



PROCEEDINGS

of the 76th Plenary Meeting



*Cotton in the Era
of Globalization
and
Technological
Progress*

Tashkent, Uzbekistan
October 2017



Discover
Natural
Fibres
Initiative

INTERNATIONAL COTTON ADVISORY COMMITTEE

PROCEEDINGS OF THE 76th PLENARY MEETING

***“Cotton in the Era of Globalization and
Technological Progress”***



ICAC
Washington DC USA

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FOREWORD

On invitation from the Government of the Republic of Uzbekistan, the 76th Plenary Meeting of the International Cotton Advisory Committee (ICAC) took place from October 22-27, 2017 in Tashkent.

The International Cotton Advisory Committee is an association of governments having an interest in the production, export, import and consumption of cotton. It is an organization designed to promote cooperation in the solution of cotton problems, particularly those of international scope and significance.

The functions of the International Cotton Advisory Committee, as defined in the Rules and Regulations, are

- To observe and keep in close touch with developments affecting the world cotton situation.
- To collect and disseminate complete, authentic, and timely statistics on world cotton production, trade, consumption, stocks and prices.
- To suggest, as and when advisable, to the governments represented, any measures the Advisory Committee considers suitable and practicable for the furtherance of international collaboration directed towards developing and maintaining a sound world cotton economy.
- To be the forum of international discussions on matters related to cotton prices.

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Statements of the Meeting, which are an integral part of the full record of the meeting, are placed on
[https://www.icac.org/mtgs/Plenary/76th/Agenda-\(Reports-Minutes\)](https://www.icac.org/mtgs/Plenary/76th/Agenda-(Reports-Minutes))

STATEMENT OF THE 76th PLENARY MEETING

“Cotton in the Era of Globalization and Technological Progress”

1. The International Cotton Advisory Committee (ICAC) met in Tashkent, Uzbekistan during 23-27 October 2017 for its 76th Plenary Meeting since the establishment of the Committee in 1939. The meeting was attended by 345 persons, including representatives from 16 Members, 4 international organizations and 9 non-members countries.
2. World cotton production is projected to rise by 10% in 2017/18 due to an increase in harvested area, as yields are expected to remain steady. World production is projected to exceed mill use during 2017/18, and world-ending stocks will remain almost unchanged. Ending stocks in China are projected to decline during 2017/18, whilst stocks outside China are projected to increase by almost the same amount.
3. Government support to the cotton sector declined in 2016/17, as market prices rose and minimum support price programs were not triggered in a number of countries. ICAC's annual report on government measures supporting the cotton sector shows that estimated value of the support declined by 39% in 2016/17 to US\$4.5 billion from US\$7.4 billion in 2015/16. The large stocks accumulated in China's reserve as a result of government intervention from 2011/12 to 2014/15 had been drawn down by half.
4. Cotton Consumption: In 2016 world cotton mill use totalled 24 million tons, which was still 9% lower than the peak reached in 2007. Cotton's share in the world fibre consumption fell to 27% compared to an increase usage of polyester fibres to 67%. The Secretariat was instructed to establish the consumption of polyester, which directly competes with cotton, as there are many applications of polyester staple and filament, which do not compete with cotton.
5. ICAC Discussion on Cotton Consumption: Proper fibre identification and the relatively high retail price of cotton apparel were some of the obstacles to increasing demand. Strategies for increasing the demand for cotton products included promoting the benefits of cotton as a natural, sustainable and renewable fibre and developing product logos and/or labels that would assist consumers in identifying cotton content. Governments were urged to strictly apply legislation as regards the correct labelling of textile items and reinforcing customs control to avoid falsification and illegal importation.
6. Textile innovations and cotton: Textile experts presented innovative uses of cotton that addressed consumers' demands for modern, functional textiles. New applications for cotton by blending with other fibres and also an assortment of other new textile materials have been developed. Governments agreed that innovation in the textile industry is crucial and that cotton has a future in this activity.
7. Biotechnology: The ICAC Researcher of the Year 2017 stated that the tools of genetic modification (GM) provide faster, more precise ways of imparting desirable traits into commercial crop varieties. GM does not supplant conventional breeding; instead GM is used in conjunction with conventional breeding to speed the identification and development of effective genetic solutions. Nevertheless, some ICAC members have concerns about GMO cotton production and as a result, have not approved its planting. It was also noted that currently about 80% of the world's cotton production is based on GM technology.
8. Technology Transfer: The Plenary was informed about the close cooperation between Brazil and the C4 countries plus Togo in developing a successful project to encourage the application of cover crops, using no till systems and integrated pest management (IPM) control. The Plenary also heard about the continuous strides made in modern communications that have radically transformed the field of 'Agricultural extension' in many developing countries. A representative from Better Cotton Initiative (BCI) described the process used by farmers to adopt better technologies in the 15% of cotton production currently identified as BCI. Among other advances, cotton is increasingly mechanised and a representative from India described new harvesting machinery for small holders. Concern was expressed that knowledge transfer activities were potentially being duplicated and the Plenary instructed the Secretariat to investigate the possibility of serving as a clearing-house for information concerning such activities.
9. The Committee decided to hold the 2018 Technical Seminar on the topic of Combating Pest Resistance to Biotech Cotton and Pesticides: Biotech cotton is cultivated in 15 countries and occupies 75% of the global cotton area. During the past seven years, reports of bollworm resistance to Bt-cotton and insecticides; weed resistance to herbicides and whitefly resistance to insecticides have emerged from major cotton growing countries across the globe. The resistant strains of bollworms, whiteflies and weeds can cause debilitating effects on cotton production if not properly addressed. There is a need to elucidate the reasons for rapid development of resistance in some countries compared to others and also chalk out strategies to combat the emerging problems of resistant insects and weeds.

10. Contamination: The Plenary heard reports on the work in progress for removal and elimination of contamination in baled cotton, specifically as regards all types of plastic, as current surveys have identified increased contamination in some countries during the last few years. The work extends into the fields and at the gins and new technology to identify and remove plastic in these locations is being tested to combat this problem

11. The Private Sector Advisory Panel (PSAP) recommended broadening the terms of reference of the Secretariat's on-going studies of the polyester market to include environmental issues related to microfibre pollution, lifecycle assessment of polyester and manufacturing processes. The PSAP recognises that cotton must coexist with polyester, but at the same time keep consumers fully aware of the facts behind competing fibres and their intrinsic properties.

12. The Private Sector Advisory Panel informed the Committee that an ePhyto industry advisory group (IAG) had been set up by the United Nations International Plant Protection Convention (IPPC) under the auspices of the Food and Agriculture Organization of the United Nations (FAO), to provide advice and guidance on the development and deployment of an electronic phytosanitary certification system. This will consist of a global hub and a generic national system to facilitate the international exchange of electronic phytosanitary information. There are ten members of the IAG and ICAC has been chosen to represent the global cotton industry.

13. Work priorities for SEEP identified: The Expert Panel on the Social, Environmental and Economic Performance of Cotton (SEEP) reported that it will work on the following 3 priority areas over the next 2 years: 1) the compilation of management practices and information relevant to cotton growers for improving soil health; 2) the continued testing and implementation of the guidance framework for measuring the sustainability in cotton farming systems (including finalising and releasing for comment by Members the 'lessons learned' report from the pilot tests conducted using the guidance framework); 3) developing alternative ways of reporting on the sustainability of cotton production that better allow for the positives to be recognised.

14. The ICAC is evolving and it was recognised that there needed to be better communications to a greater audience through the use of social media and an improved website. The Plenary agreed that the ICAC needed to be the central repository for both economic and technical information about production, consumption and sustainability issues.

15. Membership: The Committee welcomed Bangladesh and the European Union as its newest members. The membership of Bangladesh and the European Union was a positive sign of the relevance of the ICAC to the world cotton industry.

16. Future Plenary Meetings: The Committee has accepted an invitation from the government of Côte d'Ivoire to host the 77th Plenary Meeting at the beginning of December 2018 in the city of Abidjan.

17. The Committee welcomed Mr. Kai Hughes as the 7th Executive Director in its history. Mr. Hughes has great management experience and knowledge of the cotton industry and Committee members expressed great enthusiasm at the prospect of a new era of leadership.

18. The Plenary thanks the Standing Committee and the Secretariat for the support and the hard work and looks forward to the continued exchange of information between the Secretariat and Coordinating Agencies.

19. Appreciation to the Host Country: The Committee thanked the people, the Organizing Committee and the Government of Uzbekistan for hosting the 76th Plenary Meeting. Delegates commented very favourably on the efficiency of the host country in facilitating the plenary meeting and the warmth and generosity that had been extended to delegates by the people of Uzbekistan.

**ICAC****SUPPLY AND DISTRIBUTION OF COTTON****October 27, 2017**

Seasons begin on August 1

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
		Est.	Est.	Est.	Est.	Proj.
	Million Metric Tons					
BEGINNING STOCKS						
WORLD TOTAL	15.708	19.428	21.317	22.955	20.245	18.55
CHINA	6.696	10.811	13.280	14.118	12.650	10.63
USA	0.729	0.827	0.512	0.795	0.827	0.61
PRODUCTION						
WORLD TOTAL	27.079	26.225	26.269	21.484	23.048	25.57
INDIA	6.290	6.766	6.562	5.746	5.775	6.03
CHINA	7.600	7.000	6.600	5.200	4.900	5.25
USA	3.770	2.811	3.553	2.806	3.738	4.59
PAKISTAN	2.002	2.076	2.305	1.537	1.663	2.14
BRAZIL	1.310	1.734	1.563	1.289	1.530	1.57
UZBEKISTAN	1.000	0.910	0.885	0.832	0.789	0.80
OTHERS	5.107	4.928	4.801	4.074	4.653	5.18
CONSUMPTION						
WORLD TOTAL	23.450	24.101	24.587	24.180	24.561	25.22
CHINA	7.900	7.600	7.550	7.600	8.000	8.12
INDIA	4.762	5.087	5.377	5.296	5.148	5.30
PAKISTAN	2.216	2.470	2.467	2.147	2.147	2.23
EUROPE & TURKEY	1.560	1.611	1.692	1.687	1.612	1.63
VIETNAM	1.045	1.129	1.197	1.316	1.409	1.44
BANGLADESH	0.492	0.673	0.875	1.007	1.168	1.31
USA	0.762	0.773	0.778	0.751	0.751	0.73
BRAZIL	0.910	0.862	0.797	0.701	0.729	0.76
OTHERS	3.802	3.896	3.854	3.675	3.598	3.70
EXPORTS						
WORLD TOTAL	10.048	9.029	7.786	7.552	8.147	7.93
USA	2.836	2.293	2.449	1.993	3.168	3.14
INDIA	1.690	2.015	0.914	1.258	1.103	0.84
CFA ZONE	0.821	0.973	0.966	0.963	0.972	1.00
BRAZIL	0.938	0.485	0.851	0.939	0.607	0.68
UZBEKISTAN	0.690	0.615	0.550	0.500	0.337	0.37
AUSTRALIA	1.343	1.058	0.527	0.616	0.809	0.75
IMPORTS						
WORLD TOTAL	10.213	8.858	7.789	7.571	8.001	7.93
CHINA	1.055	1.112	1.183	1.378	1.412	1.44
VIETNAM	0.517	0.687	0.934	1.001	1.207	1.34
BANGLADESH	4.426	3.075	1.804	0.959	1.096	1.32
INDONESIA	0.803	0.924	0.800	0.918	0.801	0.72
TURKEY	0.686	0.651	0.728	0.640	0.746	0.76
TRADE IMBALANCE 1/	0.166	-0.171	0.003	0.020	-0.146	0.00
STOCKS ADJUSTMENT 2/	-0.075	-0.063	-0.047	-0.034	-0.039	0.00
ENDING STOCKS						
WORLD TOTAL	19.428	21.317	22.955	20.245	18.547	18.89
CHINA	10.811	13.280	14.118	12.650	10.632	9.07
USA	0.827	0.512	0.795	0.827	0.610	1.34
ENDING STOCKS/MILL USE (%)						
WORLD-LESS-CHINA 3/	55	49	52	46	48	57
CHINA 4/	137	175	187	166	133	112
COTLOOK A INDEX 5/	88	91	71	70	83	

1/ The inclusion of linters and waste, changes in weight during transit, differences in reporting periods and measurement error account for differences between world imports and exports.

2/ Difference between calculated stocks and actual; amounts for forward seasons are anticipated.

3/ World-less-China's ending stocks divided by world-less-China's mill use, multiplied by 100.

4/ China's ending stocks divided by China's mill use, multiplied by 100.

5/ U.S. cents per pound.

Заключительная декларация 76-го пленарного заседания «Хлопок в эпоху глобализации и технологического прогресса»

26 октября 2017 г

1. В период с 23 по 27 октября 2017 года в г.Ташкенте, Узбекистан, состоялось 76-е пленарное заседание учреждённого в 1939 г. Международного консультативного комитета по хлопку (МККХ). В заседании приняли участие 345 человек, в том числе представители 16 членов, 4 международных организаций и 9 стран-нечленов.
2. Прогнозируется, что **международное хлопкопроизводство в 2017-18 г. повысится на 10%** благодаря расширению посевных площадей, а урожайность может остаться неизменной. Ожидается, что вовремя 2017-18 г. мировое производство превысит промышленное использование, причём мировые конечные запасы останутся почти неизменными. Конечные запасы в Китае в 2017-18 г. могут снизиться, а запасы за пределами Китая могут увеличиться почти на то же количество.
3. **В 2016-17 г. государственная поддержка хлопковому сектору снизилась**, так как рыночные цены повысились, а в некоторых странах не были реализованы программы поддержки минимальных цен. Ежегодный доклад МККХ относительно государственных мер по поддержке хлопкового сектора содержит данные о том, что оценочная стоимость поддержки производства сезоне 2016-17 г. снизилась на 39% до 4,5 млрд. долларов США по сравнению с 7,4 млрд. долларов в 2015-16 г. Крупнейшие запасы, аккумулированные в китайском государственном резерве в результате государственного вмешательства в течении сезонов с 2011-12 по 2014-15 гг., сократились наполовину.
4. **Хлопкопотребление** В 2016 г. промышленное использование хлопка составляло 24 млн. тонн, что было на 9% меньше рекорда достигнутого в 2007 г. Доля хлопка в мировом использовании волокна сократилась до 27% по сравнению с увеличением использования полиэфирных волокон до 67%. Секретариату поручили исследовать данные по потреблению полиэфира, который непосредственно конкурирует с хлопком, так как известно множество случаев применения полиэфирных волокон и нити, в областях применения в которых нет конкуренции с хлопком.
5. **Дискуссии МККХ о хлопкопотреблении.** Надлежащее определение состава волокон и сравнительно высокие розничные цены на предметы одежды из хлопка были некоторыми из препятствий на пути увеличения спроса. Стратегии повышения спроса на хлопковую продукцию должны включать рекламирование преимуществ хлопка как натурального, устойчивого и возобновляемого волокна, а также разработку товарных знаков продукции и/или этикеток, которые помогут потребителям определять содержание хлопка. Правительствам поручили чётко использовать законодательство относительно надлежащего использования этикеток текстильных товаров и усиления таможенного контроля для избежания фальсификаций и незаконного импорта.
6. **Текстильные инновации и хлопок.** Текстильные эксперты представили информацию об инновационном использовании хлопка, и о потребительском спросе на современные и функциональные текстильные изделия. Были разработаны новые виды применения хлопка путём его смешения с другими волокнами, а также была разработана палитра других новых

текстильных материалов. Правительства согласились с тем, что инновации в текстильной промышленности чрезвычайно важны и что хлопку принадлежит будущее в этом процессе.

7. **Биотехнология.** Исследователь МККХ 2017 г. заявил, что механизмы генетической модификации (ГМ) обеспечивают более быстрые и точные пути передачи желаемых свойств в коммерческие сорта культуры. ГМ не замещает обычного селекционирования. Наоборот, ГМ используется в сочетании с обычным селекционированием для ускорения определения и создания эффективных генетических решений. Несмотря на это, некоторые члены МККХ выражают озабоченность относительно хлопкопроизводства ГМО и в результате не одобрили его посева. Также было отмечено, что в настоящее время около 80% мирового хлопкопроизводства основаны на ГМ-технологии.

8. **Передача технологии.** Пленарному заседанию сообщили о тесном сотрудничестве между Бразилией и странами С4 плюс Того в деле разработки успешного проекта по содействию применения посевных культур с использованием систем посева без вспахивания почвы и комплексных методов борьбы с вредителями. На пленарном заседании был также заслушан доклад о успехах в деле современных коммуникаций, которые существенно трансформировали область «сельскохозяйственного технологического обучения» во многих развивающихся странах. Представитель «инициативы улучшенный хлопок» (BCI) описал процесс, применения улучшенной технологии фермеры в 15% хлопкового производства, которое в настоящее время определяют, как BCI. Среди других нововведений была отмечена всё более объёмная механизация хлопка, причём представитель Индии сообщил о новом оборудовании для уборки урожая, используемом мелкими хозяйствами. Была выражена озабоченность о том, что передача технологических знаний могут быть потенциально дублироваться, причём пленарное заседание поручило Секретариату расследовать возможность работы в качестве центра передачи информации, относящейся к таким мероприятиям.

9. Комитет решил провести в 2018 г. технический семинар по теме **«Борьба с сопротивляемостью вредителей биологически модифицированному хлопку и пестицидам»**. Биологически модифицированный хлопок выращивают в 15 странах, причём он занимает 75% мировой площади под хлопчатником. В ходе последних семи лет из крупных стран-хлопкопроизводителей по всему миру поступили сообщения о сопротивляемости коробчатого червя биологически модифицированному хлопку и инсектицидам, сопротивляемости сорняков гербицидам и сопротивляемости белокрылки инсектицидам. Разновидности сопротивляемости коробчатым червям, белокрылкам и сорнякам могут иметь вредное воздействие на хлопкопроизводство, если с ними не бороться надлежащим образом. Нужно объяснять причины быстрого развития сопротивляемости в некоторых странах по сравнению с другими странами, а также наметить стратегии борьбы с появляющимися проблемами сопротивляемости со стороны насекомых и сорняков.

10. **Загрязнение.** Участники пленарного заседания заслушали доклады о продолжении работы, по удалению и устранения загрязнений в кипах хлопка, особенно по отношению ко всем видам пластмассовых материалов, так как проводимые исследования указывают на увеличение загрязнения в некоторых странах за последние несколько лет. Экспериментальная работа проводится на полях и джинурирующих предприятий по применению новых технологий определения и удаления пластмассовых материалов.

11. **Консультативная группа частного сектора (PSAP)** рекомендовала расширить полномочия Секретариата относительно проводимых исследований полиэфирного рынка, включая экологические вопросы, относящиеся к микро волоконному загрязнению, оценке жизненного цикла полиэфира и процессам переработки. КГЧС понимает, что хлопок должен сосуществовать с полиэфиром, но одновременно необходимо в полной мере информировать потребителей относительно фактов, лежащих в основе конкурирующих волокон и их наиболее существенных качеств.

12. **Консультативная группа частного сектора проинформировала Комитет о создании промышленной консультативной группы э-фито (IAG), которая была основана** Конвенцией ООН по защите растений под патронажем Продовольственной и сельскохозяйственной организации ООН (ФАО) для предоставления консультаций и инструкций относительно разработки и внедрения системы электронной фитосанитарной сертификации. Она будет состоять из глобального узла и общенациональной системы, направленных на ускорение международного обмена электронной фитосанитарной информацией. В настоящее время 10 стран являются членами IAG, причём МККХ был избран в качестве представителя мировой хлопковой промышленности.

13. **Определены рабочие приоритеты группы SEEP.** Экспертная группа по социальным, экологическим и экономическим характеристикам хлопка (SEEP) сообщила, что в последующие два года она будет работать по следующим трём приоритетным направлениям: 1) разработка современных методов управления и информации, для производителей хлопка и направленных на улучшение характеристик почвы; 2) продолжение испытания и внедрения системы для измерения устойчивости в системах выращивания хлопка (включая конечную завершение и подготовку для замечаний стран-членов доклада под названием «Полученные уроки на основании экспериментальных исследований, проведенных с использованием системных правил»); 3) разработка альтернативных путей информирования об устойчивости производства хлопка, которые наилучшим способом позволяют обозначать позитивное направление.

14. **МККХ** расширяет свою деятельность, причём была признана необходимость улучшения коммуникаций с широкой аудиторией путём использования социальных СМИ и улучшения веб-сайтов. Участники пленарного заседания согласились с тем, что МККХ должен стать центральным местом хранения как экономической, так и технической информации относительно вопросов производства, потребления и устойчивости производства.

15. **Членство.** Комитет приветствовал Бангладеш и Европейский Союз в качестве своих самых новых членов. Членство Бангладеш и Европейского Союза явилось положительным знаком значимости МККХ для мировой хлопковой промышленности.

16. **Следующее пленарное заседание.** Комитет принял предложение правительства Код д'Ивуара о проведении 77-го пленарного заседания в начале декабря 2018 г. в г.Абиджане.

17. Комитет приветствовал г-на Кая Хьюза на посту седьмого исполнительного директора за всё время существования Комитета. Г-н Хьюз обладает большим опытом руководства и знаниями хлопковой отрасли, причём члены Комитета выразили большую уверенность относительно перспектив новой эры руководства.

