Workshop Lecture 3:1
Inspections of sprayers following EN-ISO16122

Part 2: Field crop sprayers

Tutors: Emilio Gil and Jaco Kole

1. Instructions
2. Pre-inspection following EN-ISO 16122:1
3. Inspection of field-crop sprayer following EN-ISO 16122:2
4. Inspection report

1. Instructions:

In this workshop, the attendants will inspect a field-crop sprayer according to the standard EN-ISO 16122. Because the time is limited only a short inspection will be performed without the needed measurements.

The group will be divided in two small groups and each group will perform an inspection following the requirements in part 4 of EN-ISO 16122.

The sprayer is prepared, filled with clean water and ready to operate. The tutor or an assistant will operate the sprayer on instructions of the participants. The results of the inspection will be summarized on the inspection report and discussed afterwards.

2. Pre-inspection

In EN-ISO 16122:1 is a pre-inspection defined in order to be sure to perform the inspections in a safe way and efficient way, both for the inspector, the workshop and the environment.

Make a pre-inspection according to the following elements:

1. **General**
   a. Condition and calibration of the testing equipment
      Not needed
2. **Place for inspection**
   a. Risk on pollution and water contamination
      Check if risk on pollution and water contamination avoided

3. **Pre-inspection**
   a. Cleaning of the sprayer (outside and inside)
      Check if the sprayer is clean, both from the inside and outside and if any residues of pesticides are present
   b. General condition of the sprayer on the following elements:
      i. Power-transmission parts
         Check if all guards of the power-transmission parts are present and in good condition
      ii. Moving parts
         Check if the guarding of all moving parts is present and in good condition
      iii. Pipes and hoses for hydraulic transmission
         Check the condition of all pipes and hoses on the sprayer needed for hydraulic transmission
      iv. Structural parts and framework
         Check the condition of the structural parts and framework of the sprayer on point which can affect the strength of the sprayer
      v. Lockable foldable parts
         Check condition and function of all lockable parts of the sprayer for both securing safe road transport and operation in the field.
      vi. Blower
         1. General
         2. Clutch

         Not needed

4. **Conclusion**

   If the sprayer is safe and clean, than the inspection can starts, else first this faults has to be repaired before the inspection can start.

Fill in the results of the pre-inspection of the inspection report on page 7 together with the data of the inspection and the sprayer.

3. Inspection following EN-ISO 16122:2 Field-crop sprayers

Make an inspection of the sprayer following these points, fill in the results and conclusion on the attached inspection report.

1. **Leakages**
   a. Static leakages
      Sprayer not running observes on leakages.

   b. Dynamic leakages
      i. Not-spraying
         *Sprayer running at maximum pressure, **with the section valves closed**, observes on leakages*
      ii. While spraying
         *Sprayer running at pressure of 5 bar, **with section valves opened (spraying)**, observe on leakages.*
   c. Spraying on parts of the sprayer
      While spraying with the spray-boom at normal working height, observe if there is any spraying on parts of the sprayer.

2. **Pump**
   a. Capacity
      Not needed
   b. Pulsations
      While spraying at a pressure of 3 bar observe on the spray-manometer the pulsations of the pump.
   c. Air chamber
      Not needed

3. **Spray mix agitation**
   While spraying at a pressure of 5 bar, observe in the spray tank the functioning of the agitation system.

4. **Spray liquid tank**
   a. Lid
      Check presence and condition of the lid on the spray tank
   b. Filling hole
      Check presence and condition of the strainer in the filling hole
   c. Induction hopper
      If present, check functioning of induction hopper
   d. Pressure compensation
      Check presence and functioning of pressure compensation of the spray tank.
   e. Tank content indicator
      Check tank content indicator on presence, visibility and functioning.
   f. Tank emptying
      Check device for emptying the spray tank
   g. Tank filling
      If present check functioning tank filling device.
   h. Cleaning device for plant protection containers

If present check functioning cleaning device for empty containers

i. Cleaning equipment
If present check functioning cleaning device for spray tank.

5. Measuring systems, controls and regulation systems

a. Functioning
Check all present systems on functioning
b. Visible and reachable
Check if all needed control elements are visible and reachable from the operator position.
c. Pressure indicator
i. Scale
Check the scale of the manometer
ii. Accuracy
Not needed
iii. Diameter
Check the diameter of the manometer
d. Pressure adjusting device
Check functioning of pressure adjusting device

6. Line (pipes and hoses)

a. Condition
Check all lines and hoses in the spray liquid system on excessive bending, corrosion, wear and cracks.

