



**Assured Produce**

**Crop Specific Protocol**

**FRUIT (BUSH FRUIT)**

**Including Currants and Gooseberries**

**(CROP ID: 40)**



**January 2008**

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## Acknowledgements

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## Preface

This crop specific protocol has been written to complement and avoid duplicating the generic principles of the scheme and appendices.

It is advisable to read the Assured Produce Generic Crop Protocol Standards and the Assured Produce Generic Protocol Guidance Notes (referred to in this document as the Generic Standards and Generic Guidance Notes) first before reading this crop specific protocol.

This protocol is designed to stimulate thought in the mind of the reader.

This crop specific protocol contains crop specific parameters and guidance, where applicable, for the requirements stated in the Generic Standards.

All statements in this protocol containing the words "**strongly recommended**" (in bold type) will be verified during the Assured Produce assessment and their compliance will form a part of the certification/approval decision. The score required for these "**strongly recommended**" control points can be found on the final page of this document and in the checklists produced by Assured Produce licensed certification bodies.

## Disclaimer and trade mark acknowledgement

Although every effort has been made to ensure accuracy, Assured Produce does not accept any responsibility for errors and omissions.

Trade names are only used in this protocol where use of that specific product is essential. All such products are annotated<sup>®</sup> and all trademark rights are hereby acknowledged.

Notes:

Pesticides with 'Essential Use' derogations that expired 31 December 2007 can no longer be used or stored.

There may be other withdrawals or revocations. Products containing substances which have been revoked are shown on the PSD website (<http://www.pesticides.gov.uk>). Growers should check with their advisers, manufacturers, the Assured Produce website 'Newsflashes', the PSD website ([www.pesticides.gov.uk](http://www.pesticides.gov.uk))

Growers should comply with the 'Use up by' dates for all pesticide products. Growers should also be aware of and comply with changes on new product labels.

There may be changes for the following reasons:

- the deadline for use of NPE formulations has been extended to 31 August 2008, see <http://www.pesticides.gov.uk/approvals.asp?id=2122>
- Pesticides with NPE formulations must be used up by 31 August 2008. In many cases products will be replaced by new non-NPE formulations.
- At re-registration stage after Annex 1 listing there may be: reductions of dose rates; changes in timings and/or number of applications for some products.

In the following Appendices products and use by dates are only listed for SOLAs, and in some cases new product MAPP numbers may not be available yet.

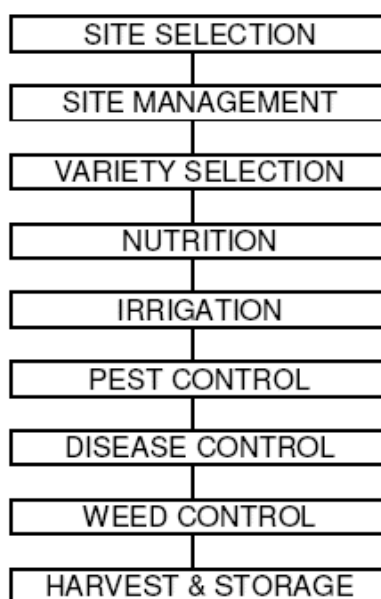
For pesticides on-label, only active substances are shown.

Any new standards have been prefixed in the text with **(NEW)**

## 1 General introduction

Following a systematic approach will help growers to identify and manage the risks involved in crop production. This protocol is based on a typical crop production process. Using a flowchart approach, food safety, Health & Safety, environmental and quality hazards are identified. Appropriate controls may then be established to minimise risk. Food safety and Health & Safety issues always take precedence over quality and environmental controls.

The flow chart is structured as shown below. Note that the sectional layout of both this protocol and the crop specific protocols follow the same structure.



The contents of each crop specific protocol are reviewed annually by informed farmers and growers, food technologists, scientists, the relevant fresh produce association, processors and agronomic consultants. Updated editions are issued prior to the cropping season.

The review process considers both new developments and all relevant technology which has emerged throughout the course of the previous year and which have been found to be both workable by the grower and beneficial to the environment. As one aim of the Scheme is to transfer such information and technologies to growers, attention is drawn to those features of specific relevance to ICM by using *italic* script. In order that growers may be confident that they are working to a current document, each protocol is dated and numbered.

## 2 Planning and records

See Generic Standards and/or Generic Guidance Notes.

## 3 Site selection

### 3.1 Site history

Correct site selection is an important factor if a plantation is to produce viable yields of optimum quality fruit. All early flowering Blackcurrant varieties require a frost-free site. Sites should slope with no obstructions at the bottom to encourage air drainage. Shelter from cold winds during flowering is important; to prevent physical damage and to encourage a warmer microclimate that in turn will encourage pollination and the presence of

pollinating insects.

The most important factor when considering a site is the proximity of other plantations, particularly if, in the case of Blackcurrants, they are infested with blackcurrant gall mite. Consideration must be given to the level of infestation and the intended variety that is to be planted. New plantations should not be planted adjacent to an existing plantation unless, it is itself a young plantation. Ideally new sites should be planted as far apart as reasonably possible from existing plantations.

Blackcurrants can be grown on a wide range of soil types, though lighter soils will require the provision of irrigation. Pure sands should be avoided due to poor availability of water. Heavy clays are also unsuitable due to possible problems of compaction, poor aeration and waterlogging. A well-maintained drainage system will reduce the impact of some of these problems.

Adequate soil preparation prior to the planting of new material is important to maintain soil structure. Cultivation with over dry soil can result in slumping and capping while cultivation with over wet soil can result in smearing and compaction. These problems can significantly reduce the success of establishment.

It is **strongly recommended** that when selecting fields for Bush Fruit production, consideration is given to soil structure, drainage, texture, pH, depth, air movement, exposure of the site to prevailing winds, susceptibility to spring frosts and proximity of other bush fruit plantations with existing levels of pests and disease.

### 3.2 Rotations

#### Previous cropping

Previous cropping should be considered when siting new plantations. Where grass has been grown, a nematode test should be undertaken to assess populations of root feeding nematode species e.g. *Pratylenchus* that can cause growth stunting.

Avoid planting Blackcurrants where vine weevil populations have been found in any previous crop. A break crop can substantially reduce numbers and will allow a far better establishment.

Where *Armillaria* has been known to exist, then Blackcurrants should not be planted until 10 years after the last known host crop has been removed.

If high levels of soil-acting residual herbicides have been applied on crops prior to the establishment of a new crop of Blackcurrants then there could be problems with the rooting of cuttings. Ideally herbicide applications should be substantially reduced in the year prior to planting.

#### Rotations

Ideally Blackcurrant crops should be rotated. In practice, with the problems of gall mite and the reduction in the life of plantations this is proving more difficult to accommodate. If a plantation has to be replanted, then there should be a minimum break of one year.

#### Soil sterilisation

Soil sterilisation is not practised in the commercial production of Blackcurrants as crop rotation is cheaper, easier and more efficient. Site selection plays a far more important role in controlling pests and diseases.

## 4 Site management

See Generic Standards and/or Generic Guidance Notes.

## 5 Variety selection

### Planting material

For successful *Ribes* production it is vital to plant stocks which are virus free and of a high health status. It is strongly recommended that planting material is obtained from an approved nurseryman where the material has been certified under the Plant Health Propagation Scheme (PHPS) or a recognisable comparable scheme and its quality meets the specifications for which it is intended. Where self propagation of planting material is carried out (where approved), however limited, it is extremely important that this material is grown in a manner as to minimise the risk of infection from viruses and pests from commercial plantations. (See Generic Standards 5.4.2 and 5.4.3)

Where growers require assurances from propagators that plants have been raised under the auspices of the Assured Produce Scheme, they should request an Assured Produce verification number from their propagator.

## 6 Nutrition

### Macronutrients

It is strongly recommended that soil and foliar analyses, soil types and timing of applications of nutrients be considered in order to achieve optimum crop response with minimal risk of environmental pollution. (See Generic Standards 6.1.2, 6.1.3, 6.1.5)

Prior to planting, a soil analysis must be carried out to ascertain existing soil levels of the macronutrients P, K, Mg and pH levels. Suitable fertilisers can then be incorporated into the soil. Apply the appropriate rate of fertiliser for Blackcurrants, to the soil for each index (see Appendix 1).

For subsequent seasons, soil should be analysed on a regular basis (1 in 4 years) and the appropriate quantity of fertiliser applied each year according to the index. Either straight or compound fertilisers can be applied.

Top dressings of inorganic fertiliser should be made each year in the spring (March - May). Avoid applying any nitrogenous fertilisers before this to prevent leaching of nitrate/nitrogen into watercourses. Where frost protection is being used apply half the rate at grape stage and the remainder at fruit set to avoid leaching.

### pH

Where soil pH is above 7, micronutrient deficiency (e.g. iron and manganese) may occur. Leaf analysis will confirm such problems and foliar or soil application will be necessary.

If soil pH is significantly below 6, lime or magnesium limestone can be incorporated pre-planting to bring the pH up to 6.5. If the soil is very acidic, part of the lime requirement should be ploughed in and the remainder applied subsequently.

## 7 Irrigation

Irrigation can be used for two purposes in Blackcurrants.

a) Overhead sprinkler systems can be used to give frost protection during the flowering period. In the past this was particularly used with the cultivar Baldwin, which flowers early, has little frost tolerance and was regularly damaged by spring frosts. However, the Scottish-bred varieties, (Ben Avon, Ben Alder and Ben Tirran), flower later than Baldwin and in most years' miss the worst frosts. As these cultivars give a more consistent yield without frost protection and because of the high capital cost of installing a system, frost protected acreage is declining. Existing installations are now mainly used for the early flowering cultivar Ben Gairn although this does have some tolerance to frost.

b) To obtain good quality fruit, with high yields and also maintain a good bush structure it is important that Blackcurrants can be irrigated, especially during periods of low available water capacity (AWC). It is particularly useful for newly planted cuttings, which have a poor root system in drought periods. However, irrigation too close to harvest can reduce fruit brix levels and so should be avoided on processing crops.

Irrigation is best applied using low level tape or pipe. However, because of the difficulty in maintaining the system over the life of the plantation, overhead irrigation with either rain guns or the static frost protection system is more widely used. Irrigation scheduling can be carried out using soil moisture monitoring devices. In this way, water can be applied at the optimum time. Irrigation should always be scheduled to operate at below field capacity to avoid leaching of nutrients.

If frost protection is not required overhead irrigation should be avoided, particularly during flowering. This can not only cause physical damage, but also lead to the development of *Botrytis* fruit rot. If frost protection is necessary, obviously watering is unavoidable and approved fungicides should be used for protection against *Botrytis*.

For Gooseberries overhead sprinkler systems can be used to give frost protection during the flowering period. This system is not widely used by growers although is effective for Gooseberries which flower at a time of year when frosts are prevalent. It is also effective for early flowering Redcurrant cultivars such as Junifer, Jonkheer Van Tets and Red Lake. Later flowering cultivars, such as Redstart, Rondon and Rovada, are less prone to frost and protection is considered less necessary.

## 8 Crop protection

### 8.1 The basic approach to crop protection

See Generic Standards and/or Generic Guidance Notes.

### 8.2 Plant protection product choice

See Generic Standards and/or Generic Guidance Notes.

#### Approved uses not included on the product label

In some circumstances product labels do not include all of the approved uses and growers and advisers wishing to check the approval notice of a particular product should note that this information is available from [www.pesticides.gov.uk/psd\\_databases.asp](http://www.pesticides.gov.uk/psd_databases.asp)

A search on the database for a product name should yield a results page. A click on the product name should link to a summary of the approval information. At the bottom of the summary are links to available notices, which will give the statutory conditions of use.

In the case of products with older approval an electronic approval may not be available. In these cases growers should contact the PSD Information Services Branch for details of the approved conditions of use.

Contact details are: [p.s.d.information@psd.defra.gsi.gov.uk](mailto:p.s.d.information@psd.defra.gsi.gov.uk) tel. 01904 455775

### 8.3 Advice on the use of pesticides

See Generic Standards and/or Generic Guidance Notes.

