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| Irish Aviation Authority The Times Building 11-12 D'Olier Street Dublin 2, Ireland www.iaa.ie Safety Regulation Division | Údarás Eitlíochta na hÉireann Foirgneamh na hAmana 11-12 Sráid D'Olier Baile Átha Cliath 2, Éire Rannán na Rialachán Sábháilteachta | UAS ADVISORY MEMORANDUM (UAM) NO. UAM 016 ISSUE 1 DATE 30.05.2024 |  |
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Guidance on Agricultural Applications of Unmanned Aircraft Systems

1. Change Record

| Date | Issue | Revision Description |
|------------|-------|----------------------|
| 30.05.2024 | 1 | Initial publication. |

2. References

- Regulation (EU) 2019/947, on the rules and procedures for the operation of unmanned aircraft¹
- Regulation (EC) No 1107/2009 concerning the placing of plant protection products on the market²
- Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides (SUP Directive)³
- Irish Aviation Authority Act, 1993⁴
- S.I. No. 24 of 2023, Irish Aviation Authority UAS (Drones) Order⁵
- S.I. No. 155/2012 - European Communities (Sustainable Use of Pesticides) Regulations 2012⁶
- S.I. No. 159/2012 - European Communities (Plant Protection Products) Regulations 2012⁷

¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0947&from=EN>

² <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02009R1107-20221121>

³ <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32009L0128>

⁴ <https://www.irishstatutebook.ie/eli/1993/act/29/enacted/en/html>

⁵ <https://www.irishstatutebook.ie/eli/2023/si/24/made/en/print>

⁶ <https://www.irishstatutebook.ie/eli/2012/si/155/made/en/print>

⁷ <https://www.irishstatutebook.ie/eli/2012/si/159/made/en/print>

- S.I. No. 427/2013 - European Union (Biocidal Products) Regulations 2013⁸
- S.I. No. 438/2019 - European Communities (Sustainable Use of Pesticides) (Amendment) Regulations 2019⁹
- ICAO Doc 9284 on Technical Instructions for the Safe Transport of Dangerous Goods by Air¹⁰ (Technical Instructions)

3. Purpose

The purpose of this guidance document is to outline the regulatory requirements of using drones for agricultural purposes.

4. Definitions

For the purposes of this guidance document, the definitions in Regulation (EU) 2019/947, S.I. No. 155/2012 (SUP Directive), Irish Aviation Authority Act, 1993 and S.I. No. 24 of 2023 apply.

5. UAS in precision agriculture

According to Teagasc¹¹, precision agriculture may be defined as “the use of information technologies for the assessment of fine-scale animal and physical resource variability aimed at improved management strategies for optimising economic, social and environmental farming.” Unmanned Aircraft Systems (UAS) are widely used in precision agriculture. The use of UAS in this industry mainly covers two areas: monitoring/mapping and aerial spraying. In this guideline we will introduce the two areas separately as they may require different types (and size) of UAS and may fall under different rules and regulation.

5.1. Monitoring and mapping

Monitoring or mapping mainly covers surveillance of the field, the crop, forest, or livestock. Therefore, the general rules of the Regulation (EU) 2019/947 apply to these UAS operations. This means that the operation may be conducted in the ‘OPEN’ category if the limits thereof are kept.

In case the operation exceeds the boundaries of the ‘OPEN’ category the operation will fall into the ‘SPECIFIC’ category. An application for an operational authorisation may be submitted, either under SORA or according to an applicable PDRAs, or a declaration or an appropriate Standard Scenario (STS). For details, please check the [UAM 012](#) and [UAM 007](#).

⁸ <https://www.irishstatutebook.ie/eli/2013/si/427/made/en/print>

⁹ <https://www.irishstatutebook.ie/eli/2019/si/438/made/en/print>

¹⁰ <https://store.icao.int/en/technical-instructions-for-the-safe-transport-of-dangerous-goods-by-air-doc-9284>

¹¹ <https://www.teagasc.ie/animals/dairy/research/livestock-systems/precision-farming-systems/>

5.2. Spraying

5.2.1. Aviation rules and operational category

According to Art. 3 point 5 of the SUP Directive, aerial spraying means “application of pesticides from an aircraft (plane or helicopter)” where the UAS drops (sprays) material during the operation.