7. Filters

a. Presence and condition
Check on presence of suction and pressure filter. Check on condition not needed.
b. Isolating device
Check if it possible to check the filters without emptying the tank.
c. Filter insert changeability
Not needed

8. Spray boom

a. Stability/alignment
Check the spray-boom on stability and excessive movement on joints.
b. Automatic resetting
Check functioning automatic resetting spray booms
c. Nozzle spacing/orientation
Check on uniformity of the nozzle spacing and orientation along the spray boom.
d. Boom deformation
i. Vertical
Check on the vertical position of the spray boom.
ii. Horizontal
Check the horizontal deformation of the spray boom.
e. Prevention of nozzle damage
Check presence and condition device to prevent nozzle damage
f. Height adjustment

Check functioning and condition system for height adjustment.

g. Damping, slope compensation and stabilization
Check all parts of the sprayer and spray boom needed for damping and stabilization of the spray boom.
h. Compensative returns
Not needed
i. Pressure drop
Not needed.

9. Nozzles

a. Similarity
Check all nozzles on similarity
b. Dripping
Check if all nozzle stop spraying and dripping after the spray has stopped.
c. Transverse distribution
Not needed

4. Inspection report:

Data inspection:				
Date of inspection				
Name inspector				
Data of inspected sprayer:				
Brand and type				
Serial number				
Year of construction				
Drive	*Mounted*	*Trailed*	*Self-propelled*	
Pre-inspection:				
Cleanness of sprayer	*Outside*		*Okay*	*Not okay*
	Inside		*Okay*	*Not okay*
Safe of the sprayer	*PTO*		*Okay*	*Not okay*
	Moving parts		*Okay*	*Not okay*
	Hydraulic system		*Okay*	*Not okay*
	Frame		*Okay*	*Not okay*
	Lockable folding parts		*Okay*	*Not okay*
	Blower		*Okay*	*Not okay*
Conclusion:	***Continue inspection***	***Stop inspection***		
Inspection:				
1.Leakages	Static leakages		*Okay*	*Not okay*
	Dynamic leakages (not spraying)		*Okay*	*Not okay*
	Dynamic leakages (spraying)		*Okay*	*Not okay*
	Spraying on parts		*Okay*	*Not okay*
2.Pump	~~Capacity~~		~~*Okay*~~	~~*Not okay*~~
	Pulsations		*Okay*	*Not okay*
	~~Air chamber~~		~~*Okay*~~	~~*Not okay*~~
3.Spray mix agitation	Functioning		*Okay*	*Not okay*
4.Spray liquid tank	Lid		*Okay*	*Not okay*
	Filling hole		*Okay*	*Not okay*
	Induction hopper		*Okay*	*Not okay*
	Pressure compensation		*Okay*	*Not okay*
	Tank content indicator		*Okay*	*Not okay*
	Tank emptying		*Okay*	*Not okay*
	Tank filling		*Okay*	*Not okay*
	Cleaning device for plant protection containers		*Okay*	*Not okay*
	Cleaning equipment		*Okay*	*Not okay*
5.Measuring systems, controls and regulation systems	Functioning		*Okay*	*Not okay*
	Visible and reachable		*Okay*	*Not okay*
	Pressure indicator: Scale		*Okay*	*Not okay*
	~~Pressure indicator: Accuracy~~		~~*Okay*~~	~~*Not okay*~~
	Pressure indicator: Diameter		*Okay*	*Not okay*
	Pressure adjusting device		*Okay*	*Not okay*
6.Lines (pipes and hoses)	Condition		*Okay*	*Not okay*
7.Filters	Presence and condition		*Okay*	*Not okay*
	Isolating device		*Okay*	*Not okay*
	~~Filter insert changeability~~		~~*Okay*~~	~~*Not okay*~~
8.Spray boom	Stability/alignment		*Okay*	*Not okay*
	Automatic resetting		*Okay*	*Not okay*
	Nozzle spacing/orientation		*Okay*	*Not okay*
	Vertical boom deformation		*Okay*	*Not okay*
	Horizontal boom deformation		*Okay*	*Not okay*
	Prevention of nozzle damage		*Okay*	*Not okay*
	Height adjustment		*Okay*	*Not okay*
	Damping and stabilization		*Okay*	*Not okay*
	~~Compensative returns~~		~~*Okay*~~	~~*Not okay*~~
	~~Pressure drop~~		~~*Okay*~~	~~*Not okay*~~
9.Nozzles	Similarity		*Okay*	*Not okay*
	Dripping		*Okay*	*Not okay*
	~~Transverse distribution~~		~~*Okay*~~	~~*Not okay*~~
Conclusion:				
Sprayer approved	***Sprayer disapproved***			
	With the following remarks:	***...*** ***...***		