### 8.4 Application of pesticides

See Generic Standards and/or Generic Guidance Notes.

### **8.5 Records of application**

See Generic Standards and/or Generic Guidance Notes.

### **8.6 Protective clothing/equipment**

See Generic Standards and/or Generic Guidance Notes.

### **8.7 Pesticide storage**

See Generic Standards and/or Generic Guidance Notes.

### **8.8 Empty pesticide containers**

See Generic Standards and/or Generic Guidance Notes.

### **8.9 Pesticide residues in fresh produce**

See Generic Standards and/or Generic Guidance Notes.

**See Generic Protocol Guidance Notes 8.9 for further background and generic advice.**

*Assured produce is aware that a key area in the production of fresh produce which requires continued attention by growers and their advisers is that of keeping pesticide residues to a minimum. This issue is not just one of meeting the MRL trading standard but ensuring that any individual or multi residues are kept as low as possible below this level.*

**The key targets are -**

- **Optimising late applications of fungicides and insecticides to the edible part of the crop.**
- **Optimising the use of post harvest treatments.**
- **Ensuring minimum harvest intervals are followed**
- **Ensuring that application equipment is applying products correctly**

**See Appendix 11 for the pesticide targets and guidelines on this crop.**

### **8.10 Pest, disease and weed control**

#### **8.10.1 Pests and diseases**

##### **8.10.1.1 Introduction**

Experience suggests that an integrated approach with emphasis on prevention rather than cure give the best results. In this way, pesticide inputs can be minimised.

The insect pests and diseases causing greatest yield and quality loss to Blackcurrants are gall mite/reversion, aphid, sawfly, leaf-curling midge, vine weevil, two-spotted spider mite, capsids, tortrix caterpillar, winter moth, powdery mildew, *Botrytis* and leaf spot.

The insect pests and diseases causing greatest yield and quality loss to Gooseberries and Redcurrants are vine weevil, gooseberry sawfly, powdery mildew, *Botrytis*, leaf spot, *Phytophthora* root rot and *Eutypa* (dead arm).

An integrated approach should be adopted to achieve optimum control involving the following management steps.

### **Good management and planning**

- a. *Careful site selection is important. Refer to Section 3.2.*
- b. *Crop rotations to reduce the build up of pest and disease infestations.*
- c. *Where appropriate use varieties that are resistant or partially resistant to pests and disease.*

### **Cultural prevention techniques**

- a. *Roguing is an important practice to identify and then remove those bushes which have been infected with the "reversion" virus. Ideally the grape should be inspected just prior to flowering and the leaves inspected during fruit development.*
- b. *Promoting crop health by reducing stress through good irrigation scheduling whilst optimising nutrient availability through soil analysis (and leaf where necessary) and the appropriate and accurate application of fertiliser.*

### **Corrective action**

*Where the above have failed, adopt the following approach:-*

- a. *Regular monitoring is important to identify problems in their early stages, which are then more capable of being controlled. The effect of prevailing weather conditions should also be considered.*
- b. *Where corrective action is required, biological and natural methods of pest and disease control, if available, must be considered. Where thresholds have been established then these should be referred to.*
- c. *Where biological or natural control is not possible, chemical control, if available should be used, whilst always considering the following:*
  - *Use the least toxic and persistent product with due respect to its ecotoxicity.*
  - *Use the most selective product to biological control agents and naturally occurring beneficial organisms such as bees and other pollinating insects.*
  - *Use appropriate application methods with effectively maintained equipment, and spot treating wherever possible.*

#### **8.10.1.2 Cultural control**

##### **i) Site select**

*Powdery mildew, Botrytis and leaf spot are the principal diseases that affect Blackcurrants. Site selection has limited effect on these diseases however, it is unwise to plant a new crop adjacent to one which is particularly prone to powdery mildew or leaf spot. For Botrytis, it is important to choose a site with good air movement and circulation to prevent the build up of moist air.*

*Where possible avoid planting Blackcurrants close to an existing plantation which is infested with big bud mite. Crops should not be planted on sites with existing infestations of vine weevil or adjacent to crops such as Strawberries, ornamentals, or Blackcurrant crops, which are known to be infested.*

*Gooseberry crops should not be planted on sites with existing infestations of vine weevil or adjacent to crops such as Strawberries, Blackcurrants, ornamentals or other Redcurrant or Gooseberry crops that are known to be infected. Sites where Gooseberries have been previously lost to Phytophthora infection should also not be used.*

#### **ii) Rotations**

It is unwise to replant an old plantation with existing infestation of vine weevil, or nematodes. Always rotate plantations wherever possible.

#### **iii) Machinery/equipment**

If fields differ in levels of infection from pest and diseases it is always better to carry out the mechanical operations in the least affected plantation first, leaving the most affected to last thereby minimising the risk of spreading the infection. It is very easy to transfer pests from one plantation to another, either directly on tractors or sprayers, or indirectly by carrying leaf and flower buds around a farm.

#### **iv) Irrigation**

Bushes under stress due to drought and lack of water uptake are more susceptible to two-spotted spider mite infestation, as well as some diseases. Reduce stress by scheduling irrigation.

In all cases during flowering, any irrigation should be kept to a minimum to avoid the spread of *Botrytis cinerea* (grey mould) on developing flowers. Furthermore, infection at the flowering stage is known to initiate the production of ethylene, which affects flower maturity and causes "run-off".

#### **v) Mulches**

*The use of a mulch is an important aid in the establishment of new plantations. Where vine weevil is known to have inhabited a site, then they are best avoided. Mulching reduces the need for herbicides in bush row and helps to conserve moisture.*

*The use of coloured polythene mulches, through which the crop is planted, has proved successful in reducing the need for sterilisation by preventing weed growth. They also act as a barrier to disease infection of the lower leaves from the soil and white mulches improve plant quality through light reflection. Clear polythene mulches have been shown to enhance root growth, but these do not provide much weed suppression.*

#### **vi) Grass tractor alleys**

*Ideally the tractor alleys should be grassed down. This would reduce the levels of compaction caused by heavy machinery and encourage ground beetles. Herbicide applications are reduced and soil erosion is eliminated on banks. A wider alley might be required, particularly on strong soils and/or where vigorous cultivars are to be grown.*

*In practice in high rainfall areas excessive growth of grass and herbs in the alleyways may lead to problems of Botrytis and fruit quality, dependent on varietal habit. In some circumstances, sowing low vigour grasses or the use of weed free alleyways may be preferable.*

#### **vii) Trash removal**

*On some farms, sweeping trash from under the bush is practised. This operation is done at the same time as pulverising the prunings. Whilst it may have the effect of reducing overwintering spores on leaf debris, the main reason is to reveal the bare soil so residual herbicide activity is far more effective.*

### 8.10.1.3 Integrated control

This involves the integration of cultural, biological and chemical control methods to achieve both optimum control and a reduction in pesticide usage.

Regular crop monitoring is essential at least once every two weeks during the growing season by specialists or trained farm staff. The main pests that should be monitored are aphids, big bud mite, leaf curling midge, sawfly, two-spotted-spider-mite, vine weevil and woolly currant scale. Minor pests can also cause damage and should be monitored as damage occurs.

As yet, few integrated control measures have been developed for Blackcurrant diseases. However, several principles should be adhered to:-

- i) There are no approved biological control methods at present for fungal diseases. However, the cultural controls outlined above should be carefully observed.
- ii) There are three major diseases. These are powdery mildew, leaf spot and *Botrytis*. Established infections are extremely difficult to eradicate. Prophylactic chemical treatments will probably have to be applied. Fortunately most of the major commercial blackcurrant cultivars are resistant to powdery mildew.

It is known that there is a greater risk of infection of leaf spot and *Botrytis* in wet and warm conditions. Risk of powdery mildew increases with higher temperatures up to 25°C then is reduced. Spray intervals and dose rates can be adapted to suit conditions at the time.

- iii) Before applying fungicides, ensure that you use the product which is safest to the environment, natural predators and introduced biological control organisms as well as being efficacious for the particular disease concerned.

- iv) All applications must be applied within the parameters given on the product label or specific off-label approval (SOLA).

### 8.10.1.4 Biological control

*The use of predatory and parasitic organisms for crop pest control has been developed extensively for glasshouse crops during the past decade. Similar principles are now being applied to outdoor crops and many predatory insects (both naturally occurring and introduced) have now been successfully adopted on outdoor soft fruit crops.*

*On Blackcurrants however, biocontrol has not been widely taken up due to the historical reliance upon fenprothrin to control blackcurrant gall mite and more recently the use of lambda-cyhalothrin for leaf midge. These chemicals are harmful to most beneficial insects and leaf residues can last for some time. However, with the increasing use of sulphur products and tebufenpyrad to control gall mite and the adoption of new varieties resistant to this pest, the use of biocontrol is now likely to have more potential.*

*Some success has been achieved locally, using the predatory mite *Phytoseiulus persimilis* to control two-spotted spider mites. Results in general have been variable due to fluctuating weather patterns. Naturally occurring predators include *Amblyseius*, *Aphidoletes aphidimyza*, *Syrphidae*-hoverfly larva, *Neuroptera*-lacewing larva, *Coccinellidae*- ladybirds and their larva, *Therodiplosis persicae* and *Typhlodromus pyri*.*

*Grass alleys appear to encourage higher population levels of *Coleoptera*-beetles, which are voracious vine weevil predators that help to maintain vine weevil at a low level.*

*The introduction of gall mite and reversion resistant varieties has enabled an overall reduction in the*

*use of insecticides, on sites where the pressure from mite infection is low. This reduction has led to a shift in the pattern of pest incidence, which in turn has increased demands on those monitoring the crop. A program of minimum chemical applications can be balanced with the use of naturally occurring predators, and it is the responsibility of all growers to remain in touch with these developments.*

### 8.10.1.5 Chemical control

Chemicals should be used as part of an integrated pest and disease management programme including cultural, biological and chemical control. Regular monitoring of bush fruit crops should be made at least fortnightly through the growing season (see Section 1) and a written record must be kept of observations made and subsequent recommendations. Current approved products are listed in the following tables and details given in Appendices 3, 4, 5, 6 and 9.

If a product is to be used under the terms of an existing SOLA the relevant "Notice of Approval" documents must be obtained and read before applying the product. At all other times abide by all label restrictions.

All Blackcurrants that are under contract to GlaxoSmithKline will be subject to samples being taken for residue analysis, at the point of despatch, during the harvesting period, with a minimum of one sample per farm. Refer to the Generic Guidance Notes for details of laboratories. It is critical that all label recommendations are adhered to so MRLs are not breached.

