EU MANAGEMENT OF THE PLANT PROTECTION PESTICIDES

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INTRODUCTION

Even though the use of pesticides in a quality modern agriculture often remains necessary, it is essential to make sure of the harmlessness of agrochemical products and of their application. In order to do that, European and national authorities, PPP producers, NGO... started many initiatives to secure the use of PPP, in order to guarantee the protection of the user, the consumer and the environment. PPP registration, withdrawal of registration, monitoring, reduction program of the PPP use, integrated pest management, code of good practices, user training...are a few examples among many initiatives taken in order to better manage the use of PPP.

These measures are however not sufficient, as the attention is not directed to the spray techniques. Indeed, a PPP can only perform well if it is applied at the right time with correctly functioning equipment. Malfunctioning sprayers will cause an improper dosage of the PPP. A too low dosage will result in poor treatment and the need of extra treatment to achieve the biological effect, even resistance may be induced as a result of an insufficient pesticide level. In turn this leads to an overconsumption of PPP which is uneconomical for the grower and hazardous for the environment. An overdose can lead to residues on the crops [10].

Given these different reasons, the European stream leads its member countries to organize voluntary or mandatory inspection of sprayers in use to improve their performance.

EUROPEAN SITUATION

The European Committee for Standardization (CEN) helps ensuring a high level of sprayers' production and leads to uniform criteria for evaluating new spraying systems as to their working quality, operator safety and environmental protection.

The European Standard EN 907 is the main standard for sprayers with regard to operator safety. In accordance with the EU Machinery Directive 89/392 EEC it specifies safety requirements and their verification for the design and construction of sprayers for pesticides and liquid fertilisers.

Concerning environmental protection, EN 12 761 takes a key position. It defines requirements on the function of all subassemblies of the sprayer in order to minimise environmental hazards (Herbst et al, 2002).

In order to use safely crop protection products in agricultural production in Europe, it is necessary to define the requirements and test methods for sprayers in use. This is a relevant step after having standardized the requirements for new equipment, in respect of safety hazards (see EN 907) and potential risks of environmental contamination (see EN 12 761). The prEN 13 790 dealing with the inspection of sprayers in use is still in preparation and will soon be published as EN standard. This new standard takes into consideration not only the original performance of the spraying equipment, but also its use, care and maintenance. This is the logical link between new equipment of good quality and well educated and concerned users. This standard specifies the requirements and the test methods for the inspection of sprayers in use (low crops, orchards and vineyards sprayers). Finally, it also states that there are three main arguments for the inspection:

- test operator safety;

- less potential risk for environmental contamination by crop protection products;

- good control of the pest with the minimum possible input of crop protection product.

The CEN produced the necessary standards for the countries to improve the quality of the new sprayers and to inspect the performances of those in use (see Table 1).

European Standards (CEN)	European Directives (EC)
EN 907 (1997) - Safety 🗕 – –	EU Machinery Directive 89/392 EEC
EN 12 761 -1,-2,-3 (2001) Environnement	> ×
prEN 13 790 -1,-2 Sprayer Inpection	▶ ×

Table 1. Technical and legal tools at European level

Several countries (Germany, Belgium, The Netherlands...) have a long tradition of sprayer inspection based on a voluntary way. However, the idea of a systematic and periodic inspection occured in the beginning of the nineties. It is one of the consequences of the CAP's reform. At this time, new concepts as quality, environment, durability have been introduced to ensure the socioeconomical function of the agriculture in the long run.



Fig. 1. European situation of the sprayer inspection

Since 1990, some European countries implemented a compulsory inspection of sprayer (Germany, Belgium, The Netherlands, Denmark, Luxembourg...). Others introduced a conditional inspection (Italy, Sweden, Finland...) which is bound with the concession of grants, premiums, labelling... Finally some nations have not progressed and kept a voluntary inspection as a temporary situation (France, UK, Spain), [13], (See Figure 1).

