Pesticides Forum Container Management Working Group Report

Background

The legislative context

There are three major areas as background to the Working Group’s discussions:

- **2007 Waste Strategy**, published by the previous Government with its emphasis upon reducing waste and re-using, recycling and recovering value from what remains.


The Review will look at all aspects of waste policy and delivery in England. Its main aim will be to ensure that the right steps are being taken towards creating a ‘zero waste’ economy, where resources are fully valued, and nothing of value gets thrown away.

This is a review of waste policies in England only, although it will consider whether lessons can be learned from experiences in other parts of the UK. Waste policy in Wales, Scotland and Northern Ireland is the responsibility of the respective administrations.

- The **EU Sustainable Use Directive (2009/128/EC)** which will place the following obligations on Member States:
  - To take measures to ensure handling and storage of pesticides, and treatment of packaging, unused products and mixtures, do not endanger human health or the environment
  - To provide up to date and appropriate training for sprayer operators, distributors and advisers
  - Distributors selling pesticides to provide specific information to customers on responsible pesticide use, with an emphasis upon health and environmental safety
  - Distributors selling to non-professional users to provide information on risks and appropriate practice in relation to storage, handling, application and disposal
  - To provide balanced information to the general public about risks for human health and the environment arising from the use of pesticides

Objectives

On behalf of the Pesticides Forum, the Container Management Working Group will identify, document and promote expertise and best practice in relation to the design, storage and disposal of pesticide containers and packaging.
In order to do this the Working Group will:

- Develop a time-tabled work plan which will result in an interim report for the Pesticides Forum by June 2010
- Where necessary, report on progress to the Pesticides Forum at its main meetings
- Review existing good practice
- Identify relevant new issues (including changes to regulations and practices) and recommend approaches as appropriate
- Liaise with the Crop Protection Association, the Agricultural Industries Confederation and individual companies on ways to improve container design and production
- Identify and engage with other relevant stakeholders, including manufacturing companies, to improve practice in container design, management, use and recycling of the plastics
- Consider how the volume of containers being disposed of via landfill might be reduced
- Develop advice for farmers and operators on the range of disposal options available, define best practice and seek ways to reduce illegal disposal of pesticide containers by working with stakeholders
- Produce a specific set of recommendations and identify appropriate recipients, for actions to be taken immediately
- Identify any areas of where information is lacking or areas of uncertainty where the Pesticides Forum may decide to investigate further
- Identify any resource implications arising from actions in this area
- Identify any appropriate targets and/or indicators

The ‘on farm’ situation

During 2006 the waste control regulations became applicable to farms in England and Wales\(^1\) for the first time. From this date on-farm burning or burial of agricultural waste became an offence. The changes in the law meant that many previously recommended disposal routes, for example burning used pesticide containers in drum incinerators, were no longer permitted.

Farmers can choose a number of legal means of disposal including taking their waste to suitably authorised disposal sites\(^2\), commercial waste collection arrangements or more specialist farm waste recycling schemes. Farmers are free to decide which option they take and their choice will depend on cost, convenience or environmental motives. Any company collecting farm wastes must have the

\(^1\) Scotland and Northern Ireland have devolved authority to pass legislation on waste control.
\(^2\) suitably authorised disposal site in England and Wales means a site which has either an environmental permit allowing it to handle that type of waste or waste exemption registered with the Environment Agency. In Scotland and Northern Ireland it means a site which has either a waste management licence, pollution prevention control permit or an exemption registered with the relevant authority.
appropriate EA permits or exemptions to handle the particular waste stream and issue waste transfer notes to farmers supplying them.

As yet, and unlike many other EU Directives, the Waste Framework Directive (75/442/EEC, as amended) is not part of Cross Compliance obligations which farmers need to observe to avoid being in breach of their Single Payment Scheme obligations. However many of the Farm Assurance Schemes do include waste management auditing so farmers involved in these schemes will be subject to inspection.

