



**International
Cotton
Advisory
Committee**

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STRUCTURE OF COTTON RESEARCH, INPUT SUPPLY AND TRANSFER OF TECHNOLOGY



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Introduction

The 'Structure of cotton research, input supply and transfer of technology' is a triennial publication of the ICAC. In an era where information is constantly updated, and technologies are rapidly upgraded, triennial publications run the risk of getting outdated quickly to become less relevant within a short time after they are published. Keeping in tune with the changing times, this current report marks the end of its triennial track, after which it merges into a new annual publication titled 'COTTON PRODUCTION AND ECONOMICS DATA BOOK' that will make its grand entry in December 2019.

The previous reports underwent several changes each time a new report was published once every three years. The last time when it was published, its name was changed from 'current research projects' to 'structure of cotton research, input supply and transfer of technology'. Details on research projects and list of researchers by discipline, were deleted and maps were added in the 2015 version. These changes were made apparently attuned to the changing times that are characterized by the web-based internet and information revolution.

The current report has been restructured into country-wise chapters that contain complete information of each country, to replace the previous format wherein information of each country was split and presented in separate sections on structure of research, research organizations, farmers organizations, ginners organizations, spinners organizations and cotton maps. Not only have the design and layout been changed, but a few new aspects have been added. The maps and organogram flow charts have been harmonized to a common format. Two new graphs on the 30-year temporal changes in area and yields have been added for almost all the cotton growing countries, to give an idea of the changes in cotton scenario so that the area and yield dynamics can be related to the structure of research, input supply and extension. The maps for each country have been linked to the latest available data on area and production in different provinces or regions of the country.

This report has basic details of the research organizations, links and relationships among organizations, main funding sources, procedures that are adopted in the approval of new varieties, their multiplication, seed supply, procurement of agrochemicals, and organizational structure of technology transfer in 45 major cotton growing countries of the world. It also provides a basic narrative on the cotton scenario, structure of cotton research and key contacts of various organizations of farmers, ginners, spinners, textile mills and national and international organizations.

The report will be available free of charge and can be downloaded from www.icac.org.

Keshav R. Kranthi
Head
Technical Information Section

Introduction

La “ Structure de la recherche sur le coton, approvisionnement en intrants et transfert de technologie ” est une publication triennale de l’ICAC. À une époque où l’information est constamment actualisée et où les technologies sont rapidement mises à jour, les publications triennales risquent de devenir rapidement désuètes et moins pertinentes peu de temps après leur publication. En phase avec notre époque, le présent rapport marque la fin de son parcours triennal, après quoi il s’intégrera à une nouvelle publication annuelle intitulée “COTTON PRODUCTION AND ECONOMICS DATA BOOK” (Grand livre des données sur la production et l’économie dans le domaine cotonnier) qui paraîtra pour la première fois en décembre 2019.

Les rapports précédents ont subi plusieurs changements à chaque parution d’une nouvelle édition, tous les trois ans. Le nom de la dernière édition a été changé de “Projets de recherche cotonnière en cours” à “Structure de la recherche sur le coton, approvisionnement en intrants et transfert de technologie”. Les détails sur les projets de recherche ainsi que la liste des chercheurs par discipline ont été supprimés et des cartes ont été ajoutées dans la version 2015. Ces changements ont été faits pour s’adapter aux changements de l’époque, caractérisés par la révolution de l’Internet et de l’information sur le Web.

Le présent rapport a été restructuré en chapitres par pays avec des informations complètes sur chaque pays, en remplacement du format précédent où les informations de chaque pays étaient divisées et présentées dans des sections distinctes sur la structure de la recherche, les organisations de recherche, les organisations paysannes, les organisations d’égreneurs, les organisations de filateurs et les cartes du coton. Non seulement la conception et la mise en page ont été modifiées, mais quelques nouveaux aspects ont été ajoutés. Les cartes et les organigrammes ont été harmonisés selon un format commun. Deux nouveaux graphiques sur l’évolution temporelle de la superficie et du rendements sur 30 ans ont été ajoutés pour presque tous les pays producteurs de coton, afin de donner une idée de l’évolution du scénario du coton, afin de lier la dynamique de la superficie et du rendement à la structure de la recherche, à l’approvisionnement en intrants et à la vulgarisation. Les cartes de chaque pays reposent sur les dernières données disponibles pour la superficie et la production dans différentes provinces ou régions du pays.

