

The Belgian experience with sprayer inspection activities and future challenges

Johan Declercq¹, Guillaume Defays², Bruno Huyghebaert², David Nuyttens¹

¹ Institute for Agricultural and Fisheries Research (ILVO), Technology & Food Science Unit - Agricultural Engineering – Burg. Van Gansberghelaan 115 – 9820 Merelbeke – BELGIUM. Contact: johan.declercq@ilvo.vlaanderen.be

² Agricultural Research Centre (CRA-W) – Agricultural Engineering Department Chée de Namur 146 – 5030 Gembloux – BELGIUM

Summary.

In Belgium, the mandatory inspection of field crop, orchard and vineyard sprayers was already started up in 1995. Furthermore, the inspection of greenhouse sprayers and soil-disinfection machines was implemented respectively in 2011 and 2014. So Belgium can look back on more than 22 years of experiences with the inspection of sprayers.

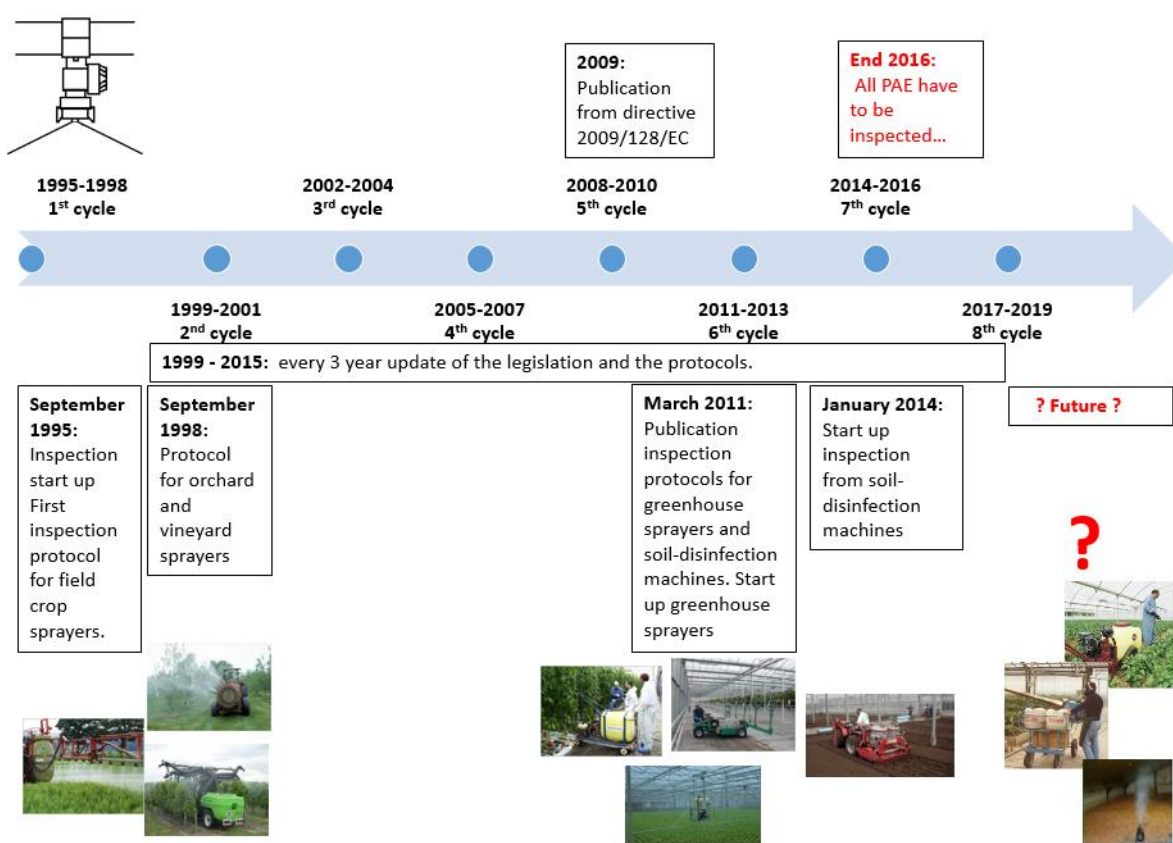


Figure 1: Evolution of the inspection in Belgium.