18. Пленарное заседание поблагодарило Постоянный Комитет и Секретариат за их поддержку и большую работу, при этом ожидается продолжение обмена информацией между Секретариатом и координирующими агентствами.

19. **Благодарность принимающей стране.** Комитет поблагодарил народ, Организационный комитет и правительство Узбекистана за организацию 76-го пленарного заседания. Делегаты очень высоко отозвались об эффективности принимающей страны в работе пленарного заседания и отметили теплоту и щедрость, которые были оказаны делегатам со стороны народа Узбекистана.

١٥ - **العضوية:** رحبت اللجنة ببنغلاديش وبالاتحاد الأوروبي كأخر عضوين جديدين. وتعتبر عضوية بنغلاديش والاتحاد الأوروبي مؤشراً إيجابياً حول أهمية اللجنة الاستشارية الدولية للقطن في مجال صناعة القطن العالمية .

١٦ - **الاجتماعات العامة القادمة:** قبلت اللجنة الدعوة الموجهة من حكومة بوركينا فاسو لاستضافة الاجتماع العام السابع والسبعين في مدينة أبيدجان في بداية شهر ديسمبر / كانون الأول ٢٠١٨ .

١٧ - رحبت اللجنة بالسيد كاي هيوز كأمين تنفيذي سابع في تاريخ اللجنة . ويتمتع السيد هيوز بخبرة إدارية واسعة وبمعرفة طويلة بصناعة القطن. وأعربت اللجنة عن حماسها الكبير حيال فتح آفاق عصر جديد في قيادة اللجنة.

١٨ - يشكر الاجتماع العام اللجنة الدائمة والأمانة على الدعم وعلى العمل الدؤوب ويتطلع إلى مواصلة تبادل المعلومات بين الأمانة والوكالات المنسقة .

١٩ - **الامتنان للبلد المضيف:** شكرت اللجنة أوزبكستان حكومة وشعباً وكذلك اللجنة التنظيمية على استضافة الاجتماع العام السادس والسبعين للجنة . وأثنى أعضاء الوفود على فاعلية البلد المضيف في تيسير أعمال الاجتماع العام وعلى الحفاوة وحرارة الاستقبال التي أحيط بها المندوبون من قبل الشعب في أوزبكستان .

رفعت الجلسة الساعة الرابعة وثمان وثلاثين دقيقة عَصراً.

١٢ - أخبر الفريق الاستشاري المعني بالقطاع الخاص اللجنة أن المجموعة الاستشارية لصناعة الصحة النباتية الإلكترونية (AG) قد تم إنشاؤها بمقتضى اتفاقية الأمم المتحدة الدولية لحماية النباتات (IPPC) تحت إشراف منظمة الأمم المتحدة للأغذية والزراعة (FAO) لتقديم النصح والإرشاد حول وضع ونشر نظام إلكتروني للتحقق من الصحة النباتية. وسيتكون هذا النظام من محور عالمي ونظام وطني عام لتسهيل التبادل الدولي للمعلومات الإلكترونية حول صحة النباتات. وهناك عشرة أعضاء في هذه المجموعة، وقد اختيرت اللجنة الاستشارية الدولية للقطن كممثلة عن صناعة القطن العالمية.

١٣ - تحديد الأولويات في عمل فريق الخبراء المعني بالأداء الاجتماعي والبيئي والاقتصادي لإنتاج القطن (SEED): أعلن هذا الفريق أنه سيعمل خلال السنتين القادمتين بشأن مجالات الأولوية الثلاث التالية : (١) تجميع ممارسات الإدارة والمعلومات المتصلة بزراعي القطن من أجل تحسين صحة التربة؛ (٢) مواصلة التجارب وتنظيم الأطر الإرشادية لقياس الاستدامة في نظم زراعة القطن، (بما فيها ذلك الانتهاء من التقرير حول "الدروس المستفادة" وتقديمه للدول الأعضاء للتعليق عليه، والخاص بالاختبارات التجريبية التي تمت باستخدام الإطار الإرشادي؛ (٣) وضع طرق بديلة للإبلاغ عن استدامة إنتاج القطن. وسيؤدي ذلك إلى الإقرار والاعتراف بإيجابيات هذا العمل.

١٤ - اللجنة الاستشارية الدولية للقطن آخذة في التطور. وقد جرى الاعتراف بالحاجة إلى تحقيق اتصالات أفضل للوصول إلى عدد أكبر من الجمهور عن طريق استخدام وسائل التواصل الاجتماعي والمواقع الشبكية المحسنة. ووافق الاجتماع العام على أن تكون اللجنة الاستشارية الدولية للقطن بمثابة مستودع للمعلومات الاقتصادية والتقنية معاً حول موضوعات الإنتاج والاستهلاك والاستدامة .

٩ - قررت اللجنة أن تعقد الندوة التقنية لعام ٢٠١٨ حول موضوع مقاومة الآفات لقطن التكنولوجيا الحيوية ولمبيدات الحشرات: يتم زرع قطن التكنولوجيا الحيوية في ١٥ بلداً، كما يغطي ٧٥ ٪ من المساحة العالمية المزروعة بالقطن . وخلال السنوات السبع الأخيرة وصلت تقارير من عدد من البلدان الرئيسية المنتجة للقطن في العالم تفيد بمقاومة دودة لوزة القطن لقطن التكنولوجيا الحيوية ولمبيدات الحشرات وبمقاومة الأعشاب الضارة لمبيدات هذه الأعشاب، وبمقاومة الذباب الأبيض لمبيدات الحشرات. ومن شأن السلالات المقاومة من دودة لوزة القطن والذباب الأبيض والأعشاب الضارة أن تتسبب في إحداث أضرار في إنتاج القطن إن لم يتم معالجتها بالشكل المناسب. وهناك ثمة حاجة لتوضيح الأسباب المؤدية إلى هذه المقاومة في بعض البلدان مقارنة مع بلدان أخرى ولوضع استراتيجيات لمكافحة المشاكل الجديدة الناجمة عن الحشرات والأعشاب الضارة المقاومة.

١٠ - التلوث: استمع الاجتماع العام إلى تقارير حول العمل الجاري لإزالة التلوث والقضاء عليه في القطن الموجود في بالات مرزومة، وتحديدًا فيما يتعلق بجميع أنواع البلاستيك، لا سيما أن الدراسات الراهنة أثبتت حدوث زيادة في التلوث في بعض البلدان خلال السنوات القليلة الماضية . ويمتد العمل إلى الحقول وإلى المحالج . وهناك تكنولوجيا جديدة يجري تجربتها لمكافحة هذه المشكلة عن طريق التعرف على البلاستيك في هذه الأماكن وإزالته .

١١ - أوصى الفريق الاستشاري المعني بالقطاع الخاص (PSAP) بتوسيع مرجعية الدراسات التي تقوم بها الأمانة حالياً حول سوق البوليستر بحيث تتضمن موضوعات بيئية ذات صلة بالتلوث وبتقييم دورة حياة البوليستر وعمليات التصنيع. ويعترف الفريق بوجوب تعايش القطن مع البوليستر، ولكن من الواجب في نفس الوقت إطلاع المستهلكين تماماً على الحقائق وراء الألياف المتنافسة وخصائصها الجوهرية.

٦ - **الابتكارات النسيجية والقطن:** قدم خبراء المنسوجات ابتكارات في استعمال القطن تواكب رغبة المستهلك في الحصول على منسوجات حديثة ذات فائدة وظيفية. وقد تم التوصل إلى تطبيقات جديدة للقطن بخلطه مع ألياف أخرى وإلى تشكيلة من المواد النسيجية الجديدة الأخرى. ووافقت الحكومات على أن الابتكار في صناعة المنسوجات مهم جداً وعلى أن للقطن مستقبل جيد في هذا المضمار .

٧ - **التكنولوجيا الحيوية:** أشار الباحث لعام ٢٠١٧ من اللجنة الاستشارية الدولية للقطن إلى أن التعديل الوراثي (GM) يشكل طريقة أسرع وأكثر دقة لنقل الخصائص المرغوبة إلى مختلف المحاصيل التجارية . والتعديل الوراثي ليس بديلاً عن الزراعة التقليدية ؛ لا بل أنه بدلاً من ذلك يُستخدم مع الزراعة التقليدية للتسريع في الوصول إلى حلول وراثية فعالة . ومع ذلك ، أعرب بعض الأعضاء في اللجنة الاستشارية الدولية للقطن عن قلقهم حيال إنتاج القطن المعدل وراثياً، وبالتالي لم يوافقوا على زرعه . كما لوحظ أيضاً بأن ٨٠ ٪ من إنتاج القطن في العالم حالياً يعتمد على تكنولوجيا التعديل الوراثي.

٨ - **نقل التكنولوجيا:** أخطر الاجتماع العام بوجود علاقة وطيدة بين البرازيل ومجموعة الدول الأربع + توغو في التوصل إلى مشروع ناجح يشجع على تطبيق محاصيل التغطية باستخدام أنظمة لا تقوم على الحرث وتقوم بمكافحة متكاملة للآفات (IPM) . كما استمع الاجتماع العام إلى الخطوات المتواصلة في ميدان الثورة الرقمية والتي أحدثت تحولات جذرية في مجال الإرشاد الزراعي في العديد من البلدان النامية. ووصف ممثل عن مبادرة أفضل للقطن (BCI) العملية التي يستخدمها المزارعون لاعتماد تكنولوجيات أفضل فيما نسبته ١٥ ٪ من إنتاج القطن الذي تطبق فيه مبادرة أفضل للقطن.

الاستشارية الدولية للقطن حول تدابير الحكومات الداعمة لقطاع القطن أن قيمة الدعم المقدرة تراجعت بنسبة ٣٩ ٪ في موسم ٢٠١٦/٢٠١٧ وبلغت ٤,٥ بلون دولار بعد أن كانت قد وصلت في موسم ٢٠١٥/٢٠١٦ إلى ٧,٤ بليون دولار. وكانت كميات المخزون الكبير المتراكم في احتياطي الصين قد انخفضت إلى النصف نتيجة لتدخل الحكومة من موسم ٢٠١١/٢٠١٢ إلى موسم ٢٠١٤/٢٠١٥ .

٤ - **استهلاك القطن:** في عام ٢٠١٦ بلغ مجمل الاستهلاك العالمي لمعامل القطن ٢٤ مليون طن أي أن الاستهلاك انخفض بنسبة ٩ ٪ عن فترة الذروة في الاستهلاك في عام ٢٠٠٧ . وتراجعت حصة القطن من الاستهلاك العالمي لمعامل الألياف إلى ٢٧ ٪ مقارنة مع ارتفاع نسبة استهلاك ألياف البوليستر إلى ٦٧ ٪ . وقد وُجّهت تعليمات إلى الأمانة لكي تحدد استهلاك نوع البوليستر الذي يشكل منافسة مباشرة للقطن، وذلك لأن هناك العديد من استخدامات ألياف البوليستر وخطوطه التي لا تشكل منافسة مع القطن .

٥ - **مناقشة اللجنة الاستشارية الدولية للقطن حول استهلاك القطن:** أدى تحديد نوعية الألياف المناسبة وارتفاع سعر التجزئة نسبياً للملبوسات القطنية إلى حدوث بعض العقبات التي حالت دون زيادة الطلب على القطن . ومن بين الاستراتيجيات الرامية إلى زيادة الطلب على المنتجات القطنية الترويج لمنافع القطن باعتباره ليفة طبيعية قابلة للاستدامة وقابلة للتجديد، ووضع شعارات و/أو علامات من شأنها مساعدة المستهلك في معرفة نوعية المحتوى القطني. وجرى حث الحكومات على اتخاذ تشريعات صارمة بشأن وضع العلامات الصحيحة على المنتجات النسيجية وعلى تعزيز الرقابة الجمركية لتجنب حدوث تزوير أو استيراد مواد غير مشروعة .



اللجنة الاستشارية الدولية للقطن

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البيان الختامي للاجتماع العام السادس والسبعين "القطن في عصر العولمة والتقدم التكنولوجي"

٢٦ تشرين الأول/أكتوبر ٢٠١٧

الساعة ١٤:٢٥

- ١ - اجتمعت اللجنة الاستشارية الدولية للقطن (إيكاك) في مدينة طشقند في أوزبكستان في الفترة الواقعة ما بين ٢٣ - ٢٧ أكتوبر / تشرين الأول وذلك لعقد اجتماعها العام السادس والسبعين منذ تأسيسها في عام ١٩٣٩. وقد حضر الاجتماع ٣٤٥ شخصاً، بمن فيهم ممثلون عن ستة عشر بلداً عضواً وأربعة منظمات دولية وتسعة بلدان غير أعضاء.
- ٢ - من المتوقع أن يرتفع الإنتاج العالمي للقطن في موسم ٢٠١٧/٢٠١٨ بنسبة ١٠ ٪، وذلك بسبب الاتساع في مساحة الأراضي المزروعة، على حين يتوقع أن تبقى الغلال مستقرة على حالها. كما أن من المتوقع أن يتجاوز الإنتاج العالمي استهلاك معامل القطن في موسم ٢٠١٧/٢٠١٨ وأن يبقى المخزون النهائي من القطن دون تغيير تقريباً. كما تشير التوقعات إلى حدوث انخفاض في المخزون النهائي للصين في موسم ٢٠١٧/٢٠١٨ وإلى زيادة في المخزون النهائي خارج الصين خلال نفس الموسم ونفس الكمية تقريباً.
- ٣ - تراجع دعم الحكومات لقطاع القطن في موسم ٢٠١٦/٢٠١٧ بينما ارتفعت أسعار السوق مع تدني عدد برامج دعم الأسعار في عدد من البلدان. ويشير التقرير السنوي للجنة

Inaugural Session

10:00 hrs. Monday, October 23, 2017

In the Chair: Dr. Ibrokhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

The Inaugural Session of the 76th Plenary Meeting of the International Cotton Advisory Committee (ICAC), was held in the Expo Centre, Tashkent, Uzbekistan on Monday, 23 October 2017 at 10.00 a.m. The session was opened by the Chair, Professor Ibrokhim Abdurakhmonov,

The CHAIR invited Minister A Kamalov, Chair of the Organizing Committee, to present the welcoming speech on behalf of the government of Uzbekistan.

Welcome Speech

Minister Kamalov welcomed delegates to the 76th Plenary Meeting of the International Cotton Advisory Committee and to the XIII International Uzbek Cotton and Textile Fair. He reported that in Uzbekistan all efforts and resources were being concentrated on the modernization of production capacities and the introduction of effective methods based on advanced technologies to ensure the further improvement of the quality of products in line with market requirements. These key areas have been under the constant attention of the leadership of the country and the President of the Republic of Uzbekistan, Shavkat Miramonovich Mirziyoyev, who earlier this year adopted a "Strategy for Action" on five priority directions for the development of the Republic of Uzbekistan between 2017 – 2021". This would result in the implementation of major reforms in the political, socio-economic, judicial, and foreign policy areas of the country, including the adoption of measures to radically improve the cotton processing industry.

Today, Uzbekistan has strong potential for growth and is gradually moving towards building a diversified economy in order to become a scientific, technical, industrial, financial, transportation, and cultural center for the region.

Since independence, the structure of the economy has moved from being predominantly agrarian towards strengthening its industrial component. Before the start of the 1990s the total acreage under cotton in the country was 2.2 million hectares, but due to the gradual reform of agriculture and diversification of economic priorities, it has been reduced to 1.2 million hectares. These measures allowed a more than 2-fold increase in the area under cereals and fruit and ensured the food security of the country. In view of the further optimization of sown areas, aimed at reducing the area under cotton, it is very important to preserve the existing cotton production volumes necessary to supply the raw materials of the textile industry.

In recent years, the specialized scientific research institutions of Uzbekistan have made significant progress in the creation of new extra fine, high-yielding varieties of cotton that satisfy the quality requirements of the modern textile industry.

High quality Uzbek cotton will be ensured through a set of measures to improve soil reclamation, create modern irrigation infrastructure, improve the management level in farms, introduce a unified system of instrumental fiber quality testing and by supplying cotton ginning enterprises with new equipment. The mechanization of cotton harvesting is a priority objective for the Republic, so the volume of cotton harvested by machines is being accelerated.

A new approach to the modernization of the cotton industry was to create cotton – textile clusters in the Bukhara, Navoi and Syrdarya regions with a full cycle of cultivation of cotton and the production of competitive finished products with high added value.

Another important aspect of the development of the cotton industry in Uzbekistan is the increase in the domestic consumption of fiber. The volume of cotton being processed has been consistently increasing due to an increase in the number of textile enterprises each year.

In 1991 the proportion of processed cotton fiber in Uzbekistan was less than 7%. However, in 2017 this figure reached 70%, and during this period there was a significant, almost 30-fold increase, in the value of light industry products from \$33 million to \$1.3 billion. By 2020, Uzbekistan plans to install more than 150 new projects in light industry worth more than two billion dollars.

Welcoming Remarks by Pakistan, Host of the 75th Plenary Meeting

Mr. Hassan Iqbal, Secretary Ministry of Textile Industry, presented welcoming remarks on behalf of all delegates. He summarized proceedings at the 75th plenary meeting and thanked the organizing Committee of Uzbekistan for their hospitality and for hosting the 76th Plenary Meeting of the ICAC.

Report of the Chair of SEEP

Mr. Allan Williams, Chair of the Expert Panel on Social, Environmental and Economic Performance of Cotton production (SEEP), highlighted the objectives of SEEP and noted that many of the issues that prompted the formation of SEEP remain of concern – in particular social issues. However, he noted that much has changed since 2006, in particular the increased expectations from the supply chain to have access to specific sustainability metrics.

SEEP members were very much looking for-

ward to participating in the proposed strategic review of ICAC. SEEP will also be working on 3 specific areas over the coming 1-2 years. These areas were identified following a full-day meeting of SEEP held in Rome on Thursday, 19th October, during which members identified a range of potential activities, and then discussed and debated which ones were to be prioritized.

The 3 areas were as follows:

1. A focus on soil health across the range of cotton production regions. The rationale being that while SEEP has focused on 'above-ground' issues such as pesticide use and labor, there has not yet been a focus on 'below the ground issues'. SEEP considers this a critical area, as recent Life Cycle Assessments highlight that the most significant impacts associated with cotton production are nitrogen fertilizer use and water use. And soil health fundamentally influences these two aspects of cotton production - the ability of soils to capture, store and release nitrogen and water.

The anticipated outcome, to be developed over the next 12-18 months, is the sharing of site specific practices that may find utility in other regions.

The sorts of practices or issues to be covered within soil health could include: salinity, drought, infiltration, compaction, tillage, surface residues, organic amendments, cover crops, soil microbiome, soil carbon, nitrate leaching, and nitrous oxide emissions. SEEP's role would be to expand the existing knowledge base on soil health and organize it into grower-relevant practices and information. Once assembled, this document would serve as a resource for the cotton industry to improve its environmental footprint and resource use efficiency regarding the critical inputs of fertilizer and water.

SEEP sees the focus on soil health as the first priority and that in time additional areas such as water management and insect management could also have a similar knowledge base developed.

2. The second priority area is the continued testing and implementation of the guidance framework for measuring the sustainability of cotton farming systems. The guidance framework, produced by SEEP and published jointly by ICAC and FAO, identifies 68 indicators for assessing the sustainability of cotton farming. The relevance of each indicator will depend on the farming system and context - not every indicator is necessarily relevant to every production system. Since the guidance framework was published in 2015, a number of countries have been pilot testing the framework in a range of ways, including initiating discussions on sustainability in the cotton sector, and publishing sustainability performance metrics.

As advised at last year's plenary meeting, a stocktake of the experiences of these pilot testing activities was commissioned by the German Development Cooperation (GTZ), and is being undertaken by Mr. Jens Soth from Helvetas. The initial draft of this report was presented to SEEP at its meeting on Thursday, 19th October. While the report and the recommendations are yet to be finalized, Mr. Williams highlighted a few key points:

- Fourteen countries have now undertaken activities that have utilized the guidance framework, making for a rich range of experiences from which to learn.
- The draft report covers the experiences of the pilot tests in six countries in detail (Australia, Bolivia, Paraguay, Peru, US, Zambia) and integrates the key findings of another 5 countries (Benin, China, Cameroon, Senegal, Togo). Pilot tests in three more countries (Argentina, Colombia and Ecuador) are ongoing and it is hoped that these can be integrated into the final report
- It is clear that a 'user manual', based on the practical experiences of the pilot tests to date, would be an extremely useful document to support the implementation of the guidance framework.
- Similarly, case studies describing the benefits that have been gained from using the guidance framework would also be extremely useful. It is clear from the pilots that the framework provides an excellent starting point for identifying and prioritizing issues at both a national level, and a more direct field or project level.
- The development of tools, such as an app to allow data entry directly with an iPad would streamline the data collection process enormously.
- Implementation should ideally be kicked off by a stakeholder workshop that convenes a broad range of national cotton stakeholders.
- The actors implementing the guidance framework should conduct a thorough screening of databases and agricultural data monitoring schemes already existing in the country. SEEP is aiming to have the report finalized by the end of the year, so that it is available in early 2018.

