Safe Use of Pesticides

Foundation Unit PA1

Introduction

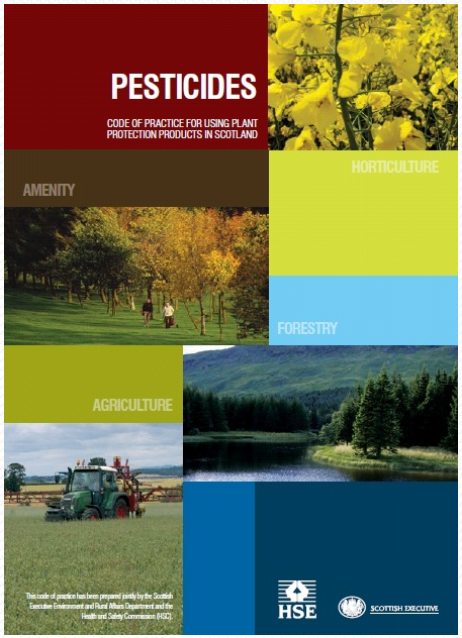
- PA1
- The safe use of Pesticides, Environmental Factors and Legislation
- Must successfully complete this module before you can be tested on Application Equipment modules.
- Test – 33 computer based multiple choice questions
- 24 correct answers which MUST include one correct answer from each of the seven sections

Application Equipment Modules

- PA2a – hydraulic boom sprayer
- PA2e – boom type air assisted
- PA6a – hand held applicators
- PA4 – granule applicator
- PA9 – fogging, misting & smoke
- PA11 – seed treating equipment
- Etc.

Legislation

- Code of Practice for using Plant Protection Products
- If you follow its advice you will be doing enough to keep within the law
- www.scotland.gov.uk
- www.defra.gov.uk



Emergency Procedures

- Anyone who uses pesticides professionally must be trained in emergency procedures and have an action plan which they understand.
- Plan must be kept up to date to cover new methods of working
- Product labels contain specific advice relating to contamination, spillage or fire
- Also Manufacturers Safety Data Sheet (MSDS)

Control of Substances Hazardous to Health (COSHH)

- A substance is “hazardous” if it could harm people, plants and creatures not being treated or the environment
- “Risk” from a substance is the chance of it causing harm, given the way it is to be used
- COSHH regulations apply to a pesticide if it is classified as :-
- 1) “very toxic”
- 2) “toxic”
- 3) “harmful”
- 4) “irritant”
- 5) “corrosive”

COSHH

- COSHH regulations also apply if :-
- A) the substance has a “Workplace Exposure Limit” (WEL)
- B) includes a micro-organism which maybe a danger to health
- C) includes dust which maybe present in a “substantial” concentration

COSHH

- Before a pesticide is used an employer or self-employed person must carry out suitable and sufficient assessment of the likely risks to health
- Consider the dangers of the pesticide (product label or MSDS)
- Decide who could be harmed and how
- Identify what action you need to take to prevent or control exposure
- Record the results of the assessment
- Revise when necessary

Finding out the dangers

- Product label
- Hazard classification :- very toxic, toxic, harmful, irritant, corrosive
- Risk & Safety phrases :- “irritating to eyes” and “wear eye protection”
- MSDS – Manufacturers Safety Data Sheet
- WEL – Work Place Exposure Limit
- Restrictions regarding existing health conditions
- HSE publications etc.

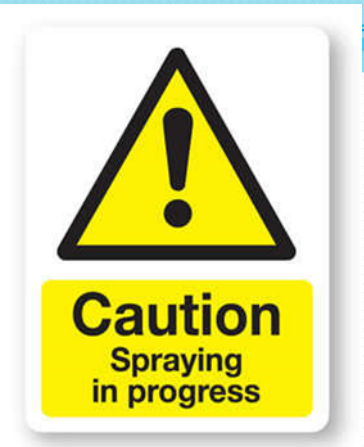
Assessing the risks, who might be harmed

- The operator
- Other employees
- Anyone else in the area eg walkers on foot paths etc.
- Anyone likely to enter the treated area
- Anyone handling treated material
- Neighbouring homes, public areas etc. if drift is a factor

How could they be harm ?

