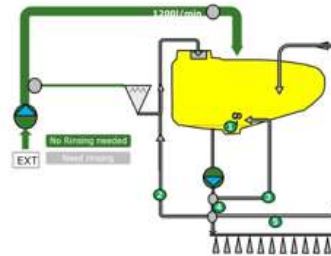


Thematic 3. Prevention of point sources pollution Environmental safety and operator health



The operations of:

- Preparation of the spray mixture and filling of the sprayer*
- Disposal of the spray mixture remnant at the end of the application*
- Internal and external cleaning of the sprayer*
- Cleaning of empty PPP cans*

are considered a risk of point sources and responsible of most of surface and ground waters contamination with agrochemicals



Preparation of the spray mixture and filling of the sprayer

Examples of incorrect PPP loading in the main tank of the sprayer



Preparation of the spray mixture and filling of the sprayer

Example of uncorrect disposal of empty PPP cans, not rinsed, still containing concentrated PPP residues



Preparation of the spray mixture and filling of the sprayer



**Sprayer tank
overflowing**



At the end of the spray application: possible origin of point sources

**Not correct
disposal of
considerable
amounts of
remnants,
often not
diluted**



**Overall yearly
amount of
cleaning water to
dispose per
sprayer for a
vineyard-farm**

Residual PPP at the end of treatment = 264 l/year

Water used for internal cleaning + circuit = 660 l/year

Water used for the external cleaning = 671 l/year

**TOTAL RESIDUES TO BE DISPOSED ~ 1500 l /
year for sprayer**



Even considering a concentration of A.I. in these residues equal to only 0.1%, **this translates into 1.5 kg / year of A.I. often distributed on a surface smaller than 10 m²**

Relevance of point sources

Diffuse sources from the field:

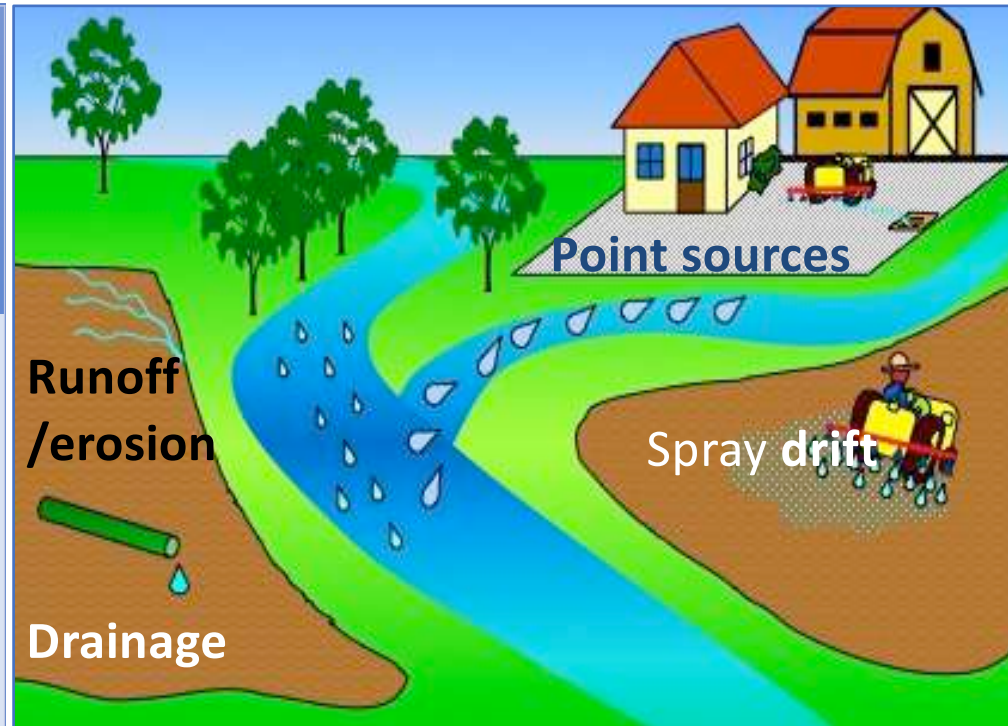
These can be reduced

Point sources from the farmyard:

