Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

For the future of our environment

Water Scarcity

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Introduction

The purpose of this document is to help identify where guidance on efficient irrigation is available. Much of the guidance highlighted has been produced by Cranfield University and the UK Irrigation Association (UKIA) and while these booklets tend to reference regulations applicable to England the good practice advice and guidance is useful to Scottish growers as well.

The Farm Advisory Service are also key sources of information on efficient water management and irrigation.

Agricultural Irrigation

Efficient Irrigation There are clear benefits to the farm business, other water users and the environment from efficient water use. Irrigating efficiently is about supplying the crop with the water it needs, when it needs it, with minimal wastage. Are there any steps or actions that can be taken to reduce the volume of water abstracted while ensuring the crop receives the amount of water it needs?

Save water and money – irrigate efficiently produced by Cranfield University and the UK Irrigation Association (UKIA) outlines the steps that can be taken along 'the pathway to irrigation efficiency'. Suggested steps include:
 	
• Understand your system:
  ○ Optimise performance of your irrigation network and equipment
  ○ Optimise your soil and water management practices.
• Demonstrating best practice
  ○ Know your soils

    - Design and maintain irrigation systems correctly
    - Use objective monitoring tools to schedule irrigation
- Irrigation audit - helping you to identify potential areas to improve water management efficiency, highlight the value of water to your business and help with investment decisions.
- Successfully scheduling irrigation helps to ensure that the crop receives the volume of water it needs without risking over irrigating. There are a number of different ways to schedule irrigation, the guidance booklet – Managing water better – outlines the agronomic, economic and environmental benefits of irrigation scheduling and discusses a number of different ways of scheduling.

Irrigation equipment

There are a number of different types of irrigators available to growers. In field situations in Scotland, rain-guns are the most common method used.

When investing in irrigation equipment a number of factors should be considered to determine the most appropriate choice including:

- Costs – capital costs and recurrent costs (energy, water, labour)
- Future irrigation plans
- Availability of water for irrigation
- Ability to apply water efficiently and uniformly
- Crop and soil damage

The guidance booklet 'Switching technologies' discusses the advantages and disadvantages of trickle irrigation in the field and booms and sprinkler irrigation.

Planning for a Drought

It is important to assess how resilient the farming system is to water scarcity, for example, how would the business manage if restrictions were applied to abstraction licences?

Water sources:

- Surface waters – Surface waters are often the principal source of water for

irrigated field crops. However, in times of drought river levels can fall to levels where it is not possible to abstract water. Where levels fall below a threshold for a continued period of time SEPA is required to take action to restrict abstractions in order to protect aquatic life.

- Ground water – In times of water scarcity and depending on availability, ground water can provide a useful temporary source of irrigation water when surface waters are not available.
- Storage - storing water in offline storage lagoons that are filled at times of high-flow, is an effective method of providing a reliable water supply. This also reduces the uncertainties associated with solely relying on surface waters.

The Guidance document – 'Thinking about an irrigation reservoir' provides a guide to planning, designing, constructing and commissioning a water storage reservoir.

- It is important to speak to SEPA at an early stage to discuss areas such as how the reservoir will be filled, how to avoid any potential impacts to natural surface waters and the need for any amendments to the abstraction licence.
- The design of the intake must avoid taking water from rivers at low flow.
- Reservoirs which are capable of holding 25,000 cubic metres or more of water above the natural level of any part of the surrounding land then it will be captured under reservoir safety legislation, SEPA can provide advice in this regard.
- The Agri Environment Climate Scheme (AECS) may be able to help support the costs of building an irrigation lagoon.

Improved soil management

- Taking care of soils will help increase resilience in the longer term, not only to drought but also to heavy rainfall. Healthy soils allow water to infiltrate and help retain moisture in the soil. They absorb water in times of heavy rainfall – reducing the risk of flooding – and also store more water making more available to support crops during dry spells and reducing the need for irrigation.
- Ensuring soils have a good structure and organic matter content are key to a healthy soil.

The factsheets 'Soil Health and Water Supply' produced by AHDB Water Management on Your Farm: Resilience produced by FAS provides further information.