- Absorption through skin
- Inhalation
- Swallowing
- Injection
- Open wound
- Eye splash

Preventative action to control exposure



- Training
- Engineering control (hydraulic folding, in cab controls, carbon filters, hoods)
- Personal Protective Equipment (PPE)
- Suitable equipment to handle, mix, load and apply pesticide
- Spill kit / drip tray
- Use alternative product/technique
- Stop spraying if people enter area being treated
- Place signs on footpaths/rights of way through treated areas

Record and review assessment

- You must record COSHH assessments and tell employees the results
- Assessments should be reviewed at least every 5 years
- Sooner if for example method of application changes or pesticide approval changes

Keep up to date

- Continuing Professional Development (CPD)
- You must keep up to date with the latest information and technology
- National Register of Spray Operators (NRoSO)
- National Amenity Sprayer Operators Register (NAsOR)
- Continued membership depends on attending appropriate training courses and conferences
- CPD points

Environmental assessment

- Habitats, wildlife and water courses need to be protected :-
- Hedges
- Ditches, ponds etc.
- Wetlands and water margins
- Rough grazing and species rich grassland
- Woodlands

Specially Designated areas

- Local nature reserves (LNR)
- National nature reserves (NNR)
- Sites of Special Scientific Interest (SSSI)
- Special areas of conservation (SAC)
- Special protection areas (SPA)

- All must be protected from harmful effects of using pesticides.
- Scottish Natural Heritage (SNH) should be consulted before applying pesticide

Leaching and surface run off

Farm Livestock

- Water courses maybe used for livestock to drink from
- Period of livestock exclusion after treatment
- Poisonous weeds such as ragwort

Birds and Mammals

- At particular risk from treated seed or pesticide in pellet or bate form eg slug pellets
- Follow label advice
- Clean up spills immediately
- Seed properly covered by soil

Suspected Animal Poisoning

- Remove animal from source of contamination wearing PPE if you are at risk
- Contact vet immediately
- Product label, active ingredient or MSDS available for vet
- **Wildlife Incident Investigation Scheme (WIIS)** should be contacted to report incidents

- http://www.sasa.gov.uk/wildlife-environment/wildlife-incident-investigation-scheme-wiis

Protecting Bees

- Bees – Pollinators and honey
- Bee population under pressure due to loss of habitat, parasitic mites etc
- Farmers need to be mindful of bees particularly when treating near or on flowering crops.
- http://www.bbka.org.uk/help/spray_liaison

Protecting Bees

- Avoid spraying when bees are actively foraging
- Spray in early morning or evening when fewer bees forage – temperatures below 10 C
- Minimise drift
- Identify local bee keepers
- Contact local bee keeper liaison officer 48 hours before you plan to use pesticide
- Choose a cool cloudy day if you have to spray during the daytime

Ensure equipment is calibrated and in good condition

- Voluntary Initiative “operator check sheet”
- National Sprayer Test Scheme (NSTC)
- www.voluntaryinitiative.org.uk
- www.amenityforum.co.uk
- www.checkyoursprayer.co.uk

Product Label Information

- Product registration number for approved products
- MAPP or MAFF depending on when product was registered
- You cannot assume a product you used before is still currently approved for use. Product approval frequently changes
- Approval status is available on www.pesticides.gov.uk website

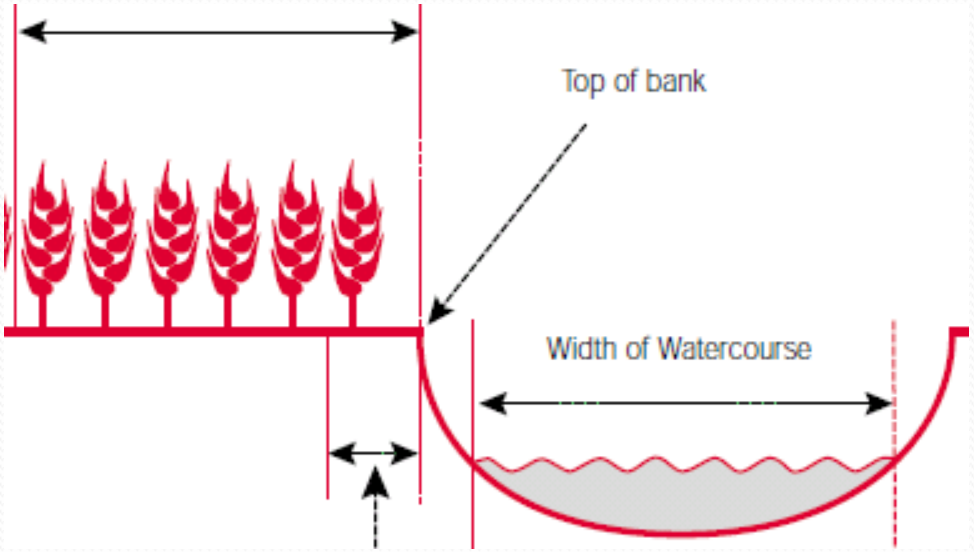
Label info. – old warning symbols

New symbols

Label info

Buffer zones from water courses

- Knapsack 1 metre buffer zone
- Boom sprayer 5 metre buffer zone
- Category A or B for LERAP
- Category A – no reduction in buffer zone permitted
- Category B – buffer zone reduction possible



Label info

- Active ingredient – part of the pesticide that gives it its properties
- Approved fields of use :-
- Agriculture
- Horticulture
- Industrial
- Forestry
- Aquatic

Label info

- Maximum dose rate
- Liquids - litres/hectare (l/ha)
- Powders/granules - grams/hectare (g/ha)
- Volume range (l/ha)
- Maximum number of treatments
- Latest timing of operation – depending on crop growth stage or harvest interval

- Note : 10,000 m2 = 1 hectare = 2.47 acres

Label info

- Approved adjuvant
- Adjuvant – a substance other than water without significant pesticidal properties which when added to a pesticide improves its effectiveness
- Eg wetting agent, antifoaming agent, anti-drift etc.