At the end of the eighties the execution of voluntary inspections was started up to gain the necessary experience. It soon became clear that a number of though-out choices had to be made at the start of the mandatory inspections. In order to guarantee the impartiality, professionalism and efficiency of the inspections, a centralized organization and implementation by region was chosen. Furthermore, the analytical inspection method (pressure and nozzle flow rate) was chosen because of the mobility of the test equipment that could be used. The benefits of the Belgian system are obvious. There are only ten experienced inspectors and two regional contact points for the inspection of all Belgian sprayers, and the inspections are carried out efficiently and at a fair price. The two regional Belgian inspection

services are also accredited according to ISO17020, guaranteeing the highest quality standard of the inspections that are carried out.

Despite the advantages of the Belgian system, some problems have arisen over the years. For example, the organization and the planning of the re-inspections require a lot of additional follow-up. Furthermore, there is a need for professional testing equipment that fulfils higher standards compared to that what is currently on the market, because of the intensive daily use. So the Belgian story is therefore an ideal example for other European inspection services.

Keywords: Sprayers, inspection, experience, Belgium

Introduction

In many ways, the mandatory inspection of sprayers in Belgium differs from inspections in other European countries. The FAVV/AFSCA (Federal Agency for Food Security) is responsible for the inspection, but it delegates the inspection to two regional bodies: ILVO (Flemish region) and CRA-W (Walloon region). Both official inspection bodies are BELAC accredited according to ISO 17020 which guarantees a maximum quality of the performed inspections. The inspection teams (3 in the Flemish region and 2 in the Walloon part) are equipped with a test van that contains all necessary equipment to perform the inspections according to the Belgian federal legislation. The inspections are carried out at a neutral location where farmers/contractors are invited at an exact date and time, to present their sprayer for testing. All over the country test locations are hired so that farmers/contractors do not need to travel distances above 15 km. Inspections are also performed at the farmyard on demand, but therefore an extra fee is charged. The inspection procedure is based on the analytical principle which means that all parts of the machine are tested separately. After the inspection the farmer/contractor receives a certificate and sticker confirming the approval of the sprayer for the next three years or specifying all the items that need to be repaired in case of a rejection. No repairs are made to the sprayer during the inspection. Consequently, the repaired sprayer has to be represented for a re-inspection. Despite the advantages of the Belgian system, some problems arose over the years which are discussed in the following chapters.



Figure 2: Inspection van with all test equipment (Flanders)

Organization

Despite the fact that the Belgian way of working and organization has a lot of advantages, there are also some difficulties.

Absences

Once a sprayer has been inspected the owner is automatically re-invited by the inspection service after 3 years at a date and time set by the inspection service. It happens regularly that the invited owner cancels the appointment, or does not show up. In the case of early cancellations, the inspection service can still change the planning slightly, but when the cancellations arrive too late changing the planning is impossible. As a consequence the inspectors are out of work for a while and no income is generated for the service. In recent years the number of absentees stagnated around 15% in Flanders, but as one can see this still means quite a significant loss of time and income.

Re-inspection

In case of the Belgian inspection the defects are not repaired during the inspection but the sprayer is rejected. When a sprayer is rejected the owner receives a temporary certificate with a validity of three months, and the inspection service is therefore assumed to re-invite the sprayer within 3 months. However, if there are not enough rejections in a particular test center, it is not economically viable to activate the test center if not even half a day of re-inspections can be planned (which is often the case). As a consequence, these re-inspections are carried out in the next semester. Furthermore, the inspection service has to send a temporary proof to prolong these certificates that could not be invited within 3 months for a re-inspection.

