



Working Paper 2

Proposed Topics for the 2020 Technical Seminar

**GLOBAL LEADERSHIP: PUSHING
COTTON'S BOUNDARIES**
Brisbane, Australia

2-5 December 2019
Tour: 6-7 December



Working Paper 2

Proposed Topics for the 2020 Technical Seminar

Recommendation from the Secretariat of the

International Cotton Advisory Committee

Brisbane, Australia

December 2019

The following topics are proposed for the 2020 Technical Seminar of the ICAC Plenary Meeting:

1. Environmental cotton sustainability: National approvals versus individual choices
2. Cotton stalks: Should they be used for value addition or be burned or recycled back into soil?
3. Is hybrid cotton technology a viable option for Africa?
4. Organic cotton: Is there room for optimism?

TOPIC-1

Environmental Cotton Sustainability: National approvals versus individual choices

Pesticides are regulated through national policies. Similarly, canal irrigation water is provided, and its use is regulated by Governments. Many highly hazardous pesticides are approved in many countries. Using these agricultural inputs in cotton is perfectly legal and is part of national or state recommendations. Does cotton farming become unsustainable if farmers use certain agrochemicals when the country permits their usage, or if farmers use irrigation water when the country regulates its usage?

For example, one fourth of the global cotton area — most of it in the developed world — is sprayed with glyphosate (*WHO group 2A: probably carcinogenic to humans*) because the chemical is legally permitted for use in these countries. Are these cotton farms sustainable when sprayed with a 'probable carcinogenic pesticide' that is legally approved for use by the Government? Similarly, canal water is released for agriculture as a national priority in almost every country. Is the farmer at fault if he uses irrigation water for cotton? Should the country be faulted for approving the use of certain inputs, or the farmer be faulted for the choice of input usage?

The technical session will debate whether sustainability is a national responsibility — or that of individuals — and also if it is proper to measure sustainability at the national level or at farm level by evaluating restricted use of certain pesticides or certain amount of water despite national

approvals. Speakers will also debate on whether or not measurements of cotton sustainability should be compared between countries.

TOPIC-2

Cotton stalks: Should they be used for value addition, or burned, or recycled back into soil?

Cotton stalks are valuable renewable resources. They can be either used for value addition to produce briquets, pellets, particle boards, or used as a nutrient source through composting or biochar production or mulching or incorporation into soil. The crop takes nutrients from the soil to grow. The plant biomass must be returned back into the soil as compost or biochar or soil incorporation, or mulch so that the nutrients are recycled; otherwise, synthetic fertilisers and manures must be applied to the soil to obtain good yields. Cotton stalks, when recycled into the soil, return valuable nutrients to the land. Most African countries however neither recycle stalks nor use chemical fertilisers, whether it's due to poor access or because they cannot afford them. Africa, India and Pakistan produce at least 50 to 60 million tonnes of cotton stalks worth more than \$ 500 million. Burning stalks not only wastes a precious soil nutrient resource but releases about 1.5 times their weight of CO₂ into the atmosphere.

The technical seminar will discuss:

1. Whether many countries in Africa and Asia should continue to burn cotton stalks, as per national policies,
2. Whether Africa and Asia should remove cotton stalks from fields and add value by converting them into briquets, pellets or particle boards, and
3. Whether Africa and Asia should develop mechanisms to slash the cotton stalks back into the soil to use as bio-mulch or convert them into compost or biochar to enrich soils and reduce dependence on synthetic fertilisers for high yields.

TOPIC-3

Is hybrid cotton technology a viable option for Africa?

Hybrid cotton is associated with hybrid vigour and therefore with high yields. However, data show that hybrid cotton technology could be beneficial in the short term under irrigated, high-input farms — but is risky and unsustainable under rainfed conditions. In the first 4 to 5 years of use, hybrids extract nutrients efficiently from the soil to produce excessive unproductive biomass, which results in higher yields but also in significant depletion of soil nutrients, which cause yields to decline in subsequent years (in the absence of fertilisers). Due to its hybrid vigour, hybrid cotton produces higher biomass in a longer duration which makes the crop vulnerable to insect pests and diseases over an extended period of time, which also increases the crop's need for water, nutrients and pesticides. Hybrid Bt-cotton seeds cost about US\$100 to \$200 per hectare compared to US \$2 to \$15 of conventional, open-pollinated varieties. Further, farm-saved seed cannot be reused.

Data show that hybrids can produce higher yields when combined with with irrigation and higher fertiliser and pesticide application, but there is no evidence to indicate that yields increased due to hybrid cotton — especially in the rainfed areas of India and other parts of the world.

Interestingly, hybrid seed companies are luring Africa with promises of spectacular increase in yields — but will hybrid cotton make a breakthrough in yields in Africa, which is primarily rain-fed, and locations where fertilisers are not commonly used? That remains to be seen.

The technical seminar will examine the impact of hybrid cotton in India and Sudan, as well as why other developed countries have not adopted the technology. Speakers will debate whether the technology would be suitable for sustainable cotton farming in rainfed African conditions.

TOPIC-4

Organic cotton: Is there room for optimism?

The United States Department of Agriculture (USDA) defines organic farming as *'the application of a set of cultural, biological, and mechanical practices that support the cycling of on-farm resources, promote ecological balance, and conserve biodiversity'*. Technically, the definition of organic farming fits well into the sustainability goals.

However, organic cotton constitutes only about 0.5% of global production, with more than 95% of the global organic cotton being produced only in seven countries (India, China, Turkey, Kyrgyzstan, Tajikistan, USA and Tanzania). In 2017, organic cotton was grown by 220,478 farmers (0.84% of global cotton farmers), 87.1% of whom were in India and 11.0% in Africa.

There are conflicting reports on yields of organic cotton compared to conventional cotton. Organic cotton yields were either similar or slightly higher than the conventional system in India, Tanzania, Uganda and Benin, but were lower in USA, Turkey and Greece. Similarly, there are conflicting reports on net profits from organic cotton production compared to conventional cotton, mainly due to variable yields and differential market prices. The net profits on conventional farms were more those of organic cotton in Greece but were lower than organic farming in Kyrgyzstan. The profit margins were significantly higher, compared to conventional farms in Gujarat and central India, but lower in Punjab.

Sceptics have considered organic farming to be ideologically driven and inefficient because it requires more land to produce the same amount of food or fibre, and that organic agriculture suffers many shortcomings and would become increasingly less relevant in the future. However, available research indicates that increasing consumer demand for organic products is likely to stimulate higher organic production in the future.

The technical seminar would discuss on the future of organic cotton and its possible role in the path to sustainability.