3. The final priority area flows on from the work on the guidance framework. While the framework focuses on the identification and collection of appropriate indicators for measuring sustainability at the level of the user of the framework, there is as yet no formal approach as to how that information is reported at a level beyond the specific use case. Currently, there appears to be 2 main ways in which the sustainability of cotton farming is claimed or assessed. First, cotton is said to be sustainable if it has

been produced according to a standard, such as organic. Second, sustainability is assessed using a Life Cycle Assessment methodology. There are challenges to both these approaches. Therefore a priority for SEEP will be to look at developing alternative ways of reporting on the sustainability of cotton production, that better allows for the positives to be recognized.

The Expert Panel considers that this discussion will fit in very nicely to the broader strategic review of ICAC, as this issue of sustainability reporting raises a number of critical issues for the cotton industry: is there a need to better speak with one voice on how the sustainability of cotton farming is assessed and reported? Is there a role for SEEP to be a "clearing house" for studies on "sustainability in the cotton sector?"

Mr. Williams ended by thanking the members of SEEP for their participation and to Mr. Terry Townsend for the support and encouragement he had given the SEEP expert Panel, both when he was Executive Director and more recently as the Executive Director *ad interim*. The report of SEEP is a statement of the meeting.

Report of the Chair of the PSAP

Mr. Peter Wakefield, newly elected Chair of the PSAP, informed delegates that an ePhyto industry Advisory group (IAG) had been set up by the United Nations International Plant Protection Convention (IPPC) under the auspices of the Food and Agriculture Organization of the United Nations (FAO). The IAG will provide advice and guidance on the development and deployment of an electronic phytosanitary certification system. This will consist of a global hub and a generic national system to facilitate the international exchange of electronic phytosanitary information. There are ten members of the IAG, and ICAC has been chosen to represent the global cotton industry.

A number of countries including the United States, the Netherlands, Australia, New Zealand and the Republic of Korea are registered to participate in the pilot. It is likely that configuration activities will take time for some countries, while others may be able to configure operations in a very short time. It is not certain when exchanges of ePhyto certificates will commence, but it is expected that this will commence very soon for at least a few countries.

However, the ePhyto Steering Group (ESG) felt that it was important to see whether the trade facilitation aspects of the ePhyto exchange can also be documented during the pilot phase and if it would be possible to consider a couple of examples of trade transactions that demonstrate the efficiencies resulting from the pilot. Once all the countries are participating fully in the project, the next stage is to see whether it is possible to track shipments and see if the use of electronic certificates facilitates trade movement.

ICAC has informed the cotton trade of these

developments via the Committee for International Cooperation between Cotton Associations (CICCA) and has requested that their members assist the project by participating in surveys sent by the IAG. The 3rd IPPC Global Symposium on ePhyto, themed "ePhyto & Trade Facilitation" will take place in Kuala Lumpur, Malaysia on 22-26 January 2018.

Mr. Wakefield also reported that the Private Sector Advisory Panel (PSAP) had recommended broadening the terms of reference of the Secretariat's on-going studies of the polyester market to include environmental issues related to microfiber pollution, lifecycle assessment of cotton and polyester and manufacturing processes for polyester and their impacts on the environment. The PSAP recognizes that cotton must coexist with polyester, but at the same time it is essential to keep consumers fully aware of the facts behind competing fibers and their intrinsic properties. It also recommended that the burden of funding such studies be provided by more than one party. The report of the PSAP is a statement of the meeting.

Report of the Chair *ad interim* of the Standing Committee

Ms. Claudia Fontana Tobiassen, Chair *ad interim* of the Standing Committee, expressed her sincere appreciation to the Government of Uzbekistan for hosting the 76th Plenary Meeting of the ICAC and recalled when Switzerland had hosted the 71st Plenary Meeting.

Ms. Tobiassen reported on the resignations of the Chair of the Standing Committee, Ms. Reenat Sandhu of India, and the previous Executive Director, Mr. José Sette. She reported that the Standing Committee at its 549th Meeting unanimously endorsed the nominations of Ms. Tobiassen to serve as Chair of the Standing Committee from the end of this 76th Plenary Meeting to the end of the 77th Plenary Meeting. This is consistent with the Rules and Regulations and the traditions of ICAC. The Standing Committee also endorsed the nominations of Mr. Ali Tahir, Minister (Trade), Embassy of Pakistan to serve as First Vice Chair and Ms. Maha Zakaria, Economic and Commercial Office, Embassy of Egypt to serve as Second Vice Chair.

Ms. Tobiassen also reported on the recruitment of Mr. Kai Hughes as Executive Director to replace Mr. José Sette. She reported on his career and qualifications to date and that his former position was as the Managing Director of the International Cotton Association based in Liverpool, a position he had held for the last 9 years.

She thanked Mr. James Johnson of the United States and Mr. Rado Wang of Taiwan, who served as Chair and Vice Chair of the Task Force on Executive Director Search, as well as to all members of the Task Force who gave of their time to ensure a successful outcome.

Ms. Tobiassen reported that at its September 2017 meeting, the Standing Committee decided to engage in a Strategic Review of ICACs mission, goals and objectives, and that this process, which should entail engagement with all stakeholders, would begin following the 76th Plenary Meeting.

She noted that among the more gratifying of Standing Committee's activities during the past year were the welcoming of two new members, Bangladesh and the European Union (EU). The membership of Bangladesh is welcomed as it helps to broaden the coverage of the ICAC to include major importing/consuming countries. Likewise, the membership of the European Union is a strong and positive sign of the continuing relevance of the ICAC to the world cotton economy.

She ended by thanking Mr. Terry Townsend for standing in as Executive Director *ad interim* until the recruitment of Mr. Hughes was completed, and she conveyed her thanks to the Government and people of Côte d'Ivoire for their invitation to host the 77th plenary meeting in Abidjan in December 2018. The report of the Chair *ad interim* of the Standing Committee is a statement of the meeting.

ICAC Researcher of the Year

The Executive Director, Mr. Kai Hughes, announced that Dr. David Stelly was the winner of the ICAC Researcher of the Year Award for 2017. This award was set up in 2009 to recognize the world's most outstanding cotton researcher each year, and it is now considered to be the most prestigious of all awards in the world of cotton research.

Dr. Stelly is a world-renowned geneticist and a highly accomplished cotton breeder. He ranks amongst the world's best cotton scientists in the subjects of genomics, genome mapping and marker -assisted breeding. Dr. Stelly was presented with a shield, an honorarium of \$1000, and a certificate.

Report of the Executive Director

The Executive Director noted that the ICAC was

nearly 8 decades old and whilst the interests of governments must always remain at the core of the mission of the ICAC, after eight decades it may be time to evaluate the governance, the way activities of the Committee are funded and the services and functions the ICAC provides. He therefore welcomed that there would be a strategic review of the organization ensuring that the Committee would be fit for purpose in the 21st century.

He highlighted that one example of an area of potential growth in the role of ICAC was public communication on the impacts of cotton production and that the ICAC should serve as a central point of information on cotton sustainability issues. ICAC must improve its use of information technology and social media to reach more people more effectively, and must facilitate greater interaction within the whole global cotton community throughout the value chain. He advocated that the ICAC must serve as an effective counterweight to critics of cotton who use evocative language, exaggeration and repetition of allegations that are years out of date to demonize cotton. It needed to provide information at the highest level of scientific rigor but also to communicate such information in compelling formats using media that reached consumers.

Another area of potential growth of the role of the ICAC is in the spheres of production technology development and dissemination. The ICAC can encourage and facilitate both public and private technology development by advocating increased public research and development expenditures in order to strengthen intellectual property rights and to support research organizations directly.

He acknowledged the contributions to the work of the ICAC of the Private Sector Advisory Panel (PSAP), the Task Force on Commercial Standardization of Instrument Testing of Cotton (CSITC), the Expert Panel on Social, Environmental and Economic Performance of cotton production (SEEP) and the International Forum for Cotton promotion (IFCP). (The reports from

the chairs of the PSAP, SEEP and IFCP are statements of the meeting).

The Executive Director highlighted the importance of the CSITC round trials in ensuring the standardization of test results and urged all countries to ensure that testing centers serving their farmers merchants and textile industries were participating in the round trials.

Delegates were reminded that the International Forum for Cotton Promotion was a private sector organization composed of member associations from around the world, which had served well as a clearinghouse for proven techniques of cotton demand enhancement. The member associations of the IFCP were however in the process of re-evaluating their mission and work so as to have the greatest positive impact on world cotton demand. He thanked the chair, Mr. Mark Messura of the United States and the Vice Chair Ms. Elke Hortmeyer of the European Union for their leadership to date.

In conclusion, tribute was paid to the diligence and thoroughness of the organizing Committee in preparing for this plenary meeting in Uzbekistan. The Executive Director stressed that the ICAC serves a unique role within the world cotton industry, and that role could and should evolve and grow in response to current challenges to create a bigger more effective ICAC that brought value to the whole cotton and textile chain in conjunction with strategic partners in order to combine resources and efforts to achieve a greater good. The report of the Executive Director is a statement of the meeting.

Approval of the Agenda of the 76th Plenary Meeting

The Secretary General noted that agenda of the 76th plenary meeting had been approved by the Standing Committee and sent to Delegates in advance. He asked if there were comments or suggestions, and seeing none, found that the agenda was approved.

Observing that there was no further business, the CHAIR declared that the Inaugural Session was completed.

First Plenary Session

Statements

15:00 hrs. Monday, October 23, 2017

In the Chair: Dr. Ibrokhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

The CHAIR invited delegates to offer statements

The delegate of ARGENTINA reported that cotton production was 663,000 tons of seed cotton on 245,000 hectares of harvested land in 2016/17, and the national yield was 2.7 tons of seed cotton per hectare. He said that an increase

in cotton area was expected this season because of higher prices relative to competing crops and better weather compared with the previous season. He noted that Argentina was supporting the cotton sector through three major initiatives: a national program of boll weevil control, an initiative to establish HVI laboratories around the country to provide objective information on cotton quality to both producers and spinners, and 3) a program for the Improvement of Quality of Cotton Fiber (PROCALGODON)

which ensures traceability through RFID (radio frequency identification) technology from production to fabric. The delegate noted that pilot tests were initially carried out on bale-traceability using bar codes, but this system had proven cumbersome because labels must remain visible. RFID technology will enable easier bale-identification. He reported that most cotton in Argentina is consumed domestically, and production was sufficient to cover consumption in 2016/17. Eighty % of Argentine cotton is

not irrigated. Therefore, yields are low and more highly variable compared with other countries with more irrigation. Argentina's country report is a statement of the meeting.

The delegate of AUSTRALIA thanked the Government of Uzbekistan for hosting the plenary meeting. He noted that cotton production in Australia is driven by water availability and price levels, not government decisions. He emphasized that Australia has greatly improved water use efficiency and reduced pesticide use in the last decade, but that continued improvements were expected. The Delegate welcomed the new Executive Director and said that Australia would support the strategic review of the ICAC that would be conducted. Australia's country report is a statement of the meeting.

The delegate of BANGLADESH reported that textiles are the largest industrial sector in the country, with cotton products accounting for 75% of the total value of textile production. He said that the sector contributes 10% of GDP, and \$31.5 billion, or 77% of total export earnings. There are about 430 spinning mills, 790 weaving mills, 250 dyeing plants, 450 knitting companies, 4,882 Ready Made Garment (RMG) companies, and more than 300,000 handlooms in the country. These sectors absorb about 4 million workers. Annual production of woven cloth is 1 billion meters and knit fabric is 5.2 billion meters. The target for annual export earnings from the textile sector is \$50 billion by 2021. Bangladesh is the second largest cotton importer and the second largest RMG exporter in the world. Bangladesh's cotton imports will creep up to 1.54 million tons in 2017/18. The Cotton Development Board of Bangladesh has developed one upland cotton hybrid, 15 upland cotton varieties, three hill cotton varieties, and several cotton production technologies. Bangladesh's country report is a statement of the meeting.

The delegate of BRAZIL thanked the organizing committee and the Government of Uzbekistan for the hospitality and warm welcome received in the beautiful city of Tashkent. He noted that Brazil suffers criticism in the international press that agriculture has been invading natural forests and land. He reported that 20% of all agricultural land has been preserved as a legal requirement to grow crops or raise cattle, 13.5% represents government green belt programs, on which no building or agriculture is permitted, 13.8% is protected for the indigenous native population and villages, and 18% is undefined ownership with native vegetation. Therefore 66% of the total land area of Brazil of nearly 9 million square kilometers is not cultivated. Of the area that is used for agriculture, 9% represents crops and planted forests, 13.2% is grass planted for cattle, 8% is natural grass, and only 3.5% is covered with cities and infrastructure. The delegate said that Brazil welcomes Mr. Kai Hughes as the new Executive Director. Brazil's country report is a statement of the meeting.

The delegate of BURKINA FASO thanked the government and people of Uzbekistan, and the Organizing Committee for serving as a host of the 76th Plenary Meeting. The delegate explained that Burkina Faso is working to develop the entire cotton value chain. Major challenges include expanding use of organic fertilizer to offset the cost of imports, improving planting seed quality, and working to ensure the involvement of micro-industries in the value chain to increase standards of living. The delegate noted that cotton is a driver of economic growth in Burkina Faso. Burkina Faso's country report is a statement of the meeting.

The delegate of CÔTE D'IVOIRE noted that 100,000 households produce cotton in Côte d'Ivoire. The country is working to increase the use of mechanization. The structure of the cotton sector includes 15 gins and two spinning factories. Areas producing cotton have been divided into six zones, with each zone controlled by one ginner who distributes inputs and collects seed cotton. There is a need to rebuild the research infrastructure that was destroyed during the decade of civil disturbance. Côte d'Ivoire is also working to expand value addition, and new investment is welcomed. Côte d'Ivoire's country report is a statement of the meeting.

The delegate of EGYPT thanked the people and Government of Uzbekistan, and the people of Tashkent, for hosting the 76th Plenary Meeting. He noted that 5 million people work in cotton production, ginning and marketing in Egypt. Production in Egypt is rising this season because of higher prices relative to competing crops. Egypt has established a marketing organization to protect the brand name of Egyptian cotton. The country is also working to improve breeding and to encourage investment in spinning and weaving. Egypt's country report is a statement of the meeting.

The delegate of the EUROPEAN UNION thanked the people and Government of Uzbekistan for their hospitality. He said that the membership of the EU is a positive sign of the relevance of the ICAC to the world cotton industry. He noted that poverty eradication is the primary objective of EU development policy, which aims to create agricultural value chains which benefit the poor by creating decent jobs and value added. The delegate noted that cotton produced in the EU (Greece and Spain) is generally recognized as being of high quality and mostly produced with integrated management systems that minimize environmental impacts. He noted that the EU grants duty-free/quota-free access to cotton imports and provides no export subsidies (as defined by the WTO), and the EU can support any outcome on cotton in the WTO that reflects such reform elements. The delegate said that the EU looks to profile its work in support of sustainable cotton and textile value chains. The delegate said that the EU is a strong proponent of a rights-based approach in produc-

tion and trade, spanning from land and labor to the final product. In this context, the delegate commended the ambitious reforms going on in the host country, particularly the abolition of child labor in the cotton harvest. The EU also welcomed Uzbekistan's continued fruitful cooperation with the ILO on the issue of forced labor – the EU has been supporting this cooperation politically and financially. The delegate endorsed increased demand for cotton produced under identity programs, BCI and CmiA, and he said that under the EU Africa Partnership in Cotton, the EU would invest Euro 11 million in cotton-specific development projects. The delegate welcomed the new Executive Director of ICAC and pledged support for his ambitious efforts to steer the Secretariat to new heights. The EU's report is a statement of the meeting.

The delegate of INDIA observed that 45 million people in approximately 9 million households are engaged in cotton production, ginning and processing in India. He noted that production is rising and that the Government of India allows exports and imports of cotton without restriction or duty. He reported on Government efforts to enhance cotton production through the use of High Density Planting, the breeding and production of naturally colored cotton and the development of extra fine varieties. He reported that India has launched a second Technology Mission on Cotton (TMC) to improve production and quality, reduce contamination, and enhance efficiency in handling and processing. India's country report is a statement of the meeting.

The delegate of KENYA noted that cotton is one of the most important crops for long term development. It is among the cash crops that thrive in the fragile Arid and Semi-Arid Lands (ASAL) where few other economic opportunities exist. He reported that Kenya launched its Industrial Transformation Program in 2015 to promote local production, improve regional market access and take advantage of global niche markets. This program has prioritized the cotton, textile and apparel sub sectors, aiming to achieve \$1 billion in exports while creating an additional 150,000 jobs by 2019. Kenya's country report is a statement of the meeting.

The delegate of MALI reported that a major reform of the cotton sector is underway. He said that three strategic axes had been selected by the Ministry of Agriculture based on proposals from a national workshop. The new strategy will 1) create a national cotton company with regional directorates, 2) create an efficient industrial system of cotton processing through a strengthening of the ginning sector and the promotion of local consumption from textile and oil mills, and 3) strengthen cooperatives of cotton producers and ensure performance by CMDT of traditional responsibilities such as maintenance of rural roads, transportation of seed cotton and inputs, support for animal health, and facilitation of women's empowerment through improved market access.

The Council of Ministers of Mali has recommended further study of past market reforms to assess impacts and determine how best to move forward with the new reforms. Mali's country report is a statement of the meeting.

The delegate of MALI, who serves as the Chair of the African Cotton Association (ACA), also gave a statement on behalf of the ACA. He said that cotton production in Africa is expanding, but common challenges across the continent include improving yields and encouraging value addition. He said that African countries remain concerned about the impacts of subsidies provided to producers in developed countries. On behalf of the ACA, the delegate congratulated Mr. Hughes on his selection as Executive Director and said that Africans look forward to supporting Mr. Hughes in his efforts to ensure that the ICAC remains fit-for-purpose in the 21st Century. The delegate thanked the Government of Uzbekistan and the Organizing Committee for their excellent efforts in hosting the 76th Plenary Meeting.

The delegate of PAKISTAN thanked the Secretariat of ICAC and the Government and Organizing Committee of Uzbekistan for their efforts to organize and arrange the 76th Plenary Meeting. He noted that cotton and cotton textiles account for 60% of export earnings and involve 10 million people. The delegate detailed efforts in Pakistan to support cotton production through research, including advanced breeding programs to enhance quality and yields, impart drought and heat tolerance and develop insect and disease resistance. The Delegate observed that developing countries that produce cotton have different perspectives than some developed Members of ICAC that primarily consume cotton, especially on issues of sustainability and value addition. He noted that cotton is sustainable, renewable and biodegradable, and he called for increased promotion of cotton. He called attention to the negative impacts of subsidies provided to producers in developed countries. Pakistan's country report is a statement of the meeting.

The delegate of SUDAN thanked the Government of Uzbekistan and the Organizing Committee for their efforts to host the plenary meeting. He noted that cotton is a livelihood and way of life for 300,000 households in Sudan. He noted that cotton and cotton-based industries provide employment, reduce poverty and improve life expectancy. He reported on the history of cotton production in Sudan, and he noted that biotech cotton hybrids now account for 95% of cotton area. He reported on research trends focused on the development of new varieties of both upland and extra fine cotton. Integrated cultural practices and the use of biotechnology, in cooperation with Pakistan, are the main focus of the new research efforts. The Delegate noted that farmers in Sudan need increased access to finance, that ginneries need additional training, and that the country is working to expand

spinning activity. Sudan's country report is a statement of the meeting.

The delegate of TAIWAN thanked the Government of Uzbekistan for its hospitality. She noted that imports of cotton by Taiwan had declined in the most recent year because of uncertainty about prices and reductions in spindle capacity. Nevertheless, textiles remain a large component of the economy of Taiwan and constitute the fourth largest category of trade surplus. She emphasized that Taiwan is focused on enhancing value addition in the cotton value chain through innovative design and production technologies. Yarn and fabric producers in Taiwan are increasing exports of products produced from organic cotton and other eco-friendly products. She reported on the ICAC International Seminar 2017 conducted in Taipei in September that drew more than 200 participants from 13 ICAC member countries. The seminar focused on new business opportunities created by information technology and big data, and efforts to enhance performance textiles through fiber blends. The Delegate thanked the new Executive Director for his support of the Seminar, and she looked forward to hosting the next ICAC Seminar in Taipei in 2019. Taiwan's country report is a statement of the meeting.

The delegate of TURKEY thanked the Government of Uzbekistan for hosting the plenary meeting. He noted that cotton production in Turkey is expanding, and that all the use of biotechnology is prohibited. He noted that the textile industry of Turkey faces challenges and is in need of increased investment. Mill use of cotton in Turkey is relatively stable at 1.5 million tons, despite competition from polyester. He noted that one-sixth of export earnings are derived from textiles, most of which are cotton based. The Delegate welcomed Bangladesh and the EU as new members of the ICAC. Turkey's country report is a statement of the meeting.

The delegate of UGANDA noted that cotton is produced in cooperation between the government and private sector. She said that farmers need increased access to inputs, including mechanization. Production in Uganda is rising, and 10% is now used domestically. She said that Uganda participates in CSITC Round Trials to ensure accuracy and precision in the measurement of cotton quality using HVI. She noted thanked the Government of India for its cooperation with Uganda in the development of a bio pesticide laboratory that will lead to enhanced use of Integrated Pest Management and Integrated Crop Management techniques. She noted that 2 million people in Uganda are associated with cotton production. The Delegate thanked the Government of Uzbekistan and the Organizing Committee for hosting the plenary meeting. Uganda's country report is a statement of the meeting.

