

# Simplified web-based risk assessment for primary plant production

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Fresh Produce Research Centre  
Harper Adams University College



*HDC is a division of the Agriculture and Horticulture Development Board*

# Acknowledgments

- David Alexander



- Grace Choto



- Mike Hutchison

Hutchison Scientific Ltd

# Overview

1. Goals of the tool.
2. How did we design it?
3. What does it do?
4. Challenges/bottlenecks.
5. Is it being used by farmers?



# How were UK growers managing risks in higher risk crops?

- FSA funded
  - Review of literature
  - Overview of current practices
- Support from growers and retailers allowing access to information
- Undertaken late 2007 – early 2008



# Key findings - B17007

1. Growers are managing risk in response to QA schemes (and multiple retailers).
2. Training and guidance is needed on micro-testing regimes and interpretation of results.
3. Support is needed for microbial risk assessments.



# FSA/HDC funded package 2010/11

**Factsheet 13/10**  
**Edible crops**



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## Roadshow & training

### Monitoring microbial food safety of fresh produce

Dr Jim Monaghan, Harper Adams University College and Dr Mike Hutchison, Hutchison Scientific Ltd

Produced jointly by HDC and FSA for field technical staff, this factsheet guides the implementation of practical food safety and risk assessment. It provides background information on important potential microbial contaminants of fresh produce (Figure 1), and also considers the role of microbiological testing of indicator species for water (Figure 2) and fresh produce, and the interpretation of laboratory reports within a food safety system.

#### Understanding food pathogens

##### What causes many common foodborne illnesses?

Ingestion of pathogens or toxins that result in infection and/or the production of toxic by-products in the human gut.

##### What pathogens that can cause foodborne illnesses are associated with fresh produce?

The number of foodborne illness outbreaks thought to be linked with fresh produce in the UK is relatively small. A report funded by the FSA in 2009 (see Further Information) highlighted a small group of bacteria and viruses that have the potential to



cause foodborne illness under certain conditions. This publication focuses on the organisms within that group that may pose a risk in the production of fresh produce under UK growing conditions.



1 Example of fresh produce



2 Water used in growing



## Keeping it Clean 2010

Keeping crops  
view.  
College  
ture Development Board

## Factsheet

Please login

Welcome

The purpose of this site is to provide sound, science-based advice to fruit and vegetable growers so that they can adequately address the microbiological risks associated with modern food production. The site provides access to decision support systems that generate customised risk assessments for water and manure usage as well as worker hygiene practices. These assessments are built in response to easy-to-answer questions. Areas and practices that are risky in terms of food safety are highlighted, and appropriate advice are provided in the form of corrective actions.

Please login to begin:

Log In


User Name:

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Remember me next time.

[Don't have an account? Create one!](#)

This site was developed by:




Harper Adams University College




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Horticultural Development Company



Food Standards Agency

The Horticulture Development Company The B17 Programme of the UK Food Standards Agency

Done  Internet

## Web-based RA tool

# Goals of the web-based RA tool

1. Easy to use.
2. Help implementation of QA schemes:
  - Reinforce Hurdles/CCP.
3. Improve understanding of food safety:
  - Manure use.
  - Water use.
  - Worker/labour hygiene.
4. NOT an audit tool.
5. Easy to use!



# How did we design it?

- Based on Assured Food Standards – UK industry led QA scheme.



- Only covering risk assessments NOT compliance with individual questions.
- Risk scoring derived from scientific evidence where possible or Best Practice.

# Red Tractor Farm Assurance



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### The Idea:

Back in 2000, we saw a need to build confidence in the quality and provenance of your food. Red Tractor was created to give an independent, expert guarantee of high standards at every stage of the food chain, from farms to pack.

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# What does the web-tool do?

- Yes/No answers.
- Score allocated to answer.
- At end of process total risk 'score' leads to 3 outcomes:
  - Red;
  - Amber;
  - Green.



# Each users must register – but it is free

[www.ukproduce.org](http://www.ukproduce.org)

## Welcome

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# 1. Choose the RA.

Please select from the following options:

- >> Assess the risks of applying irrigation water to crops
  - >> Enter water test results to be trended
  - >> View trend graphs of previously-entered results

>> Assess the risks of applying faecal wastes as soil conditioners and fertilisers

>> Assess the risks of field worker hygienic practices as hazards to food safety

>> Tell us what you think (either good or bad) about these assessment tools.

# 2. Choose crop risk category.

## Manual crop categorisation:

Using the selection box below and clicking the button, please manually choose the crop category. Examples of classified crops are provided below to help with the process.

### Category 1 = High Risk

Category 1 crops are those you can eat raw and which do not have a protective skin that is removed before eating. Category 1 crops may also have a significant [history of pathogen contamination](#).

Salad Leaves (including any vegetable leaf you can eat raw), Salad Onions, Fresh and Frozen Herbs, Baby Corn, Beetroot, Broccoli, Cabbage, Carrot, Capsicum, Cauliflower, Celery, Celeriac, Courgette, Cucumber, Mushroom, Pea, Radish, Raspberry, Strawberry, Sugar Snap Peas and Tomato are examples of Category 1 crops.

