Better Training for Safer Food
Initiative

Towards a Sustainable Use of Plant Protection Products: Training activities applied for safe working practices, Case study1.

Kyriaki Machera, MSc, PhD, ERT

Regulatory Toxicologist
Head, Laboratory of Toxicological Control of Pesticides
Director, Benaki Phytopathological Institute
8 St.Delta str., 145 61 Kifissia, Attica, Greece
k. machera@bpi.gr, machera@otenet.gr

Consumers, Health And Food Executive Agency

Training activities applied for safe working practices, Case study1.

- Issues to be considered for safety enhancement when working with PPPs
- A success story on SUD implementation
- Questions

Issues to be considered for safety enhancement when working with PPPs

The Scenario:

- Farmer, owner of 5-6 greenhouses, growing 3-4 different crops.
- 30 employees, temporarily employed, depending on the cropping needs
- All employees come in direct (mixer loaders or operators) or indirect contact (workers) with PPS.

Issues to be considered when working with PPPs in the field/GH

The Question:

Which are the main components/activities contributing/involving PPPs safety issues.

1. Farm facilities & Personnel skills
2. Planning
3. Mixing – Loading of PPPs
4. Application
5. Storage
6. Cleaning
7. Disposal of PPP wastes

1. **Farm facilities**

- Availability of dressing room
- Availability of appropriate storage for PPP and other needs (e.g. tools, PPE)
- Availability of M/L area
- Adequate wash-up facility in the farm & water supply
- Availability of lunch area
- Availability of first-aid kits
- Signs of warning
- fire prevention facilities and responsibilities.
- Measuring tools
- Facilities for IPM application
- Calendar for plant protection

Personnel skills

- Basic knowledge of PPP regulations
- Raising of awarness
- Record keeping system for training of employees
- Training of employees on:
  - Understanding of pesticide label and PSDS
  - PPE selection, maintenance and use
  - Hazards/risks and relation to farm activities, especially for products hazardous to human health, available, accessible and understandable to employees.
  - First aid measures & fire prevention
    - Job description
    - Instructions in different languages

2. Planning

- Availability of **PSDS** and **PPP Labels** (e.g. hazard symbols, mitigation measures)
- Availability of necessary **PPE** and spare parts (masks, gloves, coveralls etc)
- PPE periodical replacement, **safe storage and maintenance** (mask, boots, gloves, face shield, coverall).
- Availability and use of **tools to deal with spilling**
- Procedure and **materials for handling of hazardous waste**
- **Record keeping** on crop management (disease, PPPs etc)
- Prioritization scheme for use of non-chemical pest management techniques (cultural, mechanical and biological control).
- Criteria for PPP selection (e.g. **lowest hazard class,** resistance etc)
- Spray volumes calculation/measurement
- Suitability and calibration of spraying equipment
- Organization of alerting system in case of expiration date pf PPPs and PPEs (eg masks filters), etc
- Reentry
- Information on weather forecast

3. Mixing/Loading of PPPs

- **Follow the product label**
- **SOPs for mixing/loading (including calculations)**
- **Loading procedure of PPP's in:**
  - empty spray tank
  - half-filled spray tank
  - **half filled & use a pre-mixing tool.**

- **In case of simultaneous application of several PPP's M/L is carried out:**
  - at random or
  - **In the following order (wettable powders - dipsersible granules -flowables - emulsifiable concentrates - solutions)**
  - **with knowledge of PPP compatibility**

3. Mixing/Loading of PPPs

- **Consideration of general precaution measures:**
  - availability, suitability and use of PPEs
  - pouring below eye level
  - wind direction during outdoor M/L
  - triple rinsing of containers for finished products
  - carful closing containers and packages

- **Suitability of mixing-loading area and adequate infrastructure to be cleaned safely**

- **Quality of tank fastenings, hoses and nozzles for leakage and for tank overfilling**

4. Application

- **Monitoring of temperature and humidity**
- **Criteria for selection of:**
  - appropriate spraying equipment (SE) per crop
  - boom height
  - spraying nozzles
  - application pressure
- **Availability of:**
  - drainage system
  - tools for sprayer check & calibration
  - spare pieces for replacing valves and connections
  - maintenance plan [special care for backpack sprayers(!)]
  - calibration check & spray distribution
  - EN compliance of SE

4. Application

- **Use of standard working clothing**
- **PPE maintenance & storage Check of gloves, coverall & mask**
- **Record keeping**
- **Appropriate PPE Selection:**
  - spare PPE
  - goggles
  - coverall
  - gloves
  - mask
  - face shield
  - boots

- **Good practices during application:**
  - check pressure
  - avoid contact with wet crop
  - walk backwards when hand held spraying
  - handle nozzle blockage in a professional way (!)
  - replace of damaged PPE during application
  - placement of warning signs during & after application
  - respect of reentry period after each treatment
  - Signs of reentry

4. Application

- **Wash hands when taking a break:**
  - before smoking,
  - eating
  - use your mobile phone
  - going to the rest room
- **Take a shower with plenty of water and soap asap after PPP application**
- **Do not get into the family car while wearing working clothing or PPE**
- **Do not get into your home in working clothing or PPE**

5. Storage

- **Telephone availability, emergency numbers handy**
- **Dedicated, restricted area secured, locked and signed for PPP storage**
- **Away from water collection zones**
- **Sufficient illumination**
- **Sufficient & constant ventilation**
- **Washable floor non flammable construction material**
- **Shelves made of non absorbent material (metal)**
- **Smoke detectors**
- **PPPs stored:**
  - in their original package
  - located away from other materials
  - according to label storage requirements.
  - heavy PPPs in the bottom of shelves
  - liquid ppp's to be placed on trays
  - Separate storage for products of different properties (hazard class, compatibility etc).
- **Identification & separate storage, documented records of obsolete PPPs**
- **Secure storage of empty containers and other hazardous waste**

6. Cleaning

- **Follow the product label and PSDS**
- **Cleaning procedure for:**
  - coveralls
  - gloves
  - boots
  - sprayer and conductions
  - empty packages
  - spillage
  - contaminated soil
  - Reusable coverall to be hand washed with use of gloves
- **Handling of washing water**
- **Handling of other hazardous wastes**

7. Disposal of hazardous waste

- **Follow the product label**
- **Management of remaining spray liquid**
  - **X** poured on the farm soil in a point
  - **X** poured in domestic sewage waste
  - re-applied to the treated crop (no max dose exceedance)
  - to storage tank for hazardous waste
- **Handling of washing water**
  - use of specific system (e.g. biobeds, Heliosec, etc)

7. Disposal of hazardous waste

- **Management of obsolete PPP's**
  - **X** burn them with the container
  - return them to the supplier
  - collaboration with the local solid waste authority
- **Management of empty containers**
  - **X** burning
  - **X** domestic wastes (if not triple rinsed)
  - **X** hazardous wastes
  - triple rinsing and recycling (for non-food use or in domestic waste)
  - Collection point near the farm
- **Other non-degradable hazardous wastes & empty packaging**
  - Collection in appropriate containers and collaboration with the appropriate recycling company

Reference: ***Konstantinos M. Kasiotisa, Fotis Andrinopoulosb, Voula Kalliakakib, Kyriaki Machera*(2013), "Oasis: A Greenhouse Sustainability Web Automated Project", Procedia Technology 8: 333 – 339***
-Selection and peer-review under responsibility of The Hellenic Association for 6th International Conference on Information and Communication Technologies in Agriculture, Food and Environment (HAICTA) Information and Communication Technologies in Agriculture, Food and Environment (HAICTA 2013).-