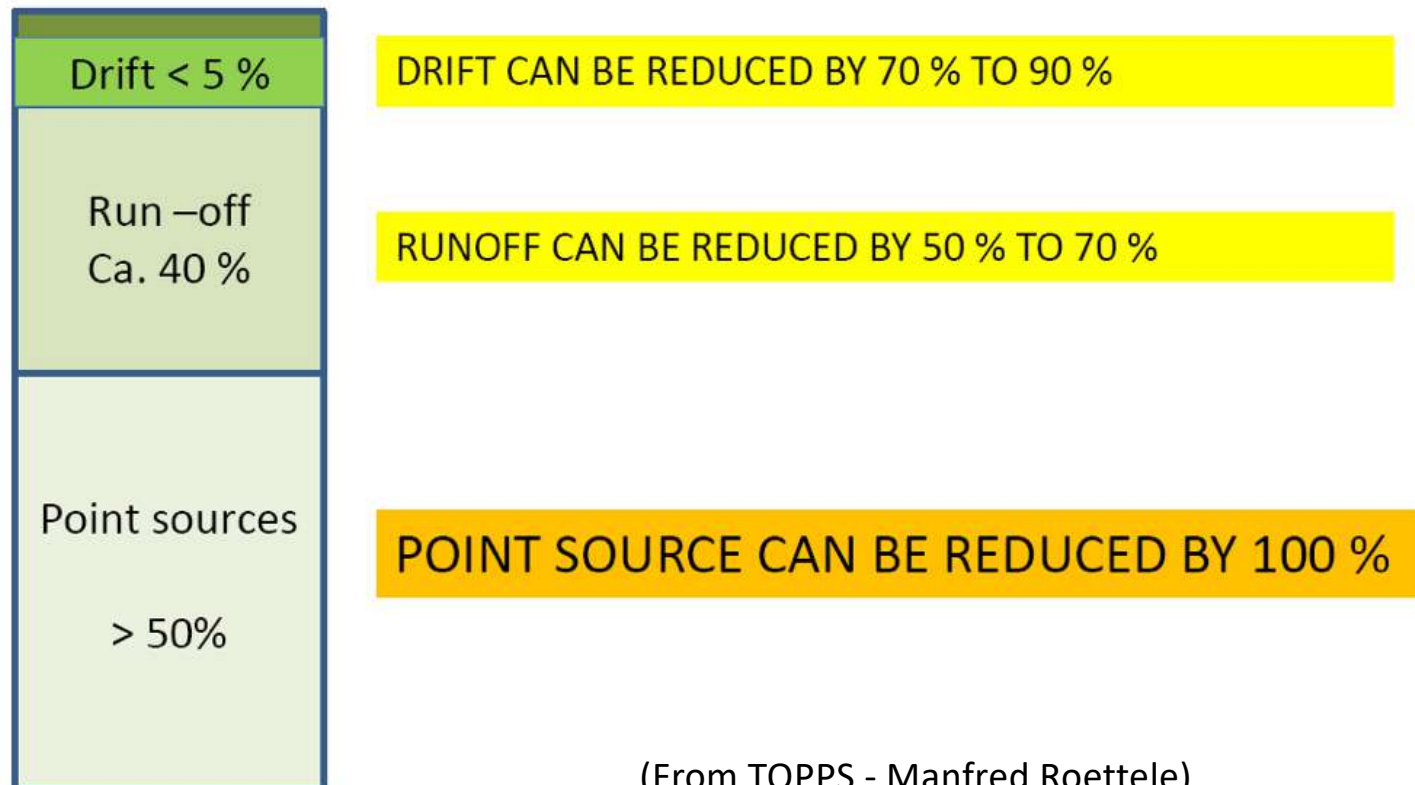
can largely be avoided

5 % Spraydrift
35 % Runoff /
Erosion

> 50 % Point
sources



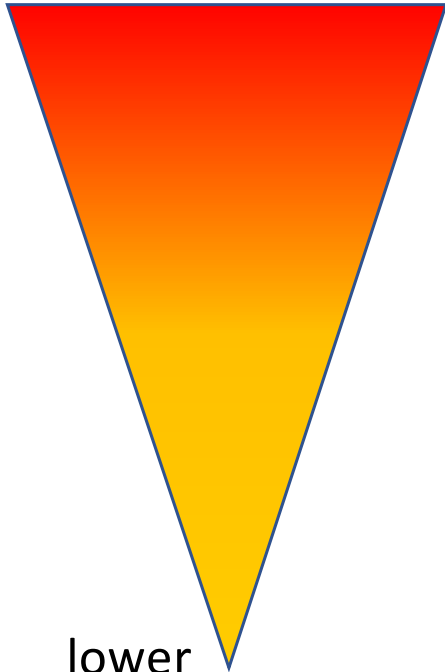
Significance of entry routes of PPP to water and mitigation potential



(From TOPPS - Manfred Roettele)

Awareness of key risks helps focus on prevention

higher



lower

Key Risks

- **Sprayer cleaning**
- **Mixing and loading**
- **Remnant management**
- **Empty containers disposal**
- Transport to the field
- Farm pesticide storage
- Transport to the farm



