

# **Efficacy Guideline 212**

Amateur product labelling – Efficacy aspects

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## Introduction

The aim of this guideline is to provide as complete a set as possible of amateur phrases for use by applicants and the HSE Efficacy team in the development and authorisation of relevant amateur products. In doing so it is hoped to provide a consistent and more simplified approach and give clarity in supporting and drafting amateur labels. Further guidance on efficacy data requirements for amateur products is currently available in a separate guideline: 'Efficacy data requirements for Home garden products'.

This guideline only addresses efficacy related issues, for all other aspects of amateur product labelling, applicants should refer to the HSE Labelling Handbook.

## General considerations

### *Product name and claims*

If a product has a name that implies a specific effect such as 'X rapid kill' then data supporting this must be provided. If submitted data do not support the implications of the product's name then an alteration may be required, in consultation with Pesticides Delivery Team.

The name must also be appropriate to the claims of the product, ie if the product is for the control of moss only, then the product name should not imply control of weeds.

The term 'Biodegradable' is not permitted.

The Labelling Handbook indicates that the following, in relation to product naming, is not appropriate;

- a false or misleading statement concerning the composition of the product
- a false or misleading statement concerning the effectiveness of the product as a pesticide
- a false or misleading statement about the use of the product for purposes other than as a pesticide
- a false or misleading comparison with other pesticides
- a statement directly or indirectly implying that the pesticide is recommended or endorsed by HSE, any government department, other than the factual phrase 'This product is authorised under the Control of Pesticides Regulation/ The Plant Protection Product Regulations/ EU Regulation 1107/2009 or GB/NI Regulation 1107/2009'
- a false or misleading statement that the product is endorsed by another organisation
- a true statement worded in such a way as to give false or misleading impression to the purchaser

- general claims as to the safety of the pesticide or its ingredients. This includes statements such as 'safe', 'non-poisonous', 'harmless', or 'nontoxic to humans and pets' (irrespective of whether a qualifying phrase such as 'when used as directed' also appears)
- comparative statements on the safety of the product, eg 'Contains all natural ingredients', 'Among the least toxic chemicals known', and 'Safer than chemical pesticides'

### **1.1 Terminology**

Many home garden products have the basis of their authorisation on extrapolation from a professional product. It may be necessary to compare instructions on an amateur product label with that on a relevant authorised professional product. It is important that any guidance and terminology on an amateur product is clear, concise, and simple. For example:

#### **Professional product**

'Ensure soil has an even tilth'

'Scarify vigorously to remove dead moss'

#### **Amateur product**

'Work soil to remove all lumps'

'Rake vigorously to remove dead moss'.

### **1.2 Soil type and dose**

For professional products different doses may be recommended for different crops depending on the soil type. The amateur, by comparison, may have less knowledge of soil types. In such circumstances, provided that efficacy and crop safety are acceptable, it may be more appropriate to recommend one general dose for all soil types.

### **1.3 Considerations for application via ready to use spray packs**

There has been a general trend in recent years towards more convenient methods of application, eg ready to use trigger spray packs (RTU), and with no measuring or disposal of diluent these are considered safer in terms of user exposure.

Where an amateur product is based only on data from professional use (ie application via a knapsack/ or public domain data from the Weed Control Handbook (WCH)<sup>1</sup> for a herbicide). It will be necessary to check that the dose applied is equivalent, and that possible effects of differences in dilution are addressed (see section 1.4).

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1 Fryer, JD and Makepeace, RJ (Eds) (1978) Weed Control Handbook Volume II / Recommendations. Blackwell scientific publications, Oxford.

If the data do not support the proposed concentration then Efficacy require information on the dose applied in terms of amount per unit area, applied as recommended, via RTU spray packs.

Data using the RTU spray pack, as recommended, can be obtained by measuring the volume of spray after x number of squirts into a volumetric measuring cylinder and the volume recorded. The area treated via an RTU pack can be determined by applying the spray at a known height and measuring the diameter of the spray. This should be repeated several times to calculate a mean radius and the area of spray contact calculated using  $r^2$ .

