Red Tractor Assurance *for Farms*

Fresh Produce Scheme

Crop Module: Onions (salad)

Effective 1st September 2015

Red Tractor Assurance

Welcome

Red Tractor Assurance for Farms
Fresh Produce Scheme

This crop specific module for salad onions has been written to complement and avoid duplicating the generic principles of the Red Tractor Farm Assurance Fresh Produce Scheme standards. It is advisable to read the Red Tractor Farm Assurance Fresh Produce standards before reading this crop specific module. This module is designed to stimulate thought in the mind of the reader. It contains crop specific guidance and standards, where applicable, in addition to the requirements stated in the generic Fresh Produce standards.

Within this module the important requirements outlined in the crop specific standards section will be verified during the Red Tractor Farm Assurance assessment and compliance will form a part of the certification/approval decision.

Disclaimer and trade mark acknowledgement

Although every effort has been made to ensure accuracy, Assured Food Standards does not accept any responsibility for errors and omissions. Trade names are only used in this module where use of that specific product is essential. All such products are annotated® and all trademark rights are hereby acknowledged.

Notes: Pesticide Information

The Red Tractor Fresh Produce team has been working with Fera to provide tailored access to the LIAISON database for all Red Tractor Fresh Produce members. This system allows individual growers access to all information for plant protection products approved for use under the Red Tractor Fresh Produce Scheme.

LIAISON can be accessed under the Produce tab via the “Checkers and Services” page where you will also find a user manual. Searches will be filtered specifically for the crops for which you are registered. Once you have logged onto the site and clicked on the LIAISON hyperlink you will be directed to the LIAISON home screen.

You will need a username and password and these will be sent once you have registered:

http://assurance.redtractor.org.uk/rtassurance/services/Registration/members.eb .

General Introduction

Following a systematic approach will help growers identify and manage the risks involved in crop production. This module is based on a typical crop production process and 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 precedent over quality and environmental controls. The layout of this module follows the same structure as that used in the Red Tractor Farm Assurance Fresh Produce Standards. The content of the module is reviewed prior to the issue of updated editions. The review process considers both new developments and all relevant technology which has emerged since the last review was completed and which have been found to be both workable by the grower and beneficial to the environment. The aim is to transfer such information and technologies to growers.

Acknowledgements

Red Tractor Farm Assurance Fresh Produce gratefully acknowledges the contribution of all consultees in the preparation of this protocol, particularly Philip Langley of Sandfields Farms Ltd.

Contents

ADDITIONAL REQUIREMENTS AGAINST CURRENT STANDARDS

None for this crop module

CROP SPECIFIC STANDARDS

None for this crop module

GUIDANCE

SITE AND SOIL MANAGEMENT

CROP ROTATION

A good rotation of crops is essential to help reduce the build-up of pests and diseases and it demonstrates a general concern for the maintenance of soil fertility.

A minimum of four years break between allium crops is desirable. However, owing to the availability of suitable irrigated land, this may not be feasible. A break of 12 months from harvesting to replanting will minimise carry-over of fungal spores from foliar diseases. Shorter rotations are likely to increase the risk from soil-borne diseases, especially white rot.

ENVIRONMENTAL PROTECTION & CONTAMINATION CONTROL

THE BASIC APPROACH TO CROP PROTECTION

The guiding principle is that pesticide inputs should be minimised through prevention rather than cure. An integrated approach should be adopted to achieve this involving the following management steps.

Good management and planning

a. Careful site selection to avoid potential or previous problems thereby enhancing plant health

b. Sensible crop rotations to avoid build-up of problems

c. Inclusion of resistant varieties (where available) in cropping programmes whilst respecting the need to meet the required quality parameters and eating requirements

d. Establish the need to take corrective action by regular monitoring referring to thresholds where established. Trained staff should carry this out. The effect of prevailing weather conditions should also be considered.

Cultural preventative techniques

a. Good crop and field hygiene, promoting crop health by maximising nutrient availability through soil analysis and accurate application to avoid excess nutrient application

   All crop residues from previous salad onion crop should be thoroughly destroyed or ploughed-in as soon as cropping is complete.

b. Utilise irrigation as a control measure wherever appropriate and feasible

c. Encourage biological and natural methods of pest control to flourish in the crop environment.

