

CROPTALK

The amount of food which is wasted in the UK has been highlighted recently thanks to some excellent reporting on both television and in the national press. That we throw away over four million tonnes of food and drink in this country every year, is indeed shameful.

Sadly, the amount of food waste is a sign of an affluent society. We frequently buy more food than we need and, as a result, much of it is thrown away. It is all too easy to blame the retailers. Their aim is to provide their customers with as wide a range of good quality fresh produce as possible. That retailer's dispose of fresh produce which is past its sell-by date is another argument. However, customers would be very quick to complain if they were faced with rotten tomatoes, mouldy bananas or decaying strawberries.

It is worth remembering that world-wide, over a third of edible produce is lost to pests and diseases. This in itself represents an enormous amount of wasted produce. It's easy to forget just how far we have come in this country in reducing these losses. The quality of the produce displayed in the fresh produce aisles of our supermarkets is excellent. Much of the credit for this lies in first-class husbandry and good crop protection undertaken by growers.

Crop protection has been responsible for greatly reducing the amount of food waste.

A grower who has his carrot crop affected by nematodes is likely to have a huge yield reduction of saleable produce and, consequently,

a considerable amount of waste. By applying a product such as NEMguard DE, this damage can be minimised thus reducing the amount of the crop that would, if left untreated, be unsaleable.

Those crops which are devastated by pests or diseases represent waste. Not only a waste of crop but a waste of resources such as inputs of fertiliser, irrigation and possibly land rent. We should not underestimate the value of the advances made in keeping crops free from pests and diseases.

Another way science has helped in reducing waste, is down to the skill of the plant breeders. Firstly, by breeding in disease resistance, and secondly by improving uniformity. The latter is largely due to the introduction of hybrids.

I well remember seeing the first hybrid cabbage – all uniform and with near a hundred percent cut. A more recent development is that of hybrid leeks. The leek plant – being tetraploid – is notoriously difficult to hybridize, but plant breeders at Wellesbourne managed to achieve it. As a result, we not only have a plant with exceptional vigour, we also have uniformity, resulting in a high proportion of saleable products and – more importantly – much less waste.



This month on Twitter

Nigel W Kingston @Kingston22W
Future technology
#ProfSimonBlackmore Robotics
#Drones @BritishGrowers
Onion&Carrot Conference



HortNews @ACTHortNews
New research on raspberry cane dormancy <http://hortnews.com/new-research-on-raspberry-cane-dormancy/> ... #hortnews

Open Farm Sunday @OpenFarmSunday
Will you sign up for #OFS16 and #ShareYourStory so consumers can #DiscoverTheWorldOfFarming?



Certis UK @CertisUK
Want to know more about the change in legislation to #GrandfatherRights have a read here <http://ow.ly/V3rOd> @FarmersWeekly



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CROPSAFE

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NEWS

Could robots become common place in food production?

With industrial technology advancing rapidly, it's only natural that the agricultural and horticultural industry follow suit. And, with increasing pressures on growers from competitive global food prices, legislation and changing consumer demands, why wait?

Professor Simon Blackmore, head of engineering at Harper Adams University and director of the National Centre for Precision Farming, is a pioneer of a new robotic mechanisation system aimed at driving efficiency in crop production, while overcoming some of the challenges the industry faces.



Scamp harvesting

"To grow crops you can't get around the fact that you need machinery, but we've now got to the stage where we can utilise smart technologies in machines to significantly improve on-farm efficiency. We've achieved this by developing a new mechanisation system that is based on intelligently targeted inputs (ITI) used in robots," says Professor Blackmore.

He explains that rather than the traditional farming practices that considers the farm or estate as a whole, ITI through robots, looks specifically at what is happening in an exact location on-farm, and does the minimum amount of work needed to achieve the targeted output.

"This new robotic system covers four main areas of crop production; establishment, crop scouting, crop care and selective harvesting. There are many examples of robotic systems that draw on this technology and fall into each of these categories," he says.

In the UK, fungicides make up 56% of the total pesticide treated area in soft fruit

crops and 64% in orchard crops. "The reliance on pesticides to control pests and diseases cannot be underestimated in these sectors," says Professor Blackmore. "But, through technology we're able to improve the accuracy of application to target specifically affected plants within the crop through the use of micro droplet spraying.

"In addition to this, using robotic vision recognition, means we're able to identify the species, biomass, leaf area and position of weeds within crops, and therefore apply herbicides directly onto just the leaves of the weeds.