Consider adding the following advice:

**Hold the pack approximately-----cm from the plant whilst spraying**

**Ensure a light even spray, avoiding spray running off the leaves** Products

registered as RTU do not require cleaning instructions.

### **1.4 Water volumes**

Amateur products are often applied in higher water volumes than professional products, and therefore the effect of the co-formulants (surfactants etc) may be reduced. Where these differences are large some data are required from use at the proposed dilution.

In addition, it is important to consider the suitability of water volumes and the surface to which an amateur product is applied. For example, a large water volume applied to a hard surface (paths, patios, drives, glasshouses, walls, and floors) may wash onto desired vegetation resulting in crop safety problems.

In terms of watering cans there can be differences in the effectiveness of certain herbicide products from an application using a knapsack or hand sprayer compared to a watering can. Surfactant dilution resulting from knapsack or hand sprayer use (where a spray volume of typically 500 litres /ha is applied) compared with that from watering can use (with spray volumes of the order of 4000 litres /ha) can have a notable impact on effectiveness. In addition, watering cans produce a very coarse droplet compared to sprays and this can also have an impact. Where watering can use is proposed bridging data are required between this and the knapsack/hand sprayer use to demonstrate comparable effectiveness. For herbicides standard advice is:

**If applying through a watering can use a very fine rose or a dribble bar to lightly wet the leaves.**

For products containing glyphosate the following phrase is important:

**Do not apply through, or store in, galvanised or unlined mild steel sprayers or watering cans.**

### 1.5 Organic/Natural claims

No references to 'Bio' or Natural may appear on amateur product labels. Terms such as natural and bio imply a misleading indication of the safety of the product. There may be a tendency for users to see such words as synonymous with safety which is not always the case. Restrictions on the use of such terms may also apply to the name of the product. This is based on guidance in the HSE Labelling Handbook.

### Herbicides

Useful additional information may also be found in the Weed Control Handbook (WCH)<sup>2</sup> which includes a chapter on 'Recommendations for the control of weeds in gardens by the amateur' (chapter 11). This is a peer reviewed source of published control claims that remains valid for some of the older herbicide actives still approved in the UK. However please note that the doses cited in the WCH may no longer be relevant in the UK.

#### 2.1 Standard efficacy phrases included on labels

'Many/most broad-leaved weeds in lawns' and 'Repeat application 4-6 weeks later if weeds persist' are considered acceptable biological claims for use by the applicant.

In situations where the product is not being applied using calibrated equipment, the following phrase should be included; **To ensure even application is it advisable to mark out treatment areas.** Details on this advice should be provided by the applicant in order to assist the user eg pellets per m<sup>2</sup>, distance between markings.

The terms **Susceptible, Moderately Susceptible, Moderately Resistant** used on professional products have limited meaning for the amateur. For the amateur user their key concern is the target on which the product is active and a general indication of effectiveness. For example, will the product control small weeds, large well-established perennial weeds, and how long is control likely to last? Therefore, a revised, simpler scheme is being proposed (and will be agreed with the amateur industry). There is still some scope to differentiate those products that are particularly effective.

<sup>2</sup> Fryer, JD and Makepeace, RJ (Eds) (1978) Weed Control Handbook Volume II / Recommendations. Blackwell scientific publications, Oxford.

Claims/situation of use	Label wording/claims
Lawn weed killers – data required across a range of commonly found lawn weeds eg daisy, dandelion, plantain etc	Kills/controls a range of weeds in established lawns including daisy, dandelion, white clover, buttercups (amend as appropriate)
For general claims of weed control data required across the range of targets that might be encountered but must include both grass and broadleaved weeds and show evidence of long-term control of perennial weeds	Kills/controls a range of annual and perennial weed grass and broadleaved weeds

Control variable  Specify treatment intervals, reflecting data presented	Effective against  Large or perennial weeds may regrow. Persistent weeds may require repeated treatments once new growth appears  Or if product limited to 1 application:  - Further treatment may be necessary with a different product.
If a residual active substance is included in the formulation, evidence of duration of control must be provided.	Prevents new weeds growing for up to X months by preventing the seeds from germinating
Speed of effect – data from 1-3 days must demonstrate seeing significant control at that point rather than simply seeing cosmetic visible symptoms – for products with claims for long-term control data must be provided to show that short-term effect does not jeopardise long-term control	'kills quickly'; 'rapid action'