About 1 500 000 of crops sprayers are in use in EU. On average for the whole EU, less than 10% are inspected each year [4]. Regarding the usual periodicity of the sprayer inspection (2 or 3 years), those results are too low. We note that the results strongly differ from one country to another and that compulsory actions are much more efficient than those made on a voluntary basis.

BELGIAN SITUATION

Concerning spraying techniques, three main actions have been taken by Belgian authorities for 20 years [1] by the authorities: the user training, the new sprayers' registration and the mandatory inspection of sprayers in use. A fourth initiative has been taken by the Belgian association of PPP producers (Phytophar) and concerns the collection of PPP empty containers.

Concerning the **user training**, courses on spraying techniques, sprayer maintenance and adjustment have been organised locally. On average less than 5% of farmers took part in this voluntary training. Due to this poor succes, authorities introduced the idea of a PPP user's licence like the PPP trader's and contractor's licences which have already been implemented. This idea is still a project, but should start within a few years.

Concerning the **new sprayers' registration**, the Belgian standard is already available since 1998 and has been notified to the EU. The notification has been rejected and the Belgian project is still under statu quo. As Belgian criteria are similar to those of the EN 12 761 (2001), the introduction of the European standard in the Belgian requirements got things moving away (Table 2).

New sprayers registration	Inspection of sprayer
1989, problems with new sprayer	1993, the Policy note
1990, installation of the Registration Working Group 1	1993, installation of the Inspection Working Group 2
1998, Notification at the EU of the final draft	1995, implementation of the mandatory sprayer inspection I
EU Rejection - Statu quo	
*	*
? 2001, EN 12761 ?	2002, 3rd cycle

Table 2. Technical and legal tools at the Belgian level

Concerning **PPP packaging**, empty containers have been systematically collected in Belgium since 1996 and are specifically removed by the firm Phytofar Recover created by the Belgian Federation of pesticides' manufacturers [9].

Since the beginning, the recovery rate (percentage of containers recovered compared with the containers sold) goes on increasing to exceed 85% in 2001. These action and results are the world's first (more than 500 tons of empty containers are collected yearly).

Belgian authorities requested, in its policy note of June 1993, to implement **the compulsory inspection** of crops sprayers and orchards sprayers already in use [11]. Consequently, a working group has studied the practical and legal methods for the starting of a compulsory inspection of sprayers in Belgium. This working group was made up of civil servants of the Ministry, specialists (Research Centres and Universities), representatives of the agricultural profession, and representatives of manufacturers [8].

The will of the Minister was to establish an inspection system which is realistic, not arbitrary and including educational aspects, while being reliable and precise. The objectivity of the inspection was to be guaranteed by a public management and that the action be financially self-supporting. A balanced and realistic project has been finalised by taking into account the constraints of the different partners.

The compulsory inspection of sprayers in use has started in September 1995 in Belgium. This action is described in details in the Ministerial Decrees of 9 June 1995, 31 August 1998 and 23 August 2001. In summary, the inspection concerns all the sprayers which spray registered PPP for agriculture; that means field crops sprayers and orchards sprayers (bush and tree crops). This inspection is periodic (3 years) and must be paid by the user (Table 2).

The test method has especially been developed to meet the constraints and objectives of an efficient inspection of sprayers. Based on the analytical principle, the method consists in measuring separately and independently the performances of the different parts of the sprayer so as to determine the dysfunctions and to establish a precise diagnosis (more that 24 check points). The master words of this particular method are : objectivity, reliability, precision, education and, that it be particularly well adapted to the field. All checks and measurements are introduced and stored in a computer. The analysis is automatic and does not require a human intervention. The report is immediately printed on the site and explained to the farmer. This computer management adapted to the field combines reliability and precision, reinforces the openness of the inspection and also allows the traceability of this action. Finally, special attention has been directed to the technician's safety [7].