"Collectively, this not only saves energy, but also reduces the amount of pesticide wastage which has a considerable environmental, economic and consumer benefit."

Professor Blackmore also explains about the advancements of technology towards selective harvesting. "Up to 60% of harvested crops don't make the grade, which is determined by consumer demand and retailers, and are therefore, not of saleable quality.

"Currently, it's common practice for growers to go into a field and harvest the entire crop even though there may be inconsistencies in crop quality. But, selective harvesting means only the part of the crop that has 100% saleable characteristics will be harvested.

"For example, we are designing a robotic strawberry harvester that uses sensing techniques to judge the quantity and quality of the strawberry crop, meaning the harvester only picks strawberries that meet the grade and are ready for sale. As well as this, the harvester is able to grade the fruit on the spot, and automatically place it in the necessary punnet.

"There's no reason why systems of intelligently targeted inputs, performed



Scamp seeding

by robots, can't be used commercially in the arable and horticultural sectors. Although this would be a big change for the industry, and something different from the norm, there are a considerable number of benefits from using this technology, not least from an energy and cost saving point of view," says Professor Blackmore.

CERTIS

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USE PLANT PROTECTION PRODUCTS SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE.

USE BIOCIDES SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE.

For further information with regard to the warning phrases and symbols for these products please refer to the product labels.

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What's lurking in your soil?

NEMGUARD

There are an estimated one million species of nematodes worldwide. And, with their combined potential to cause losses of up to \$125bn per year, growers can't underestimate the threat from these soil pests.

The ubiquitous nature of free living nematodes (FLN) in particular, is an even greater consideration for growers of root crops. These soil pests can cause losses of up to 30% in the saleable value of carrot and parsnip crops, meaning they are a major concern for this sector.

Howard Hinds, from Root Crop Consultancy, explains why they are such a big threat. "FLN in UK soils are a constant threat to carrots and parsnips, and we're not getting any better at controlling them. Severe nematode damage often coincides with warm and wet springs. And, with climatic predictions for warmer weather, this is likely to favour the activity and persistency of nematodes in the future. This is something we need to be mindful of when managing these soil pests in the future," says Howard.

He explains that the type of damage caused to the crop depends on the FLN species that it has been infected by. "For example, needle nematodes (*Longidorus spp.*) are thought to cause

multiple tap roots, known as fanging. Whereas, stubby root nematodes (*Trichodorus* and *Paratrichodorus spp.*) can give rise to thickened, 'stubby' roots with branched lateral roots. Ultimately, all of which result in unsaleable crops that haven't made the grade.

"Typically, we can expect up to 10% of UK carrot crops and 15% of parsnip crops to be affected by FLN, which has a significant economic impact on growers," he adds.

Howard explains that FLN is very difficult to predict in the soil. "Levels in the soil will depend on when soil samples are taken, as these nematodes can move up and down the soil profile depending on weather conditions.

"Because of this, the soil tests can't reliably test for risk of damage in the proceeding crop. More work is needed on sampling techniques and threshold numbers of the different FLN species, and how these relate to a decision support system for treatment.

"In the past, conventional chemical controls have been the norm for controlling FLN in the carrot and parsnip sector. But, with pressures from legislation limiting pesticide usage, and with recent product shortages, we need to seek alternative nematicides, and cultural control methods to help control these pests," he says.

"The use of NEMguard DE, a registered pesticide based on garlic extract, is one of the main nematicide options for the 2016 season. The use is expected to be on larger scale than ever before in carrots and parsnips next season, so we need to learn how to get the most out of it.

"The carrot and parsnip sector still have a lot to learn when it comes to managing FLN. But, this is a good example where further cross sector work is required within other arable and horticultural crops to improve the control of FLN," says Howard.



Carrots fanging



Parsnips fanging



Nematodes



Needle nematode head



Howard Hinds

Meet the team - Selchuk Kurtev (Semo)

Joining the Certis team as IPM manager, Semo brings with him several years of experience of working within the horticulture sector.

Having grown up in Bulgaria, in a family with strong links to the agricultural industry, Semo initially studied for a degree in forest management and game keeping. Here he found a real passion for working with plants and the dynamic nature of this sector.

He explains that new research and development into finding sustainable solutions to grower challenges, can be implemented at a lot faster pace in speciality crops compared to the forestry industry, and this is where his enthusiasm truly lies.

Before joining Certis, Semo worked as a technical and environmental manager as well as a nursery stock consultant where his knowledge, experience and contacts in the industry have developed, which will stand him in good stead for his new role.