Ce rapport contient des détails de base sur les organismes de recherche, les liens et les relations entre les organismes, les principales sources de financement, les procédures adoptées pour l’approbation des nouvelles variétés, leur multiplication, l’approvisionnement en semences, l’approvisionnement en produits agrochimiques et la structure organisationnelle du transfert de technologie dans 45 principaux pays producteurs de coton dans le monde. Il fournit également un récit de base sur le scénario du coton, la structure de la recherche sur le coton et les contacts clés de diverses organisations d’agriculteurs, d’égreneurs, de filateurs, d’usines textiles et d’organisations nationales et internationales.

Le rapport est disponible gratuitement et peut être téléchargé sur www.icac.org.

Keshav R. Kranthi
Chef
Section de l’Information technique

Introducción

La ‘Estructura de la investigación en algodón, el suministro de insumos y la transferencia de tecnología’ es una publicación trienal del CCIA. En una era en la cual la información y las tecnologías están en constante actualización y renovación, las publicaciones trienales corren el riesgo de quedar obsoletas rápidamente y dejar de ser pertinentes poco tiempo después de su publicación. En sintonía con los tiempos cambiantes, este informe actual marca el final de su trayectoria trienal, tras lo cual se fusionará en una nueva publicación anual titulada ‘LIBRO DE DATOS DE PRODUCCIÓN Y ECONOMÍA SOBRE EL ALGODÓN’ que se editará por primera vez en diciembre de 2019.

Los informes anteriores experimentaron varios cambios cada vez que se publicaba un nuevo informe una vez cada tres años. En su última publicación, su título cambió de “proyectos actuales de investigación” a “estructura de investigación en algodón, suministro de insumos y transferencia de tecnología”. En la versión de 2015, se eliminaron los detalles sobre los proyectos de investigación y la lista de investigadores por disciplina y se agregaron mapas. Aparentemente, esos cambios se hicieron para adaptar el informe a los tiempos cambiantes que se caracterizan por la revolución de la Internet y la información basadas en la web.

El informe actual se reestructuró en capítulos por países que contienen información completa de cada país, con la intención de reemplazar el formato anterior en el cual la información de cada país estaba fragmentada y presentada en secciones separadas sobre la estructura de la investigación, las organizaciones de investigación, las organizaciones de productores, las organizaciones de desmotadores, las organizaciones de hilanderos y los mapas del algodón. No solo se modificó el diseño y la diagramación, sino que también se incorporaron algunos aspectos nuevos. Los mapas y los organigramas se armonizaron en un formato común. Se agregaron dos gráficos nuevos sobre los cambios temporales de un lapso de 30 años en superficie y rendimientos para casi todos los países productores de algodón, con el objetivo de dar una idea de los cambios en el panorama algodonero de manera que la dinámica de la superficie y los rendimientos se pueda relacionar con la estructura de la investigación, el suministro de insumos y los servicios de extensión. Los mapas de cada país se han asociado con los últimos datos disponibles sobre superficie y producción en diferentes provincias o regiones del país.

Este informe contiene detalles básicos de las organizaciones de investigación, los vínculos y las relaciones entre las organizaciones, las principales fuentes de financiación, los procedimientos adoptados en la aprobación de nuevas variedades, su multiplicación, el suministro de semillas, la compra de agroquímicos y la estructura organizativa de la transferencia de tecnología en 45 principales países productores de algodón del mundo. Además, proporciona una narrativa básica sobre el panorama algodonero, la estructura de la investigación en algodón y los contactos clave de varias organizaciones de productores, desmotadores, hilanderos, fábricas textiles y organizaciones nacionales e internacionales.