The use of pest and disease monitoring and forecasting techniques should be adopted where possible as an adjunct to crop inspection, thus minimising insecticide and fungicide use. Field margins can provide a reservoir of insect predators, including ladybird larvae, hoverflies, ground beetles etc. Care must be taken to avoid spray drift from the crop into these areas.

Corrective action

If these actions fail to prevent or control pests and disease, the following approach should be adopted:

a. Where corrective action is required, additional biological and natural methods of pest and disease control (if available) should be considered first

b. If chemical control is needed, the following points should be considered, whilst ensuring effective control is achieved:

- Use the least toxic and persistent product.
- Use the most selective product to reduce the impact on naturally occurring beneficial organisms.
- Use minimum effective dose rate (full label rates may be appropriate to reduce the risk of resistance developing).
- Use appropriate application methods with effectively maintained equipment, and spot treating wherever possible.
- Exceeding the recommended dose rate is wasteful, gives no benefit in terms of control, and is also illegal under COPR.

PEST, DISEASE AND WEED CONTROL

PEST CONTROL

Onion thrip (*Thrips tabaci*)

Onion thrip is a cosmopolitan species living on a wide range of vegetables and flowers. Emergence in the spring is temperature dependent and therefore varies widely. The dispersal of the emerged adults can be extensive as they are usually carried on thermal air currents. Males are very rare and most breeding is parthenogenetic. The females lay 60-80 eggs in the leaf axils during their life span of about a month.

The larvae hatch within a week. They look similar to adults but possess only rudimentary wing buds. They are at first straw yellow in colour but darken rapidly to near black. They graze the epidermis of the leaves causing characteristic contorted silvery trails. The larvae feed for 2-3 weeks depending on temperature and then descend to the soil to pupate.

There are usually 2 generations of adults a year but weather conditions often cause what seem to be repeat infestations from April to September.

Cultural control: Regular weekly monitoring of thrips activity is essential. Plants should be pulled up, and the leaves parted. The thrips usually live in the damper areas between the leaves during the day. Regular inspections should ensure that the young yellow larvae are spotted before they start to disfigure the leaves.

When no crop exists, the thrips will complete their life cycles on a wide variety of alternative host plants. The pest therefore can quickly reach economically damaging levels even when no other onion crops are in the vicinity.

Crops planted for overwintering are at rarely at risk in the autumn but can suffer severe infestations as temperatures rise in the spring.

There is no evidence of any resistance to thrips in any of the commonly used varieties of either Allium cepa or Allium fistulosum or their hybrids.

Chemical control: As soon as thrips are identified in the crop, an application of any approved product will only be partially effective. Repeat applications may be necessary if the infestation is heavy. Check the harvest interval is adequate for growth stage of the crop.

There is increasing evidence that a degree of resistance has occurred to the pyrethroid insecticides so their use may not give the required level of control. Products containing Spinosad, thiacloprid or abamectin work best if applied early in an infestation.

Onion fly (*Delia antiqua*)

This is an uncommon pest of salad onions and is often mistaken for infestations of bean seed fly. It overwinters in the soil as a pupa and emerges during April and May. The female lays her eggs in the soil adjacent to emerging seedlings. The larvae enter the seedling and usually destroy the growing point. The seedling then either fails to emerge or dies at the early cotyledon or 1 true leaf stage. There are 2-3 generations a year but the short growing time of the salad onion crop means that onion fly populations rarely build up to provide a consistent threat to the crop.

Cultural control: Yellow water or sticky traps indicate the presence of dipterous pests and can be used to highlight periods of infestation. An experienced agronomist with entomological training is usually needed to identify the catches. Due to the sporadic nature of onion fly no cultural control measures are possible.

Chemical control: Control of early attacks can be achieved by using seed treated with products containing tefluthrin. There are no products that can be used once an infestation is established but chlorpyrifos, approved for cutworm control, may give partial control of an established infestation.