Example of sprayer components and devices available to prevent point sources during mixing and loading

Induction hoppers



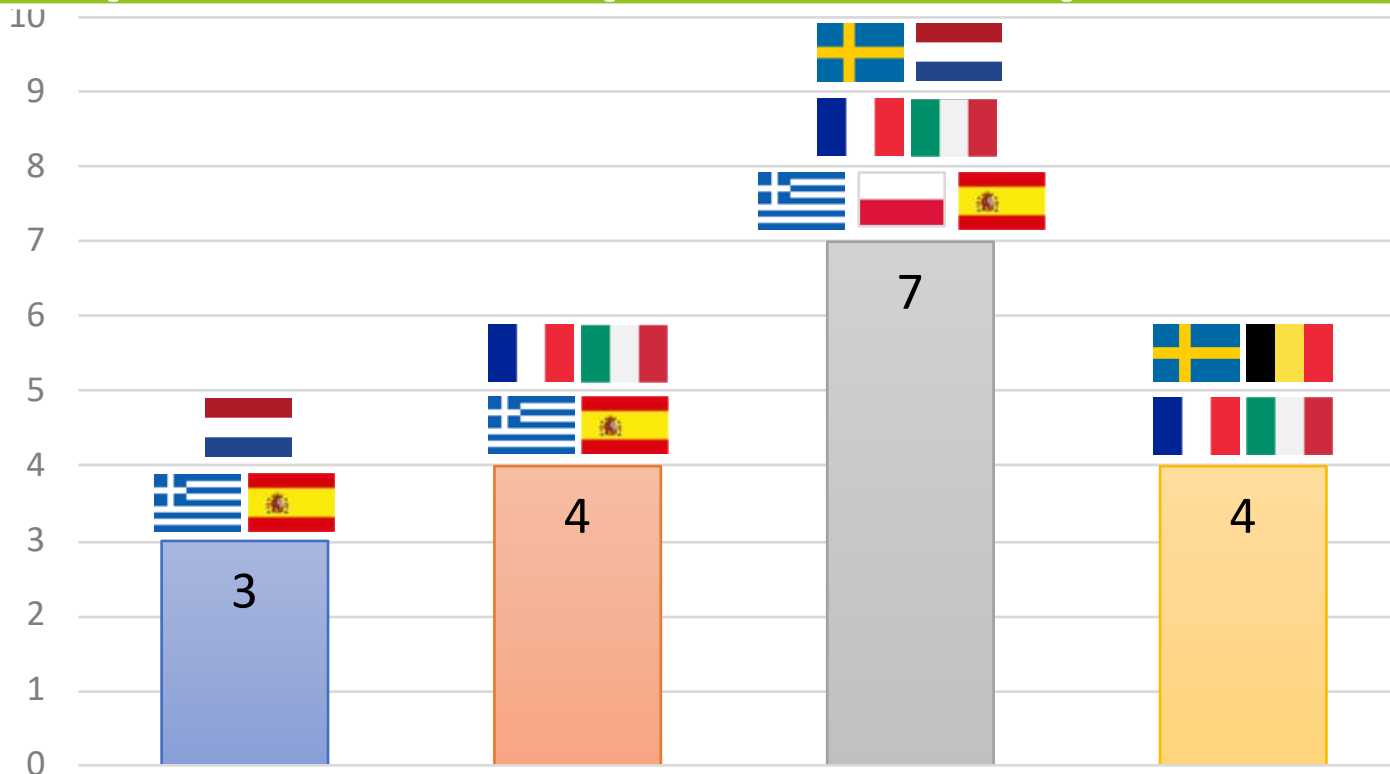
Strainers equipped with nozzles for rinsing PPP cans

