
Session 3: The inspections shall verify that pesticide application equipment satisfies the relevant requirements

Introduction paper

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Summary

Accordingly to EU Directive EC128, pesticide application equipment may satisfy minimum requirements listed in Annex II in order to achieve a high level of protection for human health and the environment. A second aspect refers to harmonized standards precised in article 20 (1) with a principle of presumption of conformity. Finally it is also possible to propose alternative methods as potential tools for sprayer inspection.

Introduction

The application of the EU Directive on sustainable use of pesticide implies essential requirements to be fulfilled by pesticide application equipments. In parallel, each member state has to comply with such requirements when the EU directive is in the national transcription phase. Existing standards may deliver guidance to specifications, measurements and thresholds if adapted. The European Commission can mandate the CEN to deliver relevant standard in conjunction with ISO.

The Directive states that *“The inspections shall verify that pesticide application equipment satisfies the relevant requirements listed in Annex II, in order to achieve a high level of protection for human health and the environment.*

Pesticide application equipment complying with harmonised standards developed in accordance with Article 20(1) shall be presumed to comply with the essential health and safety and environmental requirements.”

In addition, the general requirements are listed in the Annex II of EU Directive 2009/128/CE

Main Objectives are Health, Safety & Environment and rely on several items :

- Reliability of the equipment
- Use in conformity : precision in CPP dosage and spraying
- Safe easy and complete filling and emptying, avoid leakages
- Safe handle easy & throughout cleaning. Control and stop immediately from the operator place.
- Simple, accurate and reproducible adjustments

1- Principle of sprayer inspection in France

Following EU Directive requirements, sprayer inspection in France is introduced. It is commonly divided in 10 chapters and the evaluation can be visual check, function test or measurement (Fig. 1).

