

All Party Parliamentary Group on Science and Technology in Agriculture
14th September Palace of Westminster



UNIVERSITY
of
GREENWICH | Natural
Resources
Institute

Water security in agriculture – crop improvements from breeding

Christopher J. Atkinson





The application and exploitation of a technology - are we doing enough?

Approach is derived from an understanding of how plants cope with drought and how we can exploit that information

- The challenge for managing water
- Plant physiological perspective
- Our challenge is to maintain yields whilst maximising crop survival
- Application of irrigation generally demands efficient use and accountability





Overview

- Some of the key issues
- Current focus
- A vision of the future

No detail about DNA, genetics, heritability, molecular biotechnology



Some of the key issues

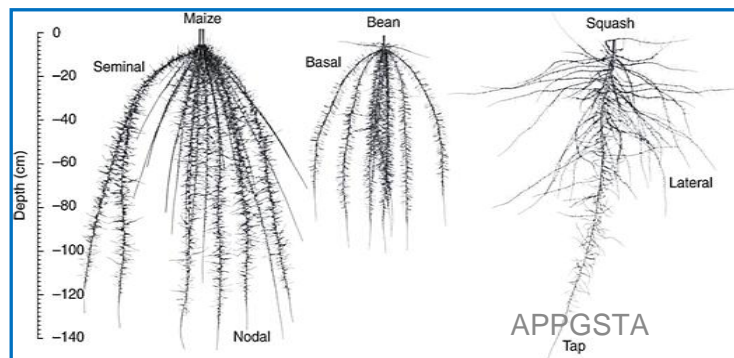
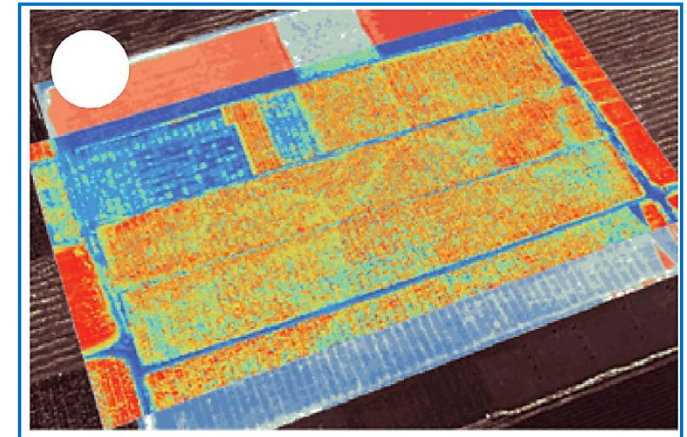
- Time required for conventional breeding approaches
- Genomic descriptors and tools
- Descriptive and has limited directly functional significance
- Fundamental questions about finding agricultural traits using approaches which lack functional gene knowledge in crop species
- Do we have enough genetic diversity?
- Creating diversity - Adoption of biotechnology
- Public versus Private support for breeding.
- IP and the exchange of plant material





Current focus

- Functional linking the phenotype (traits) and the genotype
- Agro-ecology - how plants fit within the environment
- Array of non-invasive tools to 'measure' crop performance
- Drought a complex or simple trait?
- Combined stresses
- Timing crop cycles
- Looking into new horizons





A vision of the future

actual versus potential yields

- Programmes which integrate environment, genomics, crop physiology and breeding
- Functional phenotypes which are linked to the physiological processes
- Ensure that the breeding approaches we use are appropriate
- Field evaluation/validation
- Continue to interact and learn from the global community
- Support of facilities and staff: Rothamsted, NIAB, JIC, Aberystwyth, Nottingham, JH etc.





UNIVERSITY
of
GREENWICH | Natural
Resources
Institute

**Natural Resources Institute
Faculty of Engineering & Science**

University of Greenwich
Medway Campus
Central Avenue
Chatham Maritime
ME4 4TB

Website: www.nri.org

Business Enquiries:

Telephone: +44 (0)1634 880088

Enquiry Unit:

Telephone: 020 8331 9000
E-mail: courseinfo@gre.ac.uk



FS 54723 ISO 9001

University of Greenwich is a charity and company limited by guarantee, registered in England (reg. no. 986729).
Registered office: Old Royal Naval College, Park Row, Greenwich, London SE10 9LS

APPGSTA