INTERNATIONAL COTTON
ADVISORY COMMITTEE

1629 K Street NW, Suite 702,
Washington, DC 20006, USA

78th Plenary Meeting – Brisbane (Australia)

MINUTES

Fifth Open Session

Responding to Climate Change

15:45 hrs, Tuesday, 3 December 2019
Chair: Adam Kay, CEO, Cotton Australia

The CHAIR invited Mr. Jon Welsh, Partner, AgEcon, Australia to deliver his presentation "Climate Risk Management: Tools, Tips and Barriers."

Mr. Welsh noted that managing risks in the mid-latitudes is never easy. He indicated that there are studies based on statistics that help to interpret the forecast the future climate change and use the technology to mitigate the effects. Awareness of local rainfall distribution helps to manage risks and interpret seasonal outlooks. Changes in plant and animal behavior was normally a response to humidity and air pressure differences. Crop decision support can interpret science and decisions for us in its "rawest" form. Enhanced accuracy could be achieved through big data, remote sensing and tailored weather calibration. Decision support can embed the forecast into production and remove any cognitive biases. He noted that tercile forecasts are becoming a preferred display rather than above/below median.

The delegate of USA asked how the used models account for changing rainfall baseline overtime.

Dr. Welsh replied that data for the past 20 years on the changing rainfall baseline is used with a look at the median and the average. Based on the outlook for the El Niño and La Nina effects, the projections are made.

The CHAIR invited Dr. Prakash, Principal Scientist, Central Institute for Cotton Research, India to deliver his presentation "Will cotton win over climate change in the Asian continent."

Dr. Prakash noted that major climate change challenges in Asia include climate variability, sea level rise and greenhouse gas emissions. Climate change causing temperature rise, altered precipitation and higher CO2 have an impact on cotton production, requiring impact assessment, adaptation and mitigation strategies. Dr. Prakash described his studies on the effect of temperature on cotton under elevated CO2. He indicated that cotton bolls and fibres attained maximum weight on 40th day. There was no difference between Bt and non-Bt. Cotton. Major effects of elevated CO2 in atmosphere include significant increase in plant height, dry matter production of leaf, steam and bolls, boll weight yield and harvest index. It also caused elevated pest damage and increase in fibre length and strength, good uniformity ratio, good micronaire value and high fibre quality index. Adaptation to future scenarios include a combination of several low-cost options, such as early sowing, switch to short duration varieties (150), increase the seed rate, and integrated nutrient application. It is possible that future climate change could lead to increased susceptibility to insects, pests and diseases

due to lower defence metabolites in cotton. The total burden of climate change can be mitigated by reducing the extent and impact of climate change. Adaptation strategies could include high density planting system, cover crops, mulch and weed management and soil moisture conservation techniques.

The delegate from Pakistan asked if ratooning should be a preferred method and if the increasing temperature was compensated by the increasing sea level

Dr. Prakash answered that ratooning has a double advantage by saving diesel fuel used by tractors and by easier preparation of land for planting. He indicated that rising temperatures are compensated by rising sea levels.

The CHAIR invited Dr. Michael Bange, Senior Principal Research Scientist, CSIRO Agriculture and Food, Australia to deliver his presentation “Enhancing cotton productivity in changing climate.”

Dr. Bange noted that Australia’s climate has warmed since 1910. Climate change consequences include reduced water availability, higher potential water use and increased incidents of extreme weather effects. Strategies to adapt to changes include increasing yields, improving production efficiencies and adaptive management focused on cotton productivity. To improve yields, crop resilience to stress, water usage, photosynthesis, and soil health needed to improve. Heat tolerant varieties should also be developed. He noted that elevated carbon dioxide and warmer temperatures may alter how cotton plants grow and requires assessing their water usage by developing alternative irrigation systems, improving plant rooting zones and water management strategies. Bio-degradable films could be used to prevent soil moisture losses. Plant nutrition should be optimized through improved soil health and transferring bacterial nitrogenase into plants. He indicated that in adaptive systems monitoring is the key. Active stress management and optimised growth regulator use in climate changing conditions are important. Climate change and variability required active stress management and that resilient cropping systems rely on flexibility to account for variability. Regionally specific assessments, systems-based approaches and transgenic/digital technologies will be vital.

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