**Progress and recommendations**

The Working Group considered the existing container design recommendations which are just short of 20 years old. Whilst many of the design requirements for the safe containment, transport and handling of the containers remain unchanged, no consideration is given in the recommendations to means of disposal beyond the then recommended norm of on-farm incineration. There was therefore a need for the Working Group to consider aspects of container design and packaging which impact on all other methods of disposal, including landfill or recycling.

The discussions involved all the Working Group members with contributions from other stakeholders. The following issues were raised, researched and discussed:

a) Use of foil seals, rinsing and disposal  
b) Container shape  
c) Labels, removal and disposal  
d) Polymer type used for containers  
e) Location of polymer type logo on the container  
f) Promotion of best practice for rinsing  
g) Training and advice

**a) Foils**

Foils are used to seal the pesticide container once it has been filled. This seal is to keep the product secure inside the container and keep air and moisture out. Foil seals also act as both an anti-tamper and/or anti-counterfeiting system and have become the industry norm because of their effectiveness. From the perspective of those involved in the manufacture, filling, packing, transporting, storing and selling pesticides, either along the supply chain or to end users, their performance is highly effective.

Current Advisory Committee on Pesticides (ACP) guidance states that ‘primary closures and secondary seals (i.e. foils) 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’.

Our enquiries leave us to believe that foils do present a problem to operators. This is supported by a survey which reported that over half of sprayer operators have been known to take off their protective gloves to remove foil seals. Once the seal is removed, because it is small and light weight it is also difficult to deal with, with a gloved hand. The seals will always be contaminated with product and often
this contamination is very difficult to rinse off because it has ‘dried on’ while attached to the container. There is also evidence that, because it is difficult to handle, there is a risk that the foil might be accidently dropped. During the IPU Stewardship campaign in the River Cherwell catchment the observers calculated that up to 1g of pesticide (in this case Isoproturon) concentrate could be retained by the foil and if dropped on a hard surface could result in contamination of local water course at above the 0.1 part per billion level. Just 1g on a foil seal would require to be diluted by 10 million litres of water\(^3\) to meet the European maximum limit for a pesticide in drinking water.

The most recent advice from the Environment Agency reflected in the Code of Practice for using plant protection products leaflet\(^4\) gives the following guidance on what to do with the foil seal; ‘rinsed foil caps can be collected in a container and sent once a year for disposal using a waste contractor’. The Voluntary Initiative gives similar advice stating that ‘foil seals and caps may also need to be removed and stored separately’. However the most recent version of the Code itself continues to advise users to “put the rinsed foil inside the container”. In this instance the containers and seals must be triple rinsed and free from contamination to be disposed of through a permitted landfill site or incinerator. The working group is not aware of any surveys or research into the effectiveness of triple rinsing foils or how “free” from contamination they can be made to be.

Segregating the foils and caps from the containers is more suitable for recycling schemes, but creates a low volume waste stream that can go for landfill or incineration at a suitably permitted site.

The Working Group considered alternative seals. One CPA company has developed a container with a cap that contains a waterproof padded membrane which forms a seal with the top of the container. This means that once opened, if only part of the contents are used the container can be re-sealed with less risk of subsequent leakage than with a foil seal, which is removed.

The company claims that this, along with a number of other design features which assist the operator in dispensing the correct volume and rinsing the container, can halve the time taken to open and empty the containers. Consequently farmers and sprayer operators are more likely to prefer to use these products. However it would be simplistic to suggest that container design would, on its own, be sufficient to alter a purchasing decision unless all other aspects were to be equal.

The company has also included features to ensure the cap is tamper evident and have included a number of visual features and covert measures to reduce the risk of counterfeiting.

The Working Group recognised the thought and investment that CPA companies had put into foil-less seals and container design generally. However it is recognised that pesticide container manufacture, distribution and container filling is an international operation and changes require capital investment and time to implement.