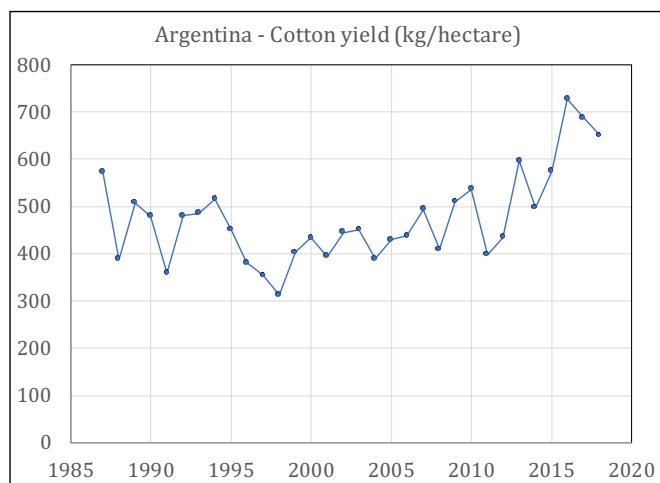
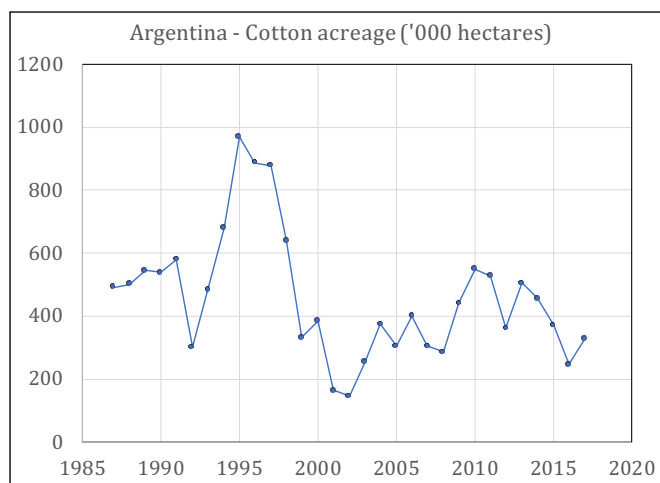
El informe estará disponible sin costo alguno y se puede descargar desde www.icac.org.

Keshav R. Kranthi
Jefe de la Sección de Información Técnica

Argentina

Cotton in Argentina

The average cotton acreage in Argentina during the period 2008 to 2018 was 404,000 hectares at an average lint yield of 548 Kg per hectare.



Structure of Cotton Research

The National Institute of Agrarian Technology-INTA (Instituto Nacional de Tecnología Agropecuaria) Resistencia, Chaco is the main agency for research on cotton. Cotton research in Argentina is conducted at universities, National Council of Science and Technology-CONICET (Consejo Nacional de Ciencia y Tecnología) and the National Institute of Agrarian Technology-INTA (Instituto Nacional de Tecnología Agropecuaria) Resistencia, Chaco. The experimental stations, mainly the INTA stations, undertake basic and applied research in a ratio of 30:70 respectively.

The INTA is a decentralised agency of the Ministry of Agriculture, Livestock and Fisheries. Cotton research at INTA is formulated within the National Industrial Crops Pro-

gram (PNIND). The project 'technological Innovations for Sustainable Development of the Argentine Cotton' at INTA aims to coordinate institutional resources to contribute to genetic improvement, plant protection, sustainable crop management and quality of cotton fibre.

Each specific project includes individual disciplines, with emphasis on plant genetics and breeding, protection, crop production (models and production systems, sustainable management, eco-physiology), quality (certification schemes, quality of products and inputs), soils, economy and rural development (extension and transfer). It also has an agreement of technological link between INTA and cotton producing provinces, whose main objective is to acquire knowledge for the development of environmentally friendly biological control strategies for the boll weevil. Assistance Program for Improving the Quality of Cotton Fibre (PROCALGODON), coordinated by the Ministry of Agriculture, Livestock and Fisheries, was created with the aim of improving the quality of cotton fibre and increase competitiveness. INTI Textiles also carries out research and development in cotton.