## 2.2 The phenoxyacetic acid or 'hormone' herbicides

This group of compounds is very commonly used on amenity turf and lawns eg 2, 4-D, MCPA, mecoprop and dichlorprop. These herbicides are selective, targeting broadleaved weeds and leaving narrow-leaved plants (grasses) unaffected at the normal dilution rate. Because of this they are used on lawns or rough grassland. Hormone weed killers are foliar-acting and translocated, moving down into the weeds' roots when applied to the foliage. They also tend to be slightly residual, remaining in the soil for a few weeks after application.

- a) **Many/most broad-leaved weeds in lawns** is allowed and **Repeat application 4-6 weeks later is needed if weeds persist**. (See note above on wording if product use is restricted to 1 application only).
- b) **Apply when weeds are actively growing**.
- c) **Do not apply to grass suffering from drought, during cold weather or when rain is imminent**. (We have allowed the removal of **cold weather** if the label states application should take place on a warm day).
- d) **Do not spray on windy days to avoid drift** (except granular formulations).

- e) A minimum of **Do not cut grass for one day after treatment**. Reference to **Do not cut for 3 days before** is also allowable. More typically advice is **DO NOT apply immediately after mowing. For best results, apply the product at least 5 days after the last mowing and wait 7 days after application before mowing again.**
- f) **Do not use on new grass for 6 months.**
- g) **The first 4 mowings of treated grass must be composted for 6 months before use as a mulch.**

### ***2.3 Phenoxyacetic acid herbicides - Granular formulations: additional phrases:***

- a) **Water in if no rain falls within 48 hours.**
- b) **During application do not allow granules to fall on to nearby plants and borders.**

### ***2.4 Dicamba and triclopyr***

These active substances are linked with the 'hormones' because they work in a similar way. Dicamba is normally formulated as a salt in water and is generally used for broadleaved weed control in grassland. It is a member of the arylcarboxylic acids and unlike the 'hormones' is soil as well as foliage acting.

**All standard warnings listed for phenoxy herbicides above apply with special note of:**

**Apply when weeds are actively growing and soil is moist.**

Triclopyr is typically included in products for the control of difficult perennial and 'brush' weeds eg brambles, thistles, nettles, dock, woody weeds and unwanted saplings.

Relevant label phrases are as follows:

- a) **Apply from May to October (June to August for woody weeds) when soil is moist and the weeds are in active growth.**
- b) **Used as directed will not kill grass. May cause damage to lawns and other fine turf.**
- c) **A repeat treatment may be applied after 6 weeks.**
- d) **Allow at least 6 weeks between application and replanting.**

### ***2.5 Ferrous sulphate products***

The active substances are applied in lawn sands or added to 'hormone' products to control moss.

Relevant label phrases are as follows:

- a) **Apply when lawns are actively growing and the soil is moist.**

- b) **Do not apply during drought or freezing conditions.**
- c) **Do not apply when heavy rain is forecast but if no rain falls within 48 hours then water the product into the lawn.**
- d) **Avoid walking on treated areas until it has rained, or they have been watered.**
- e) For the best control of moss; **grass should be cut 3 days before treatment and not cut again until at least 4 days after.**
- f) **Rake vigorously after 2 weeks to remove dead moss.** Further advice can be added regarding disposal of the moss, eg Composting, if the applicant wishes.
- g) **Retreatment may be necessary for heavy infestations or if moss returns.**
- h) **Avoid drift onto nearby plants and borders.**
- i) A warning about the possibility of darkening or blackening of turf may also appear on the label.
- j) As ferrous sulphate is a fertiliser and is often applied in mixture with other fertilisers in 'lawn, feed and weed' products the claims **boosts spring growth** and **improve sward colour** may also be allowed on the label. However, note that any speed of activity claims in terms of sward greening must be supported ie **fast greening** or **greens in 5 days**.