Bean seed fly (*Delia platura*)

This pest of the salad onion crop is much more common than the onion fly because its host range is very wide and it will thrive on many crops and hedgerow plants. It also thrives in decaying vegetation and heaps of packhouse waste. It emerges from March to April from pupae overwintering in the soil. The female lays her eggs below the soil near to the germinating seed. The larvae burrows into the seedling causing identical symptoms to those described for the onion fly above.

The pest has 4-5 generations a year but these can overlap creating difficulties in predicting significant outbreaks.

Cultural control: Water traps (yellow or white) or sticky traps (yellow) can be used as for onion fly (above) but the same reservations apply.

It is extremely unwise to create packhouse waste dumps anywhere near growing vegetable crops. Bean seed flies will readily multiply in them and form a large source from which adults will fly to infest crops.

Prompt ploughing of previously cropped land together with dispersal of any waste around field boundaries, etc. will help to reduce the build-up of this pest.

The adults are attracted by organic matter and freshly cultivated ground. If high numbers are observed, delaying drilling by a few days can reduce the level of damage.

Chemical control: The control measures for bean seed fly are as outlined for onion fly (see Onion fly (Delia antiqua)). It is not necessary to treat seed which is drilled in February or March as there are no flies emerging to infect the crops at this time.

Cutworms

These pests are the caterpillars of several species of noctuid moths, the most common being the turnip moth (Agrotis segetum) . They occur only infrequently in salad onion crops, usually in hot dry summers. The first signs of attack are short lengths of row falling over. Inspection will show that the caterpillars have eaten-off the plants at ground level. Young caterpillars hatch in June and July, start to feed on the foliage and then descend to the soil to feed at ground level, usually at night.

Treatment is only required if damage is seen or if forecast or trapping systems indicate an attack is likely.

Cultural control: Young cutworm caterpillars are easily drowned so heavy rain effectively controls some attacks. In dry weather, regular irrigation, essential for good salad onion crops, is effective in reducing damage especially when used in conjunction with trapping (pheromone traps are available).

Avoid planting salad onions into land that has previously been left very weedy as the moths are attracted to the dense cover to lay eggs.

Chemical control: Spray timings are critical, as large caterpillars are much more difficult to kill than small young ones. Base any treatments (chlorpyrifos) on warnings from subscribed forecasting systems or trapping, and use high volumes of water on to dry soil in warm weather. Irrigation immediately after application may aid activity.

Nematodes

The stem nematode (Ditylenchus dipsaci) is an occasional pest of salad onions. It is occasionally referred to as 'onion bloat' as the onion seedlings have a swollen or bloated appearance. Oats, Parsnips, Broad Beans and other horticultural crops are attacked by the same race of nematode. The nematode can reproduce on certain common farm weeds.

Cultural control: Good crop rotations are essential. If the problem has occurred in a previous host crop it is vital that salad onions are not planted on the infected land. Good weed control is also very important. As nematodes tend to thrive in wet conditions it is essential to make certain that the land is well drained.

Chemical control: There are no chemicals recommended for the control of this pest on outdoor salad onions.

DISEASE CONTROL

Leaf Rot (*Botrytis squamosa*)

Leaf rot is perhaps the most common disease of salad onions. Botrytis can be very damaging if attacks occur in warm humid conditions. This causes severe leaf spotting (initially small white spots with a pale halo) which render the onions unmarketable.

Cultural control: Keeping the crop free from weeds will encourage better air movement within the crop. Ploughing in infected debris and good rotation will also help to improve control of this disease.

Chemical control: There are fungicides that will assist in the control of this disease. These contain the fungicides, azoxystrobin, chlorothalonil, cyprodinil/fludioxonil, boscalid/pyraclostrobin and iprodione. As they come from different chemical groups, it is sensible if materials are used in an alternating programme, in order to reduce the risk of building up resistant strains. Iprodione and cyprodinil/fludioxonil are the most effective active ingredients for curative treatments. Chlorothalonil now only has full approval for use on salad onions in a formulation with azoxystrobin.

Collar rot (*Botrytis cinerea*)

This disease is common on living tissue that is not growing actively; hence it is a particular problem on overwintering onions. It causes die back of foliage and, in the worst cases, will kill the plant.

Cultural control: Good drainage is essential to eliminate waterlogged conditions, especially in overwintered onions.