The organisation of the inspection of sprayers in Belgium is the responsibility of the authorities. The inspection services (Agricultural Research Center of Gembloux and Merelbeke) take care of the daily management of the operation under the aegis of a central secretariat (AFSCA) which is directly connected with the inspectorate service (repressive element of the organization). Annual reports are submitted for approval to a Steering Committee which is made up of the partners (public, private and associative) concerned with the inspection of sprayers. Its function is to guarantee the objectivity of the action.

RESULTS

Firstly, at European level, we observed a low average result (less than 10% of the sprayers in use are yearly inspected). However, we notice that countries (Germany, Belgium, Holland...) which implemented a mandatory inspection show better results. In those countries, the general condition of the sprayers has clearly improved with all the subsequent benefits.

Secondly, only the field crops sprayers (boom sprayer) are usually concerned by the sprayer inspection. A lot of other sprayer's types like orchards, vineyards, bush, trees...are working and spraying PPP in the countryside. Thirdly, even though the CEN nearly produced all the necessary technical tools (different EN and ISO standards concerning measurement protocols are available), there is up to now no European legislative framework concerning sprayer inspection. As a consequence, several countries move forward very slowly in this area.

In Belgium, at least 24 500 sprayers have been inspected during the first cycle (1995 to 1998) and almost 82,4% of the sprayers have been certified. The remaining 17,6% have been certified after more or less important repairs. These technical results fundamentally differ from those obtained within the framework of voluntary inspections (from 1989 to 1995), where more than 80% of the sprayers were rejected. This difference is mainly explained by the fact that at present users repair their sprayer beforehand, taking the notification into account.

In the second cycle (1998 to 2001), the number of rejection at the first inspection decreased spectacularly and reached less than 10%.

It seems obvious that the functioning state of the Belgian sprayers in use reached a high level of quality regarding the European situation. Those results also reflect a real change of the farmer's mentality regarding the use of PPP.

We also noticed in Belgium a quality improvement of the different partners of the PPP network. Sprayer manufacturers or repairers have improved their standards or quality control. The PPP providers have improved their advising services. The distribution networks of agricultural products introduced the sprayer inspection in their requirements....

CONCLUSION

The security of users and consumers, the preservation of the environment and the reduction of the production costs are the constraints imposed by the current situation to the agricultural world [6]. All the steps of the production are concerned with that and the methods used for the fertilization and protection of the crops follow the same rule [12]. The good functioning of the sprayer is one of the determining elements allowing to improve the quality of the crops protection, the user's and consumer's safety and the environmental protection.

The European stream leads its member countries to take steps concerning the conformity of the sprayers. Voluntary or mandatory inspection of crops sprayers are carried out in several countries, the inspection rules being different from one country to another. This action needs a harmonisation in Europe. Technical standards have been developed by the CEN and are available. Now we need a legal and harmonized framework dealing with the new sprayer registration and the inspection of sprayers already in use.

"Inspecting for a better management, managing for a better treatment, treating while preserving the environment"; this could be the summary of the periodical spraying inspection led in Belgium since 1995. Besides several technical improvements, a positive change of mentality has been noticed. The result of the actions carried out for the management of the use of agrochemicals (sprayers inspection, user's licence, PPP waste management, cleaning the sprayer...) show the proactive attitude of Belgium.

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SUMMARY

European and national authorities started many initiatives to secure the use of Plant Protection Pesticides (PPP), in order to guarantee the protection of the user, the consumer and the environment. The European Committee for Standardization (CEN) helps ensuring a high level of state of the art of sprayers and leads to uniform criteria for evaluating new spraying systems as for their working quality, operator safety and environmental protection.

In order to use safely crop protection products in agricultural production in Europe, it is necessary to define the requirements and test methods for sprayers in use. This is a relevant step after having standardized the requirements for new equipment, in respect of safety hazards (see EN 907) and potential risks of environmental contamination (see EN 12 761). The prEN 13 790 dealing with the inspection of sprayers in use is still in preparation and will soon be published as EN standard.