When the product is in combination with an herbicide, other relevant warnings may be added or combined with those above.

## **2.6 Glyphosate products**

Products containing glyphosate may be marketed to control weeds in a wide range of situations eg on drives, pathways, around plants or for a specific use where the product is aimed at a particular target – eg control of stumps. Clearly the label wording will reflect this.

Note that for all glyphosate products, particularly those where an additional active substance is included in the formulation, evidence of long-term control of a range of perennial species is required.

There are some general phrases for products containing glyphosate as follows: a)

When to spray

- **(Spray at any time) when weeds are actively growing, and/or green with plenty of leaf area to absorb the spray.**
- **Treat established perennial weeds at the start of flowering to give best results.**
- **Leave weeds 7 days before digging or cultivation to allow the weed killer to move to the roots.**

b) Drift

- **Apply in calm conditions to avoid drift onto desired vegetation.** Some labels also have the following phrases:
- **Avoid contact by spray and spray drift onto desired vegetation. Do not use on lawns.**
- **DO NOT USE ON LAWNS OR OTHER DESIRED VEGETATION. Avoid all contact with leaves, stems, or young bark of desired vegetation by spray or spray drift.**
- **To avoid transfer to lawns, do not walk on treated areas until the product has dried.**

c) Repeat applications

**Repeat application is necessary should new growth appear or Some tough weeds may need retreatment if regrowth appears.**

d) Rainfall disclaimer

Consider the need for general advice on rainfall within 6 hours.

e) For products for the control of stumps the following phrases are relevant:

- **Apply between November and March immediately after felling. The best time for treatment is autumn and winter. Avoid use when the sap is actively rising between March and May.**

f) Fast acting claims

Unless a fast acting claim is specifically supported by data then the following must appear on labels to alert users to the delay in signs of visual effects; **Weeds may show first effects from a few days up to 4 weeks, depending on the weather and the type of weed.**

### ***2.7 Diflufenican and flufenacet products***

Products containing diflufenican and flufenacet are typically co-formulated with glyphosate in order to provide control of both emerged weeds and those yet to emerge.

Therefore, some evidence of residual control must be provided together with a statement regarding duration of control, eg **Kills weeds down to their roots and prevents new weeds growing for up to X months by preventing the seeds from germinating.**

As with glyphosate alone the following phrase should be included if use is recommended around ornamental plants - Apply carefully around shrubs and trees and make sure that the product does not contact the foliage/trunk of these plants.

Due to the risk to subsequent crops the following phrase must be included -

Diflufenican can persist in soil, and at least 6 months should pass between treatment and replanting. Then dig thoroughly to make sure there are no adverse effects on subsequent planting.

### ***2.8 Contact herbicides eg Fatty acids, pelargonic acid, acetic acid, and diquat***

Contact herbicides are non-selective and non-residual and work simply by scorching off weed foliage. This makes the ready-to-use formulations ideal for controlling annual weeds and perennial weed seedlings growing in between garden plants. However, they do not give long-term control of weeds (or moss). Due to their mode of action visible effects are rapid. Key label phrases include:

- a) **Large or perennial weeds may re-grow. Persistent weeds may require repeated treatments once new growth appears. Mosses, Liverworts and Algae may be controlled for up to 4 weeks but repeat treatment may be required.**
- b) **For best results apply in warm, dry conditions when weeds are young and actively growing, usually during spring or early summer.**
- c) **Avoid contact by spray and spray drift onto desired vegetation. Do not use on lawns.**
- d) **Kills grasses and broad-leaved weeds.**

### ***2.9 Grass cuttings***

Some active substances may be persistent in the grass eg clopyralid. Therefore, for an herbicide or plant growth regulator the potential for cuttings to cause phytotoxic effects when used as a mulch or manure needs to be considered. All amateur products for use on lawns and which contain clopyralid must contain the following wording:

**After treatment, leave the clippings from the first mowing on the lawn. The next 3 mowings should be composted well, for at least 9 months, before being used as mulch. Do not dispose of the grass clippings via council composting schemes.**

Other phrases are also in place for the hormone herbicides under 2.2.