Finding suitable test centers

The Flemish inspection service is currently inspecting at about 130 locations that are rented on a temporary base (Figure 2). Every year, at least five new test centers have to be found for diverse reasons. Sometimes the test center and terrains changed owner, in other cases the locations are assigned a different destination and in some cases they became too small. Unfortunately, it becomes more and more difficult to find suitable locations for different reasons. First, spray boom widths increase with boom widths up to 45 m. This implicates that a fairly large area is required, which is not always evident in a strongly urbanized region like Flanders. Second, most owners prefer not to share their space with our inspection service. And last, the locations must be well reachable and well positioned between existing locations.



Figure 3: Test centers in Flanders, Belgium.

Testing equipment

Intensive use

The intensive daily use of the test equipment and the daily loading/unloading and transport poses high demands on the equipment used. The equipment should not only be solid and reliable, but it must also deliver quick and accurate work sometimes in difficult wet conditions. In most cases the commercially available standard test equipment that is available must be adjusted and strengthened to meet those requirements. In order to deal with problems, there is at least one spare device available at ILVO for each different test device. In case of a fall out the spare can be used immediately.

Limited offer

The supply from standard test equipment is limited and usually concerns basic material. As an example, Belgian inspection services have been searching for a decade for a system with wireless pressure sensors to read out boom section pressures remotely (Figure 4). Such a system would make the work for the inspectors a lot healthier, faster and accurate. Unfortunately, there is no manufacturer that offers this type of equipment. So out of necessity, such systems are developed in-house.

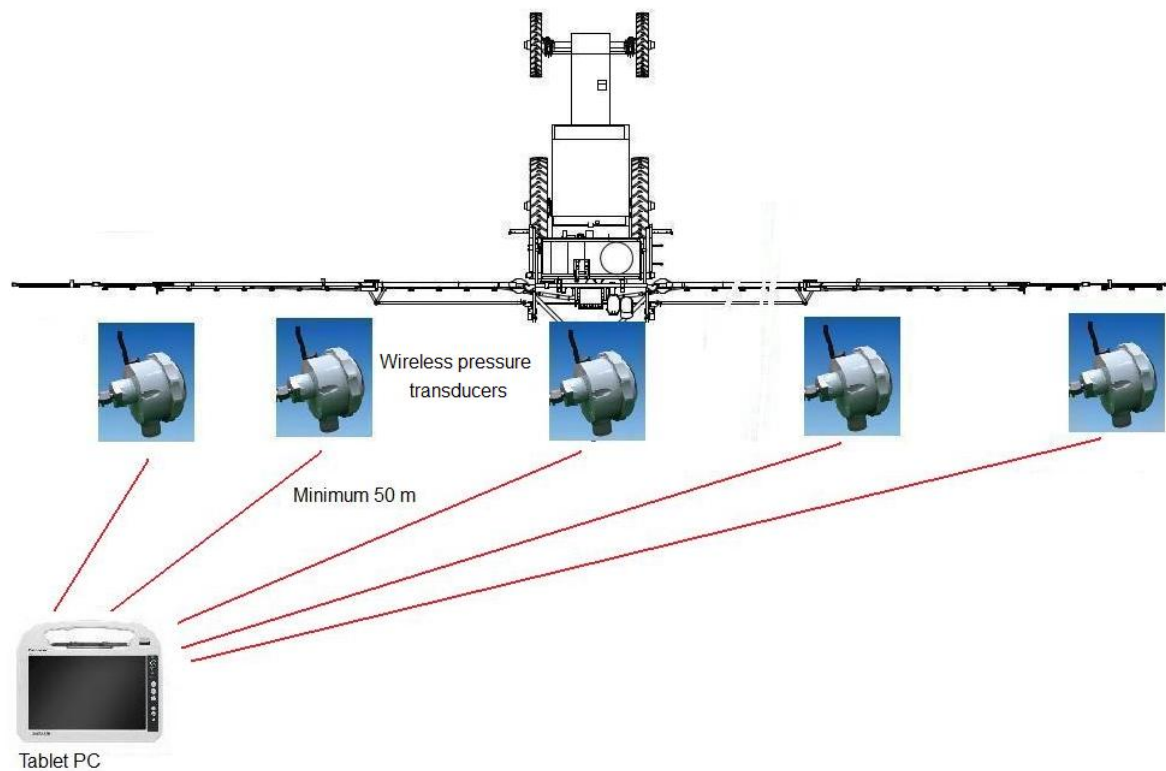


Figure 4: Principle of a wireless pressure measuring system.