According to Art. 4 (f) of the Regulation (EU) 2019/947, “during flight, the unmanned aircraft does not carry dangerous goods and does not drop any material” in ‘OPEN’ category. Therefore, all spraying operation automatically fall the ‘SPECIFIC’ category. Depending on the operational characteristics (e.g. size of the UAS, overflow area, adjacent area and operations range) a declaration for an STS may be used. If the operation does not fit into an STS, the application for operational authorisation may be submitted either under SORA or according to suitable PDRAs. For details, please check the [UAM 012](#) and [UAM 007](#).

In case of spraying with UAS, it shall be investigated if the pesticide is filled into the tank of the UAS and is sprayed from the airborne UAS constitute a transport of dangerous goods and so the operation may fall into the ‘CERTIFIED’ category.

Section 1.1.5.1. b) of Technical Instructions clearly states that it does not apply “*to dangerous goods carried by an aircraft (i.e. UAS) where the dangerous goods are for dropping in connection with agricultural, horticultural, forestry, ice jam control, landslide clearance, pollution control activities or pest management activities*”. Therefore, the agricultural spraying may not fall into ‘CERTIFIED’ Category.¹²

The AMC¹³ of the European Aviation Safety Agency (EASA) stresses in connection with the use of PDRAs, that dropping items in connection with agricultural, horticultural or forestry activities may only be possible if carriage of such items does not contravene any other applicable regulations. These other applicable – mainly agricultural - regulations will be detailed in Section 5.2.2. and have direct implications on the concept of operation.

5.2.2. Agricultural rules

While the aerial spraying is generally prohibited according to Art. 6 of the SUP Directive, the member states are allowed to apply derogation in special cases provided the following conditions are met:

*“(a) **there must be no viable alternatives, or there must be clear advantages** in terms of reduced impacts on human health and the environment as compared with land-based application of pesticides;*

¹² Please consider, that this applies to the UAS operations only, and the delivery of pesticides to the operational site may constitute a transport of dangerous goods and may fall under dangerous goods regulations other than the Technical Instructions (see references).

¹³ <https://www.easa.europa.eu/en/document-library/easy-access-rules/easy-access-rules-unmanned-aircraft-systems-regulations-eu>

- (b) the **pesticides used must be explicitly approved for aerial spraying** by the Member State following a specific assessment addressing risks from aerial spraying;
- (c) the **operator carrying out the aerial spraying must hold a certificate** as referred to in Article 5(2). During the transitional period where certification systems are not yet in place, Member States may accept other evidence of sufficient knowledge;
- (d) the **enterprise responsible for providing aerial spray applications shall be certified** by a competent authority for authorising equipment and aircraft for aerial application of pesticides;
- (e) if the area to be sprayed is in close proximity to areas open to the public, specific risk management measures to **ensure that there are no adverse effects on the health of bystanders** shall be included in the approval. The area to be sprayed shall not be in close proximity to residential areas;
- (f) as from 2013, the **aircraft shall be equipped with accessories that constitute the best available technology to reduce spray drift.**"

In Ireland no derogation has been adopted, but in general it is important to have an overview on the requirements of spraying UAS operations. Based on the above provisions of the SUP Directive, the following areas shall be regulated and consequently respected UAS operator intending to use UAS for spraying.

- (a) the pesticide or material dropped from the UAS shall be authorised;
- (b) the personnel shall be properly trained and licenced for agricultural activities; and
- (c) the spraying/seeding application of the UAS shall be certified.

Ad. a). Chapter III of Regulation (EC) No 1107/2009 lays down the most important rules on EU level. It clearly states in Art. 29 (1) that *"plant protection product shall not be placed on the market or used unless it has been authorised in the Member State concerned in accordance with this Regulation."*

Further details on the required elements of the application can be found in the Regulation, which is complemented by S.I. No. 155/2012 on national level.

According to Article 10 of S.I. No. 155/2012:

- "(1) A person shall not engage or cause or permit another person to engage in the aerial spraying of pesticides other than under, and in accordance with, a licence and the conditions attached, if any, issued by the Minister¹⁴ for that purpose. (...)*
- (4) The Minister may issue a licence under paragraph (1), attach conditions to the licence, vary a condition, insert a new condition, revoke such licence or refuse an application.*
- (5) A licence issued under paragraph (1) may be valid for a period determined by the Minister and the period shall be specified on the licence."*

As referred to, the agricultural legislation may have influence on the concept of operations and the operational area (including the flight geography area, contingency area and ground risk buffer, for

¹⁴ Minister for Agriculture, Food and the Marine

further information on these areas, please see [UAM 008](#)): Article 11 and 12 of S.I. 155/2012 mandates all operators, to keep safe distance, among others, from water sources, vulnerable areas including karst areas, sinkholes and collapse features.

