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SHORT REVIEW OF THE BENEFITS OF USING DRONES IN AGRICULTURE

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Abstract

This article is an overview of the impact of drones in precision agriculture based on information from studies made on this topic. The research includes the improvements drones has made in the agriculture, by making the work more efficent and easing it at the same time. Another thing about using drones is that the financial part is getting better, without losing the quality of the work.The subject of this research is in a continuous growth, more and more farmers are using it nowdays.As a conclusion, precision farming is getting better due to technology, with the number and quality of production increasing.

Key words*: agriculture, drones, farming, precision.*

INTRODUCTION

Nowdays, precision farming and technology have become indispensible, especially when considering their impact on the Romanian farms. Precision agriculture is the future and the progress of the Romanian farms. More and more farmers use the latest technology in the field (G.P.S, automatic devices, sensors, monitoring and control system, etc.) to ease their work and to obtain remarkable results by using resources that are distributed in a control manner.

No precision agriculture can fuction without G.P.S. Manual and automatic control has attracted more and more Romanian farmers who need fast and efficient field works. G.P.S can be placed on all equipment, from tractors to harversting machines, and from sprinklers to drones. Drones can be highly used in controlling everything that happens in the field, particulary at harverstingtime.The idea was lunched in the 1980's, but the present-day technology allows its application in a way that was previously unconceived of.

This project is the result of the work carried out by Cortney Robinson, secretary of the SC 16 technical subcommittee of the ISO/TC 20 technical committee, and responsible for the aircrafts currently known as drones.

MATERIALS AND METHODS

To characterize the utilisation of drones in precision agriculture, we followed these indicators: speed, quality, precision, the farmers opinions, the way these had developed, and what softwares they use.

The information we brought were taken from statistics, articles, interviews, and again opinions from farmers that are using drones in precision agriculture.

RESULTS AND DISCUSSIONS

Precision agriculture refers to the way farmers manage crops to ensure efficiency of inputs such as water and fertilizer, and to maximize productivity, quality, and yield. The term also involves minimizing pests, unwanted flooding, and disease.

Drones allow farmers to constantly monitor crop and livestock conditions by air to quickly find problems that would not become apparent in ground-level spot checks. For example, a farmer might find through time-lapse drone

photography that part of his or her crop is not being properly irrigated.

Agricultural drone technology has been improving in the last few years, and the benefits of drones in agriculture are becoming more apparent to farmers. Drone applications in agriculture range from mapping and surveying to cropdusting and spraying.

The process of using a drone to map or survey crops is a relatively straightforward one. Many newer agricultural drone models come equipped with flight planning software that allows the farmer to draw around the area he needs to cover. Then, the software makes an automated flight path and, in some cases, even prepares the camera shots.

As the drone flies, it automatically takes pictures using onboard sensors and the built-in camera, and uses GPS to determine when to take each shot. But if your drone does not have these automatic features, then one person needs to fly the drone while the other takes the photos.

Figure 1. An agricultural drone package

Precision Agriculture is doing the right thing, at the right place, at the right time. Knowing the right thing to do may involve all kinds of high tech equipments and fancy statistics or other analysis. Doing the right thing however starts with good managers and good operators doing a good job of using common tools such as planters, fertilizer applicators, harvesters and whatever else might be needed. (Colvin and Kerkman, 1999).

Demographic and economic research perspectives have given a great deal of attention in recent years to the adoption of precision agriculture. However, very little attention has been given to the perceptions and attitudinal reasons for farmers to adopt these technologies. While economic benefit is the primary reason given by producers to adopt precision agricultural technologies, other attitudes play roles in the adoption decision.

Drones are affordable, requiring a very modest capital investment when compared to most farm equipment. They can pay for themselves and start saving money within a single growing season.

Operation is relatively simple, and getting easier with every new generation of flight hardware. They're safe and reliable. They are easy to integrate into the regular crop-scouting workflow; while visiting a field to check for pests or other ground issues, the drone can be deployed to collect aerial data. Yet, the real advantages of drones are not about the hardware; the value is in the convenience, quality and utility of the final data product.

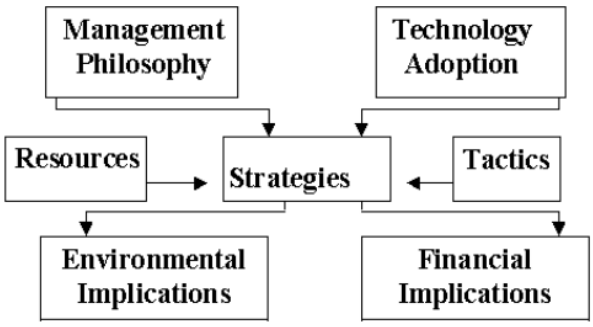

Figure 2. Factors that influence the choice of strategy

Spraying with a drone helps the farmers to reduce the cost and at the same time the precision is bigger than the spraying made manually.

