AMENITY BACKGROUNDER-
Q & A ON PESTICIDES & THE WATER FRAMEWORK DIRECTIVE NOV, 2009

With the withdrawal of many residual herbicides like atrazine, simazine, diuron, imazapyr, isoproturon and trifluralin from the market due to detection in water, there are inevitably more questions as to the possible consequences for the future of other pesticides under the Water Framework Directive (2000/06/EC). Some of the most frequently asked questions aimed at the amenity sector are addressed here.

1. What are the rules about pesticides in water under the Water Framework Directive?

The Water Framework Directive (2000,/06/EC0),(WFD), aims to achieve good status for all waters, which are defined as follows:

Groundwater means all water which is below the surface of the ground in the saturation zone. When the saturated material is sufficiently abundant and permeable to be capable of yielding significant quantities of water to wells and springs, it is termed an aquifer.

Surface water is water which flows over, or rests on, the surface of a land mass, i.e. lakes, wetlands, steams, rivers.

Drinking water is water intended for human consumption either in its original state or after treatment, regardless of origin.

Under Article 7 of the Water Framework Directive a Maximum Admissible Concentration (MAC) value of 0.1 micrograms per litre ,(ug/l or 0.1 part per billion) has been set for any single pesticide active substance *in drinking water and groundwater intended for drinking water.* Such areas have been designated Drinking Water Protected Areas.

By ensuring pesticide levels are low water companies aim to reduce the huge cost of removal of pesticides from water used for drinking.

2. Does the presence of pesticide in water necessarily mean a threat to human health or the environment?

No. Pesticides like other substances vary in their toxicity, but pesticides are not approved for sale and use in the UK unless they meet stringent safety standards.

The 0.1 ug/l limit is not based on any form of risk assessment but simply on a desire to have no pesticides in water, so it was set arbitrarily at around the limit of detection for most pesticides.

To put this in perspective compare the USA where the Environmental Protection Agency (EPA) set legal limit values for pesticides in drinking water expressed as Maximum Contaminant Level, (MCL), based on individual pesticide risk assessments and the World Health Organisation (WHO) which bases the limit on the human toxicity of the pesticide. So for example glyphosate has a limit of 0.1 micrograms per litre in the EU, 700 micrograms per litre in the USA and a WHO safe limit of 5,000 micrograms per litre.

It is important to realise that water running from surface drains is neither ground water nor drinking water, but water agencies across the EU would like all waters to meet the drinking water limit and all forms of pesticide entering watercourse will need to be addressed by the industry.

3 . How will pesticides monitoring in water be carried out?

The Environment Agency,(EA) and SEPA in Scotland are charged with the implementation of the WFD and undertake regular monitoring across the UK.

A new Priority Substances Directive (PSD) came into force in 2008 which identifies 33 Priority Substances (PS) which will be subject to monitoring and more importantly emission control. In order to carry out the monitoring Environmental Quality Standards (EQS) will be established to measure actual detections against the threshold EQS levels which will indicate a decline in water quality status. EQS levels will be based on toxicity and risk assessments. The most harmful PS are designated Priority Hazardous Substances (PHS) and will be phased out. There are no approved pesticides in the PHS category but the PS include persistent insecticides like DDT, Aldrin, dieldrin and chlorpyrifos, most already banned in the EU, plus the following residual herbicides: diuron, atrazine, simazine, trifluralin, isoproturon and alachlor - all of which are already banned in the EU.

The PSD also allows for further PS to be considered at both EU and country level to identify substances of concern which "present a significant risk to or via the aquatic environment". Proposed under this category is the brassica herbicide bentazon, the mildewicide quinoxyfen, the hormone herbicide mecoprop, AMPA (a breakdown product of detergents and glyphosate) and glyphosate, the most widely used of all herbicides. The new PS have not yet been confirmed but EQS levels are currently under discussion.

For amenity users designation of both mecoprop and glyphosate as PS will require close attention to detail to ensure Best Practice is carried out at all times in order to ensure compliance with EQS in water in order to retain the current approvals.

4. What will be the consequence of finding pesticide water?

EA monitoring particularly targets pesticides classed as PS and if they consistently find a pesticide exceeding the EQS they can force changes in its use. The EA has powers under the WFD to create Water Protection Zones where modifications to the use of pesticides might be imposed, eg rates and timings may be restricted, or compulsory buffers introduced.

5. What is the risk of water contamination from using pesticides in the amenity sector?

The highest risk of water contamination in all sectors comes from point source contamination during mixing, filling and container disposal and can be almost entirely eliminated by Best Practice during use. Remember EA monitoring will not identify the source of a pesticide, so all sides of the industry must work together. The Voluntary Initiative has worked hard for over 5 years in the agricultural sector to introduce Best Practice. Under the UK Pesticide Strategy the Home and Garden sector is now working on a similar plan for amateur use and the Amenity Action Plan is already underway with promotion of Best Practice through the Amenity Forum, the CPA, manufacturers and industry initiatives like TOPPS.

6. Why is application of herbicide to hard surfaces a particular threat to water?

Application to permeable surfaces such as soil and gravel overlying soil gives opportunity for pesticides to be locked up in the soil and gradually degraded rather than being washed straight into the nearest watercourse.

Hard surfaces include highways, pavements and paths made of Tarmac/asphalt and concrete and these are top of the priority list because any run-off will enter straight into drains and watercourses.

A very practical and cost effective way to address this issue is by applying foliar acting herbicides as a spot treatment, either manually with handheld equipment by eye or using some of the more sophisticated infra-red weed detection units which turn on only when plant material is detected. This has the further benefit of reducing the amount of herbicide used demonstrating minimum pesticide use as well as reducing the cost.

Run-off from spot-treated leaf material once it has dried is minimal because the herbicide is trapped inside the plant breaking down gradually as the plant dies and the tissue rots.

The use of residual herbicides on hard surfaces has been a popular option in the past but since the loss of diuron and diclobenil this choice will soon be gone on all hard surfaces except railway ballast.

7. What can I do to make sure the pesticides I use don't end up in water?

Follow Best Practice at all times! It is mostly common sense and includes:

- Use the minimum pesticide rate necessary to do the job. Use a BASIS qualified adviser for recommendations.
- Only use NPTC trained operators and if employing contractors make sure they are Amenity Assured.
- Avoid point source contamination during storage, mixing, filling, washing and disposal procedures.
- Using properly calibrated and maintained equipment.
- Minimise drift
    - Using specialist equipment like CDA, (Controlled Droplet Applicators) or shrouded sprayers or low drift nozzles in conventional hydraulic sprayers
    - Spray at correct pressures to ensure no drifting fines are produced.
    - Do not exceed advised boom height above target.
- Watch the weather forecast
    - Do not spray in windy conditions of >10kph or when temperatures are >25 $^{\circ}$C
    - Do not spray pesticides which need to dry on the leaf if rain is expected within the required rain-free period.
- Follow Decision Trees for particular pesticides where they exist (See VI information sheets)
- Spot treat weeds on hard surfaces
- Observe buffer zones near watercourses e.g LERAPS.
    - Do not directly overspray drains
    - Only spray in or near watercourses with EA/SEPA permission

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