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DATA COLLECTION ON PRECISION FARMING

- BACKGROUND NOTE -

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CEMA
European Agricultural Machinery

copa cogeca
european farmers european agri-cooperatives

The project "Data collection on Precision Farming" is carried out by the following partners:

- *Comité des organisations professionnelles agricoles - Comité général de la coopération agricole de l'Union européenne (Copa Cogeca)*
- *European Agricultural Machinery Association (CEMA)*
- *European Commission, Directorate-General for Agriculture and Rural Development DG AGRI*
- *European Commission, Directorate-General for the Environment (DG ENV*
- *European Commission, Directorate-General for Climate Action (DG CLIMA)*
- *European Commission, Directorate-General Directorate General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW)*
- *Eurostat, the Statistical office of the European Union*
- *Joint Research Centre of the European Commission*
- *European Environment Agency (EEA)*

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LIST OF ABBREVIATIONS

CEMA	European Agricultural Machinery Association
Copa-Cogeca	Comité des organisations professionnelles agricoles - Comité général de la coopération agricole de l'Union européenne
DG AGRI	Directorate-General for Agriculture and Rural Development
DG CLIMA	Directorate-General for Climate Action
DG ENV	Directorate-General for the Environment
DG GROW	DG GROW Directorate General for Internal Market, Industry, Entrepreneurship and SMEs
EEA	European Environment Agency
ESTAT	Statistical office of the European Union
FAS	Farm Advisory Services
JRC	Joint Research Centre
MA	Managing Authority
PA	Paying Agencies
PAT	Precision Agriculture Technologies

1 BACKGROUND & OBJECTIVES

Precision farming is often regarded as one key approach for linking environmental and economic interests in the agricultural sector. The use of precision farming equipment allows for reducing the environmental impact of farming and increased resource efficiency through e.g. a more targeted application of chemical and non-chemical input. It also offers alternative solutions to the use of chemicals. Precision agriculture can be regarded as optimisation processes of production practices, mostly through tools from a portfolio of Precision Agriculture Technologies (PAT) supporting, e.g. steering of tractors, weeding with robots, drones, as well as site-specific management through data collection from the field, data analyses and evaluation, and decision support.

An increased use of precision farming instruments is thus expected to bring environmental and economic benefits, and could contribute to the transition towards a more sustainable farming sector. For instance, Nitrogen surplus values may vary drastically between fields under precision farming and those under 'standard' agricultural production methods.

Overall, the application of PAT within the farming community may allow a step change in productivity to meet food supply requirements under land constraints and enhance environmental management and monitoring (Zarco-Tejada et al., 2014; Schrijver et al., 2016).

Precision farming is of political interest since it is offering high potential to reduce pressures. However, its actual impact assessment for policy actions post-2020 in the fields of agriculture and environment is difficult since even the extent to which precision farming instruments are used in the EU, i.e. the baseline, is unknown (Van Bogaert et al., 2018). A number of studies have examined the current uptake of precision farming instruments and generally find low levels of adoption, which is partly dependent on the regions and types of technologies considered. For instance, within certain States of the US, uptake of precision farming instruments is well documented (e.g. Holland et al., 2013; Miller et al., 2017; Kingwell and Fuchsbichler, 2011). Within Europe, uptake rates are less well explored and mostly region specific (van der Wal, 2014; Paustian and Theuvsen, 2016; Lencsés et al., 2014; Kutter et al., 2011). What is noticeable about these studies is that they have taken a case study approach, covering selected states or regions within a particular country. Moreover, given the perceived potential of PAT as a mechanism to meet both food production and environmental pressures, it would seem important to focus efforts on other regional farming systems as a means to complement the ubiquity of US-based studies.

Yet, on the other hand, the markets for and the portfolio of precision farming products (and possibly also the number of end users) is developing quickly. Strategic response to those developments do not only concern agricultural and environmental policies and how the uptake of precision farming can be promoted and supported, but also e.g. how the use of Copernicus satellite data and information services can support the uptake of precision farming.

Against this background, there is keen interest in data collection from several sides, including the representatives of the agriculture and machinery sectors, the EU Commission's Directorate-Generals for Agriculture and Rural Development (DG AGRI), for the Environment (DG ENV), for Climate Action (DG CLIMA), and for Internal Market, Industry, Entrepreneurship and SMEs, the Commission's Statistical office Eurostat (ESTAT), the Joint Research Centre (JRC), as well as the European Environment Agency (EEA).

The main objective of this project is to jointly organise the collection of data to better estimate the current and potential use of precision faming tools, involving next to the EEA, DG AGRI, JRC, ESTAT, the European farmers' association Copa-Cogeca, and CEMA, the European network of national

agricultural machinery associations and their member companies. Secondary objectives of data collection are the assessment of (perceived) environmental and economic benefits achieved through the application of certain precision farming practices, the identification of challenges of the uptake and use of precision farming instruments, and the assessment of its potential for environmental monitoring.

The task is expected to comprise three surveys to be carried out in 2018 among a) farmers, b) representatives and companies of the machinery sector and c) Rural Development Managing Authorities (MAs), Paying Agencies (PAs) and farm advisory services (FAS). In carrying out the surveys, the partners are supported by a team of consultants.

Lessons for developing a module on precision farming in recurring surveys, such as the farm structure survey, might be drawn; having a recurrent survey – as currently under discussion in the legal proposal on agricultural statistics - is likely to allow to better follow the development of the sector.

2 METHODOLOGICAL APPROACH

Following the overall objectives of the project as described in the previous section, the main interests of the partners in relation to PAT to be further explored can be broadly summed up in five categories:

a) Adoption rates

b) Adoption drivers and barriers

c) Environmental impacts

d) Economic impacts

e) Other aspects, such as the relevance of investment support for the uptake of PATs.

A suitable approach to address the research interests appears be to collect empirical data among different target groups and to have three complementary surveys, which are supplemented by the results of existing studies.

It is foreseen to carry out three online surveys among

1) Farmers across the EU,

2) Representatives and companies of the machinery sector and companies, and

3) Managing Authorities (MAs), Paying Agencies (PAs), and Farm Advisory Services (FAS).

The three outlined surveys for collecting data on PAT in the EU are planned to be launched in the year 2018. The survey among farmers will be carried out in 23 languages; the other two surveys will be conducted in English.

The results of all three surveys will be summarised within an (EEA) briefing and distributed through various communication channels.

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