Spraying by agriculture drones is estimated to save up to 90% of water usage for irrigation and could save between 30% to 50% of chemicals in crop spraying. Spraying by agriculture drones is estimated to save up to 90% of water usage for irrigation and could save between 30% to 50% of chemicals in crop spraying. Remote controlled agriculture drones expose operators to fewer chemicals. Agriculture drones are estimated to improve efficiency by between 40 times to 60 times

compared to manual labour, and up to 5 times faster than tractor application of pesticides.
On the one hand, these figures show the general interest of the agricultural community, and on the other hand, they themselves increase this interest. Such a "self-heating" market indicates that it will only grow. And maybe even an unexpected expansion will take place leaving those who are sceptical of the technology behind.The infographic provides that many farmers are actually implementing these modern aerial tools.

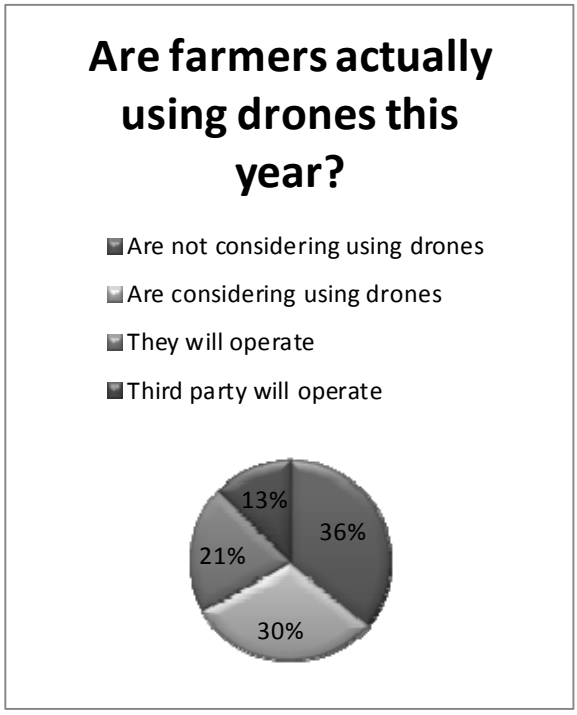

Figure 1. The percentage representation for the usage of drones by farmers

Key takeaways of the poll:
Most farmers are operating their own drones.The trend is going in the right direction – 30% said they are not using drones now, but will consider for next year;There is still some work to do for the drone industry: 36% say that they are not using drones and have no plans to do so.Of the farmers who said that they do use drones, about 64% said they will operate the drone themselves. The remaining said that they will hire a 3rd party professional operator.The 36 percent of respondents who are not using drones – and don't plan to – indicate that the industry is still in its infancy. As drone use becomes more widespread, and the drones and data platforms easier to use and more familiar, those numbers could change rapidly.

The trend is good news for the drone industry. Agriculture is one of the top vertical markets for drones, with a strong and a broad range of available tools. The drone industry claims a "triple bottom line" for agriculture. Drones provide an inexpensive method of getting data; and the data can easily be used to both cut expenses and increase yields. Drone projects scale across many different sizes and types of operations. Consequently, agriculture has been one of the fastest growing sectors for commercial drones.
The use of drones, in agriculture is growing rapidly. But practical applications for drones on the farm and ranch are expanding faster now than ever before.

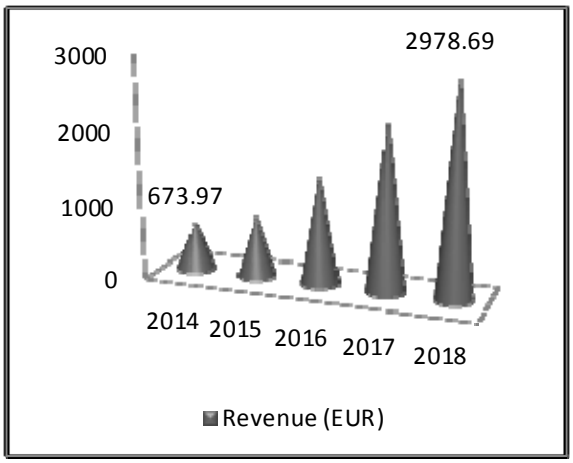

Figure 2. Evolution of market for drones

The results of the Zion Research analysis are somewhat restrained and state that by 2018 the market for drones will increase to $2.978 billion. But, regardless of the financial results, all analysts agree that the agricultural drone market is expecting significant growth.

CONCLUSIONS

Technological evolution of devices with G.P.S including drones has revolutionized classic agriculture with a bigger precision that influenced the quality and quantity of agrarian production, resulting what we call nowdays precision farming.
Remote sensing technology plays an important role in precision agriculture and it is application in the precision agriculture introduces new opportunities for improving agricultural practices.

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