The delegate of the UNITED STATES extended his thanks to the Government of Uzbekistan for

hosting the plenary meeting. He welcomed Mr. Kai Hughes as the new Executive Director and pledged to support Mr. Hughes in his efforts to conduct a strategic review of the mission and objectives of the Committee. He noted that U.S. production is rising this season to the highest level in ten years because of higher prices relative to competing crops and good weather. He noted that the U.S. operates cotton research and promotion efforts paid for by farmers and government. United States' country report is a statement of the meeting.

The delegate of ZIMBABWE thanked the Government of Uzbekistan and the Secretariat of the ICAC for organizing the plenary meeting. She noted that support from the Government of Zimbabwe to provide inputs to growers was leading to increased cotton production. Nevertheless, challenges remain, including low yields, the need for increased training, and high input costs. The Delegate reported that Zimbabwe is working to revive cotton research and to increase value addition. Zimbabwe's country report is a statement of the meeting.

17:00 hrs. Monday, October 23, 2017
Dr. Abdurakhmanov in the Chair

The representative from the French Agricultural Research Centre for International Development (CIRAD), a French public international research organization, noted that its research focus was on developing the sustainable production of crops, particularly cotton, in tropical and sub-tropical regions. The delegate focused on four activities undertaken by CIRAD to improve the cotton chain sustainability. Firstly, CIRAD has been participating in the work of the CSITC since 2003 contributing to the quarterly inter-laboratory tests conducted with the USDA and Faserinstitute in Bremen. CIRAD helped to establish functional Technical Centers in Mali and Tanzania. Secondly, CIRAD, with funding from the EU carried out an evaluation of cotton research in Africa and proposed a revamping strategy to enhance it. Thirdly, CIRAD is working with its partners in sub-Saharan Africa to model cotton cultivation and to develop technical and varietal innovations adapted to global changes and crop sustainability. Fourthly, CIRAD is also continuing its mission of training researchers from developing countries. CIRAD's report is a statement of the meeting.

The representative of the International Cotton Researchers Association (ICRA) reported that the association was created in 2012 under the ICAC initiative with objectives to strengthen the networking among cotton researchers and to enhance the competitiveness of cotton through dissemination of cotton research findings. ICRA is an independent organization open to membership for researchers from the public and private sectors. In August 2016, ICRA upgraded its website (<http://www.icracotton.org>) to improve exchanges between the members. ICRA has set up the Young Scientist Innovation Medal to be

awarded in the framework of periodical meetings of regional networks of cotton researchers and first two medals have been already awarded. The ICRA Secretariat was officially set up on October 9, 2017 at the Pakistan Central Cotton Committee, in a country with a large community of cotton researchers. ICRA aims to contribute to technological progress in cotton production. ICRA's report is a statement of the meeting.

The representative the International Forum for Cotton Promotion (IFCP), an alliance of nine member organizations from eight countries who have joined together to promote cotton, indicated that the goal of IFCP is to promote an awareness and preference for cotton. It is the view of the IFCP that the competition that cotton faces in the world market is against synthetic fibers, not cotton-producing countries competing against each other. In this belief, the members of IFCP work together to rise above geography and promote the interests of world cotton. It is a fundamental belief of IFCP that countries and organizations can promote their specific interests in cotton, but at a global level, we all will benefit if cotton's competitive position improves relative to synthetic fibers such as polyester and nylon. The IFCP operates as a clearinghouse for sharing information and strategies for promoting cotton. There are great contributions in sharing with promotion programs in India and the United States in particular. In 2017, the IFCP organization is reforming its efforts and redirecting its small financial resources to create a stronger

communications program to both promote cotton and address the misinformation that Executive Director Kai Hughes referred to earlier today in his remarks. IFCP's report is a statement of the meeting.

The representative of the World Trade Organization (WTO) reported that the WTO Secretariat has established a strong, productive, and mutually beneficial collaboration with ICAC for more than a decade now. WTO Members also highly appreciate ICAC's regular presentations on cotton production and trade trends, as well as on topics of specific interest for the development of the cotton sector in developing countries. ICAC delivers these presentations at our bi-annual cotton meetings, which we informally call WTO Cotton Days. Our Cotton Days consist of the Director-General's Consultative Framework Mechanism on Cotton and the Dedicated Discussions on the trade-aspects of cotton in the areas of market access, domestic support and export competition. Our next cotton day will be held on 17 November this year, at WTO headquarters in Geneva. On the trade related aspects the WTO members have agreed that cotton will be treated ambitiously, expeditiously and specifically within the overall negotiations on Agriculture. On export competition, the 2015 Nairobi Decision mandates developed countries to eliminate cotton export subsidies immediately, while developing countries were required to do so no later than 1 January 2017. On market access, developed country Members

and developing country Members in a position to do so have committed to grant, to the extent provided for in their respective preferential trade arrangements, duty free and quota free market access for exports by LDCs of cotton and cotton-related agricultural products. WTO Members are now actively preparing for the 11th Ministerial Conference, which will be held on 10-13 December in Buenos Aires, Argentina. It should also be noted that while the main focus of the cotton negotiation is obviously on cotton domestic support, the current discussions also cover other components, including how to further the work on the development assistance aspects. He updated members on the WTO's work on cotton development assistance. He stated that the WTO Secretariat welcomes the opportunity to participate in this Plenary, and expresses the hope that the Final Statement to be adopted will retain ICAC's steadfast support for the multilateral trading system and its contribution to a healthy, growing global economy from which all sectors, including cotton, shall derive gain and benefit. WTO's report is a statement of the meeting.

The delegate of UZBEKISTAN proposed to organize a training program or seminars for young researchers during the Plenary Meetings of the ICAC. It would greatly benefit young researchers, advance knowledge matter and improve cooperation among the researchers. He suggested that ICAC should study this proposal, including the budget implications.

First Open Session

World Cotton Market Report

13:00 hrs. Monday, October 23, 2017

In the Chair: Dr. Ibrokhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

The CHAIR presented a welcome address and opening remarks and introduced Mr. Andrei Guitchounts, the ICAC Director of Trade Analysis. Mr. Guitchounts began his presentation by noting that there is a very strong historical correlation between prices during the current season and the planted area for the next season. Average prices represented by the Cotlook A index rose from an average of 70 cents per pound during 2015/16 to 83 cents per pound in 2016/17. As a result, planted area for 2017/18 increased to 32 million hectares. Most of the increase in area is projected for the Northern Hemisphere, which accounts for 90% of world area. The world average yield is projected to remain at 790 kg/ha during 2017/18. Mr. Guitchounts noted that world average yields have remained stagnant, indicating a lack of breakthrough technologies. World cotton production is estimated to rise by 2 million tons or 10% in 2017/18 and to reach

25.4 million tons entirely due to expanded planting area. India is since 2015/16 the largest cotton producer accounting for 24% of the world total production, followed by China (21%), U.S. (18%), Pakistan (8%) and Brazil (6%). Global cotton mill use is projected to increase during 2017/18 and reach 25.2 million tons. World Cotton trade is projected to remain stable at 8 million tons. The U.S. will remain the largest exporter with 3.1 million tons of shipments. As world production is projected to edge over mill use during 2017/18, world ending stocks could increase moderately and reach 18.7 million tons with stocks to use ratio remaining little changed at 75%. However, while ending stocks in China are projected to decline by 1.7 million tons during 2017/18, outside China stocks are projected to increase by 1.9 million tons.

Mr. Guitchounts highlighted that direct assistance to cotton was provided through direct support to production, border protection, crop insurance subsidies, minimum price support use and minimum support price mechanisms. These were estimated at US\$4.5 billion in 2016/17,

down 39% from the level of US\$7.2 billion in 2015/16 and -58% from the record of US\$10.7 billion in 2014/15. Mr. Guitchounts also noted that there is a strong negative correlation between subsidies and cotton prices; in years in which prices are high, subsidies tend to decline and in years when prices are low, subsidies tend to rise. The share of world cotton production receiving direct government assistance increased from an average of 55% between 1997/98 and 2007/08, to an estimated 83% in 2008/09. During 2009/10 through 2013/14, this share declined and averaged 48%. In 2014/15 the proportion of production receiving direct assistance increased to 76%. The share declined to 71% in 2015/16 and 70% in 2016/17. Mr. Guitchounts' presentation is a statement of the meeting.

Mr. Macdonald asked for further clarification as to why cotton prices were much higher in 2016/17 and whether this could be due to speculators. Mr. Guitchounts replied that the fundamentals could not explain the current level of prices and stated that the Secretariat will look closer in to this issue. The delegate

from Pakistan asked if cotton trade has any impact in the subsidies provided by governments. Mr. Guitchounts replied that as he noted in his presentation higher prices would result in less subsidies to the cotton industry.

The CHAIR introduced Mr. Ray Butler, Chairman and Managing Director of Cotton Outlook. Mr. Butler started his presentation by noting that the ICAC and Cotlook do an excellent job in providing statistical information to the world cotton sector. The information includes reports on cotton supply and use, trade, and prices. He pointed out that the main crucial work of Cotlook that might impact world cotton prices. Mr. Butler commented that in the 2014/15 and 2016/17, world cotton prices followed a relatively steady path. In 2016/17 cotton prices were much higher than the previous two seasons due to the relative tightness of supply from certain origins. Mr. Butler highlighted that the current season is giving signals of oversupply. However, the prospect of a strong expansion of import demand from China would give a more bullish phase in the evolution

of the world cotton market. Mr. Butler presented the world cotton area and yields over time and noted both area and yield increased in 2017. As a result, world cotton production is expected to rise to almost 26 million tons in 2017/18. He noted that a surplus supply is concentrated in the world less China, and this could have implications for price in the coming months. Mr. Butler closed his presentation by commenting that in future years, the implied import requirements from China to fill its domestic production deficit is around 3 million tons annually, which represents 2 million tons more than the current import level. Mr. Butler's presentation is a statement of the meeting.

The CHAIR introduced Dr. Rinat Amirovich Gulyaev, Director General, Cotton Research Centre in Uzbekistan. Dr. Gulyaev presented the priorities, prospects and competitive advantages of the cotton industry in Uzbekistan. In his presentation, Dr. Gulyaev noted that the cotton sector in Uzbekistan is ongoing several new changes including: adoption of modern agro-

technologies; modernization and reconstruction of ginner plants; adoption of machine picking; certification and labeling of machine picked cotton; pilot projects of International Finance Corporation (IFC), in the regions of Ferghana and Jizzakh; for the introduction of sustainable cotton production principles under the BCI program; and cotton fiber quality certification according to world standards and the use of HVI.

Dr. Gulyaev presented a detailed report on the cotton fiber quality characteristics of the varieties cultivated in the Republic of Uzbekistan in 2016/17. He mentioned that the country has 21 cotton terminals, 5 free warehouses, 98 ginning plants and capacity to storage more than 400 thousand tons. Dr. Gulyaev closed his presentation by highlighting the implementation of a new electronic trade platform, which will be available at the end of 2017. Dr. Gulyaev's presentation is a statement of the meeting.

The CHAIR thanked the panelists and adjourned the session at 14:30 hrs.

Second Open Session

Exploiting Genetic Diversity, Genepools and Cotton Genomics: Where Are We and What to Expect?

9:00 hrs. Tuesday, October 24, 2017

In the Chair: Dr. Ibrokhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

Dr. Ibrokhim Abdurakhmonov presented his work on Ribo-Nucleic-Acid interference (RNAi) technology for the spectacular simultaneous improvement of fiber quality, early flowering, early maturity and high yields. Cotton plants exposed to a specific ratio of red light and far-red light were found to produce longer roots and longer fibre, thereby prompting the need to examine the cotton photoreceptor called phytochrome A1 (PHYA1). Studies showed that cotton PHYA gene was linked genetically with photoperiodic flowering. When RNA interference (RNAi) was deployed to suppress the PHYA1 gene, the phenotypic effects resulted in suppression of the photoreceptor, which in turn resulted in cell elongation in roots and the fibers. The fibre quality associated PHYA1 gene fragment was used to create a specific RNAi construct to transform the regenerable Coker-312 variety. Somatic regenerated PHYA1-RNAi cotton plants showed a suppression of up to ~70% PHYA1 transcripts, associated with a compensatory ~20-fold overexpression of other phytochromes. A total number of 142 genes were differentially expressed in the 10-DPA (days post anthesis) fiber of the RNAi line. Square tissue transcriptome revealed that out of 190 total differentially expressed genes, 118 were up-regulated and

72 were down-regulated. Phytochrome A and Gigantea genes were most affected and key epigenomic alterations were observed under the background of PHYA1-RNAi thereby highlighting the advantage of the phytochrome-RNAi based regulatory plant development, over the existing methods or the emerging new generation genome editing tools such as CRISPR/CAS9. In 2015, The RNAi based newly developed Porloq varieties were cultivated in 60,000 hectare across Uzbekistan. The PHYA1-RNAi varieties Porloq-2, Porloq-3 and Porloq-4 exhibited vigorous root, early-flowering with significantly superior fiber traits. The new varieties showed 5-15 days early maturity, 30% increase in seed mass, 20% increase in raw seed cotton yield, 30% increase in lint, superior quality fiber (type 1-2 fiber), longer root system, increased photosynthesis, better adaptation to environmental stress and better seed-oil quality. The eleventh generation RNAi cultivars were grown in 2017. The technology was patented, transferred and validated in the US and is being currently considered by several commercial companies for acquisition and commercialization. Dr. Abdurakhmonov's presentation is a statement of the meeting.

Dr. David Stelly described the fundamentals of genomics, the current challenges and the strategies being deployed for genetic enhancement. 'Epigenetics' is a heritable alteration wherein patterns of gene expression are regulated due to alterations in DNA accessibility and chromatin structure because of DNA methylation and his-

tone modification. Studies showed that allotetraploid cotton was formed approximately 1–1.5 million years ago by interspecific hybridization between the A and D genomes of two different diploid species. Divergence of A-genome and D-genome species from a common ancestor is estimated to have occurred about 5-10 million years ago. Dr. Stelly described the concept of molecular clock to interpret the extent of genetic differences in germplasm lines with reference to the evolutionary distance between them based on mutation rates in DNA over the evolutionary period. Gene sequences are not entirely stable, and mutations will occur (changes, gains, losses of bases) and can accumulate in a gene's lineage. In general, mutations accrue in a time-related manner and alleles separated for longer periods of time tend to be more different. Thus the time-period of evolutionary separation can be estimated from sequence information. Germplasm resources provide us with stockpiles of accumulated mutations. Cotton lacks genetic diversity because of high paleoploidy, monophyletic origin of the AD genome, genetic restriction through breeding, speciation and domestication. Low diversity leads to low genetic gains, instability and genetic vulnerability to biotic and abiotic stresses. Therefore, increasing genetic diversity that would be available for breeding and the creation of tools and knowledge for effective germplasm usage would be the two major objectives for crop improvement. The main challenges for 21st Century Cottons are the need to

enhance profitability, fiber quality, combat biotic and abiotic challenges, minimizing chemical pollution, conserving natural resources, reducing labor drudgery and working for future markets. Dr. Stelly informed that in a major scientific advancement, Chromosome Substitution (CS) lines were created by cytogenetic methods from *G. barbadense* (CS-B). Given the overall estimated number of genes (30-60,000), each chromosome

could possess about 500-4000 genes. Using molecular markers for genotyping has emerged as a core area in plant breeding. The main technologies to genotype cotton are SSRs (simple sequence repeats) and SNPs (single nucleotide polymorphisms). In 2015, the Cotton SNP63K chip containing around 45,000 intra-specific SNPs and about 1000 inter-specific SNPs was

developed enabling high quality, high-density SNP genotyping of upland cottons that are pure *G. hirsutum* (intraspecific) or contain germplasm from other tetraploid species (interspecific). In the discussions that followed, Dr. Stelly clarified that the best way to combat misinformation on GM technologies would be to communicate the science logically. Dr. Stelly's presentation is a statement of the meeting.

Third Open Session

Trends in the Textile Industry and Inter-Fiber Competition

11:00 hrs. Tuesday, October 24, 2017

In the Chair: Dr. Ibromkhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

The CHAIR introduced Ms. Lorena Ruiz, Economist of the ICAC. Ms. Ruiz reported that world textile demand increased from 15 million tons to over 90 million tons between 1960 and 2016, with non-cellulosic fibers increasing from 700 thousand tons to near 60 million tons, while cotton consumption increased from 10.4 million tons to 24.3 million tons. Based on current projections, world textile fiber consumption is forecast to reach 116 million tons in 2025, which will result in a per capita fiber use of 14 kilograms, which is almost three times greater than in 1960. World chemical fiber consumption per capita is currently 2.7 times greater than the corresponding level of cotton consumption. By 2025, world cotton consumption per capita is projected to decline to 3.2 kilograms, while world per capita consumption of chemical fibers is expected to continue to increase and reach a new record level of 11 kilograms. As a result of a faster expansion of non-cotton fibers, the market share of cotton in world fiber consumption is forecast to decline further to 25% in 2020 and 23% in 2025. World textile fiber consumption has been driven by three major variables: POPULATION, GDP AND FIBER-PRICES. The cotton industry should continue to promote the use of cotton in order to reduce the drop in cotton consumption. We need to make consumers aware of the advantages of cotton in all markets, but especially in the emerging markets of Asia and Africa, where the majority of population-growth in coming decades will occur. Production of filament fibers surpassed staple fibers in 1994, and it has continued to grow at a much faster pace since then. Cotton promotion and research must continue in order to change consumers' preferences and to improve the technical performance of cotton vis-à-vis polyester. High cotton prices have a negative impact in cotton consumption. New technologies that allow growers to produce more with less are needed. It is important to note that new concerns regarding plastic and microplastic pollution could have a positive impact on the demand for cotton, but more research on the

topic should be done. Ms. Ruiz's presentation is a statement of the meeting.

The delegate of PAKISTAN noted that production and use of chemical fibers growth very fast and asked how to arrest this trend.

Ms. Ruiz replied that there is a lot of information on microfiber pollution and its negative effects on human health and more research is being done on the subject. These data and research should be brought to inform consumers. New technologies should be developed to reduce the cost of cotton production. Blending cotton with polyester in new products with new properties should also benefit cotton consumption.

The delegate of BRAZIL suggested that data on polyester use includes new applications where polyester did not replace cotton. It would be correct to compare consumption of polyester and cotton in applications where these fibers are interchangeable.

Ms. Ruiz replied that this comment is correct and the Secretariat will work on this recommendation.

The delegate of TAIWAN suggested that one of the ways to deal with competition from polyester is to cooperate with this fiber encouraging innovation, developing new blended materials with new innovative properties utilizing new technologies. Taiwanese textile industry has embraced innovation as a way to be more competitive.

The delegate of INDIA asked about the comparison of the rate of degradation of chemical fibers versus cotton in view of sustainability and an environmental impact, which are of a concern to many consumers in many countries.

Ms. Ruiz replied that there is currently an ongoing project (started in January 2017) funded by the Cotton Research and Development Corporation (CRDC) and Cotton Incorporated (CI), studying the rate of degradation of cotton and chemical fibers. As soon as the results are available public should be widely informed about it.

The delegate of SUDAN suggested analyzing consumption and competition by based on varieties of cotton.

The delegate of MALI noted that cotton and polyester have different characteristics and applications and asked three questions. Why filament polyester demonstrates much higher rates of growth compared to staple. He asked to compare prices for cotton and polyester and asked if the decline of oil prices translates into lower polyester prices.

Ms. Ruiz answered that lower prices for filament explain faster growth in use compared with staple. Current polyester prices in China are 40 to 50 cents per pound lower than cotton prices. According to the ICAC research, oil prices affect polyester prices with a lag of several months.

The delegate of TAIWAN noted that there are new technologies for blends of synthetic fibers with cotton for new innovative materials and suggested to discuss not just competition, but cooperation of cotton with synthetic fibers at the next year plenary meeting.

The CHAIR introduced Mr. Bob Antoshak, Managing Director of Olah Inc., USA. Mr. Antoshak reported that aging population leads to reduce demand for clothing, and disposable demand shifts to electronics and gadgets. As a result prices for clothing remain stalled and with a price disadvantage, cotton continues to lose market share. There is a lot of confusing messages about cotton and all the initiatives, including misinformation about cotton addressed at consumers. ICAC can help and is well positioned to provide objective, respected and high quality scientific information about cotton and research to the audience beyond the agricultural community. To do that ICAC should initiate new communication initiatives, such as active use of social media, video, new updated website, allowing advertising and media partnerships. He suggested that a precise definition of sustainability in production is needed and ICAC could play a definitive role in it by creating a global sustainability index. He proposed to establish a global public-private sustainability and innovation fund to support farmers. ICAC could provide consulting services to support the fund. Mr. Antoshak suggested that ICAC should solicit partnerships with NGO's, trade associations and trade shows, and raise private capital for special projects. Mr. Antoshak's presentation is a state-

ment of the meeting.