#### Insecticides currently approved for use on Black, Red or Whitecurrants

Pest	Active Ingredients
aphid	chlorpyrifos, pirimicarb, nicotine <sup>(1)</sup> , pymetrozine <sup>(1)</sup> , rotenone, dodecylphenol ethoxylate, natural plant extracts, lambda-cyhalothrin <sup>(1)</sup> (when used for capsid control) , bifenthrin <sup>(1)</sup> (when used for two spotted spider mite control) tebufenpyrad <sup>(1)</sup> (when used for big bud mite control) thiacloprid <sup>(1)</sup> (when used for scale insect control), pyrethrins, garlic
big-bud mite	sulphur <sup>(1)</sup> , tebufenpyrad <sup>(1)</sup>
caterpillar	chlorpyrifos, bifenthrin <sup>(1)</sup> (when used for two spotted spider mite control), pyrethrins
capsid	chlorpyrifos, nicotine, dodecylphenol ethoxylate, lambda-cyhalothrin <sup>(1)</sup> (when used for capsid control), thiacloprid <sup>(1)</sup> (when used for scale insect control) , bifenthrin <sup>(1)</sup> (when used for two spotted spider mite control), pyrethrins
earwig	
leaf-curling midge	lambda-cyhalothrin <sup>(1)</sup> (when used for capsid control)
sawfly	lambda-cyhalothrin <sup>(1)</sup> , chlorpyrifos, nicotine <sup>(1)</sup> , thiacloprid <sup>(1)</sup> (when used for scale insect control), pyrethrins
scale insect	thiacloprid <sup>(1)</sup>
slug and snail	ferric phosphate, metaldehyde
two-spotted spider mite	chlorpyrifos, clofentezine <sup>(1)</sup> , dodecylphenol ethoxylate, natural plant extracts, tebufenpyrad <sup>(1)</sup> , pyrethrins
winter moth	Diflubenzuron <sup>(1)</sup> bacillus thuringiensis <sup>(1)</sup> , pyrethrins

#### Notes:

#### Some insecticides may not be approved on red or white currants

<sup>(1)</sup> Specific off-label approvals (SOLA's) apply for all or some of this active ingredient for some or all of these crops

**Insecticides currently approved for use on Gooseberries**

Pest	Active Ingredients
Aphid	chlorpyrifos, pirimicarb, nicotine, pymetrozine <sup>(1)</sup> , rotenone, dodecylphenol ethoxylate, garlic, natural plant extracts, lambda-cyhalothrin <sup>(1)</sup> (when used for capsid control), thiacloprid <sup>(1)</sup> (when used for scale insect control), pyrethrins
Big-bud mite	tebufenpyrad <sup>(1)</sup>
Caterpillar	chlorpyrifos, nicotine, diflubenzuron <sup>(1)</sup> , pyrethrins
Capsid	chlorpyrifos, nicotine, dodecylphenol ethoxylate, thiacloprid <sup>(1)</sup> (when used for scale insect control), pyrethrins
leaf-curling midge	lambda-cyhalothrin <sup>(1)</sup> (when used for capsid control)
Sawfly	chlorpyrifos, lambda-cyhalothrin <sup>(1)</sup> , (when used for capsid control) nicotine, rotenone, thiacloprid <sup>(1)</sup> (when used for scale insect control), pyrethrins
Scale insect	thiacloprid <sup>(1)</sup>
two-spotted spider mite	Chlorpyrifos, dodecylphenol ethoxylate, natural plant extracts, tebufenpyrad <sup>(1)</sup> , pyrethrins
winter moth	<i>bacillus thuringiensis</i> , chlorpyrifos, nicotine, diflubenzuron <sup>(1)</sup> , pyrethrins
slug and snail	ferric phosphate, metaldehyde

**Notes:**

<sup>(1)</sup> Specific off-label approvals (SOLA's) apply for all or some of this active ingredient

**Fungicides currently approved for use on Black, Red or Whitecurrants**

Disease	Active Ingredients
powdery mildew	bupirimate <sup>(1)</sup> , chlorothalonil <sup>(1)</sup> , fenarimol <sup>(1)</sup> , fenpropimorph <sup>(1)</sup> , kresoxim-methyl <sup>(1)</sup> , myclobutanil <sup>(1)</sup> , penconazole <sup>(1)</sup> , potassium hydrogen carbonate boscalid + pyraclostrobin <sup>(1)</sup> (when used for Botrytis control)
leaf spot	chlorothalonil, myclobutanil <sup>(1)</sup> (when used for powdery mildew control) cupric ammonium carbonate, dodine <sup>(1)</sup> , mancozeb <sup>(1)</sup> carbonate boscalid + pyraclostrobin <sup>(1)</sup> (when used for Botrytis control)
<i>Botrytis</i>	chlorothalonil <sup>(1)</sup> , pyrimethanil <sup>(1)</sup> , fenhexamid, fenhexamid + tolylfluanid <sup>(2)</sup> , tolylfluanid <sup>(2)</sup> , thiram <sup>(1)</sup> boscalid + pyraclostrobin <sup>(1)</sup>
rust	copper oxychloride, thiram

**Notes:**

Some fungicides may not be approved on red or white currants

<sup>(1)</sup> Specific off-label approvals (SOLA's) apply for all or some of this active ingredient and some or all of these

<sup>(2)</sup> All approvals for use of products containing tolylfluanid are temporarily suspended

Rust, caused by *Cronartium ribicola* is less common and should only be treated when found.

## Fungicides currently approved for use on Gooseberries

Disease	Active Ingredients
powdery mildew	bupirimate, chlorothalonil, fenarimol, fenpropimorph, myclobutanil, potassium hydrogen carbonate, sulphur, krtesoxim-methyl <sup>(1)</sup> , penconazole <sup>(1)</sup>
leaf spot	chlorothalonil, dodine <sup>(1)</sup> , mancozeb
<i>Botrytis</i>	chlorothalonil, pyrimethanil <sup>(1)</sup> , fenhexamid, fenhexamid +tolylfluanid <sup>(2)</sup> , tolylfluanid <sup>(2)</sup> , thiram <sup>(1)</sup>
<i>Septoria</i>	chlorothalonil

### Notes:

<sup>(1)</sup> Specific off-label approvals (SOLA's) apply for all or some of this active ingredient

<sup>(2)</sup> All approvals for use of products containing tolylfluanid are temporarily suspended

Rust, caused by *Cronartium ribicola* is less common and should only be treated when found.

### 8.10.1.6 Post-harvest

If vine weevil have been found in the crop, it is recommended that suitable control measures be carried out at this stage before any replanting.

### 8.10.2 Weed control

#### 8.10.2.1 Cultural control

*Cultivations between rows are an acceptable method of weed control on bare soil crops.*

*Polythene soil mulches may be used to suppress weeds and reduce the need for herbicides. At the end of the plantation's commercial life any remaining non-biodegradable mulch must be removed from the field, however, this task should ideally have been carried out during the lifetime of the plantation.*

*It is **strongly recommended** that all polythene materials are disposed of in a legal and environmentally responsible manner. Do not burn or bury polythene on the farm. Wherever possible, polythene materials should be recycled.*

#### 8.10.2.2 Chemical control

The control of weeds using residual and contact herbicides is practical. However, perennial weeds are most effectively managed by controlling prior to planting using translocated herbicides. All herbicides currently approved for use on bush fruit are given in Appendices 7, 8 and 9.

### 8.10.3 Environmental pollution

It is **strongly recommended** that applications of crop protection chemicals are made in such a way which minimises the risk of environmental pollution.

*Where chemical control is being employed, sprays should not be allowed to contact or drift onto field margins, ditches, lakes and watercourses. Be aware of the 'Buffer Zone' restrictions which appertain. The restrictions relate to the proximity of a water course, the type of spray applicator being employed and the chemical product and rate being applied.*

- As a general rule, the buffer zone restriction width for tractor mounted horizontal boom sprayers is 5

metres from the top of the bank of the watercourse.

- This applies to all pesticide products which are listed in category A.
- For any product listed in Category B, a 'local environmental risk assessment for pesticides' (LERAP) can be carried out to ascertain whether the buffer zone can be reduced.
- A written record of any calculations carried out must be kept for future reference.
- For broadcast air - assisted applications, the widths are generally greater (e.g. 18 metres) and can be even wider, due to the greater potential for spray drift problems with such applications. Buffer zones may now be reduced in certain circumstances, where a LERAP for Broadcast Air-Assisted sprayers has been undertaken.
- Always refer to the DEFRA/PSD publication "Local Governmental Risk Assessments for Pesticides - a practical guide" (Published 8<sup>th</sup> March 1999), 'Local Environmental Risk Assessment for Pesticides (LERAP) - Horizontal Boom Sprayers' (published 2001) and 'Local Environmental Risk Assessment for Pesticides (LERAP) - Broadcast Air-Assisted Sprayers' (published 2002).

## 9 Harvesting and storage

### Harvest

Smoking must not be allowed in the Blackcurrant plantation. All picking staff must be carefully supervised to ensure only quality fruit is picked and that high standards of personal hygiene are observed. It is advisable that all harvested fruit should be kept under shade at the collection point and removed from the field within 45 minutes of picking. During very hot weather, harvesting warm fruit into large containers 'traps' the field heat, very significantly reducing shelf-life and making rapid freezing impossible. These problems may be alleviated by avoiding harvesting in the heat of the day.

## 10 Pollution control and waste management

See Generic Standards and/or Generic Guidance Notes.

## 11 Energy efficiency

See Generic Standards and/or Generic Guidance Notes.

## 12 Health and Safety

See Generic Standards and/or Generic Guidance Notes.

## 13 Conservation

See Generic Standards and/or Generic Guidance Notes.

## Appendix 1 Typical fertiliser applications for Blackcurrants (kg/ha)

### Before Planting

Nutrient (kg/ha)	Soil Index				
	0	1	2	3	3+
Nitrogen (N)	nil	nil	nil	nil	nil
Phosphate (P <sub>2</sub> O <sub>5</sub> )	200	100	50	50	nil
Potash (K <sub>2</sub> O)	200	100	50	nil	nil
Magnesium (Mg)	165	125	85	nil	nil

Base dressings of macronutrients should be made prior to planting. Well-rotted bulky organic manures can be applied and incorporated to improve soil structure of all soil types and improve the water holding capacity of light soils. However, bear in mind that these manures contain nutrients and fertiliser applications should be reduced according to the following table for each tonne or cubic metre of material applied.

	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Mg
Cattle Farm manure (kg/t)	6.0	2.1	7.2	0.7
Undiluted slurry <sup>(1)</sup> (kg/m <sup>3</sup> )				
Cow (Dairy)	3.0	0.6	3.2	0.7
Pig	4.0	1.0	2.3	0.4
Poultry (Layer manure)	16.0	7.8	8.1	2.2

### Note:

(1) Adjust the values if diluted

(2) For full details of all fertiliser recommendations, see the MAFF publication 'Fertiliser Recommendations for Agricultural and Horticultural Crops (RB209)

### After Planting

Nutrient (kg/ha)	Soil Index				
	0	1	2	3	3+
Nitrogen	70-140	70-140	70-140	70-140	70-140
Phosphate (P <sub>2</sub> O <sub>5</sub> )	110	70	40	40	nil
Potash (K <sub>2</sub> O)	250	180	120	60	nil
Magnesium (Mg)	60	40	30	nil	nil
Magnesium (Mg) (for Gooseberries)	100	65	50	nil	nil

Lower applications of Nitrogen can be used on blackcurrant cultivars prone to excessive growth (e.g. Ben Hope) and other bush fruit. Routine soil analyses should be carried out during the life of the plantation and top dressings of fertiliser applied according to the results of soil analysis indices.

## Appendix 2 Biological control organisms (BCO) for gooseberry and Redcurrant production

Pest	BCO	Comments
Two-spotted spider mite	<i>Phytoseiulus persimilis</i>	<p>Typical application rate is 25000 predators per hectare but rate will depend upon level of infestation at time of introduction.</p> <p>Timing: outdoors from mid-May onwards when pest is seen.</p>

Several naturally occurring insects such as ladybirds, hoverflies, anthocorid bugs, lacewings, *Aphidius*, *Feltiella acarisuga* (midge) and *Typhlodromus* mites feed on pests such as aphids, caterpillars, weevil larvae and two-spotted spider mites. Growers should learn to recognise these predators and aim as much as possible to use selective rather than broad-spectrum insecticides to encourage these predators in their plantation.

Work is currently being undertaken to develop the use of predatory nematodes such as *Steinernema kraussei* for control of vine weevil as well as other organisms to control slugs and *Botrytis*.