Chemical control: Early application of suitable fungicides is essential. Fungicides containing iprodione, cyprodinil/fludioxonil, boscalid/pyraclostrobin and chlorothalonil/azoxystrobin are particularly effective in controlling this disease.

Copper oxychloride has an off-label approval for bacterial rots of onions. It may prove effective in protecting overwintering salad onions from both species of Botrytis.

Downy mildew (Peronospora destructor)

This is the most damaging disease of salad onions, occurring most frequently during late summer/autumn when heavy dews often accompany warm nights. It is also becoming increasingly common in early spring on overwintered crops. It can be extremely serious for if conditions are suitable, downy mildew will spread very rapidly through a crop.

Symptoms are initially a grey/purple downy area of sporulation which may develop to become a paler or necrotic area of leaf.

Cultural control: Avoid autumn production near rivers or in areas where there is poor air movement as this encourages the spread of the disease. Reducing plant populations during high risk periods can aid air movement. Regular inspection of the crop is essential to identify an outbreak at an early stage to enable swift remedial action to be taken.

The use of forecasting systems can be useful to predict periods of disease risk and the progression of disease within the crop. There is HDC funded work in progress to improve forecasting models by adding the detection of spores to the system. This may aid the timing of fungicides in future.

Chemical control: Fungicides based on metalaxyl-M/mancozeb, dimethomorph/mancozeb or chlorothalonil/azoxystrobin are approved for this disease. It is most

unwise to spray metalaxyl-M or strobilurin based fungicides routinely, as this could quickly lead to the development of resistant strains. The timing of all fungicide applications is critical as they have little or no curative activity.

Programmes starting at 2-3 leaf (depending on risk) and applied at 7-10 day intervals can be effective in preventing infection. Ensure suitable nozzles are used to give good crop coverage - angled and a fine spray quality.

White rot (*Sclerotium cepivorum*)

This is also a serious disease of Alliums and salad onions in particular. The black resting bodies (sclerotia) can persist in the ground for many years. The first visible sign of the disease is when the leaves turn yellow, wither and die. If the plant is carefully removed from the soil and the roots examined, a white mycelium can be observed colonising the base of the stem. In autumn-sown onions, the loss can be particularly severe when the soil warms up in the spring.

Cultural control: Where a light infestation is known to exist and there is a limitation on land, it is best to try to grow a summer crop. Very often, in hot summers, the germination of sclerotia is inhibited by high soil temperatures. Trials have shown the use of composted onion waste can reduce/inhibit development of white rot when incorporated prior to planting. Refer to the HDC website for trial results.

Otherwise, avoid fields known to be infected.

Care must be taken not to transfer infected soil from one site to another. Washing of cultivation and harvesting equipment is essential if cross-field contamination is to be avoided.

Chemical control: Tebuconazole is approved off-label both as a seed treatment and a foliar spray. Boscalid/pyraclostrobin has an EAMU for foliar applications only. These treatments should be applied only if there is a known risk of white rot in the field. The treatments are more effective on summer onions than overwintered crops due to the different length of time the crops are in the ground. The seed treatment may lower germination by up to 10% and may delay emergence by up to one week.

White tip (*Phytophthora porri*)

This very occasional disease of onions chiefly infects overwintered crops. It is sometimes difficult to distinguish between white tip and leaf blotch. A pathologist should be consulted if there is any doubt as the chemical treatment for each disease is very different. White tip is encouraged by wet weather and waterlogged soil.

Cultural control: As this disease survives in the soil on infected debris, it is important to pay particular attention to crop hygiene. Good drainage will assist in helping to discourage the disease.

Chemical control: Fungicides containing metalaxyl-M, dimethomorph and azoxystrobin will offer some control of this disease. One of the major problems in controlling white tip by chemical means is that when the disease is first observed, soil conditions are such that spraying is very difficult.

Note however that only 3 applications of metalaxyl-M and 4 applications of azoxystrobin may be made to any crop. Ensure this number is not exceeded, especially on overwintering crops.

Leaf blotch (*Cladosporium allii-cepae*)

A very aptly named disease as the leaf of the onion is 'spotted' or 'blotched' (pale, white/brown, oval or 'eye' shaped lesions). It usually occurs more frequently during the winter months. The fungus appears to reproduce more actively in periods of short day length.