### ***2.10 Herbicides applied to 'Areas not intended to bear vegetation'<sup>3</sup>***

Many amateur herbicides are applied to areas such as hard surfaces, eg drives and patios that are not intended for growing plants. For these products crop safety should not be a concern.

### ***2.11 Herbicides applied to control weeds in lawns and around 'desired vegetation'***

Where amateur herbicides are applied for the selective control weeds in areas of desired vegetation crop safety data must be provided to demonstrate safety to that vegetation (eg lawns/borders).

## 2.12 Residual herbicides

There are few residual, selective amateur herbicides at present. However suitable warnings may need consideration eg **Do not disturb the soil surface after treatment as this may result in poor weed control.**

## Fungicides

### 3.1 Standard efficacy phrases included on labels

There are no standardised phrases for fungicides. The terms ‘Control’, ‘Moderate control’, and ‘Reduction’ are used for professional products and have limited meaning for the amateur grower. For the amateur grower their key concern is what target the product is active against. Therefore, a revised, simpler, scheme is proposed. There is still some scope to differentiate those products that are particularly effective. It is therefore proposed that 2 categories of claim, which allows separation of the most effective products, with the highest levels of activity, from the other products with lower,

3 Taken from HSE Crop Definitions at <http://www.hse.gov.uk/pesticides/topics/databases/crop-hierarchy-introduction.htm>

but still some worthwhile, levels of activity, is established. For each disease a claim of either ‘**control**’ or ‘**useful reduction**’ should be allowed. To support a claim of ‘**control**’ a level of activity consistently in excess of 80% control relative to the untreated should be expected. To support a claim of ‘**useful reduction**’ a level of activity consistently above 40% should be expected.

The target species will need to be carefully considered wording-wise, ie would need to be ‘fungal leaf spots’ not just ‘leaf spots’.

## Insecticides

### 4.1 Standard efficacy phrases included on labels

The terms ‘Control’, ‘Moderate control’, and ‘Reduction’ have limited meaning for the amateur grower. They are based on the professional products – and reflect (for insecticides), the three categories of the levels of control in the assessed data (ie above 80%; 60-80%; below 60% if still ‘beneficial’). For the amateur grower their key concern is what target the product is active against. Therefore, a revised, simpler scheme is being proposed. There is still some scope to differentiate those products that are particularly effective.

Level of control supported in evaluation	Label wording/claims
Control consistently above 80%	Control against and/or kills [ <i>target species</i> ]
Time period specified should reflect data	Controls populations of [ <i>target species</i> ] for up to [ <i>days/months</i> ].

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Control variable between 40-80% Specify treatment intervals, reflecting data presented. Where control is at the minimum of 40%, the phrase 'further treatment may be necessary' should change to WILL be necessary.	Useful reduction against [ <i>target species</i> ]  Repeat applications [ <i>at x days</i> ] are required for optimal effect. Further treatment may be necessary with other products
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<b>Insect species and stage</b>	<b>Label wording/claims</b>
Black aphids eg <i>aphis fabae</i>	Blackfly; black aphids (or relevant aphid species name)
Green aphids – wider range	Greenfly; green aphids (or relevant aphid species name)
Groups of insect claims – permissible but need a range of appropriate species which must include species that are known to be difficult to control	'aphids'; 'caterpillars
The efficacy trials will be conducted, as appropriate, against the relevant insect life stage (or perhaps mixed populations eg adults and larvae). This will be a function both of mode of action, and timing. It is recognised that it is difficult for amateur gardeners to differentiate between the various life stages of a pest (or even between pest species/groups sometimes). Therefore, a general claim of 'effective/kills' is considered appropriate	Effective/kills insect [ <i>name/group</i> ]
However, further refinement can be made if the applicant believes this is helpful to the grower provided supported by data  Demonstrated that one life stage is particularly susceptible. This could be named on the label, or may be reflected in appropriate advice on timing, for example	Effective/kills insect [ <i>name group</i> ], including all life stages ( <i>each could be named or kept general</i> )
Where it takes a period of time for optimal control to be seen, eg 40% after 3 days, 70% after 7 days	Optimal effectiveness may take up to 7 days