**Appendix 3 Insecticides currently approved for use on Gooseberries**

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
<i>Bacillus thuringiensis</i> <sup>(2)</sup>	A bacterial insecticide for control of caterpillars. Safe for use in I.P.M. programmes.	SOLA 0358/04 (Until 31/12/13)	none stated	none stated	none stated	none set
chlorpyrifos	Organophosphate insecticide. Contact and ingested action. Broad-spectrum activity. Kills beneficial insects. Maximum rate of application 1.5L – 1kg/ha, most products only 1 application permitted per crop per year.	Full varies with product some until 31/12/13	14 days	A	Harmful Irritant	1.0 (EC MRL)
citrus fruit extract/ garlic	Physical mode of action with activity against a range of pests	Pesticide with physical properties falling outside the scope of 'Control of pesticide regulations'	nil	none stated	none stated	none stated
Diflubenzuron <sup>(2)</sup>	A selective, persistent, contact and stomach acting insecticide, for caterpillar control	SOLA's 0573/06 & 0577/06 (Until 31/12/08)	14 days	B	Harmful	none stated
dodecylphenol ethoxylate	Physical mode of action, working by suffocating the insects. Compatible with IPM programmes. Safe to bees. Controls aphids and whitefly and offers some suppression of two-spotted spider mite, mealy bug and leafhopper.	Full	nil	none stated	none stated	none stated
ferric phosphate	Non hazardous molluscicide which breaks down into iron and phosphate in the soil, becoming available for plant nutrition.	Full until 31/10/11	none stated	none stated	none stated	none set
garlic	Physical mode of action with activity against a range of pests	Pesticide with physical properties falling outside the scope of 'Control of pesticide regulations'	nil	none stated	none stated	none stated
lambda-cyhalothrin <sup>(2)</sup>	Synthetic pyrethroid insecticide with broad spectrum activity. Kills beneficial insects. 2 applications permitted/year	SOLA 0727/06 (Until 13/11/09) & 3769/07 (until 28/06/11) & 1285/07 (until 13/11/09)	14 days	B	Harmful Irritant	0.1(EC MRL)
metaldehyde	Molluscicide only kills slugs and snails. Harmless to natural predators and BCO's.	Full varies with product some until 31/12/13	none stated	none stated	none stated	none set
natural plant extracts	Physical mode of action with activity against a range of pests including two-spotted spider mites, aphids, thrips and whitefly.	Pesticide with physical properties falling outside the scope of 'Control of pesticide regulations'	nil	none stated	none stated	none stated

**Notes:**

(1) or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

**Appendix 3 Insecticides currently approved for use on Gooseberries (Cont'd)**

Active Ingredient	Product Features	Approval Type	Harvest Interval	LERAP Category	Hazard Rating	MRL (mg/kg)
nicotine	Non-persistent alkaloid insecticide with contact action. Broad spectrum. Kills beneficial insects and predators. No limit to number of applications	Full until 31/12/13	2 days	none stated	Toxic Harmful	none set
pirimicarb	Carbamate insecticide. Contact, translaminar and powerful fumigant activity. Selective for aphids. Safe to most predators and beneficial insects. No limit to number of applications	Full until 31/12/13	3 days	none stated	Harmful	none set
Pymetrozine <sup>(2)</sup>	Azomethine insecticide. Safe to predatory insects. Moves systemically and prevents aphids feeding, leading to death by starvation in 1-4 days. Up to 3 applications permitted/year	SOLA 1702/06(Until 31/10/11) for use on outdoor crop & 0504/07(Until 31/10/11) & 0492/07 (until 31/7/08) for protected crop	12 weeks	none stated	none stated	0.02* (EC MRL)
pyrethrins	Short persistence pyrethroid insecticide with broad spectrum activity. Kills beneficial insects.	Full or provisional depending on product until 31/12/13	nil	none stated	Irritant (for some products)	none set
rotenone	Natural insecticide. Contact action with low persistence. Broad spectrum. Harmful to most predators and beneficial insects. No limit to number of applications	Full until 31/12/13	1 day	none stated	none stated	none set
tebufenpyrad <sup>(2)</sup>	Pyrazole mitochondrial electron transport inhibitor aphicide and acaricide. Contact and translaminar activity. Safe to beneficial insects. One application per year. Max rate of use 1.5kg/ha	SOLA 0131/08 until 31/12/13	7 days	B	none stated	1.0 (UK Temporary MRL)
thiacloprid <sup>(2)</sup>	Chloronicotinyl insecticide. Safe to most predatory insects. For outdoor use only, maximum individual application 0.25L/ha. Maximum of 0.75l/ha or 3 application/year	SOLA 0335/06 (Until 23/12/14)	3 days	B	Harmful	1.0 (EC MRL)

**Notes:**

(1) or latest time of application

\* Level at or about the limit of determination

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 4 Insecticides currently approved for use on Black, Red & Whitecurrants

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
<i>Bacillus thuringiensis</i>	A bacterial insecticide for control of caterpillars. Safe for use in I.P.M. programmes.	SOLA 0358/04 (Until 31/12/13)	none stated	none stated	none stated	none set
bifenthrin <sup>(2)</sup>	Contact & residual pyrethroid acaricide/insecticide. For control of two spotted spider mite adults & juveniles. Very harmful to predatory insects & mites.	SOLA's 3125/06 & 3033/06 (Until 31/12/13) for use on blackcurrant <b>only</b>	1 day	A	Harmful Irritant	0.5 (EC MRL)
chlorpyrifos	Organophosphate insecticide. Contact and ingested action. Broad-spectrum activity. Kills beneficial insects. Up to 3 applications/year, rate of application varies according to target pest & product from 0.6-1kg or 1-1.5L/ha.	Full last date of application varies according to product some until 31/12/13 Can be used on Black, Red & Whitecurrent	14 days	A	Harmful Irritant	1.0 (EC MRL)
citrus fruit/ extract garlic	Physical mode of action with activity against a range of pests	Pesticide with physical properties falling outside the scope of 'Control of pesticide regulations'	nil	none stated	none stated	none stated
clofentezine <sup>(2)</sup>	Ovicidal tetrazine acaricide. Effective control of eggs and young larval stages of two spotted spider mite. Safe to predators - useful for integrated control. Only for use on outdoor crops.3 applications permitted/year	SOLA 2269/01 (Until 31/12/13) for use on Black, Red & Whitecurrant	14 days	None stated	None stated	0.5 (EC MRL) 0.05 (Codex MRL) for Black, Red & Whitecurrant
diflubenzuron <sup>(2)</sup>	Selective insecticide. Persistent, contact and stomach acting insecticide. Selective against caterpillars and sawflies. Safe to use with predators and beneficial insects thus useful for integrated control. 2 applications permitted/year, concentration must not exceed 0.3L/2000L of water	Full until 31/12/13 for blackcurrant. SOLA's 0573/06 & 0577/06 (Until 31/12/13) for Red & Whitecurrant	14 days	B	none stated	none set
dodecylphenol ethoxylate	Physical mode of action, working by suffocating the insects. Compatible with IPM programmes. Safe to bees. Controls aphids and whitefly and offers some suppression of two-spotted spider mite, mealy bug and leafhopper.	Full	nil	none stated	none stated	none stated
ferric phosphate	Non hazardous molluscicide which breaks down into iron and phosphate in the soil, becoming available for plant nutrition.	Full until 31/10/11	none stated	none stated	none stated	none set
garlic	Physical mode of action with activity against a range of pests	Pesticide with physical properties falling outside the scope of 'Control of pesticide regulations'	nil	none stated	none stated	none stated
lambda-cyhalothrin <sup>(2)</sup>	Synthetic pyrethroid insecticide with broad spectrum activity. Kills beneficial insects and harmful to bees.	SOLA 0727/06 (until 13.11.09) & 3269/07 (until 28/06/11) & 1285/07 (until 13/11/09) for use on Black, Red & Whitecurrant)	14 days	B	Harmful Irritant	0.1 (EC MRL)
metaldehyde	Molluscicide only kills slugs and snails. Harmless to natural predators and BCOs.	Varies some products until 31/12/13	none stated	none stated	none stated	none set

#### Notes:

(1) Or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

\* levelat or about the limit of determination. Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 4 Insecticides currently approved for use on Black, Red & Whitecurrants (Cont'd)

Active Ingredient	Product Features	Approval Type	Harvest Interval (1)	LERAP Category	Hazard Rating	MRL (mg/kg)
natural plant extracts	Physical mode of action with activity against a range of pests including two-spotted spider mites, aphids, thrips and whitefly.	Pesticide with physical properties falling outside the scope of 'Control of pesticide regulations'	nil	none stated	none stated	none stated
nicotine (2)	Non-persistent alkaloid insecticide with contact action. Broad spectrum. Kills beneficial insects and predators. No limitation to number of applications	Full until 31/12/13 for use on Blackcurrant SOLA 3294/06 (Until 31/12/13) for use on Red & Whitecurrant	2 days	none stated	Toxic Harmful	none set
pirimicarb	Carbamate insecticide. Contact, translaminar and powerful fumigant activity. Selective for aphids. Safe to most predators and beneficial insects. No limit to number of applications	Full until 31/12/13 for use on Black & Redcurrant, <b>use on Whitecurrant is not permitted</b>	3 days	none stated	Harmful	0.5 (Codex MRL for Black currant)
pymetrozine (2)	Azomethine insecticide. Safe to predatory insects. Moves systemically and prevents aphids feeding, leading to death by starvation in 1-4 days. Up to 3 applications permitted/year	SOLA 0504/07 (Until 31/10/11) & 0492/07 (until 31/7/08) for use on <b>protected</b> crops of Black Red & Whitecurrant SOLA 0946/06 (Until 31/10/11) for use on outdoor Blackcurrant & 1702/06 (Until 31/12/13 for use on outdoor Black, Red & Whitecurrants	12 weeks (84 days) for SOLA's 0504/07 & 1702/06  28 days for SOLA's 0946/06 & 0492/07	none stated	none stated	0.1 EC MRL for black, red and white currant
pyrethrins	Short persistence pyrethroid insecticide with broad spectrum activity. Kills beneficial insects.	Full or provisional depending on product until 31/12/13	nil	none stated	Irritant (for some products)	none stated
rotenone	Natural insecticide. Contact action with low persistence. Broad spectrum. Harmful to most predators and beneficial insects. No limitations upon use	Full until 31/12/13 for use on Black, Red & Whitecurrant	1 day	none stated	none stated	none set
sulphur (2)	Fungicide giving incidental control of big bud mite. Safe to most predators and beneficial insects.	Full for Blackcurrant, SOLA's 1042/06 & 1896/07 (Until 31/12/13 & 31/08/08) for use on Red & Whitecurrant	Nil	none stated	none stated	none set
tebufenpyrad (2)	Pyrazole mitochondrial electron transport inhibitor aphicide and acaricide. Contact and translaminar activity. Safe to beneficial insects. Maximum individual rate of application 1.5kg/ha, 1 application permitted/year.	SOLA 0131/08 until 31/12/13 for use on Black, Red & Whitecurrants)	7 days	B	none stated	1.0 for Black, Red & White currant (UK Temporary MRL)
thiacloprid (2)	Chloronicotinyl insecticide. Safe to most predatory insects. For outdoor use only. Maximum individual rate of use 0.25L/ha, up to 0.75L/ha or 3 applications permitted/year	SOLA 0335/06 (Until 13/12/14) for use on Black, Red & Whitecurrants	3 days	B	Harmful	1.0 (UK Temporary MRL) for Black, Red & White currant

#### Notes:

(1) Or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

\* level at or about the limit of determination. Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 5 Fungicides currently approved for use on Gooseberries

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
bupirimate	Systemic pyrimidinol. Protectant. Harmful to <i>Phytoseiulus</i> predators. For outdoor use only. Individual rate of use 0.7-1.4L/ha, up to 10 applications or a total of 7L/ha/year	Full final use date varies with product some up to 31/12/13	14 days	none stated	Irritant	none set
chlorothalonil	Chlorophenyl fungicide. Protectant. Safe to <i>Phytoseiulus</i> predators. Maximum individual rate of application 5L/ha in 2000L of water for 500g/L formulations. Number of applications/year varies according to product from 4 pre and 2-3 post harvest. Some products specify that last date of use must be made each year by 31 August.	Full, final use date varies with product some up to 31/12/13	28 days	B	Irritant	10.0 (EC MRL)
copper oxychloride <sup>(2)</sup>	Copper fungicide. Protectant. No restriction on number of applications made per year.	SOLA's 3131/06 & 3137/06 (Until 31/12/13)	zero	none stated	none stated	none set
Cupric ammonium carbonate	Protectant copper fungicide. 3 applications permitted/year	Full until 31/12/13	zero	none stated	harmful	none set
dodine <sup>(2)</sup>	Guanidine fungicide. Protectant and eradicant. No limitation to number of applications/year	SOLA's 0615/06 & 0617/06 (Until 31/12/13)	No harvest interval stated on label or SOLA's 1 month recommended for crops intended for processing	none stated	Harmful Irritant	none set
fenarimol	Pyrimidine fungicide. Protectant. No limit to number of applications/year	Full until 30/06/08	14 days	none stated	none stated	1.0 (EC MRL)
fenhexamid	Hydroxyenilide fungicide. Protectant. Up to 4 applications permitted/year	Full until 31/05/11	7 days	none stated	none stated	5.0 (EC MRL)
fenhexamid + tolyfluanid <sup>(3)</sup>	Protectant sulfamide: very effective against <i>Botrytis</i> . Outdoor use only. 2 applications permitted/year	Full until 31/12/13 <b>(suspended)</b>	21 days	B	none stated	5.0 (EC MRL for fenhexamid)

#### Notes:

(1) or latest time of application

(2) SOLA - see Appendix 9 for specific products and expiry dates

(3) All approvals for the use of product containing tolyfluanid are temporarily suspended

\* Level at or about the limited of determination.