Some Member-States have published lists of approved pesticides¹⁵, but please remember that the certification of pesticide shall be executed on a national level, therefore the application shall be submitted for approval in Ireland.

Ad. b). As known, Article 8(2) of Regulation (EU) 2019/947, the remote pilots in ‘SPECIFIC’ category *“shall have at least the following competencies:*

- (a) ability to apply operational procedures (normal, contingency and emergency procedures, flight planning, pre-flight and post-flight inspections);*
- (b) ability to manage aeronautical communication;*
- (c) manage the unmanned aircraft flight path and automation;*
- (d) leadership, teamwork and self-management;*
- (e) problem solving and decision-making;*
- (f) situational awareness;*
- (g) workload management;*
- (h) coordination or handover, as applicable.”*

Furthermore, UAS.SPEC.050(1) of Annex to Regulation (EU) 2019/947 requires the UAS operator to

“(d) ensure that before conducting operations, remote pilots comply with all of the following conditions:

- (i) have the competency to perform their tasks in line with the applicable training identified by the operational authorisation or, if point UAS.SPEC.020 applies, by the conditions and limitations defined in the appropriate standard scenario listed in Appendix 1 or as defined by the LUC;*
 - (ii) follow remote pilot training which shall be competency based and include the competencies set out in paragraph 2 of Article 8:*
 - (iii) follow remote pilot training, as defined in the operational authorisation, for operations requiring such authorisation, it shall be conducted in cooperation with an entity designated by the competent authority;*
 - (iv) follow remote pilot training for operations under declaration that shall be conducted in accordance with the mitigation measures defined by the standard scenario;*
 - (v) have been informed about the UAS operator’s operations manual, if required by the risk assessment and procedures established in accordance with point (a);*
 - (vi) obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15;*
- (e) ensure that personnel in charge of duties essential to the UAS operation, other than the remote pilot itself, comply with all of the following conditions:*

¹⁵

https://www.bvl.bund.de/SharedDocs/Downloads/04_Pflanzenschutzmittel/psm_drohnen.pdf;jsessionid=BC9AFC3563FE7BF7F2EF690A4C5E6726.internet971?_blob=publicationFile&v=15

- (i) have completed the on-the-job-training developed by the operator;*
- (ii) have been informed about the UAS operator's operations manual, if required by the risk assessment, and about the procedures established in accordance with point (a);*
- (iii) have obtained updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15;"*

Beyond the above general requirements, applicable to all 'SPECIFIC' category operations, in case of spraying, the UAS operator that uses UAS to spray pesticides shall be considered a "professional user" under the SUP Directive, as this concept covers every person "who uses pesticides in the course of their professional activities, including operators, technicians, employers and self-employed people, both in the farming and other sectors"¹⁶.

According to Art. 5 of the SUP Directive the professional users (i.e. the UAS operator's personnel) shall go through a training the elements of which are listed in Annex 1 to the SUP Directive.

Ad. c). The S.I. No. 438/2019 amended S.I. 155/2012 added the provision, that all spraying equipment mounted on aircraft (including UAS) shall always be specified on a list maintained by the Minister¹⁷. As for now, there is no list published about equipment falling under the scope of above provision and may be mounted on aircrafts.

However certain member states have published lists of certified spraying equipment^{18,19}. This equipment may be approved in Ireland, according to the principle of mutual recognition in the European Union. For details and criteria of recognition process, please contact Ministry for Agriculture, Food and Marine²⁰.

¹⁶ Art. 3 point 1 of SUP Directive

¹⁷ See footnote 13.

¹⁸ <https://wissen.julius-kuehn.de/mediaPublic/AT-Dokumente/02-Pflanzenschutztechnik/Drohnen/Spritzeinrichtungen-unbemannte-Luftfahrzeuge-Liste-Drohnen.pdf>

¹⁹ https://uni-mate.hu/documents/d/mate/forg-hoz-eng-novved-gepek-iegysz_20240125-pdf

²⁰ <https://www.pcs.agriculture.gov.ie/>