Container design, spillages and recycling

This paper documents the range of responses received to Alastair Leake’s initial series of prompts which were circulated after the June meeting of the Pesticides Forum. It does not represent a coherent set of recommendations, at this stage being more ‘work in progress’, but it is hoped that the recommendations might eventually result from the Forum’s discussions in this area.

There was general agreement that this paper raised complex issues, touching on many sectors and participants. Packaging, levels of contamination and appropriate recycling and disposal routes were seen by many to be the biggest waste issue the industry faces.

Container drainage

The ACP guidelines state that ‘Containers must drain well with no internal recesses which could trap the product’ yet a number of containers do not meet this standard. The European Crop Protection Association (ECPA)’s basic requirements state that containers ‘should drain well and facilitate easy and effective rinsing to maximize product residue removal’. This falls short of the ‘must’ in our own (UK) guidelines but does require manufacturers to audit their packaging.

Should the Voluntary Initiative (VI) look at container rinsing systems and promote best practice amongst users?

This question did not elicit many responses, although there was some endorsement of the suggestion. The Amenity Forum pointed out that effective use of rinsing systems had been covered in the NRoSO road shows of about 3 years ago.

However, the activity of rinsing out small and large containers potentially gives rise to unnecessary exposure. Exposure to pesticide concentrates can leave skin vulnerable to high concentrations of chemical, which can be absorbed faster than diluted material. Therefore, any reduction of such exposure is something to be aimed for.

Is improving container cleansing a priority?

Some respondents asked whether there was a significant problem regarding this issue, certainly for containers for current products. It was pointed out that PSD has a pourability test requirement (CIPAC MT 148) which must be met in order to obtain registration in the UK. Each new formulation/container combination (for oil in water formulations, suspension concentrate and supoemulsions, where the product adhering to the packaging is likely to present a problem) has to pass this test, demonstrating that the product can be rinsed out of the container properly. Pourability is an important consideration in the development of new packaging and manufacturers are working to improve this feature.

The question was also raised as to why, if packaging is controlled by the pesticides approval process, do some containers still fall below the standard specified by the ACP guidelines? It would seem to make sense to work with manufacturers and suppliers to ensure that all packaging is capable of draining freely. Containers should be designed to minimise dead space.
It was pointed out that there are major differences between the performance of well
designed containers and cheaper versions. Moreover, it was frustrating for users who
have invested in container-rinsing nozzles, only to find that the size or shape of a particular
container precludes their use. In addition, is it feasible to ask small farmers to invest in
rinsing systems and would they use them? How are the vessels to be disposed of once
rinsed?

The need to spread awareness of best practice on rinsing was stressed. It is important to
take steps to avoid inadequately rinsed containers. Such specimens will be classified as
hazardous waste under new waste rules, ultimately costing the farmer more in disposal. If
rinsing is necessary, then the size of the container needs to be considered. A lot of advice
is already available in section five of the Pesticides Code of Practice (COP), the Voluntary
Initiative website (www.voluntaryinitiative.org.uk/attachments/BPG%20Container%20Cleaning.pdf)
and the TOPPS project.

No one was strongly in favour of additional guidance, but rather that the existing guidelines
should be emphasised, with farmers being alerted to the cost implications of not following
them.

Although several respondents focused on the financial impact of inadequately rinsed
containers, one emphasised the environmental angle in that it presented a serious
impediment to their being recycled. On this basis, they argued that any and everything
that can be done to improve container design, and best practice to facilitate this, should be
promoted.

Foil cap seals

ACP Guidance is that ‘primary closures and secondary seals must be such that they may
be removed with the gloved hand. Ideally closures and seals should not require the use of
implements for their removal or the effective re-sealing of the container’. No advice is
offered regarding the cleaning and disposal of seals.

Is improving container seals a priority?

A closure that can be removed in one simple movement, along with the cap, with no foil
seal was called for. The ideal was seen to be the elimination of foil seals altogether. (It
was noted that containers seem to be sufficiently leak proof once opened in any case.)
HSE reported that they are not aware of any serious problems with the design of current
container seals, although noted that at least one manufacturer has developed a container
that does not require a foil seal. Manufacturers are working on improving seals, although
this is not a top priority.