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 5 Fungicides currently approved for use on Gooseberries (Cont'd)

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
fenpropimorph <sup>(2)</sup>	Contact and systemic morpholine fungicide. 3 applications permitted/year	SOLAs 1703/05, 0804/04, 0802/04 until 31/12/08	14 days	none stated	Harmful Irritant	none set 1.0 (EC MRL)
resoxim-methyl <sup>(2)</sup>	Strobilurin fungicide. Protectant. For outdoor use only.	SOLA 0656/06 (Until 31/12/11)	14 days	B	none stated	1.0 (EC MRL)
mancozeb	Dithiocarbamate fungicide. Protective action. Safe to beneficial insects. No limit to number of applications/year	Full until 31/12/13	1 month	none stated	Irritant	5.0 (EC MRL)
myclobutanil	Conazole fungicide. Protectant and eradicant. Rate of individual application from 0.23-0.45L/ha, up to a total of 2.7L/ha/year	Full until 31/12/13	14 days	none stated	none stated	1.0 (EC MRL)
penconazole <sup>(2)</sup>	Protectant conazole fungicide with antispore activity. 4 applications/year permitted	SOLA 1106/06 (Until 31/12/13)	28 days	none stated	Harmful Irritant	0.05* (EC MRL)
potassium hydrogen carbonate	Naturally occurring compound that offers protection and control against powdery mildew. Compatible with IPM programmes and offers no residue problems.	Commodity substance	none stipulated	none stated	none stated	none set
pyrimethanil <sup>(2)</sup>	Pyrimidine fungicide. Protectant and eradicant. Up to 2 applications or a total of 4L/ha permitted/year	SOLA 0519/04 expires 31/12/13	21 days	none stated	none stated	none set
sulphur	Inorganic protectant fungicide	Full	up to fruit swell	none stated	-	none set
thiram <sup>(2)</sup>	Dithiocarbamate fungicide. Protectant. No limitation to use	SOLA 2153/07 (Until 31/12/13) and 2154/07 (until 31/07/09)	7 days	none stated	Harmful Irritant	none set
tolyfluanid <sup>(3)</sup>	Protectant sulfamide: very effective against <i>Botrytis</i> Rate of use 1.5-2kg/ha. Up to 3 applications or a total of 5kg/ha/year permitted	Full until 31/12/13 <b>Suspended</b>	21 days	B	Irritant	5.0 (EC MRL)

#### Notes:

(1) or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

(3) All approvals for the use of product containing tolyfluanid are temporarily suspended

\* level at or about the limit of determination (L.O.D.)

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 6 Fungicides currently approved for use on Black, Red & Whitecurrants

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
Bordeaux mixture	Protectant copper sulphate/lime complex fungicide for leaf spot. No restriction on number of applications made per year.	Full on Blackcurrant only	zero	none stated	none set	none set
boscalid + pyraclostrobin	Protectant and systemic fungicide mixture including a strobilurin,. Maximum 2 pre harvest and 1 post harvest application.	SOLA 1257/07 on blackcurrant only until 30/09/13	3 days	B	Harmful	5.0 (boscalid) 2.0 (pyraclostrobin) (UK MRL)
bupirimate <sup>(2)</sup>	Systemic pyrimidinol. Protectant. Harmful to <i>Phytoseiulus</i> predators. Individual rate of application 1-2L/ha, no restriction on number of applications/year	Full on Blackcurrant SOLA 1250/06 (Until 31/08/08) and 0995/07 (Until 31/12/13) for use on Red & Whitecurrants	7 days	none stated	Irritant	none set
chlorothalonil <sup>(2)</sup>	Chlorophenyl fungicide. Protectant. Safe to <i>Phytoseiulus</i> predators. Number of applications permitted on blackcurrant and redcurrant pre & post harvest varies according to product from 4-5 pre & 2-3 post harvest.	Full on blackcurrant and redcurrant only, final use date varies with product some up to 31/12/13.	28 days	B	Irritant	10.0 (EC MRL) for black and redcurrant 5.0 (Codex) for black, red and white currant
Cupric ammonium carbonate	Protectant copper fungicide. Use only permitted on <b>Blackcurrants</b> 3 applications permitted/year	Full until 31/12/13	zero	none stated	harmful	none set
copper oxychloride <sup>(2)</sup>	Copper fungicide. Protectant. No restriction on number of applications made per year.	Full until 31/12/13 for Blackcurrants, SOLA's 3131/06 & 3137/06 (Until 31/12/13) for use on Red & Whitecurrants	zero	none stated	none stated	none set
dodine <sup>(2)</sup>	Guanidine fungicide. Protectant and eradicant. No limitation to number of applications/year	Full until 31/12/13 for use on blackcurrants SOLA's 0615/06 & 0617/06 (Until 31/12/13) for use on Red & Whitecurrant	No harvest interval stated on label or SOLA's 1 month recommended for crops intended for processing	none stated	Harmful Irritant	none set
fenarimol	Pyrimidine fungicide. Protectant. No limitation on number of applications per year.	Full until 30/06/09 for use on Blackcurrants SOLA 3122/07 (Until 30/06/08) for use on Red & Whitecurrants	14 days	none stated	none stated	1.0 (EC MRL) for Black, Red & Whitecurrent

**Notes:**

(1) Or latest time of application

(2) SOLA - see Appendix 9 for specific products and expiry dates

(3) All approvals for the use of products containing tolyfluanid are temporarily suspended

\* Level at or about the level of determination (LOD)

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

**Appendix 6 Fungicides currently approved for use on Black, Red & Whitecurrants (Cont'd)**

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
fenhexamid	Hydroxyenilide fungicide. Protectant. 4 applications permitted/year.	Full until 31/05/11 on Black, Red & Whitecurrent	7 days	none stated	none stated	5.0 (UK MRL) 5.0 (Codex)
fenhexamid + tolyfluanid <sup>(3)</sup>	Protectant sulfamide: very effective against <i>Botrytis</i> . Outdoor use only. 2 applications or up to a total of 6kg/ha/year permitted	Full until 31/12/13 for use on Black, Red & Whitecurrent <b>Suspended</b>	21 days	B	none stated	5.0 (UK MRL) forfenhexamid
fenpropimorph <sup>(2)</sup>	Contact and systemic morpholine fungicide. 3 applications per year permitted	SOLAs 1703/05 0804/04 0802/04 (Until 31/12/13)	14 days	none stated	Harmful Irritant	1.0 (EC MRL)
kresoxim-methyl <sup>(2)</sup>	Strobilurin fungicide. Protectant. For outdoor use only. Up to 3 applications/year permitted	Full for Blackcurrant, SOLA 0656/06 (Until 31/12/11) for use on Red & Whitecurrants	14 days	B	none stated	1.0 (UK MRL) for black, red & whitecurrant
mancozeb <sup>(2)</sup>	Dithiocarbamate fungicide. Protectant. No limitation to number of applications	Full until 31/12/13 for use on Blackcurrant SOLA's 1979/06 (Until 31/12/13) for use on Red & Whitecurrants	28 days	none stated	Irritant	5.0 (EC MRL) for black, red & white currant 10.0 (Codex MRL)
myclobutanil <sup>(2)</sup>	Conazole fungicide. Protectant and eradicator. Rate of individual applications from 0.23-0.45L/ha. A total dose of 2.7L/ha/year permitted	Full until for use on Blackcurrant SOLA 3067/06 (For MAPP 09397 only until 31/12/13) for use on Red & Whitecurrants	14 days	none stated		1.0 (EC MRL) for black, red & white currant 0.5 (Codex MRL) for blackcurrant
penconazole <sup>(2)</sup>	Protectant conazole fungicide with antispore activity. 4 applications/year permitted	Full for use on Blackcurrant, SOLA 1106/06 (Until 31/12/13) for use on Red & Whitecurrants	28 days	none stated	Harmful Irritant	0.5 (EC MRL) for black, red & whitecurrant
potassium hydrogen carbonate	Naturally occurring compound that offers protection and control against powdery mildew. Compatible with IPM programmes and offers no residue problems.	Commodity substance	none stipulated	none stated	none stated	none set
pyrimethanil <sup>(2)</sup>	Pyrimidine fungicide. Protectant and eradicator. 2 applications/year permitted	SOLA 0519/04 expires 31/12/13 for use on Black, Red & Whitecurrants	21 days	none stated	none stated	none set

**Notes :**

<sup>(1)</sup> Or latest time of application

<sup>(2)</sup>SOLA - see appendix 9 for specific products and expiry dates.

<sup>(3)</sup> All approvals for the use of products containing tolyfluanid are temporarily suspended

\* level at or about the limit of determination (L.O.D.)

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 6 Fungicides currently approved for use on Black, Red & Whitecurrants (Cont'd)

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
thiram <sup>(2)</sup>	Dithiocarbamate fungicide. Protectant.	Full until 31/12/13 for use on Blackcurrants SOLAs 2153/07 (Until 31/12/08) and 2154/07 (until 31/07/09) for use on Red & Whitecurrants	7 days	none stated	Harmful Irritant	none set
tolyfluanid <sup>(3)</sup>	Protectant sulfamide: very effective against <i>Botrytis</i> rate of use from 1.5-2kg/ha, a total of 5kg/ha/year or 3 applications/yr permitted	Full until 31/12/13 for use on Black, Red & Whitecurrant <b>Suspended</b>	21 days	B	Irritant	none set

**Notes :**

<sup>(1)</sup> Or latest time of application

<sup>(2)</sup> SOLA - see appendix 9 for specific products and expiry dates.

<sup>(3)</sup> All approvals for the use of products containing tolyfluanid are temporarily suspended

\* level at or about the limit of determination (L.O.D.)

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

## Appendix 7 Herbicides currently approved for use on Gooseberries

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
asulam <sup>(2)</sup>	Controls docks and bracken. Apply to ground only. Allow 10 months between applications. 2 applications permitted/year	SOLA 0799/07 (until 31/12/12), 2180/07 and 2186/07 (until 30/09/08)	none stated	none stated	none stated	none set
carfentrazone-ethyl	A triazolinone contact herbicide, for removal of annual weeds pre-planting	Full until 24/08/09	Pre-planting only	None stated	Harmful	0.01* (EC MRL)
chlorpropham	Controls chickweed and polygonums pre-emergence. Don't use on light, sandy, open textured soils. For outdoor use only. 1 application permitted per year before the 1 March. <b>This product is on part revocation but may continue to be used until the expiry date.</b>	Full until 31/08/08	None set	None stated	Harmful Irritant	0.05* (EC MRL)
chlorthal dimethyl	Apply to new plantings. Do not use on organic soils. 1 application/year. Can be used on newly planted bushes	Full until 31/12/13	none stated	none stated	none stated	none set
dichlobenil	Controls annuals and perennials, pre and post-emergence. Don't apply to frozen or waterlogged soils or weakened plantations. 1 application per year applied between late December and mid March. Should not be applied within 2 years of planting or before first year of cropping	Full until 31/12/13	none stated	none stated	Irritant	none set
diquat & paraquat	Annual weeds post-emergence. Subject to Poisons Rules 1982 and Poisons Act 1972. Apply as a directed spray. No limit on number of applications. <b>This product is on revocation but may continue to be used until the expiry date.</b>	Full until 11/07/08	none stated	none stated	Toxic Harmful Irritant	0.05* (EC MRL) for all bush fruits 0.01* (Codex MRL)
diuron <sup>(2)</sup>	Controls annual dicotyledons and annual grasses pre-emergence. Established gooseberries, applied before bud burst. One or two applications permitted/year according to rate of use at each application	SOLA 2522/07 (until 13/12/08)	none stated	none stated	Irritant	none set
fluazifop-p-butyl	Controls grasses post-emergence. Not effective against annual meadow grass. One spray per season. Do not apply between flowering and harvest	Full until 31/12/13	none stated	none stated	Irritant	none set
glufosinate-ammonium	Controls annuals and perennials post emergence. Apply as a directed spray – 3 sprays per season. Can be applied between 1 March & 30 September	Full until 31/12/13	none stated	none stated	Harmful Irritant	0.5 (Codex MRL)

### Notes :

\* level at or about the limit of determination (L.O.D.)