Legislation

Review from the legislation

The legislation is revised each inspection cycle (every three years). Experiences show that approval of a new law takes a lot of time in Belgium. In practice the changes to be made for the next inspection cycle must be prepared approximately two years before the end of the ongoing cycle, which is not always evident. Implementation from problems encountered during an ongoing cycle can take up to 5 years before inclusion in the legislation.

Regional differences

Belgium is a federal state with two completely different regions. On the one hand there is the highly industrialized and densely populated Flanders and on the other hand the more rural Wallonia. In Flanders there are quite a lot of greenhouses and there is a lot of intensive livestock farming, while in Wallonia arable farming is the most important agricultural branch. So the agricultural policy also varies from region to region. On top of that, certain competences and responsibilities are at regional level and others at federal level. This makes decision making very complicated and slow.

Quality assurance

The Belgian inspection services are accredited according to ISO17020 and as a result the quality of the service is continuously assessed and improved where necessary. Despite the benefits of a quality system, the impact of the extra work and the additional costs may not be underestimated.

Start-up of an accreditation

When starting up an accreditation for an inspection service, there is a lot of extra work involved. The best scenario is the one where the service can be fitted into an existing ISO17020 or ISO17025 quality system. General structures will already exist and in house experience will be available.

The worst scenario is the one where there is no experience at all and a start up from scratch has to be made. This will require an enormous effort. The quality manager will have to gain experience, set up the required structures, foresee the adequate trainings, etc. So before starting up an accreditation pro's and con's should be well considered.

Once accredited

Once the accreditation is obtained and running there is still a considerable amount of work to keep it maintained. Quality management is a continuous process and requires a constant effort from everyone and especially from the quality manager to keep the system up to standard. Furthermore, one may also not underestimate the extra annual returning costs for the external audits.

Conclusions

Despite the fact that the Belgian way of working entails some problems, the disadvantages do not outweigh the benefits that the system offers. The centralization of the inspection services allows the inspections to be carried out efficiently with a limited number of inspectors and within a well-structured organization. This results into a qualitative and independent inspection at a competitive price.

References

- Braekman P., Huyghebaert B., Sonck B. (2004). The Belgian way of organizing a compulsory inspection of sprayers. *Julius-Kühn-Archiv*. 1st European Workshop on Standardized Procedure for the Inspection of Sprayers in Europe – SPISE I, 27-29 April 2004, Braunschweig, Germany **397**: 97-100.
- Huyghebaert B., Mostade O., Braekman P. (2004). Overview of the sprayer inspection in Belgium. 1st European Workshop on Standardized Procedure for the Inspection of Sprayers in Europe – SPISE I, 27-29 April 2004, Braunschweig, Germany **397**: 90-94.
- Declercq J, Huyghebaert B., Nuyttens D. (2009). An overview of the compulsory inspection of sprayers in Belgium. *Julius-Kühn-Archiv*. 3th European Workshop on Standardized Procedure for the Inspection of Sprayers in Europe – SPISE 3, 22-24 Sept 2009, Brno, Czech. **426**: 122.
- ISO 17020 (2012). General criteria for the operation of various types of bodies performing inspection.
- Wehmann H.-J. (2016). Status Quo of inspection in EU: the results of SPISE enquiry. *Julius-Kühn-Archiv*. 6th European Workshop on Standardized Procedure for the Inspection of Sprayers in Europe – SPISE 6, 13-15 Sept 2016, Barcelona, Spain : 9-19.
- Defays G., Declercq J, Huyghebaert B, Nuyttens D. (2016). Belgian quality assurance system according to ISO17020 illustrated by a practical example. *Julius-Kühn-Archiv*. 6th European Workshop on Standardized Procedure for the Inspection of Sprayers in Europe – SPISE 6, 13-15 Sept 2016, Barcelona, Spain: 131-137.
- ISO 17025 (2017). General requirements for the competence and calibration laboratories.