In the interim, could adequately washed seals be recycled? For a liquid, the seal will not
be significantly contaminated, with the major source of contamination being the act of
pouring. Returnable containers were also cited as a route to bypassing the problems.

One respondent suggested that promoting best practice might be more of a priority (advice
is already being disseminated by the VI in the H2OK? campaign and in a VI/EA leaflet on
pesticide handling) and recommended that the advice in the COP and elsewhere be reviewed to ensure that it is adequate.

**Should guidelines be drawn up for best practice for seal handling and disposal?**

The EA strongly endorsed this recommendation, pointing out the significance of the Cherwell Project in demonstrating that concentrated active ingredient on seals is a potential cause of water pollution. This was pointed out to be variable, however, depending on the product and resilience of the cap.

But HSE argued that the risk associated with the careless disposal of foil cap seals is already highlighted in Section 3.8.10 of the COP and advice on their cleansing and disposal is given in Section 5.6 of the COP. The correct method of cleansing and disposal of seals should also be covered in the operator's instruction and training, so HSE were not convinced that any more written guidance is necessary.

Similarly, it was noted that the VI and the TOPPS programme have already gone a long way into looking at guidelines/best practice in container handling to avoid the risk of water contamination, and these efforts should not be bypassed or duplicated unnecessarily.

**Container labels**

All guidance states that labels must be firmly or securely attached to the container. No guidance is offered on the materials which the label is made of other than that they should be resistant to the elements, including immersion. No advice is offered on label removal, contamination or disposal.

**Is improving container label removal and disposal a priority?**

This is a difficult area since there are conflicting demands, and opinion was divided. According to current legislation, labels have to stay on the container and be durable. Label material selection is driven by cost and environmental considerations. Paper and plastic are both used. The comment was made that recycling processes in other countries seem to be able to cope with the attached labels.

Containers are currently sent away for disposal with the labels intact, attached to the container. Because labels are hard to remove, they can ruin segregation for recycling pesticide containers. It was suggested that the impact of labels on the tonnage of pesticide containers disposed of versus recycled should be investigated and solutions developed to increase ‘recyclability’.

Some felt that it was not a priority area; others that it demanded a complete rethink of what needs to be presented on the label on a container and what could be provided via other routes such as the internet. The complete removal of paper was suggested, with direct printing on to containers. This might be driven by a stakeholder initiative, with the Pesticides Forum or the Voluntary Initiative suggested as suitable proponents.

The CHIP Regulations (www.hse.gov.uk/chip/) now apply to pesticides and set out requirements for labelling. But they do not appear to include advice about label removal post decontamination and prior to disposal?
Training

Many containers remain contaminated because they have been inadequately washed by the spray operator.

Could guidance to farmers on washing equipment and procedures be improved?

Not many respondents commented directly on this question, but those that did think that guidance could be improved.

A couple of respondents asked to see the underlying evidence for the assertion that many containers remain contaminated. It was pointed out that there are standards regarding the performance of container rinsing systems, but that these say nothing about container design or operator training. AEA members were involved in developing and testing the triple rinsing protocols and were under the impression that these had been shown to work in practice, leading to an acceptance of pesticide container recycling.

Could training be improved under the BASIS Certificate in Crop Protection and NRoSO scheme or come under the VI remit?

Tuition is currently provided during initial operator training and backed up by NRoSO training updates. The BASIS Certificate in Crop Protection is not a qualification that most sprayer operators will have taken and was not perceived to be relevant in this context.

It was generally agreed that many operators and users would probably benefit from better/more training on the safe disposal of waste (both products and packaging) and the cleaning of application equipment. The NRoSO Syllabus Group has been considering subjects for a rolling programme of training themes and these two subjects have been suggested for inclusion.

The waste disposal companies were also suggested as a potential route for getting the best practice messages across to farmers; as was the VI for practices relating specifically to rinsing.

Finally, it was suggested that improvements to the design of containers would naturally improve washing methods. Evidence on the cost of well rinsed versus poorly rinsed containers could be published and communicated via NRoSO training to encourage improvements in practice.

Plastics

How feasible is it for the industry to adopt a single polymer for containers?