The delegate of PAKISTAN noted that the ICAC Task Force on Cotton Identity Programs indicated that there is a lot of confusion among consumers caused by different cotton initiatives, such as BCI, Cotton Made in Africa and others. He suggested that there is a need for additional studies on consumer preferences to in relation to those initiatives. He suggested that China should be invited to participate in our discussions on issues of competition of cotton with chemical fibers.

The delegate of AUSTRALIA pointed to the influence on consumer choices by some NGO's such as Greenpeace and others who discuss the issues of pesticide use and GMO products and what can be done to provide accurate information based on facts.

Mr. Antoshak suggested that ICAC could play an important role in collecting and distributing

science based objective information on cotton production, addressing inaccurate data originated sometimes from some NGO's.

The delegate of MALI said that there is a lot of confusing information about different cotton initiatives that sometimes could negatively affect African cotton. He suggested that better information should be provided on those initiatives and the African cotton.

The CHAIR introduced Mr. Shahrukh Rakhimov of Uzbekengilsanoat JSC. Mr Rakhimov reported that as of now the Uzbekengilsanoat includes 460 textile enterprises that produce 590,000 tons of cotton yarn and are exporting US\$ 1.3 billion of textile products in 2017 to 50 countries, with the largest markets in Russia and China. It is projected that by 2020, exports would grow to US\$3 billion with more than 38,000 new jobs created in the industry. Domestic production of

cotton yarn could grow to 900,000 tons in 2020. He described ongoing and planned projects including creating up to 10 cotton-textile clusters in different regions in Uzbekistan. The textile industry in Uzbekistan is also benefiting from an improved access to the European Union market. The textile industry in Uzbekistan is projected to attract substantial investments and to grow rapidly during the next three years.

Ms. Galina Fisher of Cotton Outlook asked in which regions cotton-textile clusters will be developed.

Mr. Rakhimov indicated that currently those clusters are functional in Navoi, Bukhara and Syrdarya regions, but additional investments are coming into Andijan, Karakalpakstan and Surkhandarya regions. Four more regions are also in works for the near future. Mr. Rakhimov's presentation is a statement of the meeting.

Fourth Open Session

Textile Innovations: Nanotechnologies for Current and Future Fabrics

14:00 hrs. Tuesday, October 24, 2017

In the Chair: Ms. Dilbar Mulehamedova, Head of Department, Ministry of Textiles, Uzbekistan

The CHAIR welcomed delegates and introduced Dr. Iroda Nabieva, Doctor of Technical Science and Professor of the Tashkent Institute of Textile and Light Industry in Uzbekistan. Dr. Nabieva, began her presentation by noting that the main pillars of the institute of textile are: improvement in the quality of consumer goods, ensuring competitiveness and producing in accordance with world standards. She presented the new technologies for the dyeing and finishing of textile materials, based on cotton fiber. Dr. Nabieva noted that the Institute also focuses on the creation of new assortments of textile materials based on cotton fiber with preservation of its mechanical properties. The applications of such

blended textile materials are: knitted fabric from cotton and nitron - 25/75, cloth based on cotton and nitron - 33/67, fabric cotton-silk - 85/15 and knitted fabric of natural silk and nitron - 25/75. She stated that the use of new technologies as well as the integration of R&D is urgently needed to tackle the current challenges faced by the dyeing process. Dr. Nabieva's presentation is a statement of the meeting.

The CHAIR introduced Dr. Ta Dolphin Yu, Director, Department of Processing Technology, Taiwan. Dr. Yu, began his presentation by highlighting the relevance of Taiwan's textile industry. The sector employees 120 thousand people approximately. Taiwan's functional fabrics include a large range of products, such as, anti-bacterial, anti-static, anti-fungus, breathable and waterproof, flame resistant, moisture absorbing, among others. Taiwan currently

has one million spindles that process staple fibers. Several processing methods are used to give the appearance and function of the yarn. Taiwan's spinning mills use both ring spinning and open-end spinning process. The country is a net importer of natural fibers: bamboo, wool, flax, and silk. These fibers are blended with cotton to produce various type of yarns to produce different functionalities such as warm-feeling or dry-feeling. Dr. Yu closed his presentation by noting that the industry is currently focusing on the R&D of polyurethane film and e-PTFE membranes, which are the main materials used in the production of breathable and waterproof textiles. Dr. Yu's presentation is a statement of the meeting.

The CHAIR thanked the panelists and adjourned the session at 15:00 hrs.

Fifth Open Session - World Café

Promotion of Cotton

16:00 hrs. Tuesday, October 24, 2017

Moderator: Mr. Mark Messura, Executive Vice President, Cotton Incorporated, USA

The *World Café* session was held on October 24, 2017 as the Fifth Open Session. The session was organized and facilitated by the International Forum for Cotton Promotion (IFCP). More than 90 plenary attendees participated in the session. Participants divided into working groups and reviewed global market research data provided by Cotton Council International and Cotton

Incorporated. The data covered purchasing behavior and consumers' attitudes toward sustainable fibers in different countries. Participants were asked to examine the market data and discuss the data relative to their own domestic or regional markets. Participants reported their assessment of the challenges and obstacles to increasing demand for cotton apparel and their suggestions for ways to achieve that in different consumer markets.

Among the key insights from the session were

the importance of proper fiber identification and the relatively high retail price of cotton apparel as obstacles to increasing demand, particularly in developing countries. Fiber identification is often lacking in apparel products and creates difficulties for consumers in finding cotton apparel. Additionally, it was noted that in many developing countries, 100% cotton apparel can be significantly higher in price relative to blends or synthetic products.

Strategies for increasing the demand for cotton

apparel centered on the need for additional promotion efforts including promoting the benefits of cotton apparel, developing product logos or identification that would assist consumers in identifying cotton content.

The IFCP indicated that the *World Café* yielded

several good ideas and follow-up opportunities for the IFCP to share cotton promotion information. It was noted that the need for additional promotion efforts and sharing information about the benefits of cotton was consistent with the communications direction noted by Kai Hughes

in his opening address at the Plenary. Fiber identification in products was identified as a topic that could warrant additional investigation by the ICAC as it concerns governmental laws for product labeling.

Sixth Open Session - Technical Seminar

Opportunities and Challenges for Technology Transfer in Cotton

9:00 hrs. Wednesday, October 25, 2017

In the Chair: Dr. Rinat A. Gulyaev, Director General, Research Centre, Uzbekistan

Prof. Sebastiao Barbosa described the 'technology transfer' approaches made by his team in Africa that enabled Brazil to disseminate cotton technologies in the C-4 countries, Mali, Benin, Chad and Burkina Faso. He outlined several similarities between Brazil and Africa to suggest a common ground for Brazilian technological applicability in Africa. Brazil decided to reciprocate the help rendered by C-4 in the WTO case on subsidies. In the initial surveys conducted by the government of Brazil, it became clear that the C-4 countries were characterized by low yields, low organic matter, conflict between cotton growers and cattle owners, soil degradation, soil erosion, acidic soils, weeds and lack of soil cover. A project was formalized to develop strategies for sustainable cotton production by addressing the core issues of soils, pest management and varietal improvement. The project was spearheaded by ABC-MRE and EMBRAPA in collaboration with the National institutes in the C-4 countries. The basic philosophy of the project was that no recipe would be taken from outside, and all strategies would be locally developed. Farmer participatory approaches were followed by fostering the concept that a community that learns together excels together. Facilities and equipment for entomology, biotechnology and soil science were upgraded at one strategic location. Training manuals were prepared for researchers, extension workers and farmers. The first field demonstration was conducted in 2009. Simple tools such as bicycle-mounted sprayer and small-scale equipment for farm operations were introduced. Trainings were imparted in Brazil on genetic improvement, nutrition management, no-tillage, cover crops and pest management. Study tours were conducted in plant breeding plots of Brazil. Germplasm lines were provided freely for the C-4 countries. Pits were dug for root assessment to show root structures of cotton and cover crops in degraded and good soils under no-till and minimum tillage. In the project areas, fields were covered with crop residues to prevent soil erosion and degradation. The project was highly successful and farmer became extension agents for change. Though the project closed in 2014, other countries such as Togo also expressed

interest to learn from the project and participate in similar projects.

In the discussions that followed, Dr. Barbosa explained that the technologies worked so well because rainfed technologies that were developed over 20 years in Brazil were taken to Africa with emphasis on addressing main issues such as soil erosion, using local resources in Africa. In response to questions, he said that local Governments are up-scaling the strategies and Brazil is following it up with technical support. It would be worthwhile to work together with global agencies such as the FAO to strengthen the initiatives. Dr. Barbosa highlighted the continuing efforts in Brazil to develop new technologies such as short season cottons and small-scale machineries specifically for Africa. Dr. Barbosa's presentation is a statement of the meeting.

Dr. Michel Fok defined three categories of Embedded technologies and the availability of opportunities to transfer them using latest tools of information and communication technologies (ICT), devices and approaches in conjunction with the conventional devices such as radio and training methods. In Togo 72.4% men and 4.8% women had mobile phones. In Benin and Burkina Faso, 96.7 to 100% men and 35.1 to 35.7% women had mobile phones. However, illiteracy could be a major constraint. Technology transfer is not the only benefit of ICT; access to market prices through ICT could have a big positive impact on the lives of farmers. However, information provided through ICT must be close to being accurate. It is also important to be able to distinguish between authentic and fake advisories which may be provided by unscrupulous elements with vested interest. ICT and mobile apps can make complex information easy through graphs and images. Other constraints are that many farmers have only basic cell phones and not smartphones; access to internet is marginal and graphical GIS representations are difficult to comprehend by farmers without proper training and assistance. In Africa, farmers can seldom indicate yields and benefits per unit area because they do not have any precise idea of the sizes of the plots. Records on input use, marketing, yields etc., are not maintained and therefore new farmers do not have any background data. Innovation is required to keep record of production inputs and

outputs. Some phones have GPS based Apps that can calculate area. ICT provides platforms for data collection and monitoring. But, the process requires competent personnel for processing and interpreting data. Expected gain from technology transfer must be documented at farmers' level. Conducive environment such as electricity in rural areas is needed for effective use of ICT. Radio broadcasting is still highly effective in rural areas in reaching out to a larger audience and can be combined with ICT for efficient transfer of technologies. Actual adoption of technology is not only influenced by information, but also by actual and timely access to basic inputs such as seeds, fertilizers and insecticides. Lack of institutional credit facilities forces farmers to borrow from private money lenders who offer loans at exorbitant interest rates, which leads to financial losses and disinterest in technological adoption. Political will and sectoral organization remain key factors for the adoption of technologies.

In the discussion session Dr. Fok informed that Togo suffered the most because women do most of the work but had least (4.8%) access to mobile phones, whereas in Benin and Burkina Faso women have fairly good access to mobile phones so as to keep contact with family. The delegate from Burkina Faso added that mobile phones and ICT have radically transformed life style and market access in the country. When asked to list a crucial advice to the African countries, Dr. Fok replied that timeliness would be most crucial for information delivery. He said that both old and new mobile technologies could be used in ICT based on the literacy and capabilities to use the devices. The delegate from India listed out the digital initiatives launched in India for technology transfer, market access and trade. Dr. Fok's presentation is a statement of the meeting.

Mr. Alan McClay started his talk with an emphasis on the need for accurate data and reliable information on University initiatives and National Initiatives, which could be provided by the ICAC. Mr. McClay spoke on scaling a sustainable approach through Better Cotton Initiative (BCI) which he defined as a holistic approach to sustainable cotton farming which covers all three pillars of sustainability: environmental, social and economic. The mission of BCI was to make global cotton production better for the people who produce it, better for the envi-

ronment it grows in, and better for the sector's future. BCI aims to transform cotton production worldwide by developing Better Cotton as a sustainable mainstream commodity. In 2015-16, about 1.6 million farmers produced 12% of the global cotton production in 23 countries on 5 continents. In eight major countries, the efforts resulted in a yield enhancement of 9-26%; profit increased by 12-65% and pesticide usage was reduced by 0-73%. The Better Cotton principles and criteria provide a global definition of Better Cotton through 6 key principles that are water, soil health, crop protection, biodiversity, fiber quality and decent work. BCI retailers and brand members play an important role in generating demand for Better Cotton, making sure the cotton that is grown in accordance to the better cotton standard system is actually bought and sold as Better Cotton. In 2016, 56 of the world's largest and most well known brands sourced 461,000 metric tones of Better Cotton. This year, they aim to source 1,000,000 metric tones of Better Cotton. The Better Cotton standard is seen as fully embedded into a country when there is an organisation or institution with a national mandate that is accountable for the implementation and credibility of the Standard (or a recognised equivalent). Therefore, BCI works with farmers, National institutions, civil societies, suppliers, manufacturers, retailers and brands.

In reply to a question as to why 'cotton share' continues to decline despite increase in the share of sustainable cotton or better cotton, Mr. McClay replied that affordable watertight traceability technologies are needed for cotton to gain its rightful place. Mr. McClay's presentation is a statement of the meeting.

Mrs. Jolly Sabune recounted her experiences in transfer of technology in Uganda through Cotton Support Programs (CSP) organized by the Cotton Development Organization (CDO) and Uganda Ginners and Cotton Exporters' Association (UGCEA) in Uganda. Cotton sector was restructured following economic reforms in 1987. Subsequently, cotton marketing, processing and export functions were liberalized in 1994. Technologies such as new cotton varieties, production practices and plant protection techniques that are developed by the National Agricultural Research Organisation (NARO), Agricultural Research Programs under Universities, Private Sector (ginners) and farmers were disseminated through demonstration plots, technical bulletins, radio messages; farmer to farmer transfer of knowledge; farmer field schools; field days and technology exhibitions. Sustained efforts resulted in doubling the yields; effective and efficient pest management; balanced use of production inputs and sustaining soil fertility levels and reduction in seed rates by 55% during planting through delinting cottonseed; reduction in production cost and improvement in fiber quality. The total number of bales classed in the top 3 grades increased from 59% in 2014/15 to 86% in 2016/17. Domestic consumption of lint

has increased from about 5% in 2015/16 to 7% in 2016/17. Sustainable use of land is being done in rotation with annual food and cash crops. Progress in the cotton sector can be attributed to an enabling environment in terms of policies, laws, statutes and regulations along the cotton value chain and participation of important stakeholders in technology transfer. International programs such as the India/Africa Cotton Technical Assistance Program (Cotton-TAP); supporting Indian Trade and Investment in Africa (SITA) and organization of Islamic Countries (OIC) etc., helped the technology transfer programs. Farmers face several challenges such as IPR fees, technology phobia, pest and disease outbreaks, climate change and unsuitability of some technologies. The CDO emphasized on low cost/affordable but effective technologies; scaling-up of bio-pesticides formulations; computer modeling; breeding short duration and drought tolerant varieties and establishment of cotton irrigation facilities. The various Stakeholders along the Uganda cotton value chain appreciate the importance of technology transfer in cotton. Validated and approved technologies, when adopted by farmers, influence the cotton yield and quality. CDO will therefore continue to strengthen the already effective model of "Public – Private Sector Platform" for effective and sustainable technology transfer. It is further envisaged to take on use of ICT based pest surveillance techniques to be provided under the second phase of the India-Africa Cotton TAP.

In response to a question as to what Uganda does to protect cotton from higher prices of competitive crops, Mrs. Sabune said that cotton marketing had never been a problem due to liberalization policy. She added that prevailing markets influence farmer choices. Government does not interfere. Optimization of production practices lead to the reduction in cost of production. When asked as to who paid the pesticide spray teams and how climate change affected cotton in Uganda, Mrs. Sabune replied that spray teams were trained by CDO but sprayers are managed by farmer cooperative groups who pay wages. Over the past five years at least, Uganda had seen more drought and untimely rains, which affected cotton and reflected the influence of climate change. Mrs. Sabune's presentation is a statement of the meeting.

Mr. Dhiren Sheth spoke on the India Perspectives of technology transfer. India has the largest cotton acreage at 12.0 million hectares. India is the largest producer, 2nd largest consumer and 2nd largest exporter of cotton in the world. About 40-50 million people are engaged in cotton cultivation, trade and processing. Yields are low because of small holdings; lack of technical know-how; vulnerability to biotic and abiotic stresses and poor irrigation facilities. The Cotton And Allied Products Research Foundation (COTAAP) is a trust set up in 1987 by the Cotton Association of India. It has one of the primary objectives to improve the productivity of farmers

through effective transfer of latest technologies. The research foundation follows standard principles of extension and bears the costs of critical inputs in marginal farms. In 1992-95 COTAAP received a donation of 25 million yen (US\$ 220,000) from the Japanese firm Nichimen Corporation which formed the corpus fund. Several other voluntary organizations support the foundation. Since its inception, COTAAP has run projects successfully in major cotton growing regions of India through Front Line Demonstrations (FLD), farm mechanization assistance, packages to improve yield, packages to improve quality, eco-friendly initiatives, farmer education and training and Farmer engagement and networking. COTAAP has demonstrated different farm-level technology ideas in 14,250 fields during 2005-16 across 100 villages in Chopda Taluka and made a significant impact on thousands of farmers in adjoining talukas. High Density Plantation System (HDPS) was implemented in Chopda region where it rapidly spread to 85% of the area. Cost of cultivation was reduced by about 15% and yield increased by 30% in fields of participating farmers. In 2016-17, along with HDPS, Pink bollworm awareness, management and bamboo staking demonstrations were conducted. Free SMS service giving vital updates on market rates, weather forecast, pest and disease alerts with recommendations is provided daily. COTAAP facilitates trainings in which farmers have access not only to Indian experts but also with technology experts from abroad. Farm mechanization for small-scale farming reduced farmers' drudgery while reducing the cost of production. COTAAP has established farm implement facility centres at nominal rent. More than 13000 farmers have received agricultural inputs amounting to almost US\$ 600,000. It was observed that for each Rupee that a farmer invested in new technology, he fetched a return of Rs. 3.02. COTAAP promotes the use of bio-fertilizers, bio-pesticides and other eco-friendly practices which reduce cost of insecticides and pesticides used thereby leading to more sustainable agriculture in this region with 80% increase in micro-nutrients and 60% increase in bio-pesticide usage. COTAAP plans to upscale its sustainable cotton initiative on a large scale.

Responding to a query, Mr. Dhiren Sheth said that high density planting systems (HDPS) and bamboo staking resulted in a 15-20% yield enhancement, but up-scaling was needed to confirm the findings. He said that women farmers do participate in the project albeit to a lesser extent. Specific nutrient demand in HDPS has yet to be worked out. Mr. Sheth's presentation is a statement of the meeting.

The distinguished delegates from USA and BRAZIL suggested that ICAC should be technically involved in the technology transfer projects that are being conducted in a scattered manner across the world.

Seventh Open Session

Impacts on Quality and Volume of Long-Term Storage of Cotton Products

13:45 hrs. Wednesday, October 25, 2017

In the Chair: Dr. Rinat A. Gulyaev, Director General, Research Centre, Uzbekistan

The CHAIR introduced Mr. James Johnson, Senior Cotton Analyst at the Foreign Agricultural Service in USDA. Mr. Johnson began his presentation by providing a perspective of long-term storage in cotton products. He explained that long-term storage was generally adopted by governments and states entities. He noted that there are two types of storage: strategic reserves, which are held to manage price volatility and can be for the benefit of both producers and spinners; and those that are the consequence of other policy objectives. He also stressed out that long-term stocks were not relevant on the balance sheet of a country, but it definitely has a direct impact on the market. The strategic reserves can influence the market by stabilizing it or by reducing price volatility. However, the lack of transparency can result in even higher price volatility as the market trades on rumors and market speculation.

Mr. Johnson then presented a summary of the Chinese state reserve. He explained that since China's reform of its cotton sector when it was negotiating its accession to the WTO, there have been three different phases to its long-term stock holding activities. He noted that over the last three seasons, sales from the state reserve have

increased dramatically, exceeding 3.2 million tons, which represents nearly 15% of world production. However, despite these sales, world prices increased slightly. He stated that prices didn't have a downward trend due to the transparency and detailed information provided by the Chinese government. Mr. Johnson finished his presentation by explaining the findings of the analysis made on the results of China's State Reserve Sales. Mr. Johnson's presentation is a statement of the meeting.

The CHAIR introduced Mr. Peter Wakefield, Chief Executive Officer, Wakefield Inspection Services, China. Mr. Wakefield, gave an explanation on how the quality of a bale of cotton is formulated. Firstly, the bale is formed and samples are taken from the sides of the bale or, if a lot system is used, from a percentage of the bales in a lot. The samples are then transported to private or government laboratories where they are assessed either by a cotton classer, by HVI, or both. Mr. Wakefield noted that the USDA's official colour and leaf grade standards for American Upland cotton have been recognized as universal cotton standard since 1924 and today 22 cotton associations from 21 countries are a signatory to the agreement ensuring that the standards are truly international. He pointed out that today there is a very strict and systematic methods of determining the colour of the cotton

using HVI. He also noted that cotton fibre seeks to reach equilibrium with the moisture in the air. Less than two percentage points of moisture can be added to a bale of cotton by the humidified air approach, the direct-spray method can also be used. However, it must be used with great care because potential fibre quality degradation.