The INTA and the Association for the Promotion of Cotton Production (APPA) of Santa Fe, have an agreement to support research, development and extension of topics identified and prioritised by the cotton cluster, from primary production to industrial processes. In addition, priority is given to the training of human resources and the links with universities and research Centres both nationally and internationally (Brazil, Colombia, Paraguay, Turkey, Australia, among others)

There are several sources of funding for the national research system, ranging from internal funds of institutions plus competition for public and private funds.

Variety Approval and Seed Supply

There is a 'National register of cultivars' and the 'National registry of cultivars property' that source seeds from the 'National Institute of Seeds-INASE (Instituto Nacional de Semillas)'. New cotton varieties are presented to a Technical Advisory Committee (TAC) composed of specialists from the public and private sectors and the National Seed Commission (CONASE) which is dependent on INASE. The process begins with descriptive-data on agronomic characteristics of the new proposed varieties and new genotypes with economically important traits such as disease tolerance, increased industrial output etc. The claims are supported by experimental tests to validate the traits. These experiments are performed for at least two years at three test sites in the cotton regions prior to approval of the varieties.

Currently the supply of cotton seed is predominantly private, since 98% of the area is planted with biotech varieties. The company 'Densus' is the leading processor and

distributor of certified seed. In addition, other distributors, cooperatives and private companies are also involved in seed business. INTA has conventional varieties, even though they occupy a small percentage of the planted area. There are also public programs that allow the purchase of seed and input financing for producers.

Fertiliser and Pesticide Supply

Farmers buy fertilisers from private suppliers, agrochemical companies and cooperatives, in the same way as other inputs. The current cotton production system in Argentina is based on planting biotech cultivars tolerant to the herbicide glyphosate, resistant to Lepidoptera pests and use narrow row for shortening the crop duration. Cotton producers get pesticides through the private commercial enterprises. Sometimes pesticides are also available in the showrooms of the cooperatives to which the farmers belong. In exceptionally cases, the state or provincial government may recommend a specific pesticide to control a particular pest, involving a serious threat to production. The vast majority are products of chemical origin and in a few cases may be of biological origin, or even minerals. The largest pesticide companies are Syngenta, Bayer, DuPont, Dow, Cheminova, BASF and Summit-Agro.