\(^3\) This is the amount of water needed to fill a stream 1 metre wide, \(\frac{1}{3}\) metre deep and 35 kilometres (or 22 miles) long. Dropping a foil seal could contaminate a significant part of a river or water course.

The Pesticides Forum recommends:

1. The Voluntary Initiative (VI), in discussion with the Environment Agency should lead in the production of clear guidance for farmers and sprayer operators on how to handle foils and what is the best way to remove, wash and store. This is particularly pertinent when the foil doesn’t go back into the container. Guidance should also cover how the foil should be stored and disposed of, and whether triple rinsing of seals is both practical and sufficient to classify them as non-hazardous waste?

2. Chemicals Regulation Directorate should issue an ‘All Approval Holders’ letter encouraging the industry, where practical, to move away from foil seals to a system of self-sealing caps. The Crop Protection Association should also support this message to its member companies.

Chemicals Regulation Directorate to consider changes to the Code of Practice to include the revised advice and this should be supported by the VI organisations.

b) Container shape

The shape volume and construction of the container is determined by a number of factors. Fundamentally the container must provide a safe, leak proof and secure enclosure for the pesticide which is able to withstand normal impacts such as the full container being dropped on a hard surface. The volume of the container depends on the concentration of the product and often reflects the level of usage of the product such as in the case of a widely used active with a relatively high volume of usage. For example Glyphosate is often packaged in 20 litre containers whilst the lower dose with less frequently used actives are packaged in smaller containers.

Containers should be easy to handle to avoid spillages. For this reason most containers of 5 litres capacity or above have either an integral moulded handle or an attached handle around the container neck. Smaller containers are more easily grasped by a single hand around the vessel itself and so there is less of a requirement for a handle. Most containers are rectangular shaped with an integral moulded handle on one side of the top of the container with the pouring spout located on the other top side. Cylindrical containers have a central opening for pouring with a handle attached to the neck for ease of handling.

20L rectangular containers are often designed to be stacked on top of one another on pallets for transportation. The shoulders of the container are moulded to lock into the base of the container which is placed on top and the pouring spout sunk to below this level to allow even and secure stacking. However washing and draining this style of container is difficult as when inverted the dilute washings descend to the lowest point inside the container which is the inverted shoulders and gathers here, the outlet spout being higher.

Since the containers are designed to be stacked and are high volume they need to be constructed more robustly than lower volume unstackable containers. This robustness makes compressing them for recycling purposes much more difficult and this in turn increases the cost of transportation for recycling or disposal. However there is no requirement for cardboard outers which are needed for unstackable containers which create additional disposal requirements.
5L packs are either cylindrical or rectangular as mentioned previously. Cylindrical containers are easier to dispense from as the centrally located spout reduces ‘glugging’ and makes the container easier to rinse and drain. Rectangular containers will ‘glug’ unless emptied more slowly and this can cause splashing. Operators also report that the inner surface of the container, below the handle is difficult to rinse because the angle the surface presents to the rinsing nozzle.

The Working Group is mindful that changes to container design will require changes to the filling operation on the bottling lines and changes to the handling and packing procedures all of which may incur costs.

On 23 June 2010, the Pesticides Forum had a presentation from a CPA company on their recently introduced container with a centrally located opening which makes the container easier to rinse and drain, and also reduces ‘glugging’. The pack, which does not have a foil seal, uses at least 25% less polymer compared to standard containers and the company predicts that when it is fully launched across the portfolio, there will be a carbon saving of approximately 2,000 metric tons per year. Additionally, to simplify recycling, all components of the container are made from polyethylene, including the label. The pack also has a number of other features designed to improve on-farm efficiency.