PPP closed transfer systems

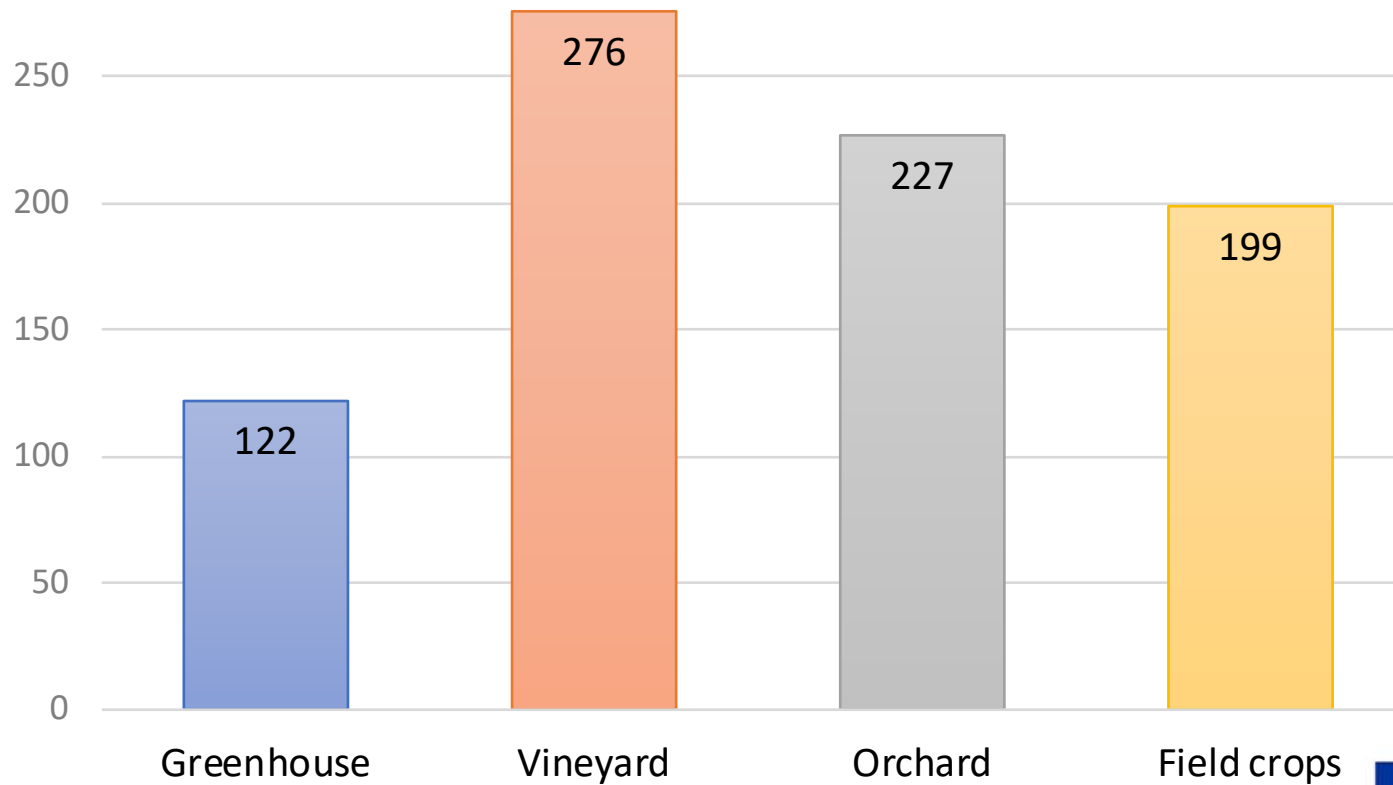


*These are some of the SETAs presented during the **Regional workshops***

Number of regional workshops on “prevention of point source pollution”



Number of attendants at regional workshops on “prevention of point source pollution”