<p><u>Claims for systemic activity</u></p> <p>These are usually derived from fully supported evidence from a related professional product. (Or would need appropriate evidence.)</p> <p>Typically, this may be ‘true’ systemic – ie phloem/xylem movement in both directions through the plant. Or some form of more localised movement eg translaminar</p> <p>Are terms such as ‘systemic’ fully understood by amateur growers?</p>	<p>Product has a ‘systemic’ mode of action</p>
<p>Speed of effect – data from 1-3 days must demonstrate seeing significant control at that point</p>	<p>‘Quick effect’ ‘kills quickly’; ‘rapid action’</p>

#### **4.2 Products containing pyrethrins**

- a) In the contents statement the a.s. should be stated as **pyrethrins**.
- b) Regarding the origin of pyrethrum reference to **chrysanthemum plants** must be amended to **a member of the chrysanthemum family**.
- c) For all approved claims the following wording should be considered **Repeat treatments may be required to maintain control**.
- d) Due to pyrethrins degradation in higher temperatures the following wording should be considered **DO NOT USE x when temperature is likely to exceed 25 °C or during strong sunlight**.
- e) **Flowers and young leaves may react particularly sensitively**.
- f) For use on ornamentals the following wording should be considered **Do not treat sensitive varieties with delicate foliage (eg poinsettias, cyclamens, kalanchoes, African violets, ferns, or ivy etc)**.

#### **4.3 Fatty acid products**

For concentrate products the following instructions must be included on the label:

**Use of hard water may reduce product performance, dilute with only soft or rain water.**

#### **4.4 Products claiming control of ‘other pests’**

As a general guide, where claims for ‘**other pests**’ or ‘**many other pests**’ are included in addition to named pests, these claims must be deleted.

#### **4.5 Number of treatments for products with glasshouse whitefly claims**

For conventional foliar insecticide treatments with a label recommendation for control of whitefly, the following wording, or similar, should be present on product labels where only control of adult whitefly has been demonstrated. This is because of the lack of control of whitefly scales. If data to demonstrate control of scales have been supplied, and are acceptable this phrase is not required:

**Repeat treatments (every 3-7 days) will be required to achieve effective control of whitefly.**

#### **4.6. Granular and Pelleted Products for Insect or Slug/snail control**

Amateur use pelleted products are usually applied as a surface application made either directly by hand or by use of a simple hand-held applicator (often the product container). Evidence for the suitability of pellet application via these methods of application has not previously been requested and problems in relation to this are considered unlikely. Therefore, based on previous precedent, for amateur products no specific evidence in relation to this is required.

There is a tendency for the amateur to overdose, especially where, in a granular placement, the granule is difficult to see. Guidance on the label needs to be clear and unambiguous as possible. Please see the HSE Labelling Handbook for further guidance on labelling requirements. The following label warning is appropriate for granules:

Avoid granules resting within plant foliage as these may cause localised damage. eg

**‘X’ g/m<sup>2</sup>: pack sufficient to treat ‘Y’ m<sup>2</sup>.**

For pellets and larger granules it may be appropriate to indicate the number of pellets per unit area eg approximately 3-4 pellets per m<sup>2</sup>. In addition, the dose may also be stated in terms of pellet spacing:

**eg Apply pellets at approximately 5 cm apart.**

#### **Crop safety (except herbicides)**

Where a related professional product has specific warnings of potential crop damage on named varieties of certain crops, it would be expected that these would appear as more generalised warnings on the amateur label (eg warnings of damage on certain named apple varieties should appear as a general warning of damage on fruit trees). Consider whether the following phrase, or one proposed by the applicant with a similar meaning may be included on a product that is used on a wide range of crops/plants. In addition, this phrase may be added if data have demonstrated phytotoxicity on some species, or if a known crop safety concern exists:

**This product has been tested on only a limited range of crop/  
plant/cultivars/species. It is recommended that only a small number of plants of**

**any one species or a small area of the crop is treated first to observe if any adverse effects occur before making wider scale treatments.**

This phrase must be included if ornamentals are one of the proposed crops.