Label info

- Specific off Label Approval (SOLA)
- Now an Extension of Authorisation for Minor Use (EAMU)
- Approval given typically for minor crops or an uncommon situation
- Information available on manufacturers websites or www.pesticides.gov.uk
- Undertaken at users choosing
- Commercial risk is entirely theirs

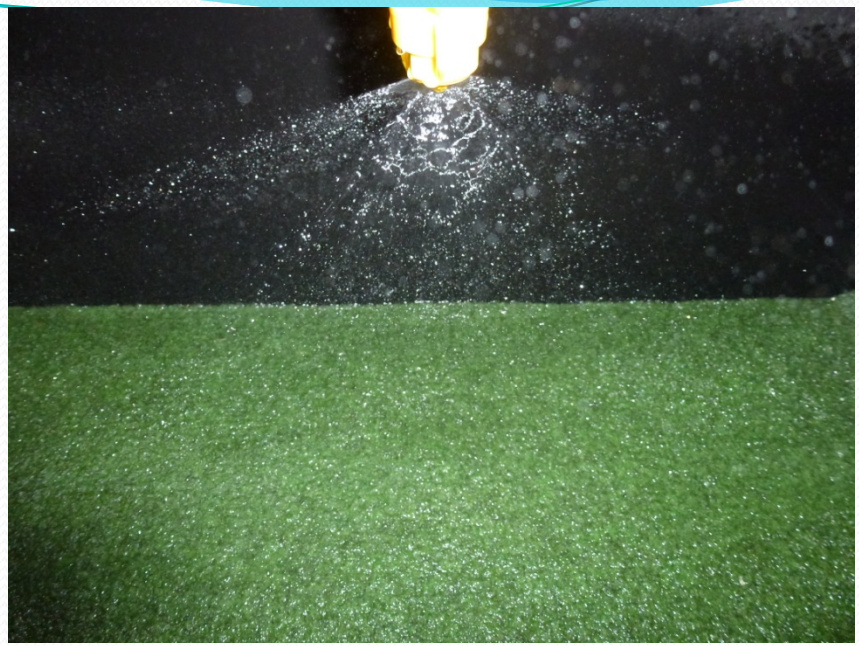
Label info

- H = Herbicide (total or selective)
- F = Fungicide
- I = Insecticide
- P = plant growth regulator

Label info

- Mode of action
- Contact – kills only the part of plant the chemical contacts
- Systemic – Chemical is translocated from the point of contact throughout the plant
- Residual – the action persists after it has been applied for a period of time
- Translaminar – penetrates leaf tissue to form reservoir of active ingredient