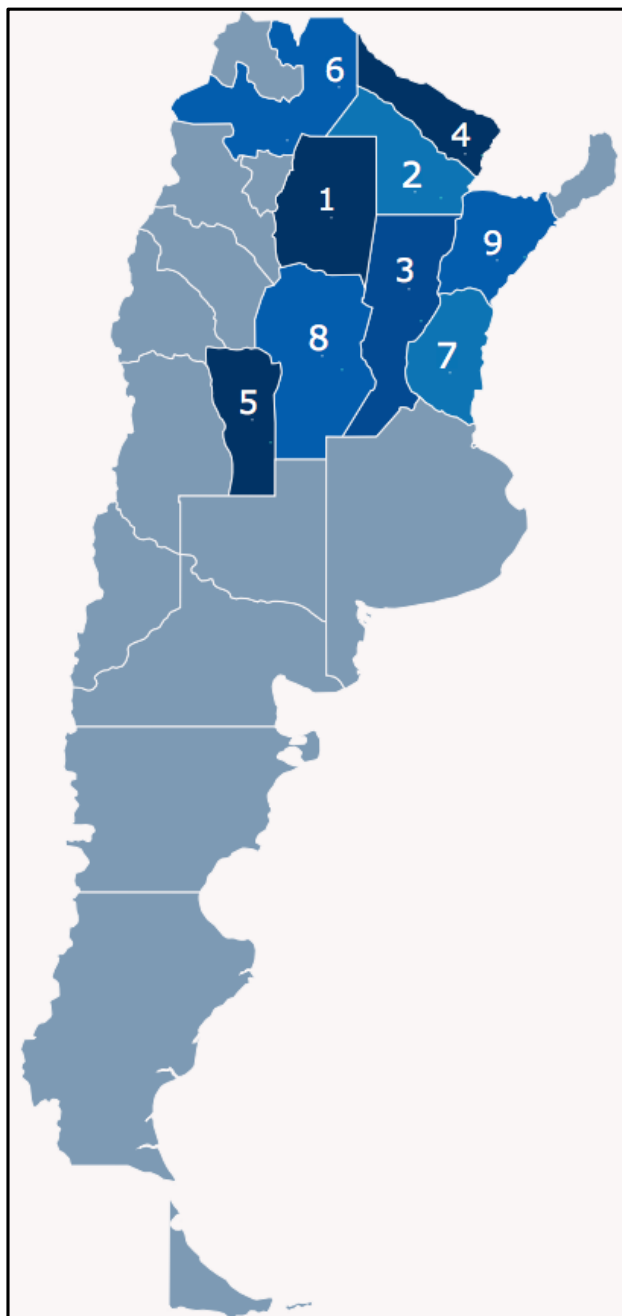
Technology Transfer

Technology transfer system is organised into two main sectors: the public, such as the INTA, universities, ministries of the provincial and national governments; and the private sector and professional advisors who handle logistics and transfer from companies, cotton producers' associations and cooperatives that generate their own technologies. In the case of public-institutions, new developments/research products are transferred through the following channels:

- Training professionals from the private sector linked to cotton production or direct relationship with producer groups.
- Capacity building programmes to producers and diverse actors of the cotton cluster from primary production to industry.
- Postgraduate training programs in cotton for masters, doctorate and independent students.
- Technology transfers programs of institutions such as INTA with their projects such as the 'Rural PROFEDER Change II' where institution professionals directly assist producers to get organised into groups.

- Technology dissemination systems and mass communication media such as television, radio, broadcast graphics, educational materials, display materials which are adjusted to different levels of production strata.
- Meetings and conferences are used in technology transfer.

ARGENTINA COTTON MAP



ARGENTINA: COTTON PRODUCTION DATA 2018 (estimates)

S.No		Area ('000 Hectares)	Production (M Tonnes)
1	Santiago del Estero	127	0.128
2	Chaco	124	0.088
3	Santa Fe	53	0.035
4	Formosa	9	0.004
5	San Luis	5	0.007
6	Salta	4	0.003
7	Entre Rios	2	0.0003
8	Cordoba	1	0.003
9	Corrientes	0	0.0001
	ARGENTINA	324	0.2684

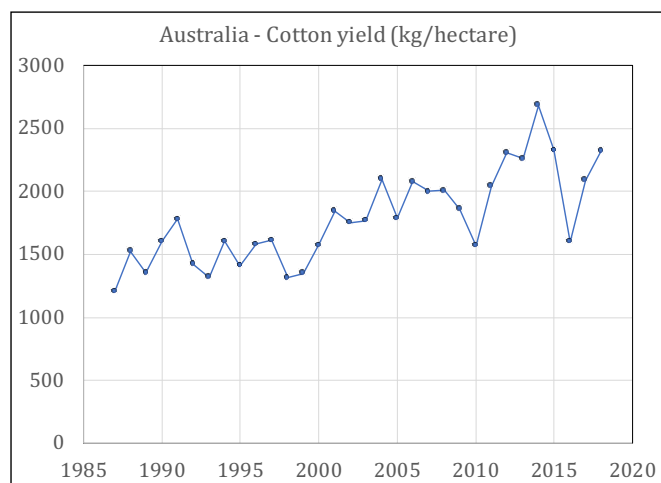
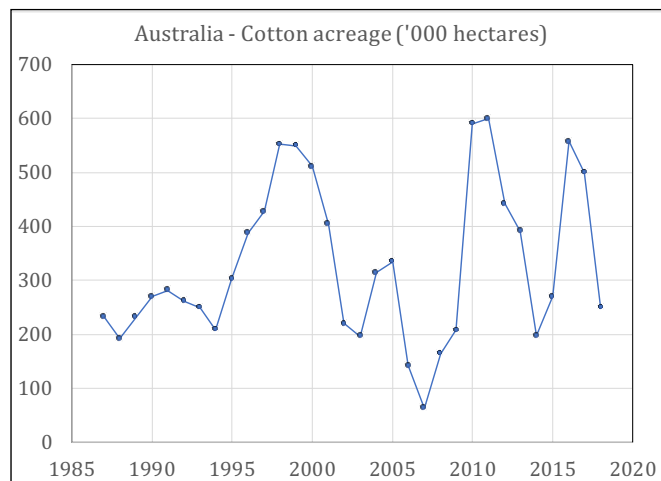
KEY CONTACTS IN ARGENTINA