Mr. Wakefield presented the results of different studies undertaken to measure quality under certain conditions and to determine the degradation of fibre quality during storage at elevated moisture contents. Studies have shown that cotton stored in conditions that combine high temperatures and high humidity conditions, the colour change shows large differences. However, colour changes slightly under medium temperature and humidity conditions, and cotton stored in low temperatures only has very small changes in colour. Mr. Wakefield closed his presentation by concluding that quality is first determined shortly after ginning; too much water added at the time of pressing can adversely affect the quality of cotton; it takes time for the bales to reach equilibrium with the moisture in the air, bales gaining or losing weight; and long-term storage will adversely affect the quality of the cotton. Mr. Wakefield's presentation is a statement of the meeting.

The CHAIR thanked the panelists and adjourned the session at 15:15 hrs.

Eighth Open Session

Modern Cotton Ginning Technology

9:00 hrs. Thursday, October 26, 2017

In the Chair: Dr. Rinat A. Gulyaev, Director General, Research Centre, Uzbekistan

The CHAIR introduced Dr. Derek Whitelock, Acting Research Leader Southwestern Cotton Ginning Research Lab., USDA/ARS, USA. Dr. Whitelock reported that cotton contamination in the USA is an important issue and includes contamination with fabrics and strings, plastic, oils, organic and inorganic matter. He noted that the 2016 ITMF survey indicated that cotton contamination and especially with plastics increasing. There are four main sources of contamination in the US: field, seed cotton storage and handling, gins and warehouses. He described the way plastic contamination originates from all four sources. Education & prevention, research, detection, separation and extraction are the main instruments employed in USA in order to deal with contamination nationwide. These efforts are aimed at producers, ginners, and warehouse operators with multiple approaches at industry meetings, conferences, magazine articles, web-

sites and mailings. Collaborative multipronged approach in research at universities, USDA and laboratories is developing methods of infield detection and collection using special cameras and drones. Methods of detection and separation of contamination are developed for module feeder video monitoring and electrostatics at the gin machinery. Color based camera systems and infrared imaging systems are employed for the detection of contamination with plastic. About 70% of contamination is removed, but 17% remains in bales and 13% is not found. Scientists in many countries work on the contamination problem and equipment to remove it already exists.

The delegate of AUSTRALIA asked if there are different methods to detect different kinds of plastics contaminating cotton.

Dr. Whitelock answered that there are in fact different ways employed to detect different kinds of plastics contaminating cotton that are currently in use based on differences on spectrum between heavy and light plastics reflect.

The delegate of PAKISTAN asked Dr. Whitelock to elaborate on the use of the drones for detection of cotton contamination.

Dr. Whitelock noted that currently it is just the beginning of experimental use of drones to detect and eliminate contaminants of cotton. The research is currently focused on developing this technology.

The delegate of ARGENTINA noted that with the increased use of cotton strippers to harvest cotton in Argentina contamination with organic matter has also increased. He asked if Dr. Whitelock's research is focused on this kind of contamination.

Dr. Whitelock answered that his research efforts are not focused on organic matter contamination, but there is a wide use of stripper harvesters in Texas there are research efforts on using machinery to remove organic matter from cotton over there. Dr. Whitelock's presentation is a document of the meeting.

Dr. Rinat Gulyaev, reported on the activities of the Scientific Research Center for Cotton Industry in Uzbekistan. He indicated that the Center was founded in 1926 and currently uses five ginning mills for ongoing cotton ginning research, developing modern ginning equipment for all stages of raw cotton processing. The Center cooperates in its research with SIFAT and has developed 40 industry standards and regulations. The Center develops certification and classification procedures, preparation of planting seeds and improvements in the ginning equipment. The Center has achieved great results in reducing costs associated with the planting seed production, modernizing ginning, fiber cleaning equipment, humidifiers, automation tools and a general reduction in the cost of ginning of. The Center has also developed modern tools for evaluating cotton quality characteristics and modern packaging system. Dr. Gulyaev's report is a statement of the meeting.

The delegate of EU asked if the problem of

plastic contamination is relevant for Uzbekistan as in USA.

Dr. Gulyaev explained that cotton in Uzbekistan is mostly hand picked and no plastic materials are used during harvest that is why cotton contamination with plastic is not relevant for Uzbekistan.

The CHAIR introduced Mr. Mahendria Kumar Sharma, Bajaj Steel Ltd., India. Mr. Sharma described different styles of cotton ginning and indicated that it is possible to reduce trash content during ginning to just 1% if needed, but governments should set standards to make this mandatory. He described differences between different technologies in ginning including brush types of ginning, double roller ginning, single roller ginning and rotobar rotary roller ginning. He described major cost factors for consideration when investing in ginning and pressing equipment. He recommended that ginners should buy equipment based on their ginning needs adopting new technologies. He suggested that

standardization of bale sizes is needed as a way to improve cotton competitiveness with chemical fibers. Mr. Sharma's presentation is a statement of the meeting.

The CHAIR introduced Mr. Engin Dirik, CEO and Partner of Balkan Cotton Ginning Machinery Ltd., Turkey. Mr. Dirik presented profile of his company founded in 1960 as textile machinery manufacturing. He described ginning capacities in Turkey with 500 mostly rotor ginning mills. A prevailing size of the mill is 60 single roller gin stands producing 10-15 bales per hour. He compared high output saw ginning to roller ginning producing higher quality fiber. He explained advantages of new high-speed roller ginning as a way to combine speed with quality and a breakthrough technology. He indicated that the rotary knife roller gin is suitable for ginning upland varieties and provides better cleaning capacity. High speed roller ginning could be an alternative for saw ginning of medium to long staple varieties. He described ginning equipment produced by the Balkan company. Mr. Dirik's presentation is a statement of the meeting.

Ninth Open Session

Effects of GMO and Non-GMO Cotton Production

11:00 hrs. Thursday, October 26, 2017

In the Chair: Dr. Ibrokhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

Dr. Unal Evcim spoke on the topic 'Global GMO and Non-GMO Cotton Production Experiences & Implications for the Future.' He presented data on the impact of GM cotton on yields, pesticide usage and adaptation of pests to GM cotton and weeds to herbicides. Despite pursuing only with non-GM cotton, Turkey has an impressive growth rate over the past 20 years with yield enhancement from 1050 kg/ha in 1996 to 1700 kg/ha in 2010. The impressive achievement was due to simple changes in management strategies by integrating Integrated pest Management (IPM), Integrated Nutrient Management (INM), soil moisture management, varietal development, mechanization and seed quality management. An argument was put forth that yields have stagnated in major GM-cotton adopting countries while production costs and pesticide use were increasing constantly, whereas non-GM cotton production continued to be more sustainable in Turkey. Dr. Evcim felt that high technology costs, impending risk of pest resistance to the GM technology and possible risk of weed resistance to herbicides could tilt the favor of choice towards non-GM crops in the near future. He recommended that the co-existence of non-GM and GM would not be in the interest of varietal bio-diversity and that non-GM cotton should be labeled. Dr. Evcim's presentation is a statement of the meeting.

Delegates pointed out that labeling non-GM

cotton would entail discrimination thereby dwindling consumer preference for cotton. It was also mentioned that while non-GM could be an option, GM technologies had the potential to strengthen management options to combat climate change, drought, salinity, pests, diseases and weeds. Scientists of Uzbekistan have shown that yields could also be increased with GM technologies such as the RNAi based gene silencing of phytochromeA1 gene in cotton. The delegate from Burkina Faso clarified that though Bt cotton was banned in the country due to deterioration of fiber quality, the benefits of the GM technology in reducing insecticide use for bollworm control should not be undermined.

Dr. Michael Murray spoke on '20 years of GMO –the Australian experience'. In 2016-17, Bollgard® 3 was made available for commercial release with an impressive 92% uptake in the first introductory year of Bollgard® 3 technology. Almost 100% of the crop contained transgenic traits of Bt and herbicide tolerance. Annual lint production varies from 136,000 mt to 1,200,000 mt. Cotton crop is 95% irrigated or semi-irrigated. Yields in irrigated region are 2400 kg/ha and 880 kg/ha in dryland farms. All production of 4.0 M bales (227 kg per each bale) is exported. Production systems are highly profitable and sustainable. High quality cotton is produced using Best Management Practices (BMP). Prior to 1996, Australia spent Au\$ 500-800/ha on 10-20 insecticides sprays per season. With the adoption of Bollgard-3 insecticide usage reduced to 0-3 sprays that costed Au\$ 140 + Au\$ 300 (licensing fee). GM cotton enabled Australia to obtain high

yields coupled with 95% insecticide reduction; reduced pest risks, increased income (Au\$ 180/ha), decreased labour, decreased fuel usage, decrease in residual herbicide use by 33%; reduced pesticide run off and increase in the populations of beneficial insects and wildlife in cotton fields. Sustainability was enhanced by window strategies; planting refuge crop; following pupae busting; annual review of resistance management programs and implementation of industry-wide Resistance Management/Stewardship Plans. Australian BMP recommends selection of the variety that suits local conditions with focus on Integrated Pest Management. Insect pest resistance is monitored regularly and IRM strategies are oriented according to resistance status of the pest. Australia's cotton production is recognised as "sustainable" through BCI and Cotton Leads. Dr. Murray expressed his opposition to labelling of GM and non-GM cottons. Dr. Murray's presentation is a statement of the meeting.

In the discussions that followed, it was pointed out that Australia had only about 1000 farmers with large land holdings, which would not serve as an ideal example to be emulated by developing countries. Further, the license fee of Au\$ 300/ha/year was exorbitant when compared to the current seed cost of US\$ 26/ha in Zimbabwe for conventional cotton. Farmers in developing countries were becoming indebted due to high seed costs of GM cotton and there is a need to understand how there was a 33% reduction in herbicide residue use with an increase in herbicide tolerant (HT) cotton. Farmer agreements, commercial and sustainable aspects can be understood only with more interactions.

Meeting of the Steering Committee

9.00 hrs. Friday, October 27, 2017

In the Chair: Ms. Claudia Fontana Tobiassen, Chair *ad interim* of the Standing Committee

Approval of the Final Statement of the 76th Plenary Meeting

The CHAIR noted that the Drafting Group had completed its work on the Draft Statement of the 76th Plenary Meeting and asked if delegates were prepared to officially approve the Statement.

The delegate of BRAZIL stated that members had debated the document exhaustively on the previous day and no further debate was necessary. The delegate of the USA supported the suggestion of Brazil.

Seeing no suggestions or comments on the draft statement, the CHAIR found that the Statement of the 76th Plenary Meeting of the ICAC was approved as drafted by the Drafting Committee.

Election of the Standing Committee Officers

Working Paper 1

The CHAIR recounted that following the resignation of the Chair of the Standing Committee, Ms. Reenat Sandhu of India, the Rules and Regulations of the International Cotton Advisory Committee had specified that where practicable, the first Vice Chair would be nominated to succeed the outgoing Chair and the second Vice Chair would be nominated to succeed the first Vice Chair. These appointments would be *ad interim* until the end of the 76th Plenary Meeting in Tashkent.

A Nominating Committee Chaired by Mr. Ali Tahir of Pakistan, first Vice Chair *ad interim* of the Standing Committee met on 11 May 2017 to consider officers for the Standing Committee for the ensuing year ending with the 77th Plenary Meeting in Abidjan. The Nominating Committee confirmed the nominations of Ms. Claudia Fontana Tobiassen, current Chair *ad interim* and Mr. Ali Tahir, First Vice Chair *ad interim* as Chair and First Vice Chair respectively. After considering the Rules and Regulations for the election of officers concerning geographical rotation, representation between importing and exporting countries, ability, interest and participation in the work of the Committee, and timely payment of assessments, it was agreed that Ms. Maha Zakaria, Commercial Counsellor, Embassy of Egypt, should be nominated to serve as Second Vice Chair. The Standing Committee had provisionally approved these three nominations at its 549th meeting on 31st of May 2017.

The delegate from BRAZIL proposed that these nominations be accepted. There being no objections it was found that:

- Ms. Claudia Fontana Tobiassen, Switzerland, be confirmed as Chair;

- Mr. Ali Tahir, Pakistan, be confirmed as First Vice Chair;

- Ms. Maha Zakaria, Egypt, be confirmed as Second Vice Chair.

The delegates congratulated the incoming officers. Working Paper 1 is attached.

Proposed Topics for the 2018 Technical Seminar

Working Paper 2

The CHAIR introduced Working Paper Two, which contained three proposals from the Secretariat to the Committee on Cotton Production Research as to possible topics for the technical seminar to be held during the 77th Plenary Meeting in 2018. During its meeting after the technical seminar (in Ragpur in September 2017), the Committee on Cotton Production Research had recommended the topic "Combating Pest Resistance to Biotech Cotton and Pesticides".

It was noted that this subject had been approved by the Plenary Meeting the day before and the Chair asked if there were any objections to the proposal. Seeing none, she declared that the topic of "Combating Pest Resistance to Biotech Cotton and Pesticides" be approved. Working Paper 2 is attached.

Uncollected Assessments of Members of the ICAC

Working Paper 3

The CHAIR requested the Executive Director to report on the situation of uncollected assessments of ICAC members.

The Executive Director introduced working paper 3, which contain the situation of uncollected assessments as of 18 October 2017 and urged those members whose assessments remained outstanding to pay promptly. Working Paper 3 is attached.

Proposal on Conducting a Strategic Review of the ICAC

Working Paper 4

The Executive Director introduced his paper by noting that the ICAC had last conducted a review of its mission and functions in 2007. It would be usual to conduct further strategic reviews periodically, normally every 3 to 5 years but this had not happened. It was therefore timely, with the change of Executive Director, that a major strategic review should be conducted.

The Standing Committee had given approval to conduct the review at its meeting on 7 September 2017 and the Executive Director outlined the procedure for doing so. He explained that it would primarily be a bottom-up approach, with much information gathering conducted by the Secretariat. There will be consultation with as many stakeholders as possible and the information would be presented to either an existing

Committee or a new Strategy Committee. The Committee should be able to co-opt members as it saw fit and the Standing Committee should make the decision as to whether to use an existing Committee or set up a dedicated Strategy Committee.

The delegate from the EU expressed a desire to have a separate Strategy Committee to consider this review. She asked about how the mini reviews would be conducted and that the EU would want to play an active part in the Strategy Committee.

The delegate from BRAZIL endorsed the suggestion to have a separate Strategy Committee and also the ability to co-opt members as necessary. He also agreed that the Standing Committee should make the decision on which type of Committee should have oversight of the strategic review.

The delegate from the USA also asked for the clarification of how feedback from mini reviews would be presented to the Strategy Committee.

The delegate from PAKISTAN wanted to know whether the ICAC staff would also be evaluated as part of the strategic review. The Chair explained that the performance of the staff was under the direction of the Executive Director.

The delegate from the EU stated that the EU would not be comfortable with outsiders being involved in the Strategic Committee and that questionnaires should go out immediately and recipients be allowed 2 to 3 months to reply.

The delegate from TAIWAN noted that a strategic review would be challenging and requested that a timeline be produced for the next Standing Committee meeting.

The delegate from AUSTRALIA asked when the strategic plan would be decided. The Executive Director explained that this could only be achieved once the strategic direction had been decided.

The recommendation to conduct a full strategic review of the organisation was approved. The strategic direction of the organisation would be approved by the Standing Committee and would be reported formally at the next Plenary Meeting in Cote d'Ivoire. Working Paper 4 is attached.

Any Other Business

The delegate from the EU expressed gratitude to the government of Uzbekistan for their warm-hearted efforts and said that the Meeting has been very worthwhile.

The delegate from PAKISTAN asked that preference be given to the research work and research outcomes and that they should be presented in the Open Session during the plenary meetings. The delegate from the EU added that the plenary meetings should focus on policy and not on the private sector and research should be presented to governments in a way that informs policy.

ATTACHMENTS**Working Paper I****Election of Standing Committee Officers****Recommendation from the Standing Committee**

A nominating committee conducted a meeting at the Office of the Secretariat on May 11, 2017, to propose a slate of officers for the Standing Committee for the coming year. Delegates from India, Pakistan, Russia, Taiwan and the United States participated. Mr. Ali Tahir of Pakistan, First Vice Chair ad interim of the Standing Committee, agreed to serve as Chair of the Nominating Committee.

The Rules and Regulations specify that when practicable, the First Vice Chair will be nominated to succeed the outgoing Chair and the Second Vice Chair nominated to succeed the First Vice Chair.

The Chair found that there was a consensus to confirm the nominations of Ms. Claudia Fontana Tobiassen (Head of Commercial Service, Embassy of Switzerland, current Chair ad interim) and Mr. Ali Tahir (Minister Trade, Embassy of Pakistan, current First Vice Chair ad interim) as Chair and First Vice Chair of the Standing Committee, respectively, from the end of the 76th Plenary Meeting in Tashkent to the end of the 77th Plenary Meeting in Abidjan.

The Rules and Regulations say that the election of officers should take into account:

1. Rotation on as broad a geographical basis as possible.
2. Adequate representation to importing and exporting countries.
3. Ability, interest and participation in the work of the Committee.
4. Timely payment of assessments.

After consideration of these factors, the Nominating Committee agreed that Ms. Maha Zakaria, Commercial Counselor, Economic and Commercial Office, Embassy of Egypt, should be nominated to serve as Second Vice Chair.

The nominations received provisional approval from the Standing Committee at its 549th meeting on May 31, 2017.

Accordingly, the Standing Committee proposes the following slate of officers to the Plenary Meeting for the period from the end of the 76th Plenary Meeting in 2017 to the end of the 77th Plenary Meeting in 2018:

- Ms. Claudia Fontana Tobiassen, Switzerland, for Chair.
- Mr. Ali Tahir, Pakistan, for First Vice Chair
- Ms. Maha Zakaria, Egypt, for Second Vice Chair

Working Paper 2**Proposed Topics for the 2018 Technical Seminar****Proposals from the Secretariat to the Committee on Cotton Production Research**

The following topics are proposed for the 2018 Technical Seminar:

1. Creating a global platform for germplasm exchange
2. Combating Pest Resistance to Biotech Cotton and pesticides
3. Cotton Traceability Technologies

Creating a global platform for germplasm exchange

Food security and agriculture research systems across the globe are built on exchange of seeds and knowledge. Revolutions in agriculture were essentially based on sharing of germplasm (live genetic material) across National boundaries for purposes of varietal improvement. The ever-changing market demands for specific fiber qualities will determine the dynamics of conventional breeding. Genotyping and phenotyping of germplasm-gene-pools, enhancement of genetic-diversity, development of pre-breeding lines, introgression of rare-valuable genes from wild-species and utilization of genetics, genomics and molecular-markers will form the core of conventional cotton breeding in the near immediate future. The cotton genetic base in many countries is narrow, and access to new germplasm holds the key for genetic improvement and progress. Such new germplasm could be available generally across continents and can assist in enhancing genetic diversity and expanding genetic variability for useful traits. Recently a few global treaties and national policies have been drafted with intentions of facilitating germplasm sharing, protecting native bio-diversity, food security, farming community rights and breeder rights. The policies developed through the 'Convention on Biological Diversity-1993', the 'International Treaty on Plant genetic resources for Food and Agriculture (ITPGRFA)-2004', and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits -2014' established clear guidelines for germplasm exchange and use between signatory countries. However, some countries have opted to draft their own national policies, which could be in broad consonance with the global policies but are strongly restrictive in stipulating conditions for seed transfers and benefit sharing. There is emerging evidence that some aspects of these policies could slow germplasm exchange across countries, which could be detrimental to the progress of cotton improvement. The seminar will discuss the implications of national policies on gene-banks, biodiversity of major cotton growing countries, the possible frictions, and the

emerging uncertainty of trans-boundary seed movement exchange. These discussions could enable the development of a roadmap to create a global platform that operates as a smooth and trustworthy channel of seed exchanges amongst countries across boundaries.

Combating Pest Resistance to Biotech Cotton and pesticides

Bt-cotton (*Bacillus thuringiensis*-cotton) and Herbicide Tolerant cotton (HT cotton) played a key role in insect pest control and weed management in major cotton growing countries over the past 20 years. Biotech cotton became very popular and spread extensively and rapidly to occupy more than 75% of the global cotton area. Cotton was modified through genetic engineering into Bt-cotton to kill insects and into herbicide tolerant HT-cotton to tolerate herbicides. Over the past seven years, bollworms have developed resistance to Bt-cotton in China, USA, Pakistan and India. Several weeds have developed resistance to the specific herbicides deployed for weed control in the HT crop. The emergence of Bt-resistant bollworms and herbicide resistant weeds has posed new challenges to cotton crop production systems. The recent instances of Pink bollworm resistance in India to Cry1Ac and Cry2Ab proteins have serious consequences to cotton production. Pink bollworm resistance to Cry1Ac in Bt-cotton has also been reported from China and Pakistan; the problem is currently not as severe as it is in India, but can emerge into a serious problem very soon. Whiteflies developed high levels of resistance to insecticides in many parts of the world. In India and Pakistan, insecticide resistant whiteflies not only cause severe crop damage, but also transmit the dreaded incurable cotton leaf curl virus. The bollworms, whiteflies and the leaf curl virus can cause debilitating effects on cotton production especially in Asia and Africa if not properly addressed. The technical seminar will discuss the reasons for rapid development of resistance in some countries compared to others and also chalk out strategies to combat the emerging problems of bollworm resistance to Bt-cotton, insect resistance to insecticides and weed resistance to herbicides.

