„Self-inspection of spraying equipment not covered by official inspection system in Poland”

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Sustainable Use Directive (2009/128/EU) in Article 8

• “By way of derogation ... following a risk assessment for human health and the environment including an assessment of the scale of the use of the equipment, Member States may ... exempt from inspection handheld pesticide application equipment or knapsack sprayers.

• In this case the Member States shall ensure that operators have been informed of the need to change regularly the accessories, of the specific risks linked to that equipment, and that operators are trained for the proper use of that application equipment ...”.

• In article 5 (on training) it is stated that “Member States shall ensure that all professional users, distributors and advisors have access to appropriate training by bodies designated by the competent authorities”.

## The PAE inspected in Poland

<table>
<thead>
<tr>
<th>PAE / inspected from year (subsequent changes in the law)</th>
<th>1999</th>
<th>2013</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field</strong> crop sprayers</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Orchard</strong> sprayers</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Railway</strong> sprayers with boom</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Railway</strong> sprayers – other</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Aerial</strong> spray systems</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Greenhouse</strong> equipment (spraying and fogging)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Other sprayers</strong> (tank volume &gt; 30 l)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Seed treatment</strong> equipment</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Granule</strong> applicators</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

As for 2016-09-13
PAE exempted from inspection
- handheld and knapsack sprayers

• A risk assessment for human health and the environment, based on the research and reports by:
  • Res. Institute of Horticulture, Skierniewice (presented at SPISE 4)
  • National Institute of Hygiene, Warsaw (presented at SPISE 4)

• Decision of the Ministry of Agriculture

• The need for training programme and materials (the need to change regularly accessories, risks linked to the equipment, proper use of it i.a. self-inspection).
The trials on the influence of knapsack sprayer technical condition on operator exposure as an input to the risk assessment for human health

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- The tests were carried out for:
  - undamaged knapsack sprayer
  - damaged nozzle
  - damaged gun valve

- The tests were carried out in:
  - low crop (strawberries)
  - medium loose crop (young orchard)
  - high dense crop (bearing fruits orchard)

- National Institute of Hygiene - operator risk for 15 pesticides (BBA model) (when >AOEL)

- The risk for operator depends on:
  - crop height,
  - Personal Protective Equipment (PPE) usage.

- In low and medium-loose crops, when PPE is used, there was no influence of the sprayer technical condition on the operator risk.

- In the high crops the knapsack sprayers should be used in the limited extent. For some pesticides the knapsack sprayers should not be used, even for efficient sprayer.

AOEL – Acceptable Operator Exposure Level:
The maximum amount of the active ingredient (a.i.) of PPP on which the operator may be exposed, without any adverse effects on his health. Expressed in mg/kg of body weight.
The trainings on pesticide use in Poland

• By persons with proper competences,
• Using proper PPE and PAE’s,
• According to training official programmes listed in the Ministry of Agriculture Regulation (Journal of Laws from 10 of May 2013; item no 554).
The need of self-inspection

• To help the trainers and growers or applicators.
• The Ministry of Agriculture ordered the training materials on self-inspection of excluded sprayers.
• The materials were elaborated in InHort in the frame of Multi-annual Programme realised for and financed by Polish Ministry of Agriculture and Rural Development.
Two instruction manuals describing the procedure of self-inspection

• To be used by the trainers and applicators.
• Elaborated in form of questions checklist.
• Containing:
  • checklist questions
  • description of the control procedures
  • protocol of self-inspection

• Published on the web on InHort and Ministry of Agriculture webpages as a pdf’s.
Elaborations which may be used as a training materials

- Self-inspection procedures
- Inspection protocol
- Illustrated brochure
Checklist questions

• Inspired by two standards:
  • ISO/CD 19932-3 (under development)
  • ISO 19932-2:2013 (published)

• Types of questions in the procedure:
  • on (device) presence AND condition-functioning
  • concerning sprayer type groups
  • **arbitrary** divided in two groups:
    • questions that all should be answered positively in 100%
    • questions that may be answered positively in 80%
The protocol of self-inspection