(1) or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates.

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit.

As label recommendations are revised regularly, read a current label before use.

### Appendix 7 Herbicides currently approved for use on Gooseberries (Cont'd)

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
glyphosate <sup>(2)</sup>	A translocated non-residual phosphonic acid herbicide. Perennials and annuals controlled post emergence. For application in established plantations as directed/shielded spray. Maximum individual application 4L/ha or 10L/ha/year. Applications can be made up to 4 weeks prior to harvest	SOLA's 2119/04 (until 31/12/08), 2035/06 and 1475/07 (until 30/06/12)	Full approval directed to alleyway or under bush	none stated	Harmful	0.01* (EC MRL)
isoxaben	Controls annual dicotyledons, pre emergence. Requires water for activation. 1 application/year, before 1 April in the year of harvest	Full until 31/12/13	none stated	none stated	none stated	none set
lenacil <sup>(2)</sup>	Controls annual dicotyledons, pre-emergence. Requires water for activation. 1 application/year between the end of harvest and start of flowering	Full until 31/12/13 and SOLAs 1707/01 & 0704/97 (until 31/12/13)	none stated	none stated	Irritant	none set
MCPB <sup>(2)</sup>	Controls annual and perennials post emergence. According to product 1 or 2 applications per year permitted. Not to be applied during flowering.	Full until 31/12/13 and SOLA's 2384/05 & 2381/05 (until 31/12/13)	none stated	none stated	Harmful	0.05* (EC MRL)
napropamide	Controls annual grass and dicotyledons pre-emergence. Apply after 1 November and before 1 March. Photo-degrades under high light levels. One spray per season.	Full until 31/12/13	none stated	none stated	none stated	none set
oxadiazon	Controls annuals pre-emergence. Bindweed pre and post-emergence Apply under bush row bands only - not over top of bushes. No more than 8L/ha/year. 2 applications can be made/year	Full until 31/12/13	none stated	none stated	Irritant	none set
paraquat	Controls annual weeds post-emergence. Subject to Poisons Rules 1982 and Poisons Act 1972. Apply as a directed spray. No limitation on number of applications that can be made per year. Inter row application. <b>This product is on revocation but may continue to be used until the expiry date.</b>	Full until 11/07/08	none stated	none stated	Toxic Harmful Irritant	0.05* (UK MRL) 0.01* (Codex MRL)

#### Notes:

\* level at or about the limit of determination

(1) or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

**Appendix 7 Herbicides currently approved for use on Gooseberries (Cont'd)**

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
pendimethalin	Controls annuals pre-emergence. One spray/season from post-harvest to bud burst. Don't use on weak plantations.	Full until 31/12/13	none stated	none stated	none stated	0.05* (UK MRL)
propachlor <sup>(2)</sup>	Controls annuals pre-emergence. One application per year. For use on outdoor crop only. For use on newly planted crops	SOLAs 1159/02 & 2424/00 (until 31/12/13)	none stated	none stated	Harmful Irritant	none set
propyzamide	Controls annuals pre-emergence, some grasses pre and post-emergence. One spray per year by end of January. Nine months between applications. Use on crops that have been established for at least 1 year Don't use on light soils.	Full some until 31/12/13	none stated	none stated	none stated	0.02* (UK MRL)

**Notes:**

\* level at or about the limit of determination

<sup>(1)</sup> or latest time of application

<sup>(2)</sup> SOLA - see appendix 9 for specific products and expiry dates

Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 8 Herbicides currently approved for use on Black, Red & Whitecurrants

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
asulam <sup>(2)</sup>	Controls docks and bracken. Apply to ground only. Allow 10 months between applications. 1 application per year permitted for Blackcurrant. 2 applications per year permitted for Red & Whitecurrant	Full until 31/12/13 for Blackcurrant and SOLA 0799/07 (until 31/12/12) and 2180/07 and 2186/07 (until 30/09/08) for use on Red and Whitecurrant	none stated	none stated	none stated	none set
carfentrazone-ethyl	A triazinone contact herbicide, for removal of annual weeds pre-planting	Full until 24/08/09	Pre-planting only	None stated	Harmful	0.01* (EC MRL)
Chlorpropham <sup>(2)</sup>	Controls chickweed and polygonums pre-emergence. Don't use on light, sandy, open textured soils. For outdoor use only. 1 application permitted per year before the 1 March. <b>This product is on part revocation but may continue to be used until the expiry</b>	Full until 31/08/08 for use on Blackcurrant. SOLA 1950/07 (until 31/08/08 for use on Red and White currant.	None set	None statd	Harmful Irritant	0.05* (EC MRL)
chlorthal dimethyl <sup>(2)</sup>	Apply to new plantings. Do not use on organic soils. 1 application per year permitted. Can be used on newly planted bushes	Full until 31/12/13 for use on Blackcurrant SOLA 1551/06 (until 31/12/13) for use on Red & Whitecurrant	none stated	none stated	none stated	none set
dichlobenil	Controls annuals and perennials pre and post-emergence. Don't apply to frozen or waterlogged soils or weakened plantations. 1 application permitted/year between late December & mid March. Should not be applied within 2 years of planting or before first year of cropping. Do not apply to bushes that have been cut back to soil level for at least 1 year	Full until 31/12/13 for use on Black & Redcurrant. Not approved for use on Whitecurrant.	none stated	none stated	Irritant	none set
diquat and paraquat	Controls annual weeds post-emergence. Subject to Poisons Rules 1982 and Poisons Act 1972. Apply as a directed spray. No limitation on number of applications that can be made per year. Inter row application. <b>This product is on revocation but may continue to be used until the expiry date.</b>	Full some products until 11/07/08	none stated	none stated	Toxic Harmful Irritant	0.05* (EC MRL) for black, red & whitecurrant 0.01* (Codex MRL)

**Notes:**

(1) Or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

\* level at or about the limit of determination Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

## Appendix 8 Herbicides currently approved for use on Black and Redcurrants (Cont'd)

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
diuron <sup>(2)</sup>	Controls annual dicotyledons and annual grasses pre-emergence. Established Blackcurrant only. Apply before bud burst. 1 or 2 applications permitted/year according to rate of use at each application.	SOLA 2522/07 (until 13/12/08) for use on Black, Red & Whitecurrant	none stated	none stated	Irritant	none set
fluazifop-p-butyl	Controls grasses post-emergence. Not effective against annual meadow grass. One spray per season. Do not apply between flowering and harvest	Full until 31/12/13 for use on Black, SOLA 3272/06 (until 31/12/13) for use on Red & Whitecurrant	none stated	none stated	Irritant	none set
glufosinate-ammonium	Controls annuals and perennials post emergence. Apply as a directed spray. Three sprays per season. Can be applied between 1 March & 30 September	Full until 31/12/13 for use on Black, Red & Whitecurrant	none stated	none stated	Harmful Irritant	0.5 (Codex MRL) for blackcurrant
glyphosate <sup>(2)</sup>	Controls annual and perennials post emergence. . Apply post harvest but before end of November. For outdoor use only. Maximum individual dose 4L/ha, maximum total dose 10L/ha/year. For application as a shielded directed spray	SOLA's 2119/04 (until 31/12/08) 2035/06 (until 12/06/12) and 1475/07 (until 30/06/12) for use on Black, Red & Whitecurrant	4 weeks before harvest	none stated	Harmful Irritant	0.1*(EC MRL)
isoxaben	Controls annual dicotyledons, pre emergence. Requires water for activation. . 1 application/year, before 1 April in the year of harvest	Full for Blackcurrant until 31/12/13, SOLA 1113/06 (until 31/12/13) for use on Red & Whitecurrant	none stated	none stated	none stated	none set
lenacil <sup>(2)</sup>	Controls annual dicotyledons, pre-emergence. Requires water for activation. 1 application/year between the end of harvest and start of flowering	Full for use on Blackcurrant and SOLAs 1707/01 (until 31/12/13) & 0704/97 (until 31/12/13) for use on Black, Red & Whitecurrant	none stated	none stated	Irritant	none set
MCPB <sup>(2)</sup>	Controls annual and perennials post emergence. According to product/SOLA on one or two applications per year permitted on blackcurrant, Red & Whitecurrant Don't apply during flowering.	Full for use on Blackcurrant (until 31/12/13) SOLA's 2384/05, 2381/05 (until 31/12/13) for use on Red & Whitecurrant	none stated	none stated	Harmful	0.05* (EC MRL)
napropamide <sup>(2)</sup>	Controls annual grass and dicotyledons pre-emergence. Apply after 1 November and before 1 March. Photo-degrades under high light levels. One spray per season.	Full until 31/12/13 SOLA's 3014/06 & 3009/06 (until 31/12/13) for use on Red & Whitecurrant	none stated	none stated	none stated	none set

### Notes:

(1) Or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates

\* level at or about the limit of determination Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

### Appendix 8 Herbicides currently approved for use on Black and Redcurrants (Cont'd)

Active Ingredient	Product Features	Approval Type	Harvest Interval <sup>(1)</sup>	LERAP Category	Hazard Rating	MRL (mg/kg)
oxadiazon <sup>(2)</sup>	Controls annuals pre-emergence. Bindweed pre and post emergence Apply under bush row bands only - not over the top of bushes. No more than 8L/ha/year. 2 applications can be made/year	Full (until 31/12/13) for use on Blackcurrant, SOLA 3296/06 (until 31/12/13) for use on Red & Whitecurrant	none stated	none stated	Irritant	none set
paraquat	Controls annual weeds post-emergence. Subject to Poisons Rules 1982 and Poisons Act 1972. Apply as a directed spray. No limitation on number of applications that can be made per year. Inter row application. <b>This product is on revocation but may continue to be used until the expiry date.</b>	Full some products (until 11/07/08) for use on Black, Red & Whitecurrant	none stated	none stated	Toxic Harmful Irritant	0.02* (EC MRL) for black, red & white currant 0.01* (Codex MRL)
pendimethalin <sup>(2)</sup>	Controls annuals pre-emergence. One spray/season from post harvest to bud burst. Don't use on weak plantations.	Full (until 31/12/13) for use on Blackcurrant SOLA's 2307/06, 2616/05, 2112/06 & 2879/05 (until 31/12/08) and 1444/07 (until 31/12/13) for use on Red & Whitecurrant	none stated	B (for products with expiry dates later than 31/12/08)	none stated	0.05* (EC MRL) for black, red & white currant
propachlor <sup>(2)</sup>	Controls annual pre-emergence. One year application per year. Outdoor use only. For use on newly planted crops	SOLA's 2424/00 & 1159/02 (until 31/12/13) for use on Black, Red & Whitecurrant	none stated	none stated	Harmful Irritant	none set
propyzamide	Controls annuals pre-emergence. Some grasses pre and post-emergence. One spray per year by end of January. Nine months between applications. Don't use on light soils. Use on crops that have been established for at least 1 year	Full some until 31/12/13	42 days	none stated	none stated	0.02* (EC MRL)

**Notes:**

\* level at or about the limit of determination

(1) Or latest time of application

(2) SOLA - see appendix 9 for specific products and expiry dates. Not all products containing these active ingredients may be currently approved for use on all forms of bush fruit. As label recommendations are revised regularly, read a current label before use.