Cultural control: A correct rotation and good crop hygiene should help lessen the risks of the disease.

Chemical control: Ensure that the disease has been correctly confirmed as Leaf Blotch by a qualified pathologist before applying any treatment. No fungicides, currently approved for use on salad onions, are specific to leaf blotch.

WEED CONTROL

Cultural methods

Salad onions are not very competitive; therefore, it is essential the crop is kept relatively free of weeds. Weedy crops encourage pests such as cutworm and bad infestations can restrict the airflow within the crop leading to an increase in diseases such as Botrytis and downy mildew.

Herbicide use can sometimes be minimised by using the stale seedbed technique. This is often useful if a weed is present with limited options for chemical weed control (e.g. fumitory) in the field.

If mechanical means of weed control are employed, consideration must be given at drilling for suitable row spacing and also care taken to avoid the nests of ground nesting birds.

Herbicides

Herbicidal techniques using repeat low dose treatments have been developed. This enables good weed control to be achieved with the minimum potential crop damage.

Consideration of soil type and drilling depth is needed when selecting the rate of residual herbicides, especially when used pre-emergence. Light sands and shallow drilling will increase the risk of crop damage, particularly if heavy rain or irrigation coincide with application.

When planning to use contact herbicides, it is important to ensure the crop has sufficient wax on its leaves to enable it to "shed" the product being applied, thus providing adequate crop selectivity.

This "wettability" is simply tested by dipping the onion leaves into a solution of crystal violet. If adequate wax is present on the leaf the solution will not adhere to the leaf surface.

Always be mindful of the correct soil and weather conditions before applying herbicides. e.g. applying a residual herbicide on to a dry soil will not usually be effective and volatile herbicides such as chlorpropham are best not applied during very hot conditions.

APPROVED USES NOT INCLUDED ON THE PRODUCT LABEL

In many circumstances, particularly for minor crops, product labels do not include all of the approved uses and growers wishing to check the approval notice of a particular product should note that this information is available using the LIAISON® search accessible via their RED TRACTOR Farm Assurance home page after logging in.

A search on the 'Extension of Authorisation for Minor Use' page of LIAISON® by crop or product name should yield a results page. A click on the product name should link to a summary of the approval information. Near the bottom of the summary is the specific off-label number (e.g. 0246/09) and this link will open up a pdf of the current EAMU document giving details of the extension of use.

NUTRITION

Salad onions grow best on light, well-drained soils. The crop will not tolerate acid conditions. A pH of 6.5-7.0 is optimal. Detailed field testing with a reliable soil indicator is essential if isolated acid pockets are to be identified. Composite sampling can give misleading pH figures, which can lead to uneven crop growth.

A soil analysis is essential prior to drilling to determine phosphorous, potassium and magnesium levels. Typical major nutrient requirements are given in the Appendix and the figures are expressed in kilograms of plant food per hectare.

Nitrogen

Winter onions have little need for nitrogen prior to sowing. Much will depend on the previous crop but in most cases, no nitrogen is needed until the spring.

For spring and summer onions, much will depend on soil the indices, but usually 50kg/ha of nitrogen is sufficient to establish the crop.

Most salad onion crops will require top dressing. Much will depend on the soil type and the experience of the grower. Most crops will not require more than 120kg/ha of nitrogen.

Phosphate

Salad onions have been shown to be responsive to starter fertilisers high in water soluble phosphate. Band application under the seed (25mm below to avoid root scorch) can be beneficial, even in fields with high P indices.

Trace elements

Onions are particularly responsive to manganese, especially if the soil is alkaline. Manganese sulphate is usually the most economical source of manganese. The addition of a non-ionic wetter will help uptake into the plant.

Organic manures

Timing of the application of organic farmyard manure (FYM), where used, must be carefully considered as nitrate release can be unpredictable, leading to excessive uptake by the crop and loss by leaching through the soil. FYM should not be applied in the autumn.

Care must also be given to the microbiological risks associated with applying manures to salad crops which may be eaten raw.