### Category 2 = Medium Risk

Category 2 crops are those you can eat raw and which either have a protective skin, or grow clear of the ground, or have no significant [history of pathogen contamination](#).

Apple, Blackcurrant, Blueberry, Broad Bean, Cherry, Garlic, Green Beans (other than runner beans), Onion (red and white), Pear, Peach, Plum, Peanut, Sweet Corn, Tree Nuts are examples of Category 2 crops.

### Category 3 = Low Risk -

Crops are those that the customer *always* cooks. Artichoke, Aubergine, Runner Bean, Leek, Marrow, Parsnip, Potato, Pumpkin, Squash, Swede, Sweet Potato and other root vegetables are examples of Category 3 crops.

I classify my crop as

If you prefer, the computer can make an attempt to automatically classify your crop in response to some questions by clicking [here](#).

# 3. Answer the questions.

Do you store irrigation water before applying it to crops?

Yes

No

[Additional information on this topic is available by clicking this link](#)

# 4. Help pages are available.

Please provide some basic information to assess your water risks - Windows Internet Explorer

Sources of irrigation water and relative safety - Windows Internet Explorer

http://www.safeproduce.eu/(F{jWN7cGYU\_umb0DycytIWQ3haBDeEXHdGwZ1zQxr2I

AVG Secure Search


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Sources of irrigation water and relative safety

compared with June to September. High rainfall and the presence of sheep near the supply were also identified as risk factors; presumably by the mechanism described for below for surface water.

## Surface waters

Surface waters from rivers, canals and lakes are considered risky for use as irrigants for fresh produce. The risks stem largely from the potential for contamination by wildlife and livestock manures upstream of where the water is abstracted. A not uncommon case for the UK is shown in Figure 2 below which shows sheep with unfettered access to the river that is also used as their drinking water supply.



# 5. Generate (and print) summary.



## Water Risk Assessment

Assessment valid from: 07/11/2011 13:11:36

Assessment expires: 07/11/2012 13:11:35

Crop Category: Category 1

Hutchison Scientific Ltd

Company Name: ACME veg

Water Source: Water 1

Risk Assessment Name: Water 1 2011

A summary of your questions and their corresponding answers is:

Q: What water source are you using?

A: Mains water, deep borehole or chemically purified (e.g. de-salinated) water

Q: Do you store irrigation water before applying it to crops?

A: Yes

Q: Do you have access to microbiological test results for the water being applied?

A: Yes

Q: Do the test results meet the test criteria?

A: Yes

Q: Does your water application method prevent contact between the marketed part of the crop and the water?

A: Yes

Q: Is the marketed part of the crop routinely exposed to sunlight and air?

A: Yes

Q: Is there one week or more between final water application and crop harvest?

A: Yes

**The risks associated with this water resource appear to be well managed.**

**It is possible they could be reduced further by considering that:**

Storing water can allow contamination by birds and other wildlife, it is a better practice not to store water. Treatment can reduce the risks (but not eliminate) associated with water storage.

# Output from assessment

- Designed for use in on-farm Food Safety Management Systems.
- Risk allocated to red, amber and green.
- Guidance on improvements also listed.
- Sign-off by responsible staff member



The risks associated with this water resource appear to be well managed.  
It is possible they could be reduced further by considering that:

Storing water can allow contamination by birds and other wildlife, it is a better practice not to store water. Treatment can reduce the risks (but not eliminate) associated with water storage.

The risks posed to consumers from microbial contamination of your crop are already low.  
But they could be reduced further by considering that:

Mains, borehole or rainwater are safer water sources than surface waters.

Storing water can allow contamination by birds and other wildlife, it is a better practice not to store water. Treatment can reduce the risks (but not eliminate) associated with water storage.

Periodic water testing and results trending is important because it allows you to monitor changes in microbiological load, giving you a chance to spot problems before they occur.

Trickle feed and soak lines tend to be safer than raingun and overhead sprinkler because they keep water away from the edible part of the crop.

You may need to do more to reduce an unacceptably high risk to consumers  
You should consider the following areas:

The more time between spreading the waste and harvesting the crop, the lower the microbiological risks.

Applying a dressing of manure to growing crops is an exceptionally risky practice.

Preventing animals from directly accessing growing crops ensures that the produce is not directly soiled with faecal material.

Pathogens can be spread through the air and travel significant distances during the land spreading of wastes.

Vehicles can act as fomites and facilitate the spread of human pathogenic microorganisms to produce.