GREENHOUSE WORKSHOPS



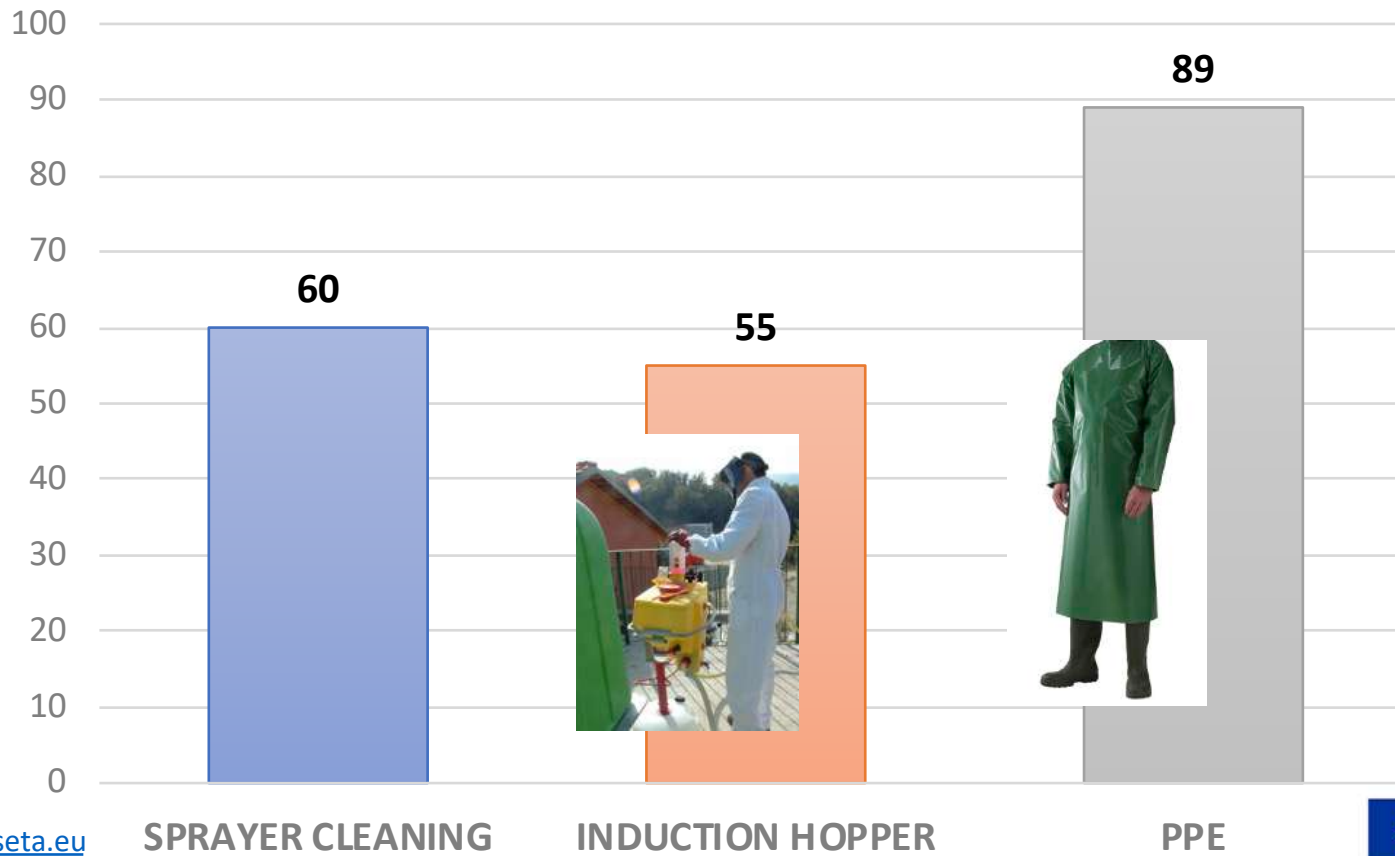
Greenhouses



HIGHEST RANKED INNOVATIONS BASED ON GLOBAL WORKSHOP OUTCOMES



Greenhouses



MAIN TECHNICAL ACTIONS NEEDED



Greenhouses

- Need to raise **awareness on the protection of operators** during their management of PPP and **to develop new PPE** (Personal Protective Equipment) that better suit the environmental conditions in greenhouses and are more ergonomic
- The **volumes of PPP packaging may be considerably smaller**, the packaging units are too large **especially when are used Low Volume Mist equipment** that require dosage amount really low and therefore the user might spill liquid when filling.
- **Improve the information and of knowledge concerning the management of plant protection products remnants.** Farmers do not always know how to properly clean the tank bottoms. **This issue is particularly relevant for PPP powder formulations**, as it is not clear where and how farmers have to manage this type of remnant.

ADDITIONAL SUGGESTIONS



Greenhouses

- Provide **more training courses and more information about the new technologies available** and to explain the way they shall be used
- **Solve the risk of contamination when cutting the pouring opening of new PPP packaging**; to open the pouring hole you have to remove the seal, that is covered with PPP and therefor it is a source of contamination risk
- **Improve the collaboration between farmers associations and farmers** in order to implement the facilities for a safer filling, cleaning of the machinery and management of the remnants