**The Pesticides Forum recommends:**

**Chemicals Regulation Directorate** should issue an ‘All Approval Holders’ letter encouraging companies to undertake an appraisal of all stackable containers to improve the draining of rinsed containers and to encourage a move to containers with a pouring point which when inverted drains to a single point. Wider openings appear to increase the speed of emptying, reduce glugging and make the container easier to rinse and drain.

c) **Container labels**

Current guidance states that labels must be securely attached to the container and be resistant to the elements, including immersion in water. No guidance is given on the materials the label is made of or label disposal.

Labels are applied to pesticide containers by three means:

1. Paper (usually treated to be water resistant) glued directly onto the outside of the can
2. As a non waterproof folded set of instructions printed on paper but sealed in a waterproof (usually plastic) wallet which is then glued to the container.
3. As low density polyethylene (LDPE) film, with printed information which is then shrunk onto a recess around the middle of the container and secured further with a dot of adhesive.

Where the container is disposed of through landfill then the type of label is of no consequence. Where containers are sent for recycling the label needs to be removed at some point during the process before granulation. There is merit in the label remaining on the container until the point when the destruction of the container commences. This allows the processor to determine the former contents of the container should there be any contamination.
However at some point the labels need to be removed, as label residue blocks the extruders during the recycling process. In small scale recovery manual removal is an option for shrunk low density polyethylene labels and pouch types. The former can be removed by tugging the label from the can. Since the material is polyethylene it can be recycled. Pouches are more problematic, since they are a mixture of paper and polyethylene. Manual separation is not practical or cost effective and so landfill is the most appropriate means of disposal.

Paper labels adhered to the container cannot be removed by hand. Recycling plants use washing procedures to remove these labels. This is a costly process involving capital investment, water and energy and results in the creation of paper sludge. This sludge should be tested for pesticide residue contamination before it is sent to the appropriate place for disposal or recovery.

The Working Group concludes that single material waterproof labels are preferable to mixed label packaging for recycling. Labels must continue to meet the legislative requirements of being ‘securely’ attached to the container but be removable at some point during the process to suit the requirements of the recipient/processor organisation. The Working Group recognise that filling and labelling takes place across borders and that changing processes can add costs.

The Pesticides Forum recommends:

1. **Chemicals Regulation Directorate** should consider issuing an ‘All Approval Holders’ letter encouraging companies to move to a single material, waterproof, washable label(s) which can be removed from the container and recycled.

d) Polymer type used for container manufacture

The trigger for the type of polymer used for the container manufacture is the product chemistry and the compatibility between the pack and the product. Manufacturers and approval holders must meet UN requirements for compatibility and safe transit. Some polymers may be affected by the solvents used in the product formulation. Most containers are made from High Density Polyethylene (HDPE) and this represents by far the greatest volume of material. Where the chemicals used in the pesticide are more aggressive compounds the plastic is fluorinated, e.g. PTFE, but this can be recycled as a mixture with HDPE. One company exclusively uses polyethylene terephthalate (PET) which is incompatible with HDPE in a recycling operation and in all cases is manually removed. However the Working Group recognised that companies need to be able to choose the polymers which best suit their range of products and that containment, stability of product and cost effectiveness should take precedence over the needs of recycling operations, which can segregate with relative ease.

More difficulty is experienced where two non-compatible polymers are used in the manufacture of a single container, for example a PET container with a HDPE handle which cannot be removed.

The Pesticides Forum recommends

1. The **Pesticides Forum** should write to the **British Plastics Federation** asking companies using mixed plastic on their containers to examine means by which the plastics might be made separable.
e) Location of polymer type logo and code

There is no mandatory need to mark plastics. However, as an aid to recycling, the British Plastics Federation (BPF) recommends the larger parts of packaging are marked with an appropriate identification code and recommends the use of a coding system devised by the American Society of the Plastics Industry.

The codes are as follows:

- **PET** (polyethylene terephthalate)
- **HDPE** (high-density polyethylene)
- **PVC** (polyvinyl chloride)
- **LDPE** (low density polyethylene)
- **PP** (polypropylene)
- **PS** (polystyrene)
- **Other** (other types of plastics)

Moulded plastics items should be marked in accordance with ISO 11469 where practicable.

