

Adapt now to keep farming's water flowing

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Agricultural and horticultural businesses could face damaging water shortages in the coming decades as a result of climate change. Adaptation across the whole industry is needed to meet the impending challenge.

That is the conclusion of a new joint report commissioned by the Royal Agricultural Society of England and carried out by scientists from the Walker Institute for Climate System Research and the School of Agriculture, Policy & Development, both at the University of Reading.

The report, *Water for Agriculture - Implications for Future Policy & Practice*, makes it clear that higher temperatures and lower rainfall in summer are likely to reduce river flow and so reduce the amount of water available for agriculture. The report also shows a clear risk from more frequent extremes of drought and flooding.

"This is a challenge for plant breeders, policy makers and planners as well as farmers," said Ian Smith, Agri-Science Director of RASE. "Plant breeders will need to incorporate drought resistance and waterlogging tolerance into new varieties; water policy will have to reflect the need to conserve and perhaps even redistribute water from wetter to drier areas and planners must be flexible in allowing farms to build reservoirs so that they can conserve winter rainfall for summer irrigation."

"For a long time, water management in the UK has concentrated on getting water off land and into rivers and drains and then into the sea. Perhaps we need to rethink some of these strategies and divert more of

that water into storage for later use.

"Above all, farmers and growers must believe that [climate change](#) is a reality and that a constant, manageable water supply is likely to be an early and major victim of those changes. Unless the industry actually believes that change is coming, adaptation will not happen and the consequences could be dire."

Dr. Alison Bailey, an author of the report, from the School of Agriculture, Policy and Development at the University of Reading, said: "Climate change is expected to produce higher temperatures, drier summers and wetter winters across much of England. This is likely to mean reduced river flow and less water available for agriculture. We found reductions in river flow of around 20% by the 2020s and 40% by the 2050s, although there was considerable uncertainty and results varied across the country."

The report says: "The Environment Agency expects direct abstractions to become less reliable during the summer and more seasonal, higher intensity rainfall is likely to result in high runoff and less water able to percolate into aquifers."

This will have impact on crops that need irrigation - such as vegetables and sugar beet forcing a geographic shift from the drier east to the wetter west of the country. It will also have impact on where crops such as maize and sunflower will grow successfully; and require greater concentration on both winter water storage and flood prevention.

The report recognises the need for further research into the water implications of climate change on UK food production and goes on to recommend key messages and areas of work.

These include:

- a need to focus on managing both water demand and supply
- ways of reducing demand and focusing production on enterprises which use water more efficiently or move some enterprises to areas where water is more readily available
- the potential to move water from areas where there are fewer requirements to areas with higher demand
- better use of excess winter rainfall and flood water through capture and storage
- feasibility of water re-use and what is acceptable to the consumer
- emphasis in plant breeding programmes on drought and water-logging resistance
- revising crop protection policy for new weed, pest and disease pressures
- adapting the management of grassland systems , including the introduction/increase of alternative forages within the diet
- investment in livestock housing, feed (conserved crops) and manure storage
- focusing on more efficient use of water for the washing of plant and machinery, particularly within dairy enterprises, through knowledge transfer initiatives regarding opportunities to capture excess winter waters
- improving irrigation techniques and research into producing crops with less demand for water focusing on drought resistance and improving quality traits without water use
- adoption of flood risk contingency plans on farms
- land management which reduces flood risk through reducing runoff and increasing infiltration
- investment in landscape features, such as hedges, ditches and ponds, to reduce flood risk
- improvements to existing drainage systems, with recognition that in some areas reverting to natural floodplains may be more appropriate.

The Report authors also make the point that climate change is only one

determinant in influencing agricultural practice in the UK. There are other, potentially more important, national and global drivers including political and socio-economic influences and technological developments. It is the interaction between these that is important for the future of the agricultural industry, particularly in terms of the effect of world commodity prices on the competitiveness and comparative advantage of UK agriculture.

"This report has clearly identified the importance of water management and the impacts of climate change on water availability, and will feature strongly in the RASE's agenda of meetings, conferences and seminars in the next year," said Ian Smith.

"To help farmers start preparing for these changes now the Society will be tackling the issues and their relevance for livestock farmers at the Society's Grassland and Muck event in May 2011, and will be using the issues identified in the report to form a key part of discussions at future Society members' events and visits. The Society also hopes to work in partnership to deliver a number of on farm events to look at what farmers can do to prepare and showcase best practice in [water](#) management."

Provided by University of Reading

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