## **Resistance management for amateur products**

For amateur users, information on resistant pests and resistance management strategies are an issue for herbicides, fungicides, and insecticides. Unfortunately, it is not considered possible to monitor resistance in an amateur environment. However, when resistance is detected, appropriate warnings will be put in place on the label. Although not ideal, at present this is the only system considered feasible and will continue to be used.

### **6.1 Herbicide products**

The risk of resistance to herbicides in the home garden is considered to be minimal. This is particularly since weeds are non-mobile and for weed control many amateur users employ a range of strategies to control weeds – this may include cutting lawns, hoeing, soil cultivation etc. Therefore, no resistance phrases are necessary on amateur labels.

### **6.2 Fungicide containing products**

There are no existing general phrases. There is no monitoring of resistance in the amateur situation and it is assumed the occurrence of fungicide resistance is not common in these situations where intensive spray regimes are generally not practiced. It is unreasonable to request monitoring data in the amateur sector so it is really a matter of risk management. A specific phrase for white rust (*Puccinia horiana*) on lily and chrysanthemum exists for both DMI and QoI fungicides following reports of such to FRAG-UK, and for which the following label wording is required on product labels containing either of the 2 respective MOA where use against this disease is proposed:

**Strains of white rust in lily and chrysanthemum resistant to {named strobilurinn} (a QoI fungicide) and {named azole} (a DMI fungicide) have been reported. Where these occur levels of control may be reduced.**

Amateur users can be expected to use a product until it is finished and are unlikely to alternate different MOA, therefore a simplified general statement for those MOA which are medium to high risk MOA (eg DMIs, QoIs, SDHIs) is proposed:

**Repeated use of the same product may lead to the development of resistant strains of some diseases. Where resistant diseases are present this product is unlikely to give control.**

### **6.3 Products with claims that include resistant insects**

Resistance management for amateur users is considered to be impractical; requiring a detailed knowledge of species identification and mode of action of active substances.

As such, a general label warning may be added for those active substances where resistance is known in relevant professional uses.

For example, amateur products containing specific active substances eg Pyrethroids and Pyrethrins or active substance groups and with a recommendation for the control of any of the stated pests must have the following phrase:

**Pesticide resistance in (glasshouse whitefly, pear sucker, some aphids, and spider mites) is widespread. Where resistant pests are present (product name) is unlikely to give control.**

However, more details on resistance development can be found on the Royal Horticultural Society's website <https://www.rhs.org.uk/>.

### **Pack size**

The pack size of all amateur use products must be limited to the maximum that would be used in 1 season to ensure that products are completely used within 1 or 2 seasons. In the UK, the following guidance is used for categorising amateur uses:

Lawn = 200 square metres

Ornamentals = 50 square metres Fruit

and vegetables = 50 square metres

Patio and paths = 50 square metres.

When submitting an application for a new product, applicants must justify the maximum pack size by considering the uses proposed (in terms of application rates/number of applications) and the above assumptions on typical areas treated.

Full details are available at: [www.hse.gov.uk/pesticides/applicant-guide/garden-pack-size-guidance.htm](http://www.hse.gov.uk/pesticides/applicant-guide/garden-pack-size-guidance.htm).

### **7.1 Pack types**

Pack types can vary within the same product from handheld trigger sprayers (1 litre), 'nested' trigger sprayers with hose or trigger spray head (3 litres), and HDPE 'Wanda' container with battery operated sprayer. Where use on ornamental trees is authorised then a handheld trigger sprayer is not considered an appropriate method of treatment, in these cases package specific labelling may be required to ensure efficacy is maintained.

### **Further information**

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit [www.hse.gov.uk](http://www.hse.gov.uk).

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if

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you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet is available at: [www.hse.gov.uk/pesticides/assets/docs/g212.pdf](http://www.hse.gov.uk/pesticides/assets/docs/g212.pdf).

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