It was pointed out that this would be difficult as different products need different materials to be effective against permeation and degradation. However, it was argued that any steps to reduce the number of polymers and facilitate better labelling, will lead to more efficient recycling. And it was also suggested that research might be undertaken to understand the potential for reducing the number of polymers with different pesticide formulations.

If not, how feasible is it to mark the containers clearly with the polymer code?
Under existing Producer Responsibility Obligations (Packaging) Regulations 2007, as amended, plastic (polymer) symbols can be found on packaging plastics used on farms. It was felt that a clearly visible symbol code should be possible (with drinks manufacturers being cited as a current example), with large, clear icons requested.

**Recycling**

At the moment, foil pouches, cardboard boxes with foil liners, and paper bags with plastic liners are not recyclable.

*Is it a realistic aim for all approved pesticides to be packaged in materials that can be recycled?*

This question elicited a range of opinions. Some felt that it was currently not realistic. Certain products have to be put in packs with specific barriers, such as foil, to ensure that they can be stored safely for at least 2 years. However, liners can be removed from cardboard boxes, which can then be recycled.

Others felt that the ideal situation would be for all packaging to be either returned and reused or recycled. A preference order for containers was suggested. (For example, are card and a soluble inner preferred from a recycling point of view, or is plastic better?)

Problems with flexible packaging and wettable powder formulations were mentioned, as they prevent the packaging from being decontaminated to a level below the hazardous waste threshold. Changing packaging types and product formulation could prevent this.

Guidelines to manufacturers would be a help. Previously they have not had to factor waste management issues into their product design. Now the industry is part of mainstream waste controls, this issue needs to be given much greater consideration if we are to avoid the problem of orphan waste streams in the industry.

Some suggested that returnable and therefore reusable containers should be the standard packaging. A national scheme, whereby all empty containers are returned to manufacturers for re-use, was posited.

**Disposal**

The regulations allow farmers, under exemption, to transport waste to a permitted site for recovery. This is a threat to groundwater. Some operators are offering skip disposal with no segregation. Waste which is contaminated and deemed to be non-recyclable is then destined for landfill.

*Is it a realistic aim for landfill and the use of mixed skips to be ruled out as a disposal option for pesticide packaging?*

Most felt that all pesticide packaging that is not contaminated, or which can be decontaminated, should go for recycling or recovery. Landfill is already no longer an option in many countries, and is a limited resource in this one. Disposal of contaminated pesticide waste to a licensed landfill site is an expensive option and not one that many farmers and growers would willingly want to follow.
Some felt, however, that landfill should be used where it presented the most appropriate route. Would the EA permit disposal of hazardous waste to a landfill site if it posed a threat to groundwater? Presumably, the site would not be licensed to handle hazardous waste if that were the case. But the use of mixed skips should be discouraged as this leads to hazardous waste being combined with non-hazardous waste, poor waste descriptions, and breaches of the duty of care and hazard waste regulations. Waste producers should be encouraged to segregate at point of production as this helps to promote better waste management and reduces disposal costs.

It was argued that the best option for contaminated waste (apart from reduction at source) was incineration with energy recovery. Clearly, contaminated waste must be stored separately from uncontaminated/thoroughly cleaned waste to avoid contaminating the whole load.

AEA has a long-standing position of supporting the development of standard container-machine interfaces which promote safer container handling and management, by allowing the successful development of systems such as Direct Injection and Closed Transfer. Such approaches can improve both operator and environmental safety.

Supermarkets and emerging protocols

UKFPCA (UK Farm Plastics Collectors Association) reports that companies are increasingly being asked to authenticate their service i.e. prove that they are recycling. It is likely that the supermarkets will soon be incorporating waste management into their protocols.

Would it be preferable for agriculture to self-regulate rather than respond to demands from the supermarkets?

There was widespread agreement on this proposal. All farms, as standard, should have an effective system to manage their waste ensuring they minimise its cost (financial and environmental) through good practices. One respondent asked whether effective waste management could be integrated into Assured Produce Schemes.

However, it was also pointed out that the farmer, as the waste producer, is not trained to make a judgement as to whether the material is hazardous, can be recycled, and so on. All parties (manufacturers, suppliers, users, recyclers) need to come together in the interests of creating a dedicated disposal/decontamination/recycling service, essential if containers are to be rinsed and disposed of whilst limiting the exposure of operators using the product.

Alastair Leake
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