



Federal Public Service of Public Health, Food Chain Security and Environment

**DG Animals, Plants and Food
Service Pesticides and fertilizers**

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Evaluation of new drift-reducing equipments: classification criteria and procedure in Belgium

1. Introduction

The Federal Public Service of Public Health, Food Chain Security and Environment has drawn up a list of devices used to reduce spray drift (see brochure “Bescherming van het oppervlaktewater bij het gebruik van gewasbeschermingsmiddelen”).

<https://fytowe.be/nl/handleiding/gewasbescherming/bescherming-van-het-oppervlaktewater-bij-het-gebruik-van>

The present document is mainly intended for companies producing spraying material. Its aim is to explain the classification criteria and the procedure to ‘register’ drift-reducing equipments.

Drift-reducing equipment classification falls within the competence of the Technical Committee “Pesticides Application” made up of spraying equipment experts (from the Fruit Research Station in Gorseme and the Rural Engineering Stations in Gent and Gembloux), one delegate from the Belgian Food Agency (AFSCA / FAVV) and members of the Pesticides and Fertilizers department of the FPS of Public Health, Food Chain Security and Environment. The Pesticides and Fertilizers department is responsible for approving plant protection products.

Drift-reducing equipments include not only sprayers themselves, with various equipment to reduce drift, but also surrounding factors as, for instance, the presence of hedges in an orchard.

In field crops, there are three drift-reduction categories for drift-reducing equipment or techniques : 50%, 75% and 90%. For orchard crops, there is a fourth category (99%). No drift reduction is allocated for drift reduction potential beneath 50%.

2. Classification criteria

In a first approach, the Belgian classification is generally based on the classification work that has been made in adjoining countries (Germany, the Netherlands and the United Kingdom). In a second approach, the Technical Committee uses tests carried out in accordance with the international standard ISO 22866 (Equipment for crop protection – Methods for field measurement of spray drift). When simplified test protocols will be recognized internationally, they will be taken into account for equipment classification.

2.1. Drift-reducing nozzles classification

The Belgian classification of spraying nozzles is firstly based on the classification work that has been made in Germany (BBA classification), in the Netherlands (“Lozingenbesluit open

teelt en veehouderij" decree of 27/01/2000 and the list in of the "College voor de Toelating van bestrijdingsmiddelen") and in the United Kingdom (LERAP classification). In principle, the Technical Committee follows the most stringent of the three foreign classifications.

a) Nozzles made for field crops (field crops, vegetables, strawberries, meadows...)

As far as equipment for field crops is concerned, nozzles are classified according to their drift-reducing potential compared to a reference nozzle used under given reference conditions. The reference nozzle is a standard ISO 03 nozzle and its work pressure is 3 Bar. After a comparison with that reference nozzle, nozzles are allocated to three different drift-reduction classes (50, 75 et 90%) when used in the representative conditions for Belgium (boom height = 50 cm and work pressure = 3 bar).

b) Nozzles used for orchard crops

As far as orchard spraying is concerned, there is no consensus at international level concerning nozzle, pressure and reference spraying equipment. The list of the Netherlands (Lozingenbesluit) only includes field nozzles (situation in 2005). In the United Kingdom, the LERAP classification mainly applies to nozzles used for field cultivation. In Germany, as far as orchard sprayers are concerned, nozzles are tested in the fields and compared to standard drift values of spraying equipments worked out from results of field test measurement. In Belgium 90% of all nozzles used for orchard spraying are fan nozzles working with a pressure resulting in a "thin" spray spectrum. A pragmatic approach has been chosen on the basis of these arguments for the Belgian classification:

- Nozzles that reached at least 50% drift reduction when tested in a wind tunnel test independently from the sprayer (with a 3 bar pressure compared to the ISO 03 reference nozzle used for field cultivation, for low-pressure anti-drift nozzles) belong to the 50% drift-reduction category. The wind tunnel studies should be the basis of the Netherlands, Germany or the United Kingdom classifications or should have been carried out in Belgium.
- Nozzles tested in real conditions with an orchard sprayer that reach 50% drift reduction in the Netherlands, Germany or the United Kingdom classifications, or on the basis of tests carried out in Belgium, belong to the 50% drift-reduction category.

In the category of orchard sprayers, the air stream created by the ventilator of the sprayer has an important impact on drift reduction potential. Without a classification considering the whole sprayer drift-reducing potential, higher drift-reduction classes (75 and 90%) for nozzles are temporarily not applied as far as orchard crops are concerned.