Institution	Contact Address
Research Institutions	
INTA (Instituto Nacional de Tecnología Agropecuaria)	www.inta.gob.ar
CONICET (Consejo Nacional de Ciencia y Tecnología)	www.conicet.gov.ar
Universidad Nacional del Nordeste	www.unne.edu.ar
Universidad Nacional de Santiago del Estero	www.unse.edu.ar
Universidad Nacional del Litoral	www.unl.edu.ar
Universidad Católica de Santa Fe	www.ucsf.edu.ar
Producers Organisations	
Cooperativas Agrícolas Algodoneras (varias)	
Unión Agrícola de Avellaneda (UAA)	www.uaa.com.ar
Unión de Cooperativas Algodoneras Limitada (UCAL)	Osvaldo Previale Email: contacto@appasantafe.org.ar
Asociación para la Promoción de la Producción Algodonera (APPA)	www.appasantafe.org.ar
Federación Agraria Argentina	www.faa.com.ar
Confederación Intercooperativa Agropecuaria (ConInAgro)	www.coninagro.org.ar
Sociedad Rural Argentina (SRA), Otras	www.sra.org.ar
Organisations	
Asociación de Desmotadores Algodoneros Argentinos	
Cámara Algodonera Argentina	www.camaraalgodonera.com.ar
Trade and Textile Associations	
Association for the Promotion of Cotton Production (APPA) Calle 16 N°469, (3561) Avellaneda - Santa Fe (03482) - 482424	contact@appasantafe.org.ar administracion@appasantafe.org.ar
Federación Argentina de Industrias Textiles Fadit (F.I.T.A.)	Eduardo Detoma, General Manager
Reconquista 458 - 9 Piso, C1003ABJ - Buenos Aires	Tel: (+54-11) 4394 3700
Web: www.fadit-fita.com.ar	Fax: (+54-11) 4325 6286 Email: fadit@fadit-fita.com.ar

Australia

Cotton in Australia

The average cotton acreage during the period 2008 to 2018 was 379,000 hectares at an average lint yield of 2096 Kg per hectare.



- The Queensland Government's Department of Agriculture and Fisheries,
- The NSW Department of Primary Industries
- Australian National University,
- Deakin University,
- Griffith University,
- Macquarie University,
- University of Southern Queensland,
- Queensland University of Technology,
- University of Melbourne,
- University of New England,
- University of New South Wales,
- University of Queensland,
- University of Southern Queensland,
- University of Sydney,
- University of Technology, Sydney and
- University of Western Sydney

In 2012 these key cotton research organisations formed the Cotton Innovation Network to coordinate research in the Australian cotton industry to address a number of key issues and identify key drivers. Public investment in cotton research and development is funded through an industry levy and matching Australian Government contributions. Cotton farmers pay a levy of \$2.25 for each 227-kilogram bale of cotton. Cotton levy revenue is collected at the point of ginning, that is, when cotton has been picked and delivered to cotton gins. This occurs from March to September of each calendar year; therefore, cotton levy revenue in any financial year is drawn from two consecutive cotton crops. The provision of cotton research and development is coordinated at organisational and wider industry levels. CRDC, for example, works in collaboration with cotton industry bodies and other rural Research and Development Corporations (RDCs) to achieve strategic outcomes for the industry and to leverage higher returns for its investments. The Cotton Innovation Network provides a formal mechanism to coordinate the cotton industry's research and development activity and ensure a collaborative and cohesive approach to achieving the industry's long-term goals.