As IPM manager, Semo will be working directly with growers and the industry to help implement effective and bespoke integrated pest management strategies, while advising on Certis' growing crop protection portfolio.

Away from the office, Semo enjoys playing tennis and squash and has an avid interest in Formula 1, where he is looking forward to attending the Austrian grand-prix in July.



Right to left: Semo Kurtev and Neil Robins

Growing pressure from a silent disease

Crown Gall is by no means a new disease to the horticultural industry, but up until now has not perhaps been a major concern for growers.

However, with the impact on the saleable value of crops one of the main adverse effects of Crown Gall, Semo Kurtev, Certis' IPM manager, explains how growers should manage this potential disease threat.

"Crown Gall is caused by the gram-negative soil bacterium, *Agrobacterium tumefaciens*, which is currently seen mainly on crops in the rosaceous family. The bacterium attacks damaged and susceptible plants by penetrating open wounds, exchanging a proportion of genetic material and causing the plant cell to produce a substance called opine, which can only be utilised by the bacterium. This results in the rapid multiplication of cells to form tumour like

growths on roots, stems and branches, known as galls.

"If Crown Gall is present in soils, even mechanical weed removal in soft fruit crops, or root pruning in grape vine crops to improve sugar levels in the fruit, can cause physical plant damage and expose crops to the risk of the disease taking hold," adds Semo.

The impact of the disease weakens and stunts plant growth, and not least affects the aesthetic appearance of the crop and its overall saleable value. "An increasing number of UK growers are encountering problems with Crown Gall infection.

"It's known to remain in soils for up to four years, but with soil sterilants such as Basamid (dazomet) only allowed one year in three on the same soil, and the difficulty in finding 'clean' land for crop rotation, managing the threat from this disease is a real challenge for growers.

"An integrated approach to crop management will be vital to ensure this disease does not become an overpowering issue for the sector. Starting clean and staying clean will be key," says Semo.



Crown Gall

Six top tips to 'start clean and stay clean'

1: Don't bring the problem in
When purchasing plants, inspect them carefully for signs of galls. Do not purchase plants that show gall-forming symptoms

2: Avoid damaging the plant tissue
Minimise physical damage to crops where possible

3: Disinfect tools and work surfaces
After each cut, disinfect tools with an approved disinfectant, such as Jet 5

4: Destroy infected plants
All infected plant material should be destroyed by burning or secure disposal to reduce the risk of the disease spreading

5: Sterilise soils
Using a soil sterilant and 'steaming' are possible options to help reduce populations of bacteria and control this pathogen

6: Replant with more tolerant plant species
There are a number of plants showing tolerance to Crown Gall. Consider using these where applicable

First class results with Botanigard WP

An integrated approach to pest management has been evolving at Double H Nurseries for the past 25 years.

As a business, they're responsible for supplying 4.5 million household plants to UK supermarkets each year. "We supply Marks and Spencer, Sainsbury's and Tesco with what are referred to as their 'core-line' household plants," says Howard Braime, technical manager at Double H Nurseries.

"Primarily we're growing protected begonia's, pot chrysanthemums, mini-roses and orchids. Because of the variation in the plants, their differences in susceptibility to certain pests and diseases and length of production cycle, this has to be taken into account in terms of our management and operation system.

"For example, pot chrysanthemums are brought in from Uganda and potted. Nine weeks later we have a flowering plant, ready for sale. Orchids, on the other hand, are brought in as young plants but are not ready for sale until 46 weeks later."

Howard explains that this is where an effective IPM programme has come into its own. The recent introduction of Certis' bio-pesticide, Botanigard WP (*Beauveria bassiana*), as part of this programme has been an important addition in helping to reduce insecticide usage while controlling pest infestations.

"Pests such as glasshouse whitefly (*Trialeurodes vaporariorum*) have been a reoccurring challenge at Double H Nurseries. The increasing pressure to reduce chemical usage, and the building issue of resistance means we've been looking at alternative ways to control these pests for a number of years.

“We've knocked the glasshouse whitefly and thrip populations for six and reduced insecticide usage in our roses and chrysanthemums by 60%”

"Among other IPM techniques, we've used nematodes, aphids and two-spotted spider mite predators as biological controls. But, more recently we've used Botanigard WP to help control whitefly on our rose and chrysanthemum crops."