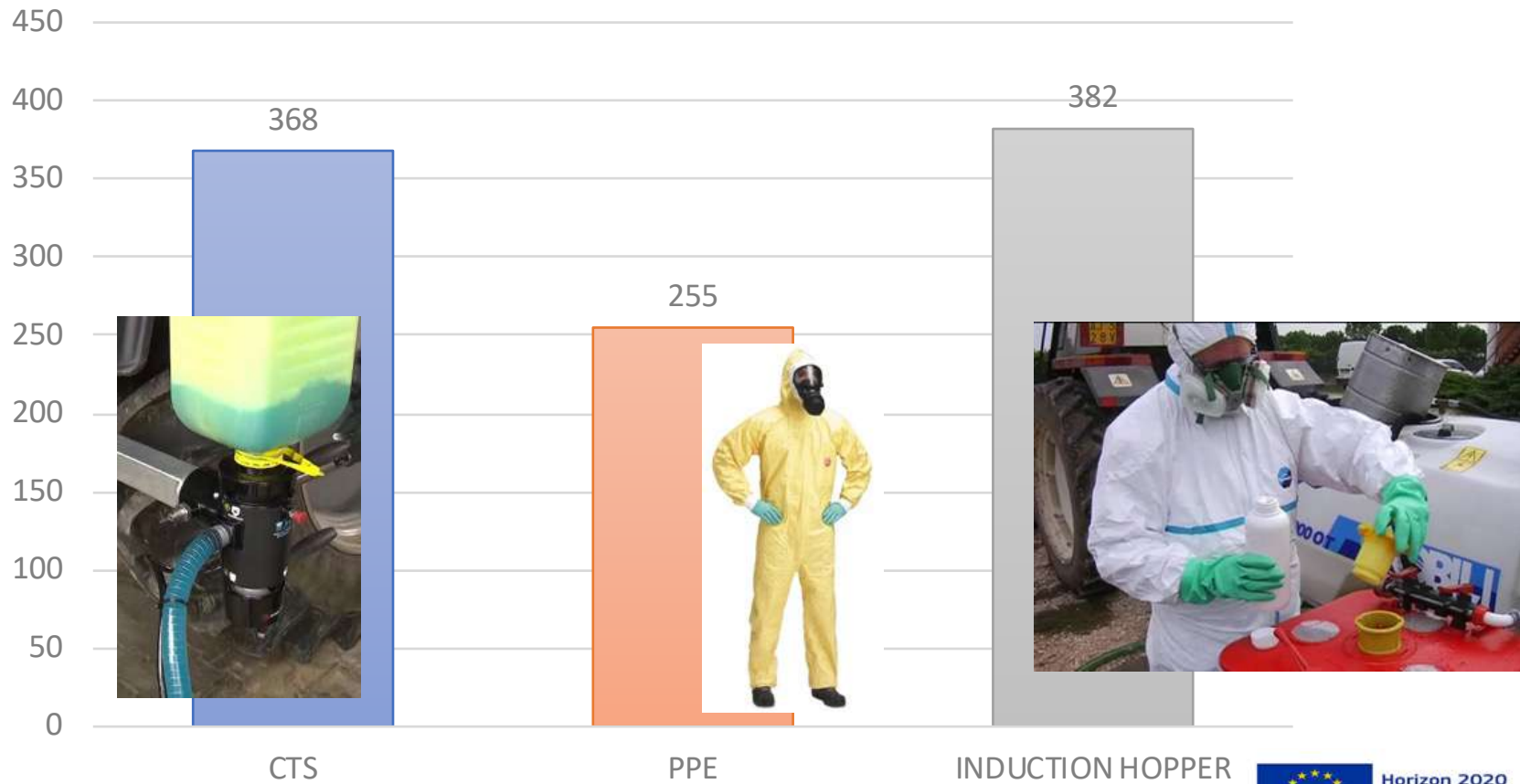
ORCHARD WOKSHOPS



Orchards



HIGHEST RANKED INNOVATIONS BASED ON GLOBAL WORKSHOP OUTCOMES



MAIN TECHNICAL ACTIONS NEEDED



Orchards

- Use of personal protective equipment (PPE) is not widespread because they are uncomfortable. **Necessary to develop R&D** on textiles, among other things **to improve comfort**, including the warmth felt when wearing **PPE equipments** in summer.
- **A decision support tool, to select the right PPE** according to the spraying situation and the product used, **could be developed by ECPA** (European Crop Protection Association) and national associations such as UIPP in France (Union of Plant Protection Industries) and AGROFARMA in Italy.

ADDITIONAL SUGGESTIONS



- **Make mandatory the use of CTS both in new and in use PAE** as will be done in Denmark and in Netherlands in 2024.
- It would be interesting to better **test and** than **promote the use of specific complexes able to neutralize the active ingredients** that remain into the tank bottoms after a spray treatment.
- **Develop micro-injection system** (for apple, walnut, peach, etc.) in order to avoid the management of spray waste and make the operators safer .