Refer to the relevant crop protocol (e.g. Red Tractor) for the appropriate intervals required between application of organic manures and planting/cropping of salad onions.

IRRIGATION

Salad onions require adequate soil moisture for uniform establishment and care must be taken to ensure the top layer of soil does not dry out during germination.

The crop responds well to irrigation and yields are generally higher in a well watered crop.

In order to make best use of any water source, it is recommended to use an irrigation scheduling system where possible.

A risk assessment should be carried out on any water source for microbiological contamination. Risk is highest where crops are watered close to harvest. It has been demonstrated that post-harvest washing does not remove all contamination.

APPENDIX 1: TYPICAL NUTRITION REQUIREMENT FOR FRESH SALAD ONIONS (KG/HA)

Nutrient (kg/ha)	SNS, P, K, or Mg Index						
	0	1	2	3	4	5	6
Nitrogen (N) all soil types	130	120	110	100	80	50	20
Phosphate(P_2O_5)	200	150	100	50	*	*	nil
Potash (K_2O)	275	225	175 (2-) 125 (2+)	35	nil	nil	nil
Magnesium (as MgO)	150	100	nil	nil	nil	nil	nil

* At P index 4 and 5, phosphate up to 60kg P_2O_5 /ha as starter fertiliser may be justified.

At SNS index 0 on light sands where spring soil mineral nitrogen levels are 40kg/ha or less, a further 15kg/ha can be applied.

Apply no more than 100kg N/ha to the seedbed of the spring sown crop. The remainder should be applied when the crop is fully established.

For the autumn crop care must be taken not to apply too much nitrogen as the crop is prone to disease. Apply not more than 40kg/ha. If the crop is planted on organic or peaty soil where large amounts of crop residue have been incorporated, no seedbed nitrogen is required. The remainder should be applied in the following spring.

Don't forget to: make allowance for nutrients applied in organic manures (refer to section 2 in RB209).

APPENDIX 2: GUIDELINES FOR MINIMISING PESTICIDE RESIDUES IN SALAD ONIONS

These guidelines have been produced after consultation between crop stakeholders and the Fresh 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. The table below lists the active ingredients that may give rise to crop residues and details potential alternative strategies.

Active ingredient	Target: pest, weed, disease	Current position	Suggested guidelines for active ingredients:
azoxystrobin	Leaf rot/collar rot (Botrytis squamosa/cinerea) Downy mildew (Peronospora destructor)	7 day PHI	Lengthen the PHI by up to a further 7 days. This will give the active ingredients more time to degrade Use azoxystrobin early in the life of the crop. It is a protectant fungicide only and will not cure an established infection Include chlorothalonil based products in any protectant programme for both Botrytis and downy mildew Participate in a disease forecasting programme. It will assist in decision making on whether to apply fungicides for both Botrytis and downy mildew
iprodione	Leaf rot/collar rot (Botrytis squamosa/cinerea)	7 day PHI	
boscalid	Leaf rot (Botrytis squamosa) White rot (Sclerotium cepivorum)	14 day PHI	
cyprodinil	Leaf rot (Botrytis squamosa)	14 day PHI	
dimethomorph	Downy mildew (Peronospora destructor)	14 day PHI	
fludioxinil	Leaf rot (Botrytis squamosa)	14 day PHI	
dithiocarbamates	Downy mildew (Peronospora destructor)	14 day PHI	
chloridazon	Weed control, pre- and post-emergence	Up to and including 2nd leaf	These herbicides are only occasionally detected Aim to finish applications of residual herbicides before the 2nd true leaf is visible
pendimethalin	Weed control, pre- and post-emergence	Before 3rd leaf visible	

GUIDELINES

UK grown salad onions are supplied between April and June from crops drilled from August to September and then over-wintered. Supply from June to October is from crops drilled from February to July. Supplies from November to March are sourced mainly from Mexico and Egypt.

The life cycle of the two main salad onion diseases, downy mildew and leaf rot, are closely governed by temperature, humidity and leaf wetness. Ideal conditions for infection exist in the spring and autumn, hence the increased incidence of these diseases during these periods.

Salad onion quality is fundamentally affected by any blemishes on the leaves caused by pests or diseases. Growers have to ensure that the crops are effectively blemish free as the supermarket specifications allow only minor imperfections.