Botanigard WP contains the fungus *Beauveria bassiana*, and works on the pest by producing spores which stick to the insect's cuticle and germinate. Its hyphae penetrates the cuticle and continues to grow inside the insect, overwhelming its immune system, causing death after five to seven days.

"Temperature and relative humidity affect the efficacy of *Beauveria bassiana*. And, because we're usually applying Botanigard WP in the summer months, as well as dealing with a living organism, we make sure we use thermal screens in the glasshouses to maintain humidity, and also spray in the late afternoon or evening when UV light is low.

"As a result of using Botanigard WP we've knocked the glasshouse whitefly and thrip populations in our roses, chrysanthemums and other crops for six in a very short time frame.

"Not only have we reduced our insecticide usage in our rose and chrysanthemum crops by 60%, we've also not seen the return of pests among these crops to the extent that we have done in the past," says Howard.

Top tips to achieve maximum efficacy when using Botanigard WP*

- Treat as soon as insect pests are detected
- Aim for temperatures between 20 to 30°C
- Keep relative humidity >70% shortly after application to allow Botanigard WP to establish
- Apply in the late evening to ensure UV levels are low
- Target the under-side of leaves
- Use with Eradicoat or Majestik to achieve a robust control programme that targets all stages of whitefly

*Please consult Certis directly if using Botanigard for the first time.

To find out more, watch our best practice videos at www.certiseurope.co.uk/certis-videos

EAMU update

Certis have a wide range of products that may also have an off-label use, or Extension of Authorisation for Minor Use (EAMU). When establishing if a product has an EAMU, it is advisable to check the Certis, CRD, Liaison or AHDB Horticulture websites.

CRD: <https://secure.pesticides.gov.uk/offlabels/search.asp>

Liaison (by subscription): <https://secure.fera.defra.gov.uk/liaison/>

AHDB Horticulture (access by levy payers): <http://horticulture.ahdb.org.uk/horticulture-levy-payers>

Warning notices about EAMU use: As Extensions of Authorisations for Minor Use conditions will not be given on the product label provided by pesticide manufacturers, it is essential that anyone who needs to use a pesticide product does so in accordance with an Extension of Authorisation. The text of the Extension of Authorisation must be read before commencing any spraying operation.

All Extensions of Authorisation for Minor Use carry dates of expiry details. However, they remain in force only while the product from which they are derived continues to be authorised.

These uses are not endorsed by Certis and are carried out entirely at the risk of the user.

EAMU product update

The following products have recently been granted an EAMU:

- Botanigard WP has been granted an EAMU for the use as a insecticide for the control of thrips and whitefly on protected and outdoor strawberries
- Cuprolyt (M16944) has been granted an EAMU for use as a fungicide and bactericide for the control of *Pseudomonas spp.* and *Xanthomonas spp.* on outdoor ornamental plants
- Cuprolyt (M17079) has been granted an EAMU for use as a fungicide for the control of *Dothistroma* needle blight in forest nursery crops
- Karma has been granted an EAMU for the use as a fungicide for the control of downy mildew in protected and outdoor lettuces
- Karma has been granted an EAMU for the use as a fungicide for the control of powdery mildew in protected and indoor crops of courgettes, melons and cucumbers
- NEMguard DE has been granted an EAMU for use as a nematicide for the control of free living nematodes in outdoor crops of fodder beet and red beet, where they are grown under temporary covers such as fleece or polythene
- NEMguard DE has been granted an EAMU for use as a nematicide for the control of stem and bulb nematodes (*Ditylenchus dipsaci*) and root knot nematodes (*Meloidogyne spp.*) on bulb onions, shallots, garlic and leeks
- Mogeton has been granted an EAMU for use as a herbicide for the control of moss in protected ornamentals

These extensions of the authorised use provide for the use of Botanigard WP (M17504), Cuprolyt (M16944) and (M17079), Karma (M16363), NEMguard DE (M16749) and Mogeton (M15837) in respect of crops and situations, other than those included on the product label. No efficacy or phytotoxicity data have been assessed and as such the 'extension of use', is at all times done at the user's choosing, and the commercial risk is entirely theirs.

Users must be in possession of a copy of the Extension of Authorisation Number: 0110 of 2016 and/or 1176 of 2015 and/or 2416 of 2015 and/or 1940 of 2015 and/or 1941/2015 and/or 1838 of 2015 and/or 1841 of 2015 and/or 2273 of 2015 for full details of product extension prior to use.

