The importance of sprayer inspections in the EU from a chemical industry perspective

SPISE : 7th European Workshop on Standardized Procedure for the Inspection of Sprayers in Europe. 2018, Athens Greece
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Outline

• Introduction
• EU – legal framework / requirements
• Harmonized Standards
• Links between SUD and Machinery Directive
• Current status of sprayer inspection (new vs sprayers in use)
• Harmonized procedures for inspection are needed across countries
• Crop Protection needs to be understood as a process
• How can we use sprayer inspection to optimize application advice
• STEP water a online tool to provide information and learning
• Outlook + conclusions
About 12 T years ago crop protection started. Harvested was what pest, diseases and weeds left remaining under the actual soil, climatic and management conditions.

Scratch plough gave crop competitive advantage against weeds through better germination conditions.

Mouldboard plough gave further competitive advantage against weeds by turning them down.
Spray application / dusting
Started about 120 years ago

Copper and Sulfur applications for disease control

Arsenic and Nicotine for pest control

Herbicide applications started around 1950 with the phenoxyys (2,4 D)

Spray principle has hardly changed.
Liquid
Disperser
Pressure
Legal Framework for crop protection increasingly focuses on the crop protection process


Water Framework Directive 2000/60/EC Water protection / improvements

Machinery Directive + Amendment 2009/127/EC requirements for application machines

PPP - properties Use phase
• **Training:** Professional pesticide users, distributors and advisors must receive proper training on the safe use and handling of PPP (sprayer licence); *(Application technique not obligatory in the curriculum in most countries)*

• **Establish competent authorities and certification systems for trainings;** *(... Application advice, who delivers, what content and how (methodes) ?)*

• **Inspecting application equipment in use:** All PPP application equipment should have been inspected at least once by 2016 *(except knapsack sprayers)* and subsequently at ongoing intervals *(3 to 5 years)*.

• Minimise or prohibit PPP use where necessary in certain critical areas for environmental or health reasons; *(e.g. aerial application)*

• **Set up of National Action Plans (NAPs)** containing objectives and timetables to reduce risks and impacts of pesticide use;
Point 7 of the Directive (2009/127/EC) points out the following:

"This Directive is limited to the essential requirements with which machinery for pesticide application must comply before being placed on the market and/or put into service, while the European standardisation organisations are responsible for drawing up harmonised standards providing detailed specifications for the various categories of such machinery in order to enable manufacturers to comply with those requirements."
Essential requirements for new sprayers since 2011 as mentioned in the amendment to the machinery directive

The amendment defines specific requirements for crop protection machinery concerning the protection of the environment. All new machines entering the market from 2011 onwards should fulfill the harmonized standards of the machinery directive.

- Control + monitoring
- Filling + emptying
- Application of pesticides
- Maintenance
- Inspections (enable)
- Marking of nozzles, strainers, filters
- Indication of pesticide in use
- Instruction manual
The harmonized standards support the implementation of the SUD through the definition of the respective functional and technical requirements.

<table>
<thead>
<tr>
<th>New sprayers</th>
<th>Sprayers in use</th>
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<tbody>
<tr>
<td>ISO 16119</td>
<td>ISO 16122</td>
</tr>
<tr>
<td>„access to market“</td>
<td>For inspection only</td>
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**Self certification** by manufacturer

If compliant with the standard **CE – label**

New sprayers are not inspected under ISO 16122 (no respective label)

Inspection follow a functional control on technologies available on a sprayer. No control of compliance with standards (e.g. a sprayer which has no clean water tank will receive an inspection label ?)
Sprayer inspectors report that new sprayers enter the EU markets, which are non compliant with the harmonized standards (no or fake labels recorded).

In general, the enforcement level of the machinery directive would benefit from strengthening in most EU member states, and this needs to be addressed urgently.

Sprayers which have entered into the market after 2011 should get no inspection label if obvious standards are not met.
If standards cannot be stronger enforced more regulations must be expected by authorities or also through certification schemes

Example:
Switzerland supports upgrading of sprayers with continuous internal cleaning systems for sprayers with 2000 Sfr.

From 2023 a system for sprayer inside cleaning (> 400l) is obligatory. The cleaning process needs to be operational without stepping down from the tractor.