Most detections are fungicides, reflecting the need to maintain control programmes close to the harvest interval during periods of high disease pressure – most are protectant with very little curative activity available. For example, mancozeb (dithiocarbamate in Invader and Fubol Gold) is the mainstay of downy mildew control and is only just effective at a 14 day PHI.

Residue testing is based on risk, so most samples are taken during the times of high fungicide use – spring and autumn. These tend to have more residue detections compared to samples taken in the summer.

Routine pesticide residue testing of UK salad onions has shown a regular incidence of fungicides (listed above); albeit well below their MRLs (the majority of detections occur at less than 20% of their respective MRLs, the rest at 20-50% of their MRLs).

The herbicides chloridazon and pendimethalin have also been detected infrequently, probably reflecting use close to the latest growth stage of application.

Notes on table:

Bullet points 1-4 detailed in the table should effectively lower fungicide residues in salad onions. They should only be undertaken by growers utilising the services of an agronomist experienced in the crop and who is able to inspect crops at risk at least weekly, and preferably more frequently in times of perceived risk.

Forecasting may not always reduce residues as infection periods, not picked up by inspections, may trigger further applications of fungicides. It will however help to avoid unnecessary applications.

There are currently forecasting programmes available to predict downy mildew infection risk for use by both bulb onion and salad onion growers.

Inputs are derived from remote weather stations sited in salad onion crops. The data is regularly downloaded to the computer model via a modem. Output gives the incidence of sporulation and infection of both diseases and has proved valuable in identifying the correct time to apply fungicides for maximum efficacy.

Documented inspections, along with forecasts from the weather station data and computer models are the best way of using the minimum number of pesticide applications whilst ensuring the crops reach maturity without any quality defects.

N.B. It is not advisable to reduce application rates to lower potential residue levels. This is because the diseases are exposed to lower levels of the active ingredients and the surviving disease organisms could potentially mutate on multiplication causing a buildup of resistance to the fungicides.

Red Tractor Assurance

Certification Bodies

Your routine point of contact with the Scheme is through your Certification Body.

Certification Bodies are licensed by Red Tractor to manage membership applications and to carry out assessment and certification against the Standards. The table below shows which Certification Bodies apply to each enterprise.

Certification Body	Beef and Lamb	Dairy	Combinable Crops and Sugar Beet	Fresh Produce	Pigs	Poultry
NSF	✔	✔	✔	✔	✔	✔
Kiwa PAI	✔	✔	✔	✔	✔	✔
SAI Global	✔	✔	✔	✔	✔	✔
SFQC	✔	✔	✔	✔		
NIFCC (Northern Ireland)		✔				✔
QWFC (Wales)		✔				

NSF Certification

NSF Certification
Hanborough Business Park
Long Hanborough
Oxford OX29 8SJ
Tel: 01993 885739
Email: agriculture@nsf.org
Web: www.nsf-foodeurope.com

PAI kiwa Partner for progress

Kiwa PAI
The Inspire,
Hornbeam Square West, Harrogate,
North Yorkshire HG2 8PA
Tel: 01423 878878
Email: paienquiries@kiwa.co.uk
Web: www.kiwa.co.uk/pai

SAI GLOBAL ASSURANCE SERVICES

SAI Global Assurance Services Ltd
PO Box 6236,
Milton Keynes MK1 9ES
Tel: 01908 249973
Email: agrifood@saiglobal.com
Web: www.saiglobal.com/assurance

SFQC
Specialist assurance for the food and farming sectors

SFQC Ltd
Royal Highland Centre,
10th Avenue, Ingliston,
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Tel: 0131 335 6605
Email: redtractor@sfqc.co.uk
Web: www.sfqc.co.uk

NIFCC
NORTHERN IRELAND FOOD CHAIN CERTIFICATION

NIFCC [Northern Ireland]
Lissue House,
31 Ballinderry Rd, Lisburn,
Northern Ireland BT28 2SL
Tel: 028 9263 3017
Email: info@nifcc.co.uk
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Red Tractor Assurance *for Farms*

Fresh Produce Scheme

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Fresh Produce Standards