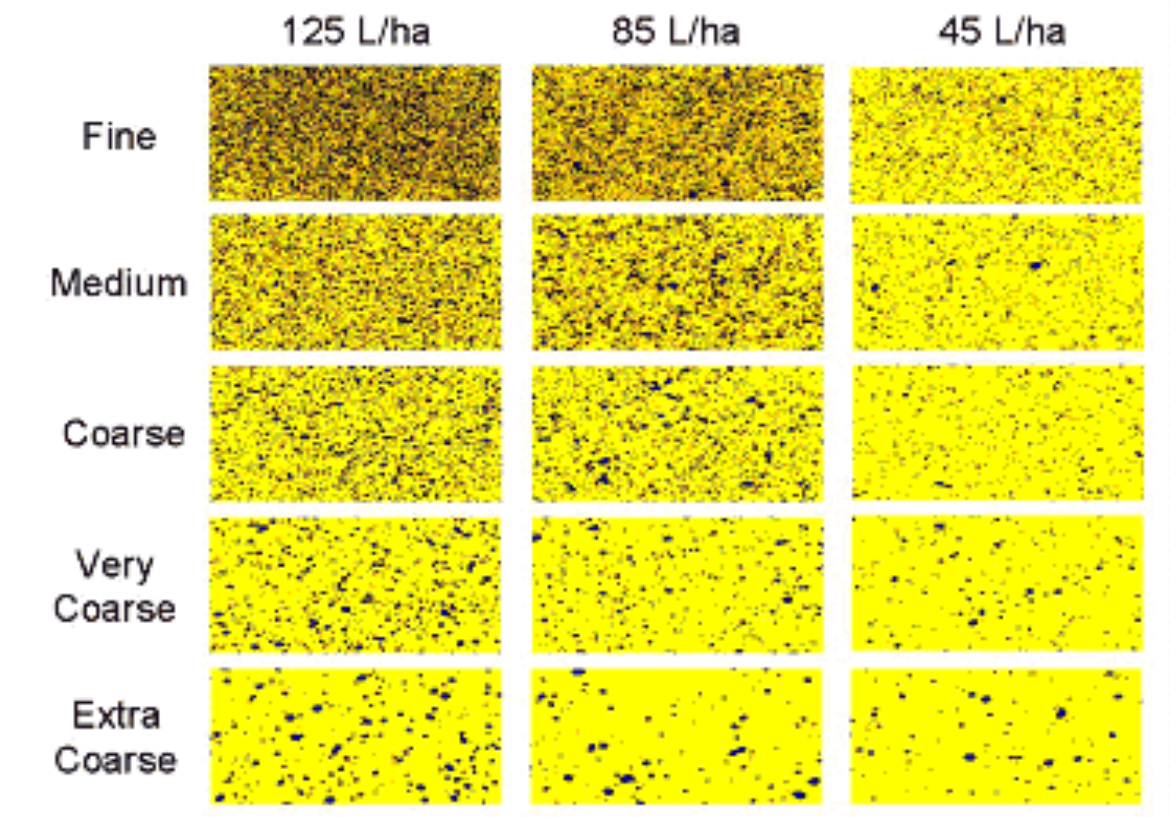
Label info



- Spray quality defined as :-
- Fine
- Medium
- Coarse
- Influenced by nozzle type and operating pressure
- Higher the pressure the finer the droplets

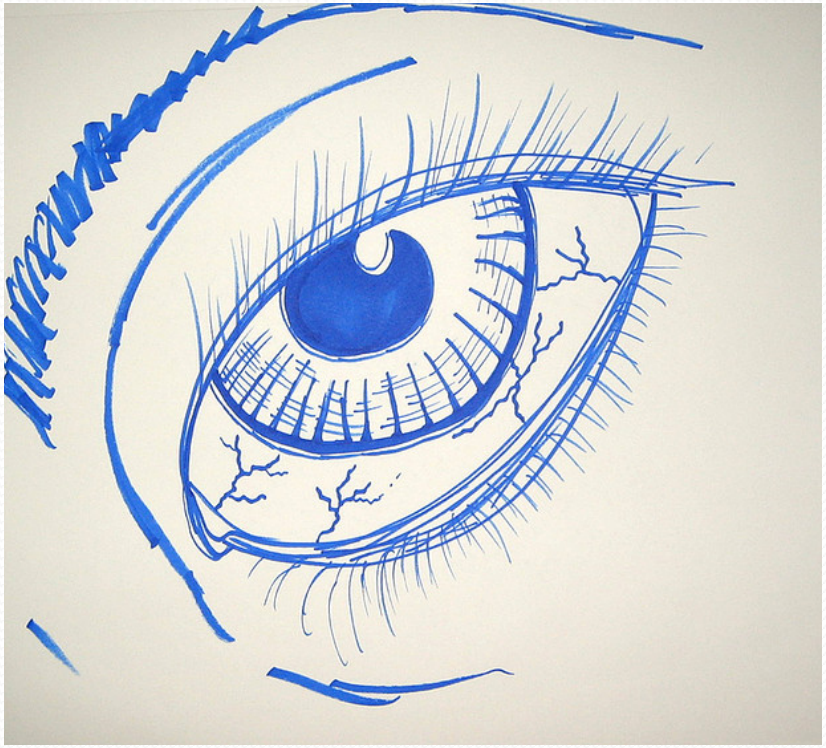
Spray quality

	Risk of drift	Penetration	Retention	Microns
Fine	High	Low	Very good	101-200
Medium	Moderate	Good	Good	201-300
Coarse	Low	High	Moderate	301+



Personal Safety & Contamination

- Inhalation, ingestion, absorption
- Eating, drinking, smoking, using toilet
- Symptoms :
- Headache
- Nausea
- Stomach pain/vomiting
- Eye irritation
- Rash
- Tremors etc.