The Belgian classification system does not take nozzles spraying-angles into account. We consider that the spray of 110/120° nozzles should not hit parts of the sprayer frame. We also consider that the spraying jet should not go above the maximal height of the trees to be treated. For that purpose, users are invited to place an off-centre spray nozzle or an 80/90° angle nozzle at the highest spray point.

2.2. Classification of techniques and environment factors reducing drift

Beside the use of drift-reducing nozzles, there are also other techniques to reduce drift (for field crops: using an air-assisted sprayer, in-line spraying, protecting cover, etc; for orchard crop: using a tunnel, etc.). The Technical Committee has specified drift classes for those

different techniques. Of course, the Technical Committee has planned to combine those different techniques with drift-reducing nozzles.

Beside drift-reducing nozzles and techniques, surrounding factors can also reduce drift. The use of hail nets or the presence of hedges in orchards contributes towards limiting drift. Similarly, a drift-reduction class is assigned for these techniques.

For the time being, we take the presence of hedges into account to calculate the drift classes only for air-assisted, horizontal airflow or tunnel orchard sprayers.

3. Classification procedure

There are two different ways to update the drift-reduction devices list published on the Phytoweb Internet site:

a) As the FPS announced it in November 2005, sprayers and nozzles manufacturers are invited to submit reports on the tests carried out according to the guidelines applying in the Netherlands, Germany and the United Kingdom or according to the international reference norms ISO 22866 if they want to see their material appear in the tables. (The Committee recommends applicants to wait until their material is classified in the three adjoining countries before applying in Belgium)

Applicant submit a full application (preferably in electronic format, five copies if it is in paper format) containing the following elements:

- test reports showing the drift-reducing character of the equipment concerned using the normative reference system (a detailed description of the test protocol and a clear presentation of measure results are essential). Tests must be carried out by reference test centres;
- possible classification in another country than the countries previously mentioned;
- technical and commercial information on the equipment in question;
- a classification proposal allowing to include that new equipment in the Belgian classification (preferably, we ask applicants to insert their proposal in the existing Belgian classification table – see tables here below)

Third parties may also apply for classification if they have Belgian or foreign tests allowing classification of new equipment that does not yet appear in the Belgian classification.

b) The second classification way consists in a systematic biannual revision of nozzles lists adopted in the foreign laws previously mentioned. It is worth noticing that, on principle, when a drift-reducing material or technique has been classified in Belgium, the Technical Committee will not change an already assigned classification, except in case of obvious mistake.

The Committee may also take scientific literature into account to classify equipments. Scientific literature provides other information than the information given by the determinist approach of ISO tests; this other information can be for instance biological efficiency.

4. Contact point and members of the Technical Committee “Pesticides Application”

The applications have to be submitted to
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DG4 Animals, Plants and Food
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The members of the committee are :

- FPS Health, Food Chain Safety and Environment (I. Pittomvils, G. Malfait)
- Federal Agency for the Safety of the Food Chain (J-F. Schmit)
- Département de Génie rural (CRA-W) de Gembloux (B. Huygebaert)
- Instituut voor Landbouw-, Visserij- en VoedingsOnderzoek (D. Nuyttens)
- Proefcentrum voor Fruitteelt van Gorseem (D. Bylemans, K. Ruysen)
- INAGRO (E. Pauwelyn)
- Vlaamse Overheid, Departement Landbouw en Visserij (A. Demeyere, P. Braekman)

Tables

Field crops

Trade mark	Nozzle type	Nozzle size	Drift reduction potential (in %)					
			Conventional sprayer	Air-assisted sprayer	Sprayer with covered boom	In-line sprayer	In-line sprayer with protecting caps	

Orchard crops

Trade mark	Nozzle type	Nozzle size	Drift reduction potential (in %)							
			No hedge or screen				Presence of hedges or screens			
			Conventional sprayer (axial, centrifugal)	Horizontal airflow sprayer	horizontal airflow sprayer Hail nets	Tunnel sprayer Horizontal airflow sprayer with collectors	Conventional sprayer (axial, centrifugal)	Horizontal airflow sprayer	horizontal airflow sprayers Hail nets	Tunnel sprayer Horizontal airflow sprayer with collectors
Air-injected nozzles							Without leaves : With leaves :	Without leaves : With leaves :	Without leaves : With leaves :	Without leaves : With leaves :
Low pressure drift-reducing nozzles							Without leaves : With leaves :	Without leaves : With leaves :	Without leaves : With leaves :	Without leaves : With leaves :