Upcoming industry events

Event	Location	Date
FAST Conference	Great Danes Hotel, Kent	4 February
NFU Conference	ICC Birmingham, West Midlands	23 to 24 February
Edible Garden Show	Stoneleigh Park, Warwickshire	11 to 13 March
RHS Malvern Spring Festival	Three Counties Showground, Worcestershire	5 to 8 May
RHS Chelsea Flower Show	Royal Hospital Chelsea, London	24 to 28 May

Organic update

A number of Certis products are permitted for use on organic crops, following renewal of their organic status.

Full organic status has been secured for:

- Botanigard WP (*Beauveria bassiana*)
- Cyd-x (Granulovirus – *Cydia pomonella*)
- Jet 5 (peroxyacetic acid)
- Karma (potassium hydrogen carbonate)
- NEMguard DE (garlic extract)
- SluXX (MAPP 14462), SluXX HP (MAPP 16571) and Derrex (ferric phosphate)

Derogation organic status has been secured for:

- Cuprokylt (copper oxychloride)
- Eradicoat (maltodextrin)
- Majestik (maltodextrin)
- Spruzit (pyrethrins)

Growers are reminded to check with their individual certification authority prior to use.

For more information, growers are urged to contact the Certis technical hotline on: 0845 373 0305

Technical hotline

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BASIS & NRoSO CPD points

Reading this publication qualifies the reader for two BASIS Crop Protection points and two NRoSO points.

BASIS reference number: CP/40296/1516/g – to apply for your BASIS points e-mail the code and your BASIS account number to scott@basis-reg.co.uk

NRoSO reference number: NO461850f – to apply for your NRoSO points e-mail the code and your NRoSO membership number to robin.ray@cityandguilds.com or nrosocpd@cityandguilds.com

Cuprokylt reminder

Growers are reminded to be aware of label changes to Cuprokylt (copper oxychloride).

As of 31 January 2016, old label Cuprokylt (M16944) registered as a fungicide for the control of various diseases in top fruit, tomatoes and potatoes, is no longer available to buy from distribution. However, end users

will have a further 12 months, up until 31 January 2017, to use-up the product.

New label Cuprokylt (M17079) will be available from distribution from January 2016 but is only authorised for use on wine and table grapes.

It is possible that additional EAMU's may be granted in the near future. Please check the CRD or Certis website for the latest approvals information for Cuprokylt.

Welcome to our 'Certis interactive' page

This is a chance for you to take part and get in touch via Twitter @CertisUK

Where do you read Cropsafe News?

We're interested to know your favourite spot for reading your copy of Cropsafe News – send us your pictures via Twitter @CertisUK, or e-mail at: infocertisuk@certiseurope.com

ID the pest

Do you know what the pest in the picture is?



Tweet us @CertisUK or e-mail infocertisuk@certiseurope.com to be in with a chance of winning

Your questions

#CertisFAQ
tweet us your questions

1. I've had Grandfather Rights in the past, so am I still legally able to apply pesticides?

Previously, anyone born before the 31 December 1964 has been allowed to use Plant Protection Products (PPPs), authorised for professional use on their own or their employer's land, without an operator's certificate of competence, as long as they were suitably trained and competent for the job.

But from 26 November 2015, changes to the law mean anyone applying crop protection products must hold a recognised certificate of competency.

2. What do I need to do to ensure I can still apply pesticides?

There are three possible options available to growers to ensure they are applying crop protection products legally:

New 'Grandfather' certificate

This is aimed at those who will only be spraying their own land. This is a new level two certificate in the Safe Use of Pesticides that replaces Grandfather Rights. To gain the certification, operators must complete a practical test, which includes one to one questions focusing on safe handling and application.

City and Guilds PA qualifications

There are 15 units to choose from within the established Safe Use of Pesticides (PA) certificates which allow operators to apply pesticides on their own land, or as a contractor. Under this certification, all operators must complete PA1 as a mandatory foundation unit, and one other PA qualification dependant on the application methods appropriate to the individual. These are also practical tests with one to one verbal questioning.

Use a contractor

If there is no one in the business that is legally qualified to apply PPP's, or who wishes to become qualified, businesses can employ a qualified contractor to undertake all spraying operations.

3. If using a spray contractor, are there any factors that I need to consider?

If employing a spray contractor, businesses must ensure that the contractor has all the necessary PA qualifications, NRoSO membership and that sprayers are NSTS tested.

It's also important that the chosen contractor is insured for spraying, and that it is agreed from the outset who is responsible for the supply and disposal of any chemical wastage. You can find out more information at www.naac.co.uk