Personal contamination

- Stop work
- If necessary call medical help
- Prevent further exposure / remove from area
- Remove contaminated clothing
- Wash contaminated skin, eyes or hair thoroughly with clean water
- Administer first aid if necessary
- Active ingredient, product label, MSDS available to medical personnel

Personnel Protective Equipment (PPE)

- PPE must comply with conditions of approval on product label
- PPE must be made to an appropriate standard
- Equipment that meets this European standard will carry a CE mark
- Must be regularly checked for defects
- Faults should be reported and dealt with

PPE

- Coveralls
- Gloves
- Faceshield
- Footwear (waterproof)
- Respiratory protective equipment (RPE)
- Must all fit properly
- Consult product label or MSDS for type

PPE coveralls

CEN types	Protection against
Type 3	Liquid jets
Type 4	Sprays
Type 5	Solid particles
Type 6	Liquid splashes & solid particles

- Sleeves worn over gloves
- Coverall legs over boots

PPE gloves

- Consult pesticide label or specific COSHH assessment for type
- Otherwise nitrile rubber
- 0.5 mm thick
- 300 mm long

- Remove when entering clean areas eg. cabs
- First on last off

PPE face shields

- Full face protection
- Anti mist
- Not scratched / damaged

- Boots – water proof
- Wellington boots best

PPE respirators

- See product label or COSHH assessment for type
- Potential dust particles or spray droplets in the air
- Potential vapour in air
- Must fit face properly
- Proper maintenance and record keeping essential

PPE Storage & Cleaning

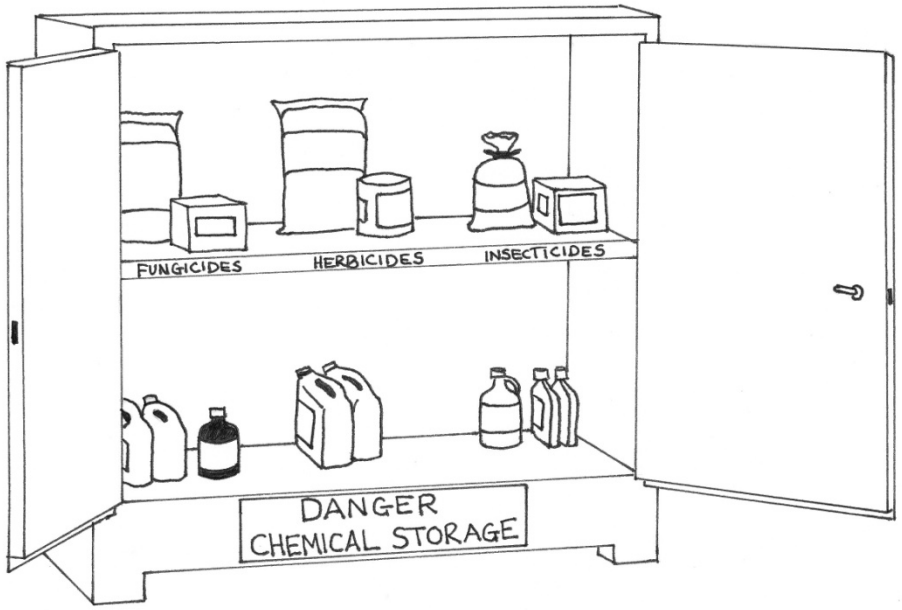
- PPE cleaning must not contaminate the environment, especially water.
- Never wash in domestic washing machine
- Gloves should be washed inside and out
- Discarded PPE should be disposed of safely and legally
- Should be stored separately in a clean, dry, ventilated and secure facility

Pesticide containment and storage

- Precautions to reduce chances of spillage
- Check container condition – damaged, leakage, securely closed
- Do not leave containers unattended
- Return unused concentrate back to store
- Risk to children, pets, livestock etc.

Storage

- www.hse.gov.uk
- Don't store unapproved or unwanted pesticides
- Use oldest stock first
- Store powders above liquids
- Segregate different products
- Up to date stock list – 2 copies, 1 in store and 1 nearby in case of emergency eg. fire



Transporting pesticides

- You should never carry pesticides in the cab of a tractor, self propelled equipment or other vehicle
- Use a vehicle with a bulkhead between the cab and load compartment
- Or a secure enclosed chemical container
- Or secure container mounted outside the vehicle or on a trailer
- Carry MSDS and spill kit

Leaking containers/ spillages

- Wear suitable PPE – see label or COSHH assessment
- Keep people and animals away from contaminated area
- Contain any spillage immediately and dispose of any contaminated material safely and legally
- Transfer contents to an identical container, or place the leaking container inside another container to prevent further leakage
- Containers must be clearly labelled
- Soak up spillages with an inert material eg sand or cat litter
- If appropriate inform authorities and neighbours

Waste packaging and empties

- Read product label for recommendations
- Containers should be triple rinsed and drained, rinse water being placed in spray tank
- Rinsed foil seals should be placed inside the container and lid firmly replaced.
- Empties should then be securely contained in a weather proof area away from stored pesticide (either in a separate store or in a separate area of the chemical store) until disposal.