VINEYARD WORKSHOPS



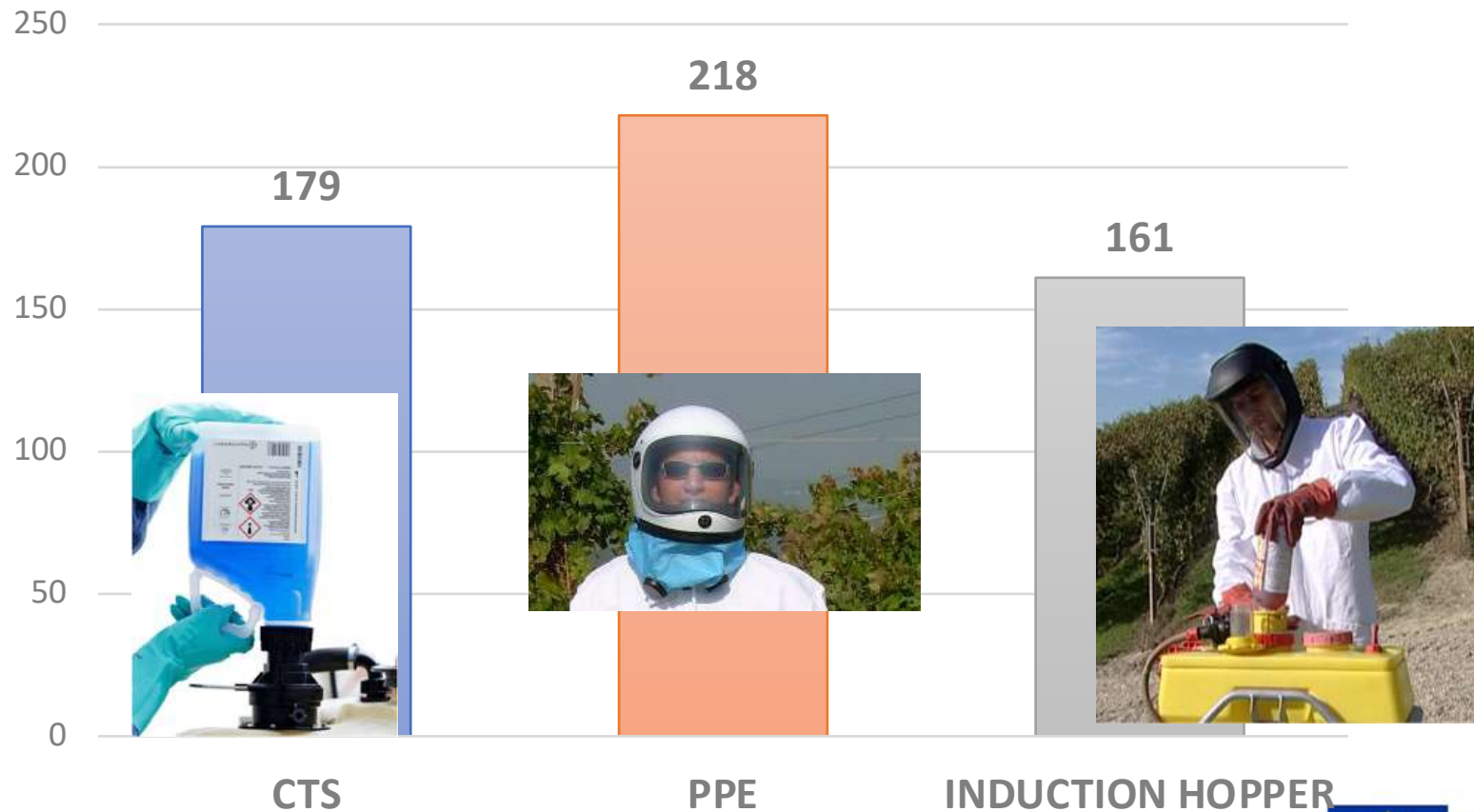
Vineyards



HIGHEST RANKED INNOVATIONS BASED ON GLOBAL WORKSHOP OUTCOMES



Vineyards





MAIN TECHNICAL ACTIONS NEEDED

- **Improve sprayers building conception** in order to facilitate their cleaning and filling.
- Develop solutions for an **easy and safe filling also with PPP powdery formulation** .
- Develop solutions allowing **precise measurement of the volume of water filled in the sprayer**.
- Make **induction hopper (PPP mixers) mandatory on sprayers**.
- Promote that **PPP sellers can also sell PPP mixers/induction hoppers or CTS**



Vineyards

ADDITIONAL SUGGESTIONS

- **National Plans and European Rural Development Plans should also include economic incentives** to facilitate and encourage the purchase of useful tools to prevent point sources contamination
- Make a **mandatory and periodic control at farm level of the correct PPP management practices** including ways to limit point source pollution;
- **Need to improve training on these specific aspects.**