# Challenges/bottlenecks

- Making it worth doing.
  - It must help growers or it won't be used.
- Training / Publicity.
  - HDC/FSA roadshows.
  - Support from Assured Food Standards.
- Identifying errors.
  - Growers to test the system and give feedback.
- Need to maintain site and information.
  - Funding



# Is it being used by farmers?

## *Launched October 2010*

No. of registered users = 224

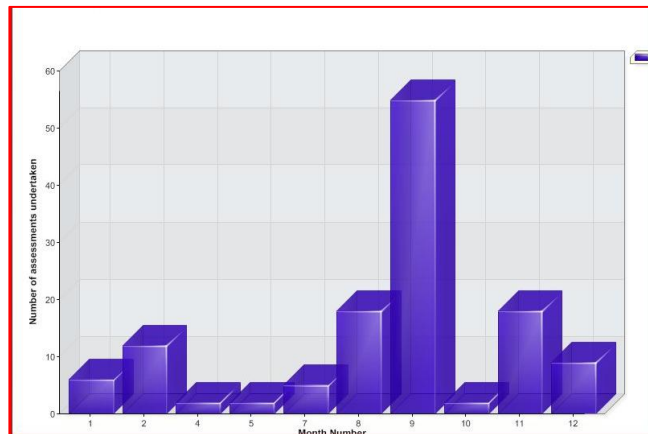
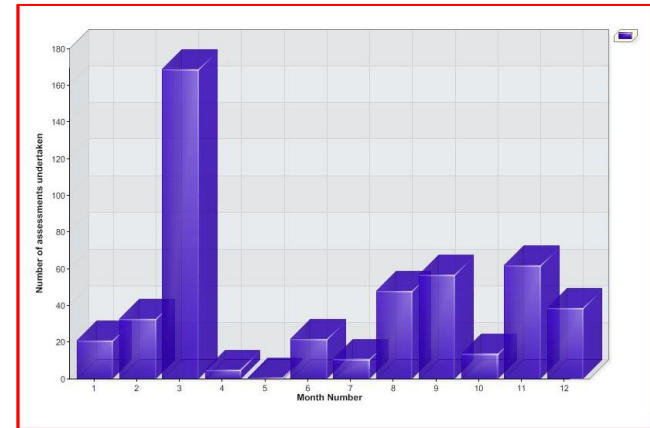
Total risk assessments = 916

- Water = 503
- Worker = 288
- Manure = 125

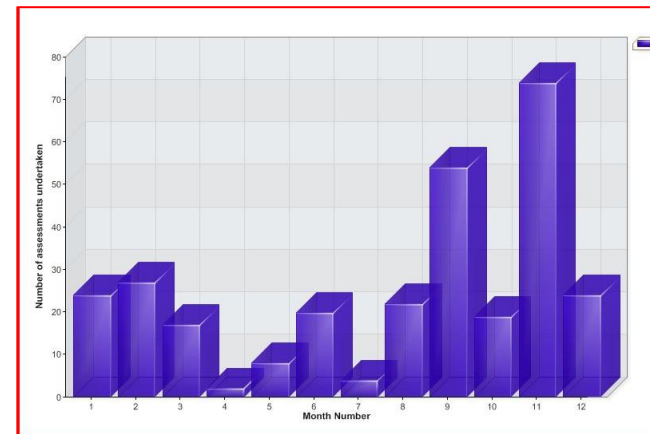


# Peak activity differs for different RA

Water RA = March



Manure RA = September



Worker RA = November

# An unexpected benefit....

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30 September 2011 Last updated at 01:31 149 Share [f](#) [t](#) [e](#) [l](#)

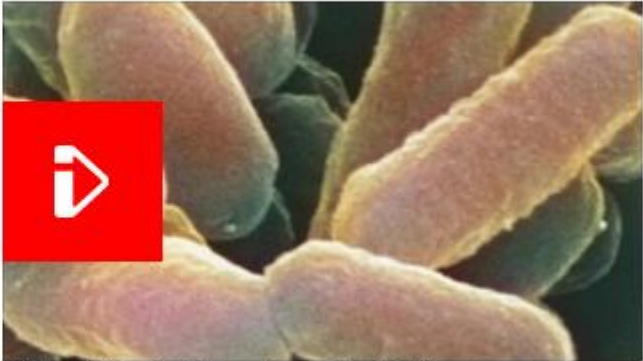
### Leek and potato soil linked to E. coli outbreak

By James Gallagher  
Health reporter, BBC News

**Soil stuck on leeks and potatoes may have been the source of an E. coli outbreak in the UK earlier this year, according to the Health Protection Agency (HPA).**

There were 250 cases scattered across England, Wales and Scotland between December 2010 and July 2011.

The Food Standards Agency said it was a "myth" that dirt did no harm.



Richard Westcott reports on the findings

**Harper Adams University College**

# An unexpected benefit....

- Advice on Risk Assessment summary for growing potatoes with manure inputs (Category 3 crop)

The risks associated with this waste resource appear to be well managed.  
It is possible they could be reduced further by considering that:

Category 3 crops are always cooked but can still contaminate kitchen environments prior to cooking.



# Summary

- Developed a simple web-based risk tool for growers.
- Avoided compliance issues.
- Focussed on implementation of food safety.
- Helped growers with an area they are unfamiliar - food safety.
- **Protected consumers??**