Cotton Traceability Technologies

Recent instances of dubious claims made by a few textile manufacturers have brought the subject of traceability into focus. The recent 'fraudulent' claims have raised questions as to whether it would be possible to reliably detect the origins of a particular type of fiber in a finished textile product. Fabrics that were claimed to have been spun from a particular premium quality fiber were discovered to have been made either from inferior quality fibers or mixed with them. Fabrics that were labeled as organic cotton were found to contain fibers from biotech cotton that were unacceptable to users of organic cotton. Such misleading claims of premium quality fabrics have recently caused concern to

the credibility of genuine producers. Traceability can be defined as a process that enables the identification of the authentic origins of raw fiber in a finished product. Origins of a fiber could be related to the place of cultivation, or a type of farming method, or a particular fiber quality, or a specific species or a variety. Traceability methods are expected to establish authenticity of fiber quality, establish fiber origins, quantify fiber purity and track the processing path from fiber to fabric. Currently traceability methods employ either DNA tagging-and-detect methods or DNA finger-printing or the use of nano-impregnated cellulosic fibers or block-chain documentation methods through open-ledger systems to track the origin and authenticity of fibers used along the value chain. The seminar will discuss the state-of-art cotton traceability-technologies that are available to ascertain the credibility of claims in a cost effective manner.

Working Paper 3
Uncollected Assessments of
ICAC Members
Recommendation from the
Standing Committee

Working Paper 3

Uncollected Assessments of Members of ICAC
As of October 18, 2017

Recommendation from the Standing Committee to the 76th Plenary Meeting

INTERNATIONAL COTTON ADVISORY COMMITTEE

Tashkent (Uzbekistan)

Oct-17

Country	Current year 2017/18	Prior year 2016/17	Prior year 2015/16	TOTAL
Argentina	29,100			29,100
Bangladesh	133,300	26,150		159,450
Brazil	99,200	108,000		207,200
Burkina Faso	46,600	38,100		84,700
Cameroon	32,200	32,200		64,400
Egypt	33,300			33,300
Kazakhstan	28,300			28,300
Kenya	23,600			23,600
Korea	3,425			3,425
Mozambique	25,300	16,964		42,264
NIGERIA*		27,697		27,697
Pakistan	63,877			63,877
South Africa	24,400			24,400
Sudan	21,425			21,425
Tanzania	27,700	28,300	17,225	73,225
Togo	26,800			26,800
USA	244,300			244,300
Uzbekistan	78,800	17,000		95,800
Zimbabwe	28,600			28,600
TOTAL	970,227	294,411	17,225	1,281,863

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Outstanding July 1, 2016	1,700,900	475,576	17,225	2,193,701
Received	730,673	181,165	0	911,838
Forecast (budget)	1,300,000	151,400	98,600	1,550,000
Difference	569,327	-29,765	98,600	638,162

Assessments become due on the first day of the fiscal year (i.e. July 1) and are payable in 90 days.

*Suspended. Included in Table 1 for purposes of budget control only. Value for 2016/17 includes \$27,800 annual assessment and \$16,197.25 relative to 1st instalment of repayment of arrears (as per SC-538-003/16).

Table 2: Payments Due in Forward Years

Member	Due date	Amount
Sudan	31-Jul-17	15,200.00
Nigeria	31-Dec-17	16,197.25
Sudan	31-Jul-18	8,400.00
Nigeria	31-Dec-18	16,197.25
Sudan	31-Jul-19	15,200.00
Nigeria	31-Dec-19	16,197.25

Table 3: Advance Payments Received

Member	Date	Amount
Sudan	27-Oct-16	3,775.00
South Africa	23-Nov-16	1,400.00
Pakistan	2-Dec-16	123.00
Kazakhstan	4/17/17	300.00
TOTAL		5,598.00

Table 4: Uncollected Assessments of Members that have
Withdrawn or Whose
Membership Has Been Suspended

	Amount (US\$)	Withdrawal / Suspension Date
Azerbaijan	22,025.00	1999
Colombia	11,150.00	2016
El Salvador	34,300.00	1985
Guatemala	89,408.00	1996
Honduras	32,105.00	1993
Iran	104,946.59	2015
Iraq	26,800.00	1985
Mexico	18,700.00	1995
Nicaragua	94,006.00	1996
Paraguay	60,192.00	2016
Philippines	20,000.00	2005
Peru	132,424.00	2015
Senegal	44,500.00	1996
Syria	79,053.00	2013
Zambia	43,400.00	2016
TOTAL	813,009.59	

Working Paper 4

Proposal on Conduction a Strategic Review of the ICAC

Recommendation from the Standing Committee

INTRODUCTION

The International Cotton Advisory Committee (ICAC) last conducted a review of its mission and functions in 2007. Strategic reviews should result in a strategic plan, performance against which is reviewed annually with further strategic reviews held periodically, usually every 3-5 years depending on the pace of change in the international cotton industry environment. Strategic reviews need to be holistic and should involve input from as many current and, if possible, any identifiable future stakeholders as possible. It is therefore important that we communicate through as many different channels as possible why we are conducting a strategic review and what benefits may be achieved through such a review and why their participation in the process is so important.

PURPOSE

The Standing Committee has already given approval to conduct the review at its meeting on 7 September 2017. The mechanics of how that review is to be conducted now need to be approved by the Plenary Meeting in Tashkent. Therefore, the purpose of this paper is to outline the steps that need to be taken, with associated timelines, in order to conduct a Strategic Review of the ICAC.

WHAT IS STRATEGY?

It is worth having the following key definitions in mind when conducting the Strategic Review and developing the resultant strategic plan;

- Strategy is about giving an organisation purpose and direction.
- Strategy is about determining how an organisation will match its diverse capabilities with the needs of stakeholders, now and in the future in order to maximise impact.
- An organisation's strategy will determine how it relates to the outside world – how it makes the most of opportunities, responds to change, and faces up to threats: opportunities to innovate, improvise and improve.

- A strategy makes it clear what the priorities are, and what the organisation's resources should be concentrated on delivering.
- Strategy usually focuses on the medium term (3 to 5 years), but is reliant on the short term too.
- Strategies are often developed 'top-down,' but increasingly organisations seek to mobilise and motivate everyone in the organisation by early involvement.
- Strategy will also emerge from the grassroots of an organisation, so finding ways of creatively integrating top down from bottom up is vital.

PROCEDURE

The following procedure will start with a 'bottom up' approach where much of the debating and information gathering is conducted internally by the Secretariat and a dedicated subcommittee of the Standing Committee, and then presented to stakeholders at a 'Strategic Away Day' where themes are identified with resulting enablers.

For the ICAC, this will mean either using an existing Committee to fulfil this role (The Sub Committee on Administrative Matters?) or set up a dedicated Strategy Committee. This should be a permanent committee which will continue to monitor performance against the strategic plan throughout the year, and in future years, and to identify any new areas that need to be added into the Strategic Plan. In short, the dedicated subcommittee will provide oversight of Strategy on behalf of the Standing Committee.

Once approval is given as to the direction above, composition of the committee needs to be considered to ensure that there is a broad range of stakeholders represented. It is recommended that such a committee should be no more than 8 persons.

Following the Plenary Meeting in Tashkent, the Secretariat will hold a brain storming session to consider and review the following:

- Mission /Vision
- Purpose & Values
- Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis
- Political, Economic, Social, Technological (PEST)

- Both SWOT and PEST are important as they help to organise, key in and prioritise ideas around the organisation; without them it is difficult to create a succinct and well-ordered plan
- Identify sources of information that will be required to enable comparisons, and benchmarking
- Produce a draft questionnaire for all stakeholders soliciting their views and ideas

The designated committee will review the Secretariat findings, approve the questionnaire, and identify current and potential stakeholders.

The Secretariat will send the questionnaire to stakeholders

The Secretariat will collate Questionnaire results

The Secretariat will Collate benchmarking and comparative data

Review of progress by Standing Committee

Presentation of the above for discussion and further input to all stakeholders at the Plenary Meeting in Abidjan at the World Café session to confirm and identify further key themes.

Implementation of Strategic review decisions around key themes

Development and approval of enablers and performance matrix

SUMMARY

A well-formed strategic review and resultant strategic plan needs to ask the following four fundamental questions:

- What are we trying to achieve?
- Where are we now?
- Where do we want to be?
- What do we need in order to get there?

RECOMMENDATION

That the above procedure be approved and that a Subcommittee of the Standing Committee be designated to take oversight of the process and report to the Standing Committee on progress. The Standing Committee will then agree on the Strategic direction of ICAC, and report that decision formally at the Plenary Meeting in Cote d'Ivoire.

Closing Plenary Session

11.00 hrs, Friday, October 27, 2017

In the Chair: Ms. Claudia Fontana Tobiassen, President *ad interim* of the Standing Committee

Reading of the Final Statement of the 76th Plenary Meeting

The CHAIR welcomed delegates to the Closing Plenary Session and began the meeting by requesting the Executive Director to read the Final Statement of the 76th Plenary Meeting. The delegate of BRAZIL proposed that as the Statement had already undergone extensive scrutiny by the Drafting Committee, it should be considered to be taken as read. There being no objections, the CHAIR took the Final Statement as read.

Invitation from Côte d'Ivoire to Host the 77th Plenary Meeting

The delegate from CÔTE D'IVOIRE read a short statement and thanked members for selecting Côte d'Ivoire to host the 77th Plenary Meeting. A short video was then shown highlighting Côte d'Ivoire as a country of agriculture and cotton. On behalf of the Government of Côte d'Ivoire, ICAC delegates were invited to attend the Plenary Meeting in Abidjan between 1–10 December 2018.

Closing Comments by Pakistan, Host of the 75th Plenary Meeting

The delegate from PAKISTAN thanked, on behalf of the people and Government of Pakistan, the Government of Uzbekistan for being such excellent hosts and remarked that the country's rich culture and hospitality would always live in their memories.

Closing Comments by Other Countries

Delegates from numerous countries congratulated the Government of Uzbekistan and the Organising Committee on their organisation of the Plenary Meeting and the warm hospitality that they had received. Thanks were also extended to the presenters and delegates for their contributions and enabling the conference to be so successful. In particular, some delegates were appreciative that the Plenary Meeting had provided the platform to exchange information and the EU referred to the upcoming Strategic Review and the opportunities that this would give.

Closing Comments by Uzbekistan, Host of the 76th Plenary Meeting

The delegate from UZBEKISTAN thanked, on behalf of the Organising Committee and the Government of Uzbekistan, all those who had participated in the 76th Plenary Meeting and expressed his gratitude for the active participation of delegates in the discussions during the Ses-

sions. He noted that the world cotton community was functioning in an era of globalisation and rapid technical progress and that all the sessions had been valuable and covered a wide range of questions relating to the cotton sector in the modern and ever-changing world.

In order to find answers to big challenges UZBEKISTAN were actively involving the Uzbek scientific community. More than 200 people had participated in the plenary sessions including scientists, specialists, and researchers from 27 scientific organisations and academic institutions as well as students from 17 higher education institutions.

The attendance of young scientists, volunteers from higher education institutions and colleges during the meetings had allowed them to acquire the priceless experience of participating in an international conference and the delegate hoped that the ICAC could create a special international scientific youth division to form the future of the cotton community in their countries and of the cotton community as a whole.

He ended by once more expressing his gratitude to the participants for their contributions and he hoped that this would lead to strategic partnerships and the development of the international cotton business. He wished all participants future success and wished Côte d'Ivoire success during the next Plenary Meeting.

First Breakout Session

Technology for the Preparation and Planting of Cotton Seeds in Diverse Soil and Climatic Conditions

9:15 hrs. Tuesday, October 24, 2017

In the Chair: Dr. Shukhrat Shermatov, Scientific Secretary, Center for Genomics and Bioinformatics, Uzbekistan

Dr. Kater Hake, Vice President, Cotton Incorporated, Agricultural and Environmental Research Development, United States, spoke on the topic of, "The Toughest Planting Environment is the One We Need." Dr. Hake's basic conclusion is that cotton farmers need to plant into residue (organic material, such as corn stubble or grass straw) to increase carbon sequestration, reduce weed pressure and inhibit soil erosion. However, planting a field covered in residue is inherently difficult.

Dr. Hake observed that planting cotton is more difficult than planting grass crops, such as corn, because cotton is a perennial and has not evolved over millions of years to be planted each year. He noted that the modes of action of all herbicides in current use were discovered more than 40 years

ago, and no new modes of action have been discovered since. In contrast, weeds continuously evolve to develop resistance to all sources of stress, including herbicides. Consequently, the efficacy of herbicides may degrade until their use is pointless. Further, he noted that warmer global temperatures result in higher rainfall intensity (warmer air holds more water than cooler air, resulting in higher volumes of rain per minute of fall), and rainfall intensity results in less water infiltration and more soil erosion. He observed that year-round residue cover on soils can mitigate these challenges.

The trouble with maintenance of year-round residue is that numerous problems develop, including slower warming of soils at the start of each season and poor seed-to-soil contact during planting operations. In addition, the growth of a residue crop requires moisture that will not be available to cotton (a problem in arid regions), and residue provides habitat for nematodes,

diseases, weeds and insects. To counter these difficulties, farmers need to ensure 1) seed quality (germination, vigor and purity) must be excellent, 2) residue must be terminated prior to cotton's growth, and 3) seed must have good physical contact with moist soil for at least 48 hours to permit germination. Dr. Hake described methods and techniques of achieving these requirements in mechanized agriculture, and he suggested ways in which small holders could overcome barriers to adoption of year-round residue strategies. Dr. Hake's presentation is a statement of the meeting.

During discussion, Dr. Hake emphasized the need to terminate residue prior to cotton growth, and the need to ensure that residue is dry. He agreed that in arid regions farmers need to balance the benefits of residue maintenance against the cost of water use.

The Chair, Dr. Shukhrat Shermatov, spoke on the topic of, "Genetic Engineering of Drought-

Resistant Cotton.” His conclusion is that the tools of genetic engineering (GE) provide faster, cheaper, more precise ways of imparting desirable traits into commercial crop varieties. He said that GE does not supplant conventional breeding; instead GE is used with conventional breeding to speed the identification and development of effective genetic solutions to common plant challenges.

Dr. Shermatov noted that cotton is a desert crop grown in arid and semiarid regions because it can survive in such environments where other crops fail. Accordingly, drought tolerance is an important trait in cotton variety development. He noted that conventional breeding is “highly time-consuming.” He observed that drought tolerance is not turned on or off by a single gene amenable to simple breeding solutions. Rather, drought tolerance is controlled by complex mechanisms, and the tools of GE can help scientists accelerate the development of solutions. The challenge is to develop varieties with reduced water requirements and stable yields in fluctuating environments.

Scientists in Uzbekistan have targeted a specific gene, ESKIMO1, which seems to have a role in

drought, cold and salt tolerance. Scientists have successfully sequenced the full length of the ESKIMO1 gene of Arabidopsis from allotetraploid and diploid cottons. They have used GE techniques to impart desirable traits into commercial varieties, and those varieties are being tested for drought resistance. Work is ongoing to develop commercial varieties of cotton and other crops. Dr. Shermatov's presentation is a statement of the meeting.

During the ensuing discussion, there were questions about how “drought” is defined and measured, and what is the mode of action in the plant associated with the ESKIMO1 gene to impart drought tolerance. Dr. Shermatov noted that “drought” is a relative term with different meanings in different climates and could be applied whenever a plant experiences water stress leading to reduced yield. He said that the mode of action within plants is not fully understood.

Dr. Shadman Namazov, Director General, Research Institute of Selection, Seed and Agrotechnology of Cotton Cultivation, Uzbekistan, spoke on the topic of, “Problems and Achievements of Cotton Breeding of Uzbekistan.” The main point of Dr. Namazov's presentation is that

cotton breeding in Uzbekistan is conducted in numerous locations with great scientific rigor and that new varieties are being developed under strict regulatory guidelines.

Dr. Namazov described the research priorities of cotton breeders in Uzbekistan. He listed ten organizations in Uzbekistan conducting cotton breeding activities. He listed cotton breeding methods, including inter- and intra-specific hybridization; experimental mutagenesis using cobalt, laser rays and chemicals; heterosis; and molecular biology and biotechnology. There are five gene banks in Uzbekistan accounting for 32,580 accessions across five species. Since 1991, 206 cotton varieties have been developed, including varieties with desirable stress tolerance traits and fiber qualities. Thirty-three of the varieties are registered for commercial use, and 16 more varieties are “promising.” Dr. Namazov's presentation is a statement of the meeting.

Dr. Namazov responded to several questions, noting that traits from non-native varieties have been introduced into 14 Uzbek varieties with promising results.

The CHAIR thanked the three speakers and all participants for their attention.

Second Breakout Session

New Technologies and Other Measures for Increasing Cotton Yields

11:15 hrs. Tuesday, October 24, 2017

In the Chair: Dr. Keshav Kranthi, Head, Technical Information Section, ICAC

Dr. Fakhridin Kushanov, Head of Laboratory, Center for Genomics and Bioninformatics, Uzbekistan, described efforts underway in his laboratory in using marker-assisted breeding for the development of several elite cultivars. He explained that cultivars such as Ravnaq-1, Ravnaq-2, Baraka, Shakovat, and Tafakkur, with premium quality fiber of 37-38 mm are being developed. RNAi-PHYA1 based varieties Porloq-1, Porloq-2, Porloq-3 and Porloq-4 were developed for high yields and improved fiber traits. These varieties, along with Ravnaq-1 and Ravnaq-2, were further improved for resilience to climate change by pyramiding genes using DNA markers associated with resistance to *Fusarium oxysporum* f.sp. *vasinfectum* and *Verticillium dahliae* diseases. Markers were used, not only for Marker Assisted Selection (MAS), but also to select wilt donor lines from the cotton germplasm. Dr. Kushanov's presentation is a statement of the meeting.

In response to questions, Dr. Kushanov confirmed that one or two markers, sometimes 3, are used in experiments. He described methods of DNA isolation, and he confirmed that single markers were associated with individual traits.

Dr. Ghorban Ali Roshani, Director, Cotton Institute, Iran, outlined the progress of cotton research in the Mediterranean and Middle-east countries. He said that the effects of climate change can only increase. Therefore, the development of new varieties with higher yield potential will be possible only by using both conventional agro-technologies and emerging new biotechnologies. He said that commendable work has been carried out in Iran to develop varieties such as Khordad, Sepid, Golestan, Armaghan, Khorshid, Latif, Shayan, Sajedi and Intraspecific hybrids of *G. hirsutum* and inter-specific *G. hirsutum* x *G. barbadense* hybrids with an emphasis on fiber quality and resistance to pests and diseases. Recent attempts were made to develop indigenous Bt-cotton. Mutation breeding efforts with Cobalt-60 over the past 10 years resulted in the development of two new varieties that are ready for release. The new varieties are high yielding and possess good fiber quality, Wilt tolerance and Earliness. Agronomic strategies such as Narrow-Row (NR) and Ultra-Narrow-Row (UNR) for high density planting were developed using early-season cultivars that have a growing period of less than 130 days. Short season cotton varieties lead to reductions in the costs of weeding and pest management. Small-scale machine pickers have been developed in Iran to reduce the cost

of harvesting. Dr. Roshani suggested that an International Cotton Research Institute could be established under the CGIAR or other inter-governmental institutions so that germplasm lines and technologies could be exchanged easily to enhance yields. Dr. Roshani's presentation is a statement of the meeting.

In response to questions, Dr. Roshani noted that current yields average 3 tons of seed cotton per hectare and that the quality of new lines equaled or exceeded average length and micronaire values of current varieties. He clarified that UNR was defined as 25 centimeter row spacing.

Dr. Michel Fok, Cotton Scientist, Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), spoke from the floor regarding efforts to establish an international cotton research center under the umbrella of the Consultative Group for International Agricultural Research (CGIAR). Dr. Fok serves as the Chair of the International Cotton Researchers Association (ICRA). He noted briefly that there have been many efforts over many years by the cotton research community to encourage donor countries that support CGIAR to establish such a center, most recently in 2005. However, donors are not inclined to establish such a center. The current international political climate is not conducive to the establishment of new institutions of any kind. No new money is

likely to be provided by donors for agricultural research, and consequently the establishment of an international cotton research center would result in reduced funding for centers currently operating. As an alternative, Dr. Fok encouraged scientists to join and participate actively in the work of the ICRA (ICRACotton.org).

The Chair observed that funding for international cotton research could be available from sources other than donor governments, perhaps from the textile industry. He implied that the ICAC Secretariat would develop proposals for further consideration by ICRA and discussion at the ICAC plenary meeting next year in Côte d'Ivoire. The Chair pledged to keep researchers aware of developments through regular on-line postings on the ICRA web site, and he reinforced the message from Dr. Fok that researchers with an interest in international cooperation on matters related to cotton science should join ICRA and participate actively in its activities.