## Appendix 9 Specific off-label approvals for Bush Fruit

Crop	Number	Product Name	Active Ingredient	Expiry
Blackcurrant	2540/07	Alpha Propachlor <sup>®</sup>	Propachlor	31/01/09
	2269/01	Apollo 50 SC <sup>®</sup>	Clofentezine	31/12/13
	1475/07	Asteroid <sup>®</sup>	Glyphosate	30/06/12
	0335/06	Calypso <sup>®</sup>	Thiacloprid	31/12/14
	0492/07	Chess WG <sup>®</sup>	Pymetrozine	31/07/08
	05/04/07	Chess WG <sup>®</sup>	Pymetrozine	31/10/11
	3752/06	Clayton Lanark <sup>®</sup>	Bifenthrin	13/11/09
	1703/05	Cleancrop Fenpropimorph <sup>®</sup>	Fenpropimorph	31/12/13
	0802/04	Cleancrop Fenpro <sup>®</sup>	Fenpropimorph	31/12/13
	1707/01	Cleancrop Lenflow <sup>®</sup>	Lenacil	31/12/13
	1285/07	Cleancrop Silo <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	0804/04	Corbel <sup>®</sup>	Fenpropimorph	31/12/13
	0358/04	Dipel DF <sup>®</sup>	<i>Bacillus thuringiensis</i>	31/12/13
	2522/07	Diurex 50 SC <sup>®</sup>	Diuron	31/12/08
	0727/06	Hallmark with Zeon <sup>®</sup> Technology <sup>®</sup>	lambda-cyhalothrin	13/11/09
	3269/07	Markate 50 <sup>®</sup>	lambda-cyhalothrin	28/06/11
	0131/08	Masai <sup>®</sup>	Tebufenpyrad	31/12/13
	0946/06	Plenum WG <sup>®</sup>	Pymetrozine	31/10/11
	1702/06	Plenum WG <sup>®</sup>	Pymetrozine	31/10/11
	1159/02	Ramrod Flowable <sup>®</sup>	Propachlor	31/12/13
	2119/04	Roundup Biactive <sup>®</sup>	Glyphosate	31/12/08
	2035/06	Roundup Biactive <sup>®</sup>	Glyphosate	30/06/12
	0519/04	Scala <sup>®</sup>	Pyrimethanil	31/12/13
	1257/07	Signum <sup>®</sup>	Boscalid & pyraclostrobin	30/09/13
	3125/06	Starion Flo <sup>®</sup>	Bifenthrin	31/12/13
	3033/06	Talstar 80 Flo <sup>®</sup>	Bifenthrin	31/12/13
	0704/97	Venzar Flowable <sup>®</sup>	Lenacil	31/12/13

### Notes:

Specific off-label approvals (SOLAs) provide for the use of the product named in respect of crops, situations or pests other than those included on the product label. Such use is undertaken at the user's choosing and the risk is entirely theirs and /or their advisers.

Specific off-label uses may only take place if all the conditions in the "Notice of Approval" the product label and/or leaflet and any additional guidance on off-label approvals have first been read and understood. The conditions of approval given in the "Notice of Approval" are statutory and supersede any on the label which would otherwise apply.

All SOLAs are conditional on the extant approval of the specific product.

**Appendix 9 Specific off-label approvals for Bush Fruit (Cont'd)**

Crop (Cont'd)	Number	Product Name	Active Ingredient	Expiry
Redcurrant	2370/06	Alpha Pendimethalin <sup>®</sup>	Pendimethalin	31/12/08
	2540/07	Alpha Propachlor <sup>®</sup>	Propachlor	31/01/09
	2269/01	Apollo 50SC <sup>®</sup>	clofentezine	31/12/13
	1475/07	Asteroid <sup>®</sup>	Glyphosate	30/06/12
	2180/07	Asulox (09969) <sup>®</sup>	Asulam	30/09/08
	2186/07	Asulox (09969) <sup>®</sup>	Asulam	30/09/08
	0799/07	Asulox (13175) <sup>®</sup>	Asulam	31/12/13
	0615/06	Barclay Dodex <sup>®</sup>	Dodine	31/12/13
	2381/05	Bellmac Straight <sup>®</sup>	MCPB	31/12/13
	2112/06	Bunker <sup>®</sup>	Pendimethalin	31/12/08
	0335/06	Calypso <sup>®</sup>	Thiacloprid	31/12/14
	0504/07	Chess WG (13310) <sup>®</sup>	Pymetrozine	31/10/11
	0492/07	Chess(10651) <sup>®</sup>	Pymetrozine	31/7/08
	3752/06	Clayton Lanark <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	1703/05	Cleancrop Fenpropimorph <sup>®</sup>	Fenpropimorph	31/12/13
	0802/04	Cleancrop Fenpro <sup>®</sup>	Fenpropimorph	31/12/13
	1707/01	Cleancrop Lenflow <sup>®</sup>	Lenacil	31/12/13
	4167/06	Cleancrop Rover <sup>®</sup>	Chlorothalonil	31/08/07
	1285/07	Cleancrop Silo <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	2616/05	Cleancrop Stomp <sup>®</sup>	Pendimethalin	31/12/08
	1950/07	Comrade <sup>®</sup>	Chlorpropham	31/08/08
	0804/04	Corbel <sup>®</sup>	Fenpropimorph	31/12/13
	3131/06	Cuprokyt <sup>®</sup>	Copper Oxychloride	31/12/13
	3137/06	Cuprokyt FL <sup>®</sup>	Copper Oxychloride	31/12/13
	1551/06	Dacthal W75 <sup>®</sup>	Chlorthal-dimethyl	31/12/13
	3014/06	Devrinol <sup>®</sup>	Napropamide	31/12/13
	3009/06	Devrinol (09374) <sup>®</sup>	Napropamide	31/12/13
	0573/06	Dimilin Flo <sup>®</sup>	Diflubenzuron	31/12/13
	0577/06	Dimilin Flo (08769) <sup>®</sup>	Diflubenzuron	31/12/13
	0358/04	Dipel DF <sup>®</sup>	Bacillus thuringiensis	31/12/13
	2522/07	Diurex 50SC <sup>®</sup>	Diuron	31/12/08
1113/06	Flexidor 125 <sup>®</sup>	Isoxaben	31/12/13	

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**Appendix 9 Specific off-label approvals for Bush Fruit (Cont'd)**

Crop (Cont'd)	Number	Product Name	Active Ingredient	Expiry
<b>Redcurrant (Cont'd)</b>	3272/06	Fusilade Max <sup>®</sup>	Fluazifop-P-butyl	31/12/13
	0727/06	Hallmark with Zeon <sup>®</sup> Technology <sup>®</sup>	lambda-cyhalothrin	13/11/09
	1979/06	Karamate Dry Flo Newtec <sup>®</sup>	Mancozeb	31/12/13
	1042/06	Kumulus DF <sup>®</sup>	Sulphur	31/12/13
	3269/07	Markate 50 <sup>®</sup>	Lambda-cyhalothrin	28/06/11
	0131/08	Masai <sup>®</sup>	Tebufenpyrad	31/12/13
	1250/06	Nimrod (10563) <sup>®</sup>	Bupirimate	31/08/08
	0995/07	Nimrod (13046) <sup>®</sup>	Bupirimate	31/12/13
	1702/06	Plenum WG <sup>®</sup>	Pymetrozine	31/10/11
	0617/06	Radspor FL <sup>®</sup>	Dodine	31/12/13
	1159/02	Ramrod Flowable <sup>®</sup>	Propachlor	31/12/13
	3296/06	Ronstar Liquid <sup>®</sup>	Oxadiazon	31/12/13
	2119/04	Roundup Biactive <sup>®</sup>	Glyphosate	31/12/08
	2035/06	Roundup Biactive <sup>®</sup>	Glyphosate	12/06/12
	3122/07	Rubigan <sup>®</sup>	Fenarimol	30/06/08
	0519/04	Scala <sup>®</sup>	Pyrimethanil	31/12/13
	2879/05	Stomp 400 SC (11777) <sup>®</sup>	Pendimethalin	31/12/08
	1444/07	Stomp 400 SC (13405) <sup>®</sup>	Pendimethalin	31/12/13
	0656/06	Stroby WG <sup>®</sup>	Kresoxim-methyl	31/12/13
	3067/06	Systhane 20EW (09397) <sup>®</sup>	Myclobutanil	31/12/13
	1106/06	Topas <sup>®</sup>	Penconazole	31/12/13
	1896/07	Tripart Imber <sup>®</sup>	Sulphur	31/08/08
	2384/05	Tropotox <sup>®</sup>	MCPB	31/12/13
	2153/07	Unicrop Thianosan DG <sup>®</sup>	Thiram	31/12/08
	2154/07	Thianosan DG <sup>®</sup>	Thiram	31/07/09
	0704/97	Venzar Flowable <sup>®</sup>	Lenacil	31/12/13
	3294/06	X L All Nicotine 95% <sup>®</sup>	Nicotine	31/12/13

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**Appendix 9 Specific off-label approvals for Bush Fruit (Cont'd)**

Crop (Cont'd)	Number	Product Name	Active Ingredient	Expiry
<b>Whitecurrant</b>	2370/06	Alpha Pendimethalin <sup>®</sup>	Pendimethalin	31/12/08
	2540/07	Alpha Propachlor <sup>®</sup>	Propachlor	31/01/09
	2269/01	Apollo 50SC <sup>®</sup>	clofentezine	31/12/13
	1475/07	Asteroid <sup>®</sup>	Glyphosate	30/06/12
	2180/07	Asulox (09969) <sup>®</sup>	Asulam	30/09/08
	2186/07	Asulox (09969) <sup>®</sup>	Asulum	30/09/08
	0799/07	Asulox (13175) <sup>®</sup>	Asulum	31/12/13
	0615/06	Barclay Dodex <sup>®</sup>	Dodine	31/12/13
	2381/05	Bellmac Straight <sup>®</sup>	MCPB	31/12/13
	2112/06	Bunker <sup>®</sup>	Pendimethalin	31/12/08
	0335/06	Calypto <sup>®</sup>	Thiacloprid	31/12/14
	3752/06	Clayton Lanark <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	1703/05	Cleancrop Fenpropimorph <sup>®</sup>	Fenpropimorph	31/12/13
	0802/04	Cleancrop Fenpro <sup>®</sup>	Fenpropimorph	31/12/13
	1707/01	Cleancrop Lenflow <sup>®</sup>	Lenacil	31/12/13
	1285/07	Cleancrop Silo <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	2616/05	Cleancrop Stomp <sup>®</sup>	Pendimethalin	31/12/08
	1950/07	Comrade <sup>®</sup>	Chlorpropham	31/08/08
	0804/04	Corbel <sup>®</sup>	Fenpropimorph	31/12/13
	3131/06	Cuprokyll <sup>®</sup>	Copper Oxychloride	31/12/13
	3137/06	Cuprokyll FL <sup>®</sup>	Copper Oxychloride	31/12/13
	1551/06	Dacthal W75 <sup>®</sup>	Chlorthal-dimethyl	31/12/13
	3014/06	Devrinol <sup>®</sup>	Napropamide	31/12/13
	3009/06	Devrinol (09374) <sup>®</sup>	Napropamide	31/12/13
	0573/06	Dimilin Flo <sup>®</sup>	Diflubenzuron	31/12/13
	0577/06	Dimilin Flo (08769) <sup>®</sup>	Diflubenzuron	31/12/13
	0358/04	Dipel DF <sup>®</sup>	Bacillus thuringiensis	31/12/13
	2522/07	Diurex 50SC <sup>®</sup>	Diuron	13/12/08
	1113/06	Flexidor 125 <sup>®</sup>	Isoxaben	31/12/13
	3272/06	Fusilade Max <sup>®</sup>	Fluazifop-P-butyl	31/12/13
	0727/06	Hallmark with Zeon <sup>®</sup> Technology <sup>®</sup>	lambda-cyhalothrin	13/11/09
	1979/06	Karamate Dry Flo Newtec <sup>®</sup>	Mancozeb	31/12/13