While the presence of a voluntary coding scheme is welcome, there appears to be no common location on the container for the logo. Consequently it is difficult to quickly identify the polymer in the recycling...
process. Some basic recommendations on logo placement e.g.: top/bottom/back/front would be helpful.

The Pesticides Forum recommends:

1. The Pesticides Forum should write to the British Plastics Federation encouraging the adoption of the BPF voluntary scheme for labelling pesticide containers with the polymer type logo and to ask the BPF to look at the feasibility of agreeing a common location on the container for the logo.

f) Promotion of best practice for rinsing.

The Working Group considered the industry initiatives to promote the importance of ‘triple rinsing’. Containers treated in this manner can be classified as ‘non-hazardous’ waste, which relieves the industry of both practical and administrative costs. The promotional campaigns to raise awareness appear to have been highly successful, this being borne out by container recycling operations who report, through monitoring and testing, extremely low incidences of contamination.

The Working Group noted that a number of container rinsing devices were now on the market which provides a continuous rinsing stream through a vertical nozzle or hand held pressure nozzles. The Working Group considered ‘Recycling pesticide containers from pesticides and pesticide related products’ produced by the American Society of Agricultural and Biological Engineers where the Society chose to provide distinct advice to those using continuous stream rinsing compared to the ‘reseal and agitate’ triple-rinse approach.

The Pesticides Forum recommends:

1. The Environment Agency, the VI and Chemicals Regulation Directorate should continue to promote triple rinsing as best practice.

2. The Environment Agency should be asked to advise on new guidance for continuous stream washing procedures. This advice should promoted by the VI organisations. This advice should also include guidance on how to wash those container lids that do not use foil seals.


g) Disposal

The Working Group noted that many Assurance Schemes set requirements for waste management. The new Single Payment Scheme legislation and enforcement of Cross Compliance (in particular Statutory Management Requirement (also known as SMR 9) brought aspects of ‘The code of practice for using plant protection products’ to bear on farmers and growers. Lack of compliance with SMR9 can result in penalties (a percentage removal of the single payment from the EC)). The EA have produced a re-drafted
Waste Guidance Note\(^5\) and the NAAC produced a specific standard for an Assured Land-based Contractor (Agricultural Waste Collection) Scheme\(^6\).

**The Pesticides Forum recommends:**

1. The **Voluntary Initiative** should seek to get continued cross-industry support and promotion of schemes which increase best practice in container disposal.

**h) Training and advice**

The Working Group noted the success of industry initiatives through the EA, Voluntary Initiative, NRoSO schemes etc. New legislation from the European Commission (Sustainable Use Directive 2009/128/EC and EC Authorisations Regulation 1107/2009, in particular) means updated laws will be passed in the UK which covers training, information and advice about pesticide use.

**The Pesticides Forum recommends:**

1. Advisor and operator training organisations such as **BASIS** and **City & Guilds Land Based Services** should include information from the recommendations in this Report in future operator training.

2. **Chemicals Regulation Directorate** should consider the recommendations of this Report in impending legislation and advice and amendment to the Code of Practice in light of the agreed National Action Plans.

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**Container Management Working Group**

**14 October 2010**

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**Organisations involved in the Group:**

- Game & Wildlife Conservation Trust
- Crop Protection Association
- The Co-operative Farms
- Agricultural Industries Confederation
- Country Land & Business Association
- Chemicals Regulation Directorate
- Farming & Wildlife Advisory Group
- National Farmers’ Union
- UNITE
- Agricultural Engineers Association
- Environment Agency

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\(^6\) The NAAC standard for Assured Land-based Contractor (Agricultural Waste Collection) Scheme can be found at: [http://www.naac.co.uk/Docs/Generic_Scheme_Protocol.pdf](http://www.naac.co.uk/Docs/Generic_Scheme_Protocol.pdf)