Container disposal

- Licensed waste disposal contractor
- Licensed waste disposal site that accepts rinsed containers
- Licensed incineration
- Returnable containers should be dealt with according to the label instructions

Chemical Disposal

- Avoid the need for disposal if possible
- Accurate :- Calculation
- Area
- Calibration
- Mixing
- Application

Disposal – surplus concentrate

- Return to supplier if possible
- Where possible use in an approved way
- If approval withdrawn there is usually a "wind-down" period to use up remaining stock (except for major safety concerns)
- Approved waste disposal contractor

Disposal records

- You must fill in a “consignment note” if you are moving or disposing of “hazardous” waste
- A copy of which must be kept for 3 years

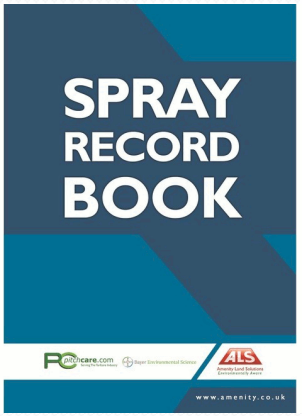
- A waste “transfer note” is needed for other waste
- A copy of which must be kept for 2 years

- www.environment-agency.gov.uk for waste classification

Disposal – surplus mix

- Find more use
- Spray over area again – but ONLY if it meets conditions of approval eg dose rate, number of applications etc.
- Licensed use of an approved bio bed
- Licensed use of an approved treatment plant
- Licensed disposal contractor

Record Keeping



- Pesticide store records (up to date)
- Pesticide treatment records (to be decided)
- LERAPs 3 yrs
- COSHH assessment (until revised)
- Environmental assessment (until revised)
- Maintenance/inspection records (PPE, RPE, application machinery) 5yrs
- Disposal records 2/3 yrs
- Training/CPD

Spray drift

- Pesticides must be targeted at the land, crop, structure, material or area you want to treat.
- Pesticide drift off target can affect neighbours, wildlife, plants, water courses and water supplies.

Causes of spray drift

- Wind speed
- Height of spray nozzle
- Spray quality (nozzle type and spray pressure)
- Speed of travel
- Local atmospheric conditions eg thermals
- Equipment condition/settings

Wind speed and Beaufort scale

Less than 2 km/h (Less than 1.2 mph)	Force 0	Calm		Smoke rises vertically	Only use medium or coarse spray quality
2 - 3.2 km/h (1.2 - 2 mph)	Force 1	Light air		Direction shown by smoke drift	Acceptable spraying conditions
3.2 - 6.5 km/h (2 - 4 mph)	Force 2	Light Breeze		Leaves rustle, wind felt on face	Ideal spraying conditions
6.5 - 9.6 km/h (4 - 6 mph)	Force 3	Gentle Breeze		Leaves and twigs in constant motion	Increased risk of spray drift. Take special care
9.6 - 14.5 km/h (6 - 9 mph)	Force 4	Moderate		Small branches moved, raises dust or loose paper	Spraying inadvisable