FIELD CROP WORKSHOPS



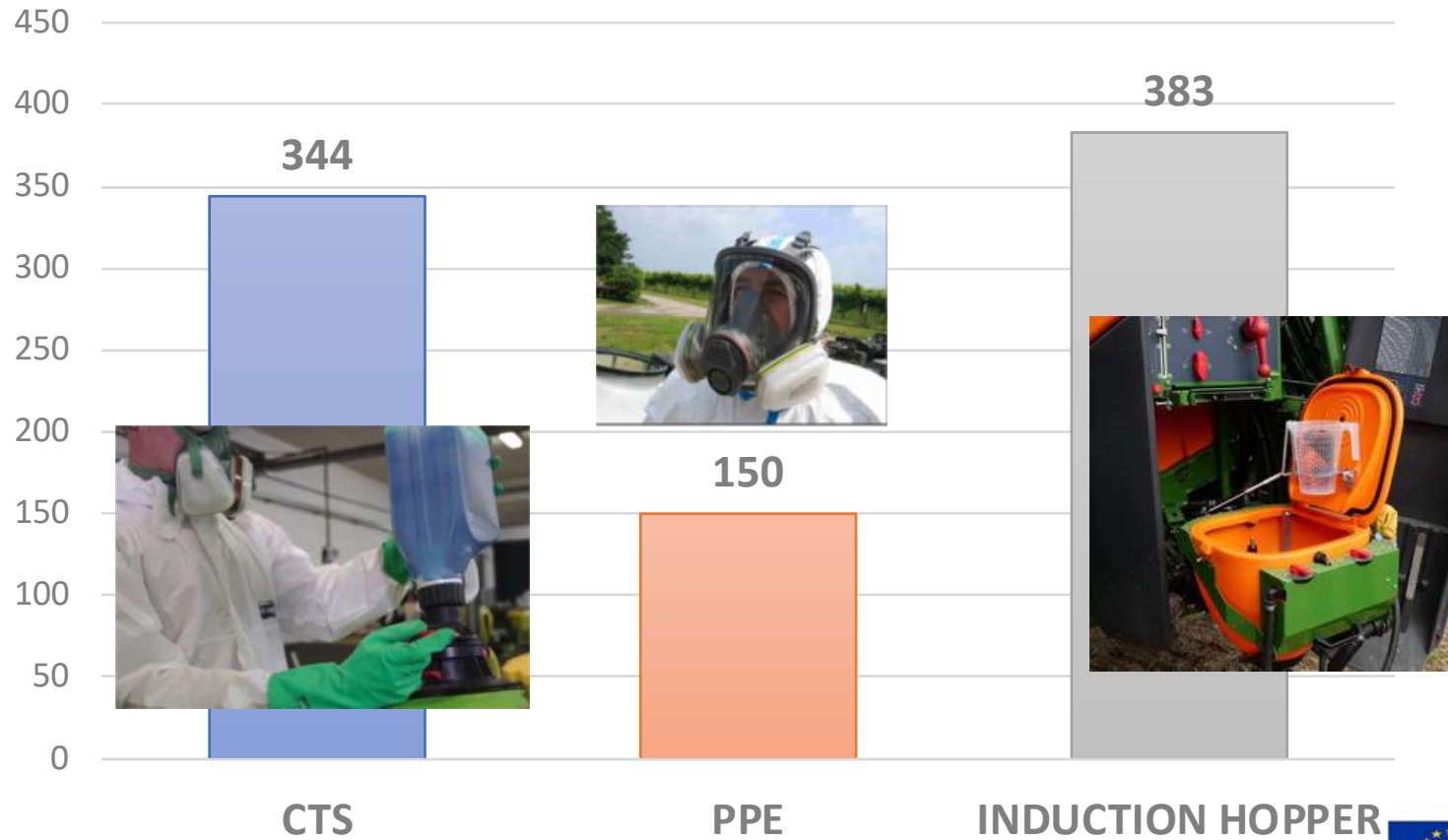
Field Crops



HIGHEST RANKED INNOVATIONS BASED ON GLOBAL WORKSHOP OUTCOMES



Field Crops



MAIN TECHNICAL ACTIONS NEEDED



Field Crops

- **Promote the use of the automated system for internal cleaning of the PAE in the field.**



ADDITIONAL SUGGESTIONS



Field Crops

- **Improve training and dissemination of technologies useful to prevent point source also through television/internet;**
- Promote a kind of **environmental labelling of the PAE (A, B, C, classes)** in analogy with the class of electrical devices such as refrigerators, TV, etc).

General remarks

It seems there is **still a lack of information and of knowledge concerning the management of plant protection products remnants**

Improvement of the use of PPE , induction hoppers and CTS as of automatic water filling systems and cleaning systems is needed

In order to improve the situations **is suggested to promote:**

- *Economic support for buying new technologies (eg., trough CAP)*
- *Research in order to have more useful devices (eg., more comfortable PPE)*
- *Training and dissemination (eg., internet/television)*
- *New EU regulations (eg., make mandatory the presence of CTS or Induction hoppers for brand new and in-use sprayers)*



Thank you for your attention!

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putting research into practice