Source:
https://www.blw.admin.ch/blw/de/home/instrumente/direktzahlungen/ressourceneffizienzbeitraege/beitrag-fuer-die-spritzenreinigung.html
Harmonization of inspection procedures in countries need to be consistent with other Regulations / Directives

• Current inspection procedures and cost vary a lot within and by country

• Harmonized procedures are key prerequisite for a successful implementation of the objectives of the SUD (risk reduction)

• Inspection intervals are widely diverse. (e.g. first inspection in DE 6 months after purchase; AU first inspection after 5 years)

SPISE activities therefore should be actively supported through respective funding by EU projects
Advice and training for farmers on correct use of application equipment and adjustment is not well developed

TOPPS-Adviser Survey 2016 (n= 1161)
Question: Do farmers get sufficient advise on correct adjustment and use of sprayers (% respondents)?
Can we develop the sprayer inspection schemes further to also provide advice on technical matters and the adjustment of sprayers?

• Well trained Sprayer inspectors are a untapped potential for advice concerning sprayer use and their correct adjustment

• They will see the sprayers and their operators at the inspections and therefore reach most of the operators.

• The appearance of the sprayer indicates directly related training and advice needs
HOW MUCH DRIFT CAN BE REDUCED BY JUST CORRECT ADJUSTMENT OF SPRAYERS?

Not correct adjusted vertical profile and air flow rate
Healthy Crops, Clean Water

Evaluation Tool
Testimonials
Try it Yourself
Regulations

http://step-water.org

“Find out how I improved my Sprayer with STEP Water”

Frank Miller

Embracing the Challenge of the Future Together

The Online Evaluation for Crop Sprayers
Online information on sprayers (Field+BTC) Technologies to reduce water pollution (why and what?) and requirements.

Healthy Crops, Clean Water

We can protect our crops and care about clean water.
The technical possibilities of recent years provide new solutions to today’s challenges.
Discover the ideas farmers came up with to lessen their impact.

Criteria:

**Required:**
Harmonized standard

**Strongly recommended** (standard in future)

**Recommended** (additional risk reduction)
Healthy Crops, Clean Water

Evaluate your:

Bush & Tree Sprayer  Field Sprayer

We respect your privacy!
None of your answers will be saved. The questionnaire is completely anonymous and we don’t collect any of the data you provide.

Filling  External Cleaning  Internal Cleaning  Remnants  Reduce Spray Losses
Report on the features as **required** by the harmonized standard and technologies which will further add to protect water (**strongly recommended and recommended**)
Outlook and conclusion (1)

**Stronger view on Crop protection process**

- With the Directive on sustainable use of pesticides (SUD) and the Amendments to the Machinery directive the current PPP focus is extended to the whole crop protection process.

- Application technique offers technologies for further risk reduction.

- Environmental aspects gain more importance and are for the first time mentioned in the Amendment of the Machinery directive with specified requirements for Pesticide Application Equipment (PAE)

- Risk reduction sprayer technologies will increasingly be linked with the regulatory process for PPPs (e.g. spray buffer, distance regulations)
Outlook and conclusion (2)

Sprayer inspection is needed

• Inspection procedures should deliver comparable results. Currently the procedures and inspection intervals seem not sufficiently harmonized.

• Inspection should be transparent, auditable and consistent with other PPP regulatory needs

• Documentation of inspection protocols are needed with the hand out of the inspection label

• Inspection should be extended to more environmental relevant aspects and to PAE which is not yet inspected (adjustment, agitation)

• SPISE could further drive forward the harmonized development of inspections across countries but financial support is necessary (EU – project)
Outlook and conclusion (3)

Standards facilitate implementation of regulation and contribute to harmonisation between countries.

- Standards will enable steady improvements of sprayers if better enforced
- Standards should be further developed to cover more environmentally relevant areas (e.g. air profil performance / adjustment)
- If standards are not respected other forms of regulation will be necessary. (legal obligations by authorities; requirements from market organizations)
- Develop standards for machines which are currently used without standards
- Funding of standard work is necessary for special PAE
- Create awareness for the standards with farmers, advisors and dealers
Outlook and conclusion (4)

Better training on application is needed

- Knowledge on application and technology need to be improved for advisers and farmers

- Obligatory farmer training need to have a key focus on application techniques (theory + practice)

- Trainings need to meet certain quality standards

- Application techniques need stronger focus in education programs in farmer schools and universities
Thanks for listening