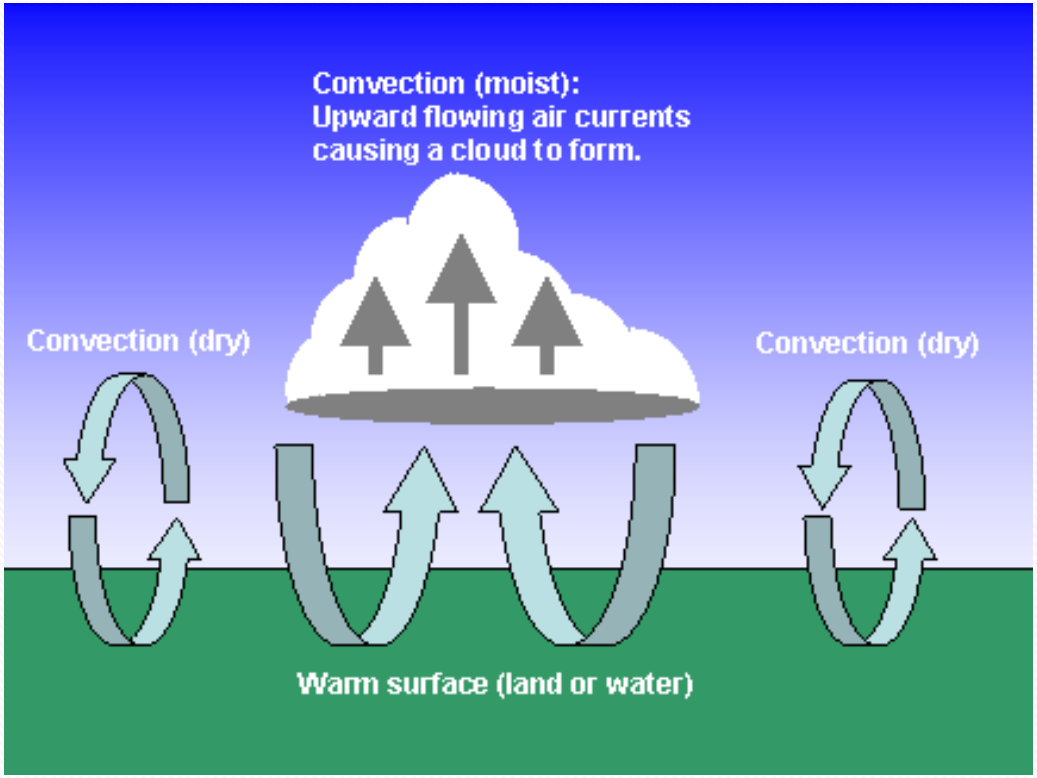
Weather

- Safest conditions :- Cool and humid with a steady wind speed 2-4 miles/hour blowing away from sensitive areas

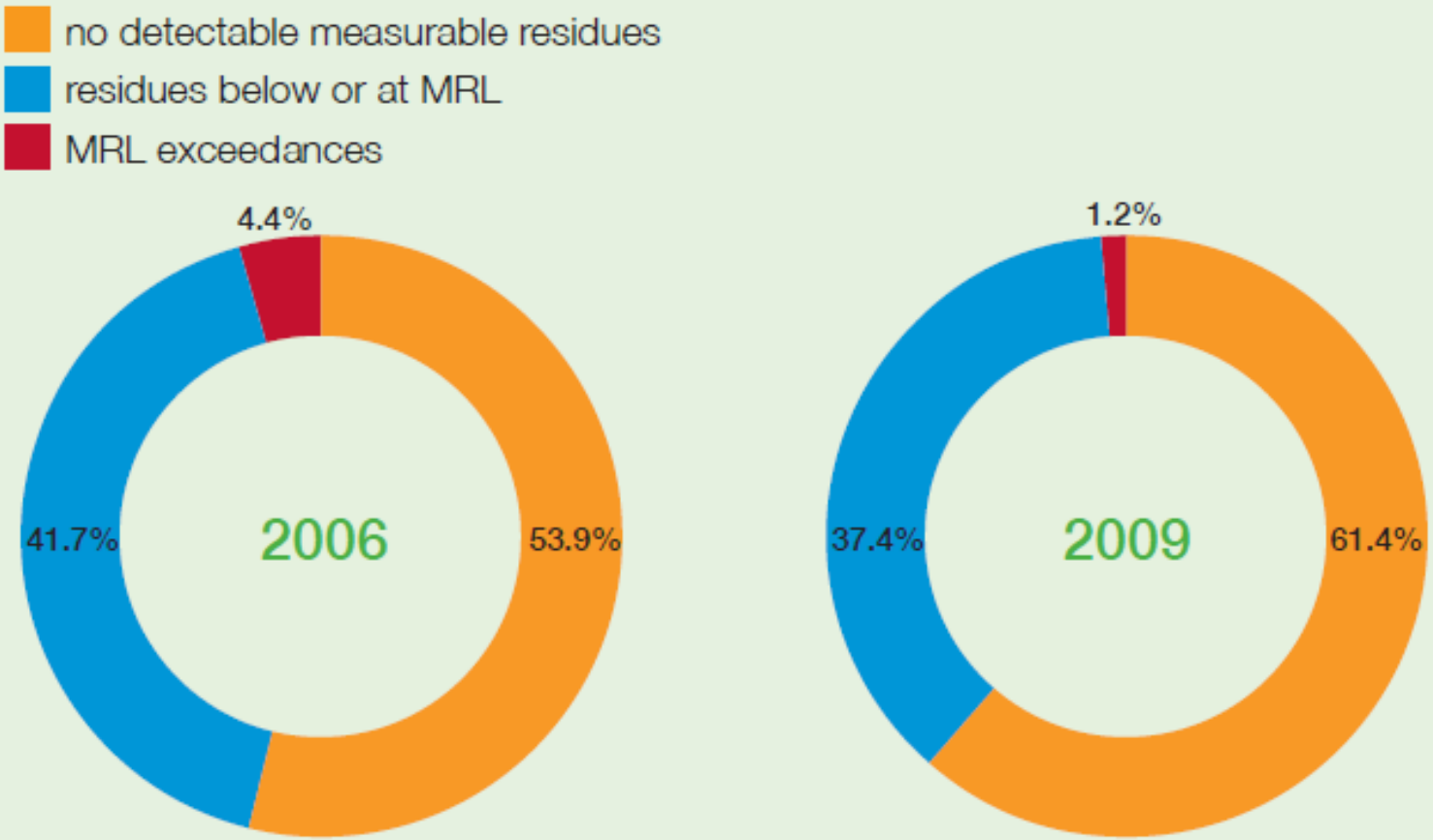
- Avoid weather with :- little or no wind under a clear sky in the morning or evening, when air layers do not mix, as any drift may hang over the treated area until carried away by unexpected air movements.

