
[2]Major in agricultural engineering, College of agriculture & life sciences, Hankook university, Sejong, 56789, Rep. Korea
[3]Research institute of precision agriculture, College of agriculture & life sciences, Hankook university, Sejong, 56789, Rep. Korea
§ E-mail : sslee@chosun.korea

초록(Abstract)

Precision agriculture (PA), satellite farming or site specific crop management (SSCM) is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops. The goal of precision agriculture research is to define a decision support system (DSS) for whole farm management with the goal of optimizing returns on inputs while preserving resources.

Among these many approaches is a phytogeomorphological approach which ties multi-year crop growth stability/characteristics to topological terrain attributes. The interest in the phytogeomorphological approach stems from the fact that the geomorphology component typically dictates the hydrology of the farm field.[1][2]

The practice of precision agriculture has been enabled by the advent of GPS and GNSS. The farmer's and/or researcher's ability to locate their precise position in a field allows for the creation of maps of the spatial variability of as many variables as can be measured (e.g. crop yield, terrain features/topography, organic matter content, moisture levels, nitrogen levels, pH, EC, Mg, K, and others). Similar data is collected by sensor arrays mounted on GPS-equipped combine harvesters. These arrays consist of real-time sensors that measure everything from chlorophyll levels to plant water status, along with multispectral imagery. This data is used in conjunction with satellite imagery by variable rate technology (VRT) including seeders, sprayers, etc. to optimally distribute resources. However, recent technological advances have enabled the use of real-time sensors directly in soil, which can wirelessly transmit data without the need of human presence.

Precision agriculture has also been enabled by unmanned aerial vehicles like the DJI Phantom which are relatively inexpensive and can be operated by novice pilots. These agricultural drones can be equipped with multispectral or RGB cameras to capture many images of a field that can be stitched together using photogrammetric methods to create orthophotos. These multispectral images contain multiple values per pixel in addition to the traditional red, green blue values such as near infrared and red-edge

spectrum values used to process and analyze vegetative indexes such as NDVI maps.These drones are capable of capturing imagery and providing additional geographical references such as elevation, which allows software to perform map algebra functions to build precise topography maps. These topographic maps can be used to correlate crop health with topography, the results of which can be used to optimize crop inputs such as water, fertilizer or chemicals such as herbicides and growth regulators through variable rate applications.

Figure 1. An image of describing concept of precision agriculture connection to the smart-farming.
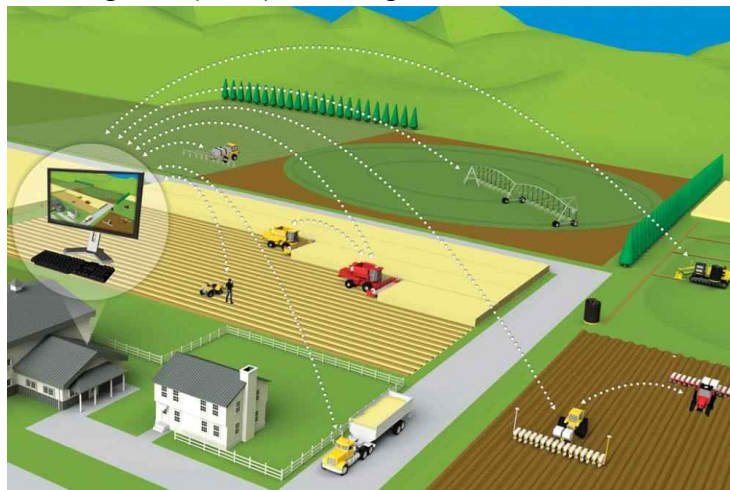

Figure 2. Data network scheme between mobility entities and the control station.

참고문헌(References)

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키워드(Keywords)

Precision agriculture, Satellite farming, Site specific crop management, Wikipedia