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**Appendix 9 Specific off-label approvals for Bush Fruit (Cont'd)**

Crop (Cont'd)	Number	Product Name	Active Ingredient	Expiry
<b>Whitecurrant (cont'd)</b>	1042/06	Kumulus DF <sup>®</sup>	Sulphur	31/12/13
	3269/07	Markate 50 <sup>®</sup>	Lambda-cyhalothrin	28/06/11
	0131/08	Masai <sup>®</sup>	Tebufenpyrad	31/12/13
	0995/07	Nimrod <sup>®</sup>	Bupirimate	31/12/13
	1702/06	Plenum WG <sup>®</sup>	Pymetrozine	31/10/11
	0617/06	Radspor FL <sup>®</sup>	Dodine	31/12/13
	1159/02	Ramrod Flowable <sup>®</sup>	Propachlor	31/12/13
	3296/06	Ronstar Liquid <sup>®</sup>	Oxadiazon	31/12/13
	2119/04	Roundup Biactive <sup>®</sup>	Glyphosate	31/12/08
	2035/06	Roundup Biactive <sup>®</sup>	Glyphosate	12/06/12
	3122/07	Rubigan <sup>®</sup>	Fenarimol	30/06/08
	0519/04	Scala <sup>®</sup>	Pyrimethanil	31/12/13
	2879/05	Stomp 400SC (11787) <sup>®</sup>	Pendimethalin	31/12/08
	1444/07	Stomp 400SC <sup>®</sup>	Pendimethalin	31/12/13
	1444/07	Stroby WG <sup>®</sup>	Kresoxim-methyl	31/12/11
	3067/06	Systhane 20EW (09397) <sup>®</sup>	Myclobutanil	31/12/13
	1106/06	Topas <sup>®</sup>	Penconazole	31/12/13
	1896/07	Tripart Imber <sup>®</sup>	Sulphur	31/08/08
	2384/05	Tropotox <sup>®</sup>	MCPB	31/12/13
	2153/07	Unicrop Thianosan DG <sup>®</sup>	Thiram	31/12/08
	2154/07	Thianosan DG <sup>®</sup>	Thiram	31/07/09
	0704/97	Venzar Flowable <sup>®</sup>	Lenacil	31/12/13
	3294/06	X L All Nicotine 95% <sup>®</sup>	Nicotine	31/12/13

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**Appendix 9 Specific off-label approvals for Bush Fruit (Cont'd)**

Crop (Cont'd)	Number	Product Name	Active Ingredient	Expiry
Gooseberry	2540/07	Alpha Propachlor 50 SC <sup>®</sup>	Propachlor	31/01/09
	1475/07	Asteroid <sup>®</sup>	Glyphosate	30/06/12
	0799/07	Asulox (13175) <sup>®</sup>	Asulam	31/12/13
	2180/07	Asulox (09969) <sup>®</sup>	Asulam	30/08/08
	2186/07	Asulox (09969) <sup>®</sup>	Asulam	30/08/08
	0615/06	Barclay Dodex <sup>®</sup>	Dodine	31/12/13
	2381/05	Bellmac Straight <sup>®</sup>	MCPB	31/12/13
	0335/06	Calypso <sup>®</sup>	Thiacloprid	31/12/13
	0492/07	Chess WG (10651) <sup>®</sup>	Pymetrozine	31/07/08
	0504/07	Chess WG (13310) <sup>®</sup>	Pymetrozine	31/10/11
	3752/06	Clayton Lanark <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	0802/04	CleanCrop Fenpro <sup>®</sup>	Fenpropimorph	31/12/13
	1703/05	CleanCrop Fenpropimorph <sup>®</sup>	Fenpropimorph	31/12/13
	1707/01	Cleancrop Lenflow <sup>®</sup>	Lenacil	31/12/13
	1285/07	Cleancrop Silo <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	0804/04	Corbel <sup>®</sup>	Fenpropimorph	31/12/13
	3131/06	Cuprokyt <sup>®</sup>	Copper oxychloride	31/12/13
	3137/06	Cuprokyt FL <sup>®</sup>	Copper oxychloride	31/12/13
	0573/06	Dimilin Flo <sup>®</sup>	Diflubenzuron	31/12/13
	0577/06	Dimilin Flo <sup>®</sup>	Diflubenzuron	31/12/13
	0358/04	DiPel DF <sup>®</sup>	Bacillus thuringensis	31/12/13
	2522/07	Diurex 50 SC <sup>®</sup>	Diuron	13/12/08
	0727/06	Hallmark with Zeon Technology <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	3269/07	Markate 50 <sup>®</sup>	Lambda-cyhalothrin	13/11/09
	0131/08	Masai <sup>®</sup>	Tebufenpyrad	31/12/13
	1702/06	Plenum WG <sup>®</sup>	Pymetrozine	31/10/11
	0617/06	Radspor FL <sup>®</sup>	Dodine	31/12/13
	1159/02	Ramrod Flowable <sup>®</sup>	Propachlor	31/12/13
	2119/04	Roundup Biactive <sup>®</sup>	Glyphosate	31/12/08
	2035/06	Roundup Biactive <sup>®</sup>	Glyphosate	30/06/12

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**Appendix 9 Specific off-label approvals for Bush Fruit (Cont'd)**

Crop (Cont'd)	Number	Product Name	Active Ingredient	Expiry
Gooseberry (cont'd)	0519/04	Scala <sup>®</sup>	Pyrimethanil	31/12/13
	0656/06	Stroby WG <sup>®</sup>	Kresoxim-methyl	31/12/11
	2154/07	Thianosan DG <sup>®</sup>	Thiram	31/07/09
	1106/06	Topas <sup>®</sup>	Penconazole	31/12/13
	2384/05	Tropotox <sup>®</sup>	MCPB	31/12/13
	2153/07	Unicrop Thianosan DG <sup>®</sup>	Thiram	31/12/08
	0704/97	Venzar Flowable <sup>®</sup>	Lenacil	31/12/08

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## Appendix 10 Guidelines on minimising pesticide residues

These guidelines have been produced after consultation between crop stakeholders and the Assured Produce crop author. They will be developed over the coming seasons as knowledge on minimising residues develops. Growers should consult with their crop protection adviser to ensure other best practices are not compromised before considering these guidelines.

Consumers and retail customers are raising increasing concerns over the incidence of pesticide residues occurring in fresh produce. Their desire to purchase produce that is free from residues has necessitated bush fruit growers to consider ways and means of minimising the risk of any residues from occurring in their harvested product.

Assured Produce, in consultation with technical representatives from all of the major marketing groups and producer organisations has considered the problems facing the bush fruit industry. Having identified a list of these active ingredients, they have formulated guidance notes on potential crop protection and crop management strategies that growers may wish to follow to minimise the risk of residues occurring.

### Active Ingredients Found in UK Bush Fruit

Following good agricultural practice and integrated crop management should prevent growers from exceeding any set Maximum Residue Levels (MRL's) in the first place. The table below lists those active ingredients commonly found in residue analyses conducted in bush fruit crops. It is not a list of incidences where MRL's are exceeded, but where residues are reported between the MRL and the limit of detection. Each has a star rating, depending upon the frequency with which they are found. Where an active ingredient is not listed, this indicates that either it gives rise to a detectable residue very rarely, or insufficient information is available for its inclusion:

Crop	Chemical type	Active Ingredient	Typical Product Name	H.I.Days	Star Rating
Bush Fruit	Fungicide	chlorothalonil	Bravo 500, Joules etc	28	***
		myclobutanil	Sythane 20EW	14	***
		pyrimethanil	Scala	21	**
		bupirimate	Nimrod	7	*
		boscalid	Signum	43	*
	fenhexamid	Teldor	7	**	
	Insecticides	chlorpyrifos	Dursban 4, Lorsban WG etc	14	**
		pirimicarb	Aphox	3	**

\*\*\* Residues found regularly in samples \*\* Residues found less regularly in samples \* Residues found occasionally in samples

### Possible Solutions to Minimise these Residues

A number of suggestions have been formulated to minimise the risk of some of these active ingredients occurring in residue analyses for both insecticides and fungicides. Suggestions have only been offered where a strategy is considered to be reasonable and can be practically achieved.

#### Fungicides

##### Botrytis

- Aim to establish the best possible control of *Botrytis* at flowering. Late season applications of botryticides are more likely to give rise to residues, and are difficult to apply in bushes that are weighed down with crop. In this situation it is almost impossible to achieve good cover, and the physical damage caused by driving through the crop may well make subsequent infection of damaged tissue by this opportunistic pathogen worse. If *Botrytis* infection has occurred at flowering and is 'latent' within the fruit, later fungicide applications will not ever come into contact with the pathogen, and will be entirely ineffective.

- *Botrytis* pressure increases with bush size and age. Moderate fertiliser and water application, along with pruning to reduce bush density and remove low hanging branches and replanting when bush age becomes excessive, can be used to reduce disease pressure.
- Aim to make the last pyrimethanil and chlorothalonil applications no later than the end of flowering.

#### Leaf Spot

- Aim to establish the best possible control of leaf spot before the disease becomes established. Where this is done successfully, protectant sprays can cease well before harvest.
- Observe the longest possible harvest interval when using chlorothalonil and mycobutanil. Applications after flowering in particular are liable to give rise to detectable residues.

#### Rust

- Delay mycobutanil sprays (Systhane) treatments for Rust until after harvest. Though rust can be detected at low levels in many crops for much of the season, rust epidemics typically don't become serious until after harvest, and a post-harvest application of Systhane is usually sufficient to prevent outbreaks becoming significant and causing premature defoliation.

### Insecticides

#### Aphids

- Aphid outbreaks prompt the use of both chlorpyrifos and pirimicarb in affected plantations. Recent research in blackcurrants has shown that the over-wintering aphid population in a plantation, and as a result the subsequent aphid infestation during the following season, can be markedly reduced following the application of pirimicarb during the last week of September or the first week of October.

#### Sawfly

- Sawfly is an intractable pest that has led to the use of chlorpyrifos during the 'green fruit' stage. Treatment is more likely to be effective and later re-treatment unnecessary, where excellent control is achieved as soon as the outbreak is detected. Frequent careful monitoring of the underside of the lower leaves in the centre of the bushes will detect infestation at an early stage, and prompt treatment with chlorpyrifos, in sufficient water to give excellent cover, often obviates the need to re-treat closer to harvest.

### Improved Crop Monitoring

One way of ensuring that agrochemicals are applied at the optimum time and only when necessary (to avoid the use of unnecessary applications), is to rely upon high quality, routine crop monitoring. Ideally, crops should be assessed every week during key times, for the commonly found insect pests and diseases, as opposed to the fortnightly inspections that is currently the industry standard. This is particularly important early in the season. At this stage, should specific insect pests or diseases appear, then early curative and preventive action can be taken to avoid the use of applications later in the season, closer to harvest, thus reducing the risk of residues occurring.

Where such monitoring is conducted, it is wise to employ record sheets to log any problems which were found each week, record the choice of agrochemical, the date it was applied and why it was applied. At the end of the season, this allows growers to relate any residues that have occurred to the chemical application and the monitoring procedure, thus allowing the effectiveness of the monitoring to be assessed.

## Appendix 11 Control Points: Fruit (Bush Fruit)

### CS.40 FRUIT (BUSH FRUIT)

- CS.40.1      You should be able to show evidence that when selecting fields for bush fruit production you have considered soil structure, drainage, texture, pH, depth, air movement, exposure of the site to prevailing winds, susceptibility to spring frosts and proximity of other bush fruit plantations with existing levels of pest and disease
- Protocol reference: Section 3.1
- CS.40.2      When using crop protection chemicals, growers should ensure that applications are made in a way which minimises the risks of environmental pollution
- Protocol reference: Section 8.10.3
- CS.40.3      Growers should ensure that any polythene waste from plantations is recovered, and disposed of or recycled in the most appropriate manner
- Protocol reference: Section 8.10.2.1