Weather

- Avoid : low winds on warm sunny afternoons when humidity is low
- Avoid : temperatures above 30 C, as rising air currents may carry droplets and vapour in unexpected ways



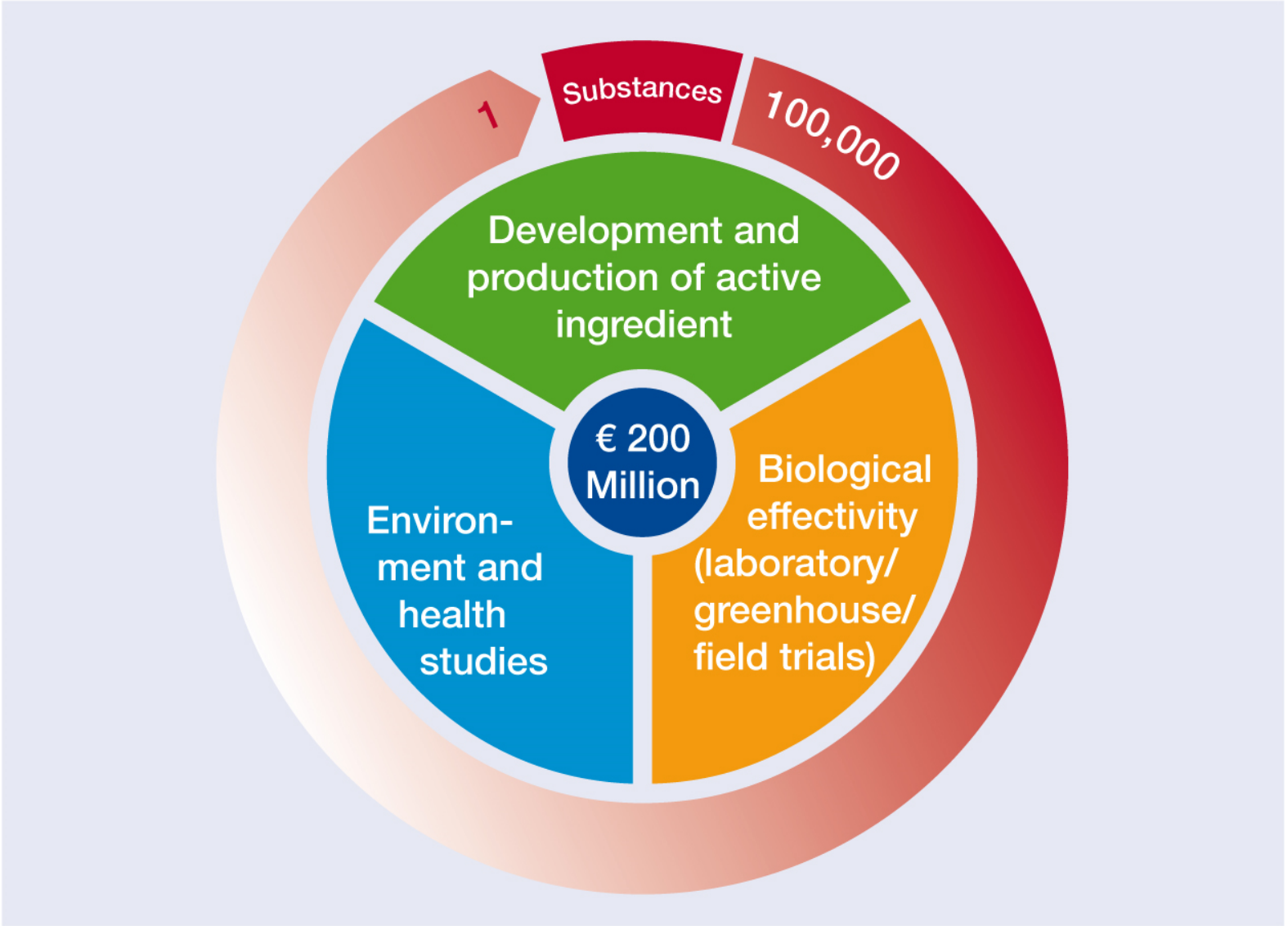
RESULTS OF THE EU COORDINATED MONITORING PROGRAM FOR RESIDUES IN FOOD



Note: Identical food commodities were analyzed in both years but more pesticides were included in the 2009 analysis.

Source: EFSA, 2011

DEVELOPMENT OF A NEW PESTICIDE



Source: Industrieverband Agrar e.V. (IVA)

Finally

- If you follow the Code of Practice you will stay within the law
- PA 1 is knowledge of the code of practice