

WEDNESDAY 18 FEBRUARY 2004: METEOROLOGY AND AGRICULTURE

[Dr Mike Dennett](#), Dr Ian Dale, Dr Roger Stern, University of Reading: **Establishing meaningful relationships.**

The establishment of statistical relationships between crop data and weather variables has a long and chequered history. Some of the key developments in this history are briefly outlined. The uses and value of such relationships are described. Difficulties in deriving relationships are considered and reasons why the approach may or may not be appropriate are discussed. The relative merits of statistical analyses and crop growth modelling are outlined. Possible developments in the application of statistical techniques to crop–weather relationships are considered.

[Dr Robin Matthews](#), Cranfield University: **Rice and global climate change: victim or culprit?**

Various options available to rice farmers to adapt to climate change are discussed. These include modification of sowing dates to permit a transition from single cropping to double cropping at some locations, and to help avoid severe spikelet sterility caused by high temperatures at other locations. Selection for varieties less sensitive to higher temperatures also seems capable of offsetting detrimental effects of higher temperatures. Options available to reduce methane emissions from rice fields to the atmosphere include midseason drainage, direct wet seeding, the use of inorganic fertilizers, particularly those containing sulfate, and the application of compost and biogas sludge rather than fresh organic material. Future research should focus on integrated assessment approaches to evaluate adaptation and mitigation options. For developing countries, economic development is still the primary concern, and there is a need to find ways for farmers both to enhance their livelihoods on the one hand and to adapt to climate change and reduce methane emissions, if possible, on the other.

[Dr Andrew Challinor](#), Dr Tim Wheeler, Prof Julia Slingo, Dr Peter Crauford, Dr David Grimes, Mr Tom Osborne, University of Reading: **The development of combined weather and crop productivity forecasting systems for the tropics**

The productivity of crops in tropical regions is highly vulnerable to inter-annual and sub-seasonal climate variability. The strong climatic seasonal cycle in seasonally-arid regions make these areas ideal for the study of the predictability of the impacts of weather on crop yield. Where predictability exists, it can be capitalised upon using pragmatic crop models which simulate key processes, together with accurate meteorological data and model output. This presentation describes issues and progress to date in this area, principally using a case study of groundnut in India. It concludes with some remaining research questions.

[Dr Keith Weatherhead/Dr Jerry Knox](#), Cranfield University: **Assessing the impacts of**

climate change on soil moisture and irrigation demand in England and Wales

The demand for water for irrigation in England and Wales is currently growing at 2-3% per annum. The impacts of climate change will be additive and could impact on irrigation water use, affecting plant physiology, soil water balances, cropping patterns, the areas irrigated and the methods used. The impacts of predicted enhanced levels of atmospheric CO₂ on irrigation demand are unclear. The use of potential soil moisture deficit (PSMD) as a climatic indicator suggests that agroclimatic zones will move northwards and westwards. By the 2020s, central England will be similar to the present eastern England, and by the 2050s eastern, southern and central England will have irrigation needs higher than currently experienced anywhere in England. Climate change will extend land suitability for most crops northwards, and make some land in the south unsuitable for rain-fed crops due to droughtiness. Water demand modelling suggests that climate change would increase dry year water demand by around 30% by the 2020s and by around 55% by the 2050s with greatest increases in the midlands and the south-east. Given the uncertainties associated with modelling and the underlying UKCIP data (combined with the sensitivity of the assumptions and correlations used) climate change outputs should be interpreted with caution.

[Prof Martin Parry](#), Chair IPCC working group II: **Climate change, food supply and risk of hunger**

This paper summarises what we currently know about effects of climate change on potential production of major food staples worldwide, and the implications for food prices and risk of hunger. It will place these conclusions in the context of those of the IPCC and also look ahead to the emerging focus of the IPCC's Fourth Assessment, due for completion in 2007.