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The leading, dedicated supplier of potatoes to Tesco

Environmental pressures on the potato supply chain

Potatoes in Practice - 9th August 2007

Environmental pressures on the potato supply chain

- Pesticide usage
- Countryside management
- Water
- Soils
- Carbon footprint and global warming

Pesticide usage

- Many older, more environmentally hazardous pesticides are no longer available
    - *EU Annex 1 listing suggests that 60% of all pesticide AI's on the European market in 1993 will be gone by 2008*
- Newer, less hazardous chemistry (soil water pollution)
- Pesticide lists and use of ICM by qualified advisors
- Product stewardship

Countryside management

- Countryside stewardship schemes
- Enhancement and conservation of important habitats – field margins, ancient monuments, etc
- Public access
- Avoiding pollution by sprays and fertilisers
- Waste disposal exemptions
- Requires positive management

Water quality

- The Water Framework Directive (WFD) requires all inland and coastal waters to reach a "good status" by 2015
- River basin district structure with demanding objectives
- Defra, the Scottish Executive, Welsh Assembly Government and the DENI are responsible for the implementation
- Implementation by the Environment Agency in England and Wales, Scottish Environment Protection Agency in Scotland
- Environmental Impact Assessments - water abstraction

Water quality - examples

- Rivers / lakes – assessment includes phosphates, suspended solids, biological oxygen demand
  - *Phosphates: 324 lakes / lochs surveyed*
  - *Less than good standard: Scotland 15%, England 67%, Northern Ireland 75%, Wales 80%*
- Estuaries – assessments to include nitrogen
  - *121 sites tested around UK, 29% at a standard less than good*

Soil - management

- Integral to achieving Water Framework Directive
- Soil erosion and run-off
  - tied ridgers
  - subsoiling
  - Aqueel
  - cover crops
  - grassland margins
  - contour farming

Soil - nutrients

- Leaching
  - timing and size of applications
  - capture by cover crops
  - irrigation scheduling
- Nutrient balance
  - soil analysis
  - meeting crop requirements without build-up of high indices and risk of nutrient pollution
  - NVZ initiative
  - in-field variation / precision application?
  - revision of RB209

Carbon footprint

- **Definition:** The effect of human activities on climate in terms of the total amount of greenhouse gases produced (measured in CO_2)
- Average UK person responsible for 11.8t CO_2 output with a government target to reduce this by 20% by 2010
- Around 20% of UK's overall greenhouse gas emissions are related to food consumption
- Production of field vegetables has low carbon emissions
- Carbon footprint analysis for potatoes is incomplete and needs to account for both field production and storage

Carbon footprint of Walkers crisps

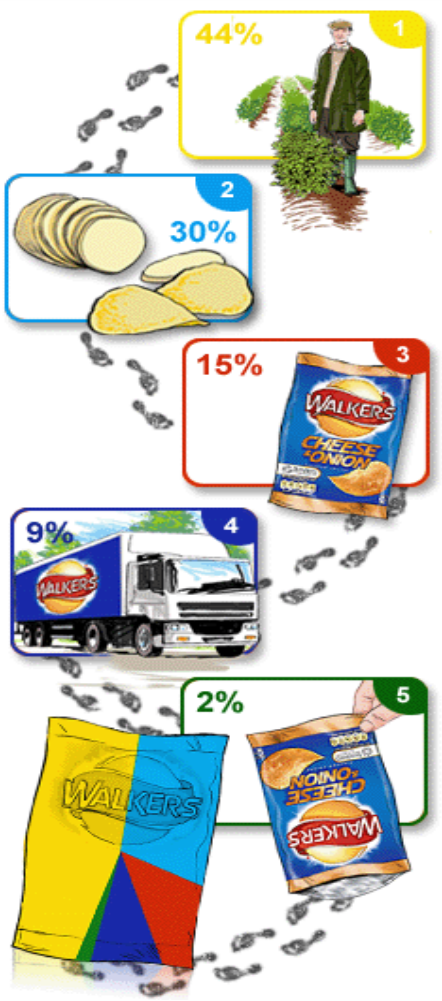
Raw materials: potatoes, sunflowers, etc

Manufacture: producing crisps

Packaging

Distribution

Disposal of empty packs



*** High dry-matter potatoes are most energy efficient as less water means lower transport costs and faster cooking time**

Carbon footprint issues

- Nitrous oxides (GW equivalent = 310 x CO_2)
  - the intergovernmental panel on climate change calculates 1.25% of fertilizer nitrogen is lost as N_20
- Methane
- Refrigerants
- Energy use – including crop storage versus transport
- Carbon capture opportunities – soil organic matter?
- Climate change – longer growing seasons!

Carbon footprint

Potato harvesting (crop 50t/ha, tractor 100 bhp)				
Conditions	**Harvesting rate (ha/hr)**	**Fuel usage (litres/hr)**	**Diesel (litres/tonne)**	**CO_2 output (kg/tonne of potatoes)**
Good	**0.50**	**8**	**0.32**	**0.84**
Poor	**0.25**	**15**	**1.21**	**3.18**

1 litre diesel = 2.63 kg / CO_2 equivalent

Summary

- Environmental pressures are growing, including Countryside Stewardship and public access
- Pesticide usage has dominated the last 10 years
- Water quality and carbon footprint issues will feature more strongly in the years ahead
- Considerable skill and expertise will be needed to adapt to environmental pressures whilst meeting an increasing demand for food and biofuels?

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