• Two-page A4 document.
• The introduction part contains owner and diagnostician information as well as sprayer data.
• Main protocol parts for:
  • all types of hand-held and knapsack sprayers
  • additional checks for engine-driven sprayers
  • additional checks for electric motor-driven sprayers
  • additional checks for compression sprayers
• Two supplementary and informative parts:
  • on nozzles flowrate measurement
  • on how to use the protocol (range of inspection for different types of sprayers, the importance of questions)
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Present</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Is the sprayer clean, empty and not pressurised?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1.2</td>
<td>May the sprayer be carried by operator in vertical position by handle or shoulder strap?</td>
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<tr>
<td>1.3</td>
<td>Can the operator able to wear the sprayer on his back comfortably and safely without aid?</td>
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<tr>
<td>1.4</td>
<td>Is the quick-release mechanism present AND is it possible to open it under load and release the sprayer using only one hand?</td>
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<tr>
<td>1.5</td>
<td>Are the load bearing straps present (wider or softly upholstered elements of harness)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>May the sprayer, filled with water to the nominal volume, stand upright on flat hard surface without support?</td>
<td></td>
<td></td>
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<tr>
<td>1.7</td>
<td>Is the sprayer, filled with water to its nominal volume, when not pressurised, standing on the ground vertically and inclined at 45° (strap side facing down and up) not leaking?</td>
<td></td>
<td></td>
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<tr>
<td>1.8</td>
<td>Is the sprayer, tilted with water to its nominal volume, when not pressurised, during wearing it on operator’s back not leaking? (x3)</td>
<td></td>
<td></td>
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<tr>
<td>1.9</td>
<td>Is the sprayer, filled with water to its nominal volume, being under the maximum pressure, not leaking when NOT spraying? (x3)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1.10</td>
<td>Is the sprayer, filled with water to its nominal volume, being under the maximum pressure, not leaking when spraying? (x3)</td>
<td></td>
<td></td>
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<tr>
<td>1.11</td>
<td>Is the strainer/filter present in the tank opening AND whether it is in good condition?</td>
<td></td>
<td></td>
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<tr>
<td>1.12</td>
<td>Is there a quick-acting shut off device present AND does it work properly?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1.13</td>
<td>Is there a pressure indicator present AND has it a recommended accuracy of indications?</td>
<td></td>
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<td></td>
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<tr>
<td>1.14</td>
<td>Are all hoses in good condition?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1.15</td>
<td>Are all flexible hoses laid without constrictive stress and bends?</td>
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<tr>
<td>1.16</td>
<td>Is there a filter fitted on the pressure side present AND is it in a good condition?</td>
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<tr>
<td>1.17</td>
<td>Are the filter orifices less than the nozzles ones (Does filter mesh correspond to nozzle)?</td>
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<tr>
<td>1.18</td>
<td>Are all nozzles fitted in the lance in good condition?</td>
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<td></td>
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<tr>
<td>1.19</td>
<td>Are all nozzle bodies in good condition?</td>
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<tr>
<td>1.20</td>
<td>Is the shape of the spray jet regular (uniform shape, homogenous spray)?</td>
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<tr>
<td>1.21</td>
<td>Is the sprayer lever-operated AND is lever in good condition?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Is it possible to empty the sprayer tank without having to invert the engine (without turning the sprayer upside down)?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2.2</td>
<td>Is there a pressure safety valve present AND does it work properly (prevents pressurisation of the sprayer beyond the maximum working pressure)?</td>
<td></td>
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<tr>
<td>2.3</td>
<td>Are there the power-driven components guarded (pulleys, shafts, gears, flywheels, drive belts and chains) AND are that guards in good condition?</td>
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<td></td>
<td></td>
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<tr>
<td>2.4</td>
<td>Has the fuel cap a retainer, and does fuel tank have a ventilation system present AND does it work properly?</td>
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<tr>
<td>2.5</td>
<td>Are there the covers of hot elements (engine, silencer) present?</td>
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<tr>
<td>2.6</td>
<td>Are the exhaust outlets located and directed safely for the operator?</td>
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<td></td>
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<tr>
<td>2.7</td>
<td>Are the parts of the engine being under a high voltage insulated to avoid contact with operator?</td>
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<td></td>
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<tr>
<td>2.8</td>
<td>Are there the blower and air guide plates present and are complete? AND work properly?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2.9</td>
<td>Is it possible to control the engine AND is the engine speed stable?</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
The brochure

• The 80-page brochure
• Basic information on knapsack sprayers and their professional use
• Relevant legislation and standards,
• The construction, mode of operation
• Frequent faults and basic repairs
• Illustrations and drawings
• Risks for operator and environment during sprayers use
• Information on risk trials (presented at SPISE-4)
• Procedures of self-inspection
• Suggested measuring equipment
• The self-check protocol
Conclusions

• For PAE excluded from the official inspection, the training materials availability for growers and trainers is demanded.

• The training materials should contain inspection procedure which may be carried out by the grower himself.

• The procedure have to be simple question checklist.

• In case of the equipment certificate needed (eg. in GAP, IPM, certificated production) that procedure may be documented by grower himself in the protocol.

• The illustrated brochure containing the basis information on the equipment, and self-inspection procedure may be used by trainers and applicators themselves.
A mandatory inspection - every 3 or 5 years

• ... so self-inspect your PAE between inspections
• Use only calibration equipment
• Do full procedure in the beginning of the seson
• Do short procedures before each sprayer use
Literature


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This work was performed in the frame of Multiannual Programme 2015-2020 financed by the Polish Ministry of Agriculture and Rural Development.

Additional information:
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... thank you