Dr. David Stelly, ICAC Researcher of the Year 2017, Professor, Department of Soil Sciences, Texas A&M University, United States, described the latest tools developed for Marker Assisted selection (MAS). Significant progress has been made in non-destructive seed genotyping, in high-throughput (HT) systems. Germplasm resources and wild species of cotton contain several useful alleles that can be utilized to enhance diversity to develop new germplasm and cultivars that will be able to combat climate

change and biotic stress factors. Germplasm accessions are characterized through phenotyping which involves cost and time. The availability of a large number of molecular markers will facilitate genotyping to be able to identify differences among accessions. Several factors influence MAS. Good quality DNA is crucial. Developmental transcriptomes—single nucleotide polymorphisms (SNPs); mapping and use of heritable methylation changes and bio-informatic resources (data and software) would play a crucial role while considering genetic aspects of MAS. A high-throughput genotyping system such as CottonSNP63K has been established with SNP markers. The cotton SNP63K array enables researchers to efficiently and reliably exploit a large number of SNP markers to analyze genetic diversity, compare SSR (simple sequence repeat)-based phylogenetic analysis and identify loci associated with traits. More than 12 million differentially methylated cytosines across all species were comparatively analyzed and single-base resolution methylomes of domesticated allotetraploid cottons and their wild tetraploid and diploid relatives were generated. Data of methylomes with transcriptomes were integrated to discover more than 500 putative epialleles that may have influenced evolution and domestication of polyploid cottons. Epigenomic resources can be used to improve crop production by epigenetic engineering and breeding.

Dr. Stelly also described recent advances in genetic transformation systems that enable regeneration at will across genotypes. Other important strategies could include endophytes, RNAi, protein-guided and RNA guided gene editing, CRISPR/Cas9; transcriptional enhancers or repressors to experimentally modify expression and histone methylase/demethylase to target changes of histone methylation. Improvement in cultivars for resilience to biotic and abiotic stress factors enables yield actualization. Dr. Stelly noted that, "Genetic engineering is going to be big, unless we stop it from being big."

In addition to genetic tools to develop cotton varieties with higher yield/higher quality/improved resistance traits, Dr. Stelly briefly listed a host of electronic, mechanical and other miscellaneous developments in cotton technology that could lead to higher yields. As examples, Dr. Stelly mentioned the use of ultra-precise guidance systems utilizing GPS, crop surveillance and management technologies using remote sensing and automated systems, robotics, automated data collection, the use of Big Data in crop yield analysis, and other concepts. Dr. Stelly's presentation is a statement of the meeting.

In response to questions, Dr. Stelly observed that chemical markers could be useful in MAS, provided that such markers were efficient (lower cost and faster). There was a brief discussion of the potential use of natural plant regulators in the management of plant growth.

Third Breakout Session

Standardization, Quality Assessment, Traceability and Certification

9:15 hr. Thursday, October 26, 2017

In the Chair: Dr. Ibrokhim Abdurakhmonov, Director, The Centre of Genomics and Bioinformatics, Uzbekistan

Dr. Bakhtiyar Baykhanov, First Deputy of the General Director, Uzbek Center Sifat, Uzbekistan, spoke to the topic of, "The Quality Control System of the Fiber and its Role in the World Market for Improving the Competitiveness of the Uzbek Cotton." Dr. Baykhanov described the Uzbek network of HVI laboratories located in nine strategic locations around the country, with the central laboratory located in Tashkent. He provided information on the quality distribution of Uzbek cotton by region, and he showed how the use of testing instruments was leading systematically to improvements in cotton quality over time as breeders used information provided by Sifat to select better varieties. Dr. Baykhanov's presentation is a statement of the meeting.

Mr. Axel Drieling, Senior Manager Cotton, Faserinstitut Bremen e.V., Germany gave a presentation on the topic of, "CSITC Round Trials: Current Status and Aims Towards Including New

Parameters." Mr. Drieling noted the international acceptance of the Round Trials sponsored by the ICAC Task Force on Commercial Standardization of Instrument Testing of Cotton (CSITC). The Round Trials are conducted in cooperation between the ICAC Secretariat (registration of participants), the United States Department of Agriculture – Agricultural Marketing Service (test sample preparation and distribution) and the Faserinstitut (confidential analysis of results and information useful for performance improvement). The aim of the Round Trials is to improve cotton testing accuracy and precision. Currently, 114 laboratories from 35 countries participate actively. A majority of Round Trial participants are production and controlling companies, whereas spinning mill laboratories are missing. During the last 5 years, the variation in test results between laboratories has declined by about 30%, mostly as a result of Round Trial participation.

Mr. Drieling reported that 6 parameters, microaire, strength, length, length uniformity, color reflectance and yellowness, are currently used for evaluating laboratories. He said that efforts are underway to add trash and short fiber index

to the list of official CSITC parameters, but additional work is needed because the interlaboratory variation for these tests remains high.

Mr. Drieling added that work continues on improving measurement of other parameters, including neps, fineness, maturity, gravimetric trash content, and stickiness. Mr. Drieling's presentation is a statement of the meeting.

In the discussion following on the presentation, there was a consensus that laboratories operated by spinning mills should participate in the CSITC round trials if they wish to achieve results within international tolerances for precision and accuracy. There was also a suggestion to add Spinning Consistency Index (SCI) as a test in future Round Trials.

In response to questions, Mr. Drieling emphasized that the role of CSITC Round Trials is to reduce the variation in results between laboratories and instruments, regardless of the types of instruments used.

Regarding the testing of stickiness, Mr. Drieling noted that most spinning mills are indifferent to the sources of stickiness in cotton, they just want

to identify whether there will be a problem in the spinning process and how to deal with it. Accordingly, current research is focusing on mechanical means of stickiness testing, not chemical means.

Dr. Mohamed Negm and Suzan Sanad, Cotton Research Institute – Giza, Egypt gave a presentation called, “Egyptian Cotton Traceability.” Because the inherent qualities of Egyptian cotton are superior to most other origins, brands, retailers and manufacturers have an incentive to

mislead consumers into thinking that products are made from Egyptian cotton, when in fact they are made of lower-priced cotton. In order to combat such practices, Egypt has developed a robust traceability program with three components including the Cotton Research Institute (CRI), the Cotton Arbitration & Testing General Organization (CATGO), and the Egypt Cotton Association (ECA). The program ensures varietal purity of Egyptian cotton through a system of zoning production and ginning. Bales of

cotton can be traced using a Permanent Bale Id (PBI) with bar codes for ease of data retrieval. And products sold at retail can be tested with a DNA-based method. Dr. Negm and Dr. Sanad's presentation is a statement of the meeting.

In response to questions, Dr. Negm indicated that the DNA-based methods of testing for fiber parentage took between five and 15 days.

The CHAIR thanked the presenters and the audience for their participation.

Fourth Breakout Session

Economic Aspects of the Issues of Harvesting and Procurement of Raw Cotton and Settlements with Producers

11:15 hrs. Thursday, October 26, 2017

In the Chair: Dr. Rinat A. Gulyaev, Director General, Research Centre in Uzbekistan

Mr. Boubacar Ba, Commercial Director, Compagnie Malienne pour le Développement des Textiles (CMDT), Mali, gave a report on, “Comments on the Reform of the Cotton Sector in Mali.” Mr. Ba reported that CMDT is the national company in Mali with responsibility for all phases of cotton production and marketing. CMDT has 17 ginning units and a fleet of trucks. The mean inter-annual (MIA) rainfall for the cotton zone is 655 mm in the north and 1,036 mm in the south. The total population of the cotton zone is over 4,000,000. The cotton zone has 200,000 farms and produces more than 2,000,000 tones of cereals a year, in addition to 600,000 tons of seed cotton.

In Mali, the collection, grading, weighing, and transportation of seed cotton from farmers to CMDT, and the payment of producers, is the responsibility of Cotton Producer Cooperative Societies (CCPC), who operate through teams of literate producers. At the start of each marketing campaign, CMDT trains members of the CCPC marketing teams in 1) adjusting scales and weighing seed cotton; 2) completion of marketing documents in the national language, and 3) classification of seed cotton against seed cotton standards boxes. Each CCPC marketing team is divided into subcommittees of classers, packagers, and weighers. The marketing documents include: (i) a book recording the weight of cotton delivered by each farmer, (ii) a book with copies of receipts given to each farmer, (iii) another book recording each farmer's choices on whether to retain or relinquish cottonseed, (iv) bills of lading covering truck shipments of seed cotton from the village to a gin, and (v) a book recording payments received by each farmer).

Mr. Ba reported that prior to the start of each marketing season in September, CMDT pays to ensure that scales owned by the CCPC in each village are calibrated and tested by an approved servicing company. Scales have capacities of be-

tween 500 kilograms and one ton. After inspection, a certificate of control and repair is issued to the cooperative, with extension to CMDT.

Also at the start of each marketing campaign, there is a national meeting of all stakeholders, including representatives of CMDT, OHVN, the Confederation of the SCPC, banks, the Ministry of Agriculture, and the agricultural research organization. During this meeting, the main marketing policies and procedures are decided, and the transport and load plans of each ginning plant are determined. The seed cotton production forecast is estimated through an objective statistical process. Harvested area is estimated based on measurements taken on one-fourth of all farms. Sample plots are carefully evaluated in each Agricultural Production Zone, and yields are estimated based on counts of squares and bolls within each plot.

CMDT, in collaboration with the National Roads Authority, develops and executes a roadway improvement program each year. This makes it possible to evacuate seed cotton from the production areas beginning in mid-October to supply the ginneries.

Seed cotton markets are located in open areas outside villages at least 200 meters from the nearest structure. The market yard is led by a leader from each CCPC, who ensures the proper functioning of the working committees (packers, classification of seed cotton, and weighing). The leader ensures that the seed cotton storage area is clean. Farmers begin delivering seed cotton to the market area at least three days before the arrival of the first truck. The scale and standards boxes are readied. The standards box is provided by the Office of Cotton Classification (OCC).

The seed cotton grading system in each village in Mali involves a Classification Commission, composed of one CMDT agent and two producers from the cooperative, one of whom is an experienced elder and one of whom is literate. A sample taken from the producer's heap of cotton is compared to the contents of a standards box. The Classification Commission makes a decision

based on color and trash and gives the producer a ticket indicating the grade of his cotton.

The Weighing Commission consists of a weigher, a co-weigher and two secretaries. Before beginning, the Weighing Commission decides the amount of tare to be applied. The cotton that has been weighed is either loaded directly onto a truck or stored in a silo. When the weight of cotton in a silo reaches 100 tons, weighings are stopped until a truck arrives to evacuate the silo. In the case of large farms, (greater than or equal to 10 tons) seed cotton is loaded directly onto the truck after grading and evacuated directly to the plant. Members of the CCPC load cotton on the trucks. Young people are organized into one or two working groups, depending on the size of the cooperative,

Once the truck is loaded, it is accompanied by a village representative (Conveyor) to the factory, and the cotton is weighed in his presence at the weighbridge. The weighing ticket given to the Conveyor serves as the basis for the payment for seed cotton.

The net amount paid to the village is based on the weight of the seed cotton delivered to the gin times the seed cotton price per kilogram, minus the costs associated with operating the market, minus the amount of the cooperative's farm credit for inputs.

A CMDT accountant checks the amount payable, and the net amount is paid into the cooperative's account. All cooperatives have bank accounts. The agents of the cooperatives withdraw the net amount from the bank and are responsible for making individual payments to each cotton producer. The seed cotton and agricultural credit weighing books are used to allow the payment of each producer. After deduction of agricultural credit, each producer receives his/her net payment.

Mr. Ba reported that cotton plays an important role in the country's economy. The primary marketing of seed cotton involves several actors in addition to CMDT, including cotton producers,

the company for the control of scales, the suppliers of marketing materials (weighing scales, canvases, tarpaulins), printers, transporters, banks, etc.

Cotton income enables producers to meet the needs of their families: children's schooling, medical care, renewal or repair of agricultural equipment, habitat improvement, and inputs for cereal crops. The market fees paid to co-operatives are intended for office operations, collective investments such as construction of input storage sheds, construction of health centers, and acquisition of marketing material. The primary marketing of seed cotton is a very important activity in Mali. It mobilizes several actors who benefit from the economic spin-offs, and it's good organization facilitates the correct supply of ginneries.

In response to questions, Mr. Ba explained that a pre-planting price is negotiated between CMDT, the government, and producers. Mali does not use a specific formula, but producer prices are related to the Cotlook A Index. The pre-planting price is paid to farmers via their village co-operatives within a few days of delivery of seed cotton from each village market yard to the gin. Months later, at the end of the season when all results from sales of lint by CMDT are final, an additional "top-up" payment is made if the results of the marketing campaign have been good. Mali operates a price stabilization fund. In seasons when market prices are above the long run average, money from lint sales is invested in the fund, which is held in a bank. When prices are below average, money is taken from the fund

to support prices paid to producers. The fund was last used in 2011 when market prices were highly variable.

Mr. Ba noted that production is rising in Mali because of expanded area. He explained that increases mechanization is enabling the area expansion. He added that the Government of Mali subsidizes the purchase of fertilizer. Mr. Ba's presentation is a statement of the meeting.

Mr. Fatih Dogan, Vice President Mediterranean Textile and Raw Materials Exporters' Association, Turkey, spoke on the topic of, "Economic Aspects of the Issues of Harvesting and Procurement of Raw Cotton and Settlements with Producers." Mr. Dogan reported that farmers in Turkey deliver directly to ginneries and are paid at that day's market level, or they agree with the ginner to fix the price on call later. Ginning starts in September and ends by March. Since prices tend to be lowest at harvest and rise to the season's end, some farmers leave their cotton at the gin on consignment and fix the price later. Prices are fixed mainly at seller's call at a mutually agreed basis off the price at a local exchange. Prices for seed cotton paid to farmers are derived from market prices for lint, adjusted for ginning outturn, color, trash and moisture. The base moisture level is 8.5%, and premiums or discounts are applied after testing. Gins themselves grade seed cotton deliveries against standards for Turkish cotton provided by local exchanges. Market forces, combined with local reputation, ensure fair treatment of farmers.

In addition to market payments, farmers receive

subsidies from the government. To qualify for subsidies, farmers must register with the Ministry of Food, Agriculture and Livestock prior to planting. Ministry officers verify planted area and the observance of good production practices through on-site visits and satellite imagery. After seed cotton is delivered to gins, farmers present documents to the same government office to confirm the ownership, weight, price and quality of seed cotton, the use of a minimum of 20 kilograms of certified planting seed per hectare, and the ownership or rental arrangement for the land on which the cotton was produced. Farmer's bank accounts are credited electronically. The calculation of the subsidy amount is based on a maximum yield of 6,250 kilograms seed cotton per hectare for first plantings and 4,000 kilograms per hectare for the second plantings. Mr. Dogan's presentation is a statement of the meeting.

In response to questions, Mr. Dogan confirmed that each gin evaluates the quality of seed cotton delivered by farmers against standards boxes provided by local exchanges, which are managed by the national government. He also explained that marketing cooperatives in Turkey were inefficient and are no longer used for cotton. Planting seed is developed by both public and private breeders and provided by private seed companies. Farmers plant delinted seed. Payments are made directly to farmers by ginneries.

The CHAIR thanked both speakers and the audience for their participation.

Fifth Breakout Session

Cotton Products and Research Trends

14:15 Hr. Thursday, October 26, 2017

In the Chair: Dr. Rinat A. Gulyaev, Director General, Research Centre in Uzbekistan

Dr. Greg Holt, Research Leader, Agricultural Research Service, USDA, USA, spoke on the topic of, "Can Cottonseed Be a Quality Protein Source for Aquaculture and Humans?" Dr. Holt observed that co-products produced from the cotton gin can be used in a plethora of uses, ranging from animal feed to food to textile products. He focused on the positive impacts from a new research in which a new trait has been introduced into the cotton genome to result in ultra-low expression of *gossypol* in cotton seeds while maintaining normal *gossypol* expression in other parts of the cotton plant. *Gossypol* is a cumulative toxin produced naturally in cotton plants as a defense against predators, including many insects. *Gossypol* binds to iron molecules in hemoglobin and displaces oxygen, causing death. *Gossypol* is sufficiently toxic that it can kill even mature mammals, and current feed use

is limited to mature ruminants who can process a limited quantity of cottonseed meal in their feed rations. The presence of *gossypol* in cotton seed is the single biggest factor limiting value and utilization.

Dr. Holt noted that glandless varieties of cotton have been around since the 1950s, but such varieties are of no commercial value because of their extreme susceptibility to insect damage. However, genetically engineered cotton with ultra-low levels of *gossypol* in the cotton seed has been developed. The new events contain normal levels of *gossypol* in the green material of plants, thus providing protection against insects, but *gossypol* is not expressed in the seeds. Varieties produced with this new trait will have great commercial significance as cotton seed meal and oil will no longer be toxic to people and animals, and the range of possible applications will expand enormously. Global cotton seed production totals between 40 and 50 million tons each year. Cotton seed without *gossypol* could provide 10

million tons of protein meal appropriate for human use, enough for 600 million people a year. Cotton seed meal without *gossypol* will also result in increased applications in aquaculture and other feed uses. Dr. Holt's presentation is a statement of the meeting.

In response to questions, Dr. Holt said that the new technology was nearing the end of the regulatory approval phase, and that commercial varieties may be available as early as 2019.

Mr. Lav Bajaj, Business Executive, Bajaj Steel Industries Ltd. India, spoke on the topic of, "Producing and Conserving Co-products/By-products in the Ginning Process – Ginning Machinery Manufacturer's Perspective." Mr. Bajaj said that each and every part of the cotton crop, including its stems, flowers, roots and bark are valuable & have tremendous potential to enhance the profitability of all stakeholders including farmers and ginneries. There are several cotton by-products which are either under-utilized or disposed of without any value addition. A large

amount of cottonseed is still processed worldwide using traditional methods, leading to a loss of linters and reduced oil recovery.

One-hundred million tons of cotton stalks, which could be a valuable source of renewable energy through the production of briquettes & pellets, are still mostly burnt in field, causing environmental pollution and soil degradation. Cotton stalks can also be used for particle board production.

Mr. Bajaj listed other uses of cotton seed and oil, linters, hulls and gin co-products. Mr. Bajaj's presentation is a statement of the meeting.

Mr. Stephen Kabwe, Senior Researcher, Indaba

Agricultural Policy Research Institute, Zambia, spoke about, "Informal trade in cotton: Understanding drivers, working toward solutions in Zambia and Zimbabwe." Mr. Kabwe reported that increased side selling and undermining of contracts had led to the withdrawal of major investors from the cotton sectors of East Africa. Accordingly, production was declining. He noted that there are 11 actors in Zambia and 16 in Zimbabwe, many of whom do not provide inputs to growers but they actively buy seed cotton during harvest. As much as half of all seed cotton produced in each country is sold to ginner who have not provided inputs. Farmers justify such

sales by saying that they need the money and prices offered by reputable ginner are unfair. Ginners who participate in pirate buying justify their actions saying that they have to have the volume for their gins.

Mr. Kabwe discussed potential policy solutions, including industry regulation, contract enforcement, and farmer education to build trust and facilitate input delivery to farmers. Another policy direction would be to recognize that such efforts have failed in the past, and both countries should attempt to better regulate the open and competitive market structures in existence. Mr. Kabwe's presentation is a statement of the meeting.

Sixth Breakout Session

Recent Developments in Logistics and Insurance Systems

16:15 hrs. Thursday, October 26, 2017

In the Chair: Dr. Rinat A. Gulyaev, Director General, Research Centre in Uzbekistan

Mr. Ted Rekerdres, Chief Executive Officer, Rekerdres and Sons Insurance Agency, Inc., USA, spoke on the topic of, "Cotton Logistics, which includes Cotton Insurance, is not at all BORING!" Mr. Rekerdres differentiated between gambling and insurance: gambling is a speculative risk with the objective of gaining money, while insurance is a transfer of risk with the objective of remaining unharmed by loss. He explained that misrepresentations and fraud undermine insurance coverage. The three most common losses associated with cotton include missing bales within a shipment, country damage and water damage. Other losses stem from

fire, theft, breakage, labor disputes that disrupt shipments, foreign matter, insolvency or arrest of parties to a shipment, general average losses on a shipment and insect infestation. Most insurance claims on cotton shipments are relatively modest at less than \$10,000 per claim, but some claims exceed \$500,000. The greatest dollar value in claims come from fire and theft. Mr. Rekerdres' presentation is a statement of the meeting.

Mr. Rustam Azimboev, Head of Transport and Logistics Department, Uzpakhtaexport, JSC, Uzbekistan spoke on the topic of "Actual Issues of Cotton Fiber Logistics System." Mr. Azimboev described existing transportation corridors from Uzbekistan to Europe and Asia. There are direct rail links to Tallinn, Riga, Klaypeda, Brest,

Chop, Ilichevsk, and Poti in the west, Nahodka and Shanghai in the east and Bandar Abbas to the south. Uzbekistan maintains 21 cotton terminals and 5 free warehouses with a total capacity of covered storage of 400,000 tons. Mr. Azimboev described efforts to ensure fast, efficient and low-cost storage and movement of cotton from Uzbekistan, including optimizing the use of loading capacity and weight capacity of railroad wagons, use of automated equipment to speed loadout operations and modernizing loading yards used in handling export cargoes. Mr. Azimboev's presentation is a statement of the meeting.

The CHAIR thanked both presenters and all participants in the session.