<p>1. PRELIMINARIES</p> <p>1.1. GLOBAL ASPECT</p> <p>1.1.1. Sprayer functioning</p> <p>1.1.2. Clean e equipment</p> <p>1.1.3. Context</p> <p>1.2. SAFETY ASPECTS</p> <p>1.2.1. Hydraulic Transmissions between tractor and sprayer</p> <p>1.2.2. Mechanical transmissions between tractor and sprayer</p> <p>1.2.3. Mechanical transmissions on sprayer</p> <p>1.2.4. Attachments to the chassis</p> <p>1.2.5. Fan discoupling</p>		
<p>2. GENERAL SHAPE</p> <p>2.1. 3 POINTS OR HITCH POINT</p> <p>2.1.1. Deformations</p> <p>2.1.2. Modifications</p> <p>2.1.3. Corrosion</p> <p>2.2. CHASSIS & STRUCTURAL FRAME</p> <p>2.2.1. Deformations</p> <p>2.2.2. Defauct on metallic parts</p> <p>2.2.3. Defauct on welds</p> <p>2.2.4. Corrosion</p> <p>2.2.5. Backlash</p> <p>2.3. SPRAY MIX LEAKS</p> <p>2.3.1. Minor leaks</p> <p>2.3.2. Major leaks</p> <p>2.4. SPRAYER TRANSMISSIONS</p> <p>2.4.1. Hydraulic transmissions</p> <p>2.5. TIRES</p> <p>2.5.1. Mounting - Maintenance</p> <p>2.5.2. Wear</p>		
<p>3. PUMP</p> <p>3.1. GENERAL SHAPE</p> <p>3.1.1. Oil Leaks</p> <p>3.2. FUNCTIONING</p> <p>3.2.1. Pulsations</p> <p>3.2.2. Air Chamber</p> <p>3.2.3. Flowrate</p>		
<p>4. SPRAY MIX TANK</p> <p>4.1. OPENING LID</p> <p>4.1.1. General shape</p> <p>4.1.2. Adequation</p> <p>4.2. TANK LEVEL INDICATOR</p> <p>4.2.1. General shape</p> <p>4.3. INTRODUCTION BOWL</p> <p>4.3.1. General shape</p>		
<p>5. MEASUREMENT, COMM AND CONTROL DEVICES</p> <p>5.1. GENERAL SHUT DOWN COMMAND VALVE</p> <p>5.1.1. General shape</p> <p>5.2. BOOM SECTION SHUT DOWN COMMAND VALVES</p> <p>5.2.1. General shape</p> <p>5.2.2. Calibrated pellets</p> <p>5.3. PRESSURE CONTROL VALVE(S)</p> <p>5.3.1. General shape</p> <p>5.3.2. Functioning</p> <p>5.4. PRESSURE INDICATOR</p> <p>5.4.1. General shape</p> <p>5.4.2. Functioning</p> <p>5.5. OTHER INDICATORS USED FOR PRESSURE CONTROL</p> <p>5.5.1. Forward Speed indicator</p> <p>5.5.2. Flowrate indicator</p> <p>5.6. OTHER INDICATOR(S)</p> <p>5.6.1. General shape</p>		
<p>6. HYDRAULIC HOSES</p> <p>6.1. DISTRIBUTION HOSES</p> <p>6.1.1. General shape</p>		
<p>7. FILTERS</p> <p>7.1. INLET FILTER</p> <p>7.1.1. General shape</p> <p>7.2. CENTRAL OUTLET FILTER</p> <p>7.2.1. General shape</p> <p>7.3. BOOM SECTION FILTERS</p> <p>7.3.1. General shape</p> <p>7.4. NOZZLE FILTER</p> <p>7.4.1. General shape</p>		
<p>8. SPRAYER BOOM</p> <p>8.1. BOOM STRUCTURE</p> <p>8.1.1. Deformation on a vertical plan</p> <p>8.1.2. Deformation on a horizontal plan</p> <p>8.1.3. Protection of boom end nozzles</p> <p>8.2. BEHAVIOUR OF THE BOOM</p> <p>8.2.1. Backlash on joints</p> <p>8.2.2. Stability</p> <p>8.2.3. Setting of boom height</p> <p>8.3. NOZZLE HOLDERS</p> <p>8.3.1. Distribution</p> <p>8.3.2. General shape</p> <p>8.3.3. Functioning</p>		
<p>9. NOZZLE SPRAY</p> <p>9.1. EQUIPMENT</p> <p>9.1.1. Nature of mounting</p> <p>9.1.2. Orientation</p> <p>9.2. FUNCTIONING</p> <p>9.2.1. Regularity</p> <p>9.2.2. Flowrate</p>		
<p>10. AIR ASSISTANCE</p> <p>10.1. FAN</p> <p>10.1.1. General shape</p> <p>10.1.2. Functioning</p> <p>10.2. AIR DISTRIBUTION</p> <p>10.2.1. Air hoses</p> <p>10.2.2. Air outlets</p>		

Fig. 1. Chapters of Sprayer Inspection in France. GIP Pulvés Document.

2. Harmonized standards

In parallel to the application of the EU directive, the European Commission mandated the CEN (European Committee for Standardization) to deliver relevant and updated standards. The following table introduces the evolution of EN/ISO standards (Tab. 1)

Tab. 1.

Topic	Current reference	Future reference	Sub part	Expected publication date*
Inspection of new sprayers	EN/ISO 12761 series	EN/ISO 16119 series	Part 1 : general	March 2013
			Part 2 : horizontal boom sprayers	March 2013
			Part 3 : sprayers for bushes and orchard	March 2013
			Part 4 : Fixed and semi mobile sprayers	November 2014
Inspection of sprayer in use	EN/ISO 13790 series	EN/ISO 16122 series	Part 1 : general	August 2015
			Part 2 : horizontal boom sprayers	August 2015
			Part 3 : sprayers for bushes and orchard	August 2015
			Part 4 : Fixed and semi mobile sprayers	November 2014

*Reference July 2012

Such standards can be considered as references for protocols and threshold values to be obtained.

Conclusion

The investigation of those aspects regarding essential requirements, standards, and methods, is developed through 3 presentations :

- 1- Development of ISO/EN standards regarding the inspection of sprayers,
J.-C. ROUSSEAU (France)
- 2- Sprayer tank agitation check: A proposal for a simple instrumental evaluation,
P. BALSARI, M. TAMAGNONE, D. ALLOCHIS, C. BOZZER (Italy)
- 3- Inspection method for spray rate controllers in Flanders (Belgium),
J. DECLERCQ, D. NUYTTENS (Belgium)