Structure of Cotton Research

Cotton Research and Development Corporation, Narrabri, NSW plays an important role in cotton research. The Australian cotton research system is a network of professional disciplines, public institutions, non-profit organisations and private companies bound by legislation and commercial relationships. The agencies involved in the cotton research system include:

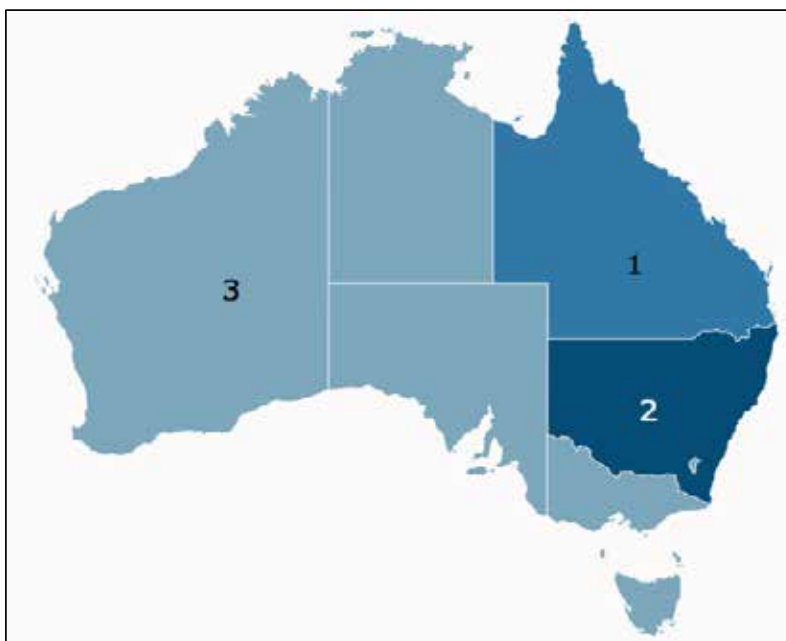
- The Commonwealth Scientific and Industrial Research Organisation (CSIRO),
- The Cotton Research and Development Corporation (CRDC),
- Cotton Australia,
- Cotton Seed Distributors,
- The Australian Government's Department of Agriculture and Water Resources,

Technology Transfer

Transfer of technology is primarily conducted through the Australian cotton industry's extension program 'CottonInfo'. It is co-funded by three core members of the Australian cotton research system: CRDC, Cotton Australia and Cotton Seed Distributors. 'CottonInfo' is designed to service the commercially unmet cotton research and development information needs of growers and to support industry efforts to improve the adoption of R&D, enable successful industry expansion, preparedness to respond to biosecurity threats and assist in the event of natural disasters. In addition, the Australian cotton industry has a well-established network of agronomists, consultants and service providers, who assist with the transfer of information and commercial technologies to cotton growers.

KEY CONTACTS IN AUSTRALIA

Institution / Mailing Address	Contact Person, Position
CRDC www.crdc.com.au	Bruce Finney, Executive Director
Department of Agriculture (Commonwealth) www.agriculture.gov.au	Daryl Quinlivan, Secretary
Department of Agriculture and Fisheries (QLD) www.daf.qld.gov.au	Garry Fullelove, General Manager, Crop and Food Science
Department of Primary Industries (NSW) www.dpi.nsw.gov.au	Alison Bowman, Director, Productivity and Food Security
CSIRO www.csiro.au	John Manners, Director, CSIRO Agriculture
Australian Council of the Deans of Agriculture (representing the universities) www.acda.edu.au	Neal Menzies, President
Cotton Innovation Network www.crdc.com.au/cotton-innovation-network-0	Bruce Finney, Secretariat
Cotton Seed Distributors Ltd www.csd.net.au	Peter Graham, Managing Director
Australian Association of Cotton Scientists www.cottonresearch.org/About_AACS	Paul Grundy, Chair
Cotton Australia www.cottonaustralia.com.au	Adam Kay, CEO
Australian Cotton Ginners Association	Andrew van der Stok, President
Australian Cotton Shippers Association www.austcottonshippers.com.au	Cliff White, Chair
Cotton Classers Association of Australia	Greg Parle, President
Crop Consultants Australia www.cropconsultants.com.au	Jamie Iker, President
Trade and Textile Associations	
Australian Cotton Shippers Association (ACSA) Office and Secretariat PO Box 4, Annerley QLD 4103	Cliff White, Chairman Tel: +61 7 3848 3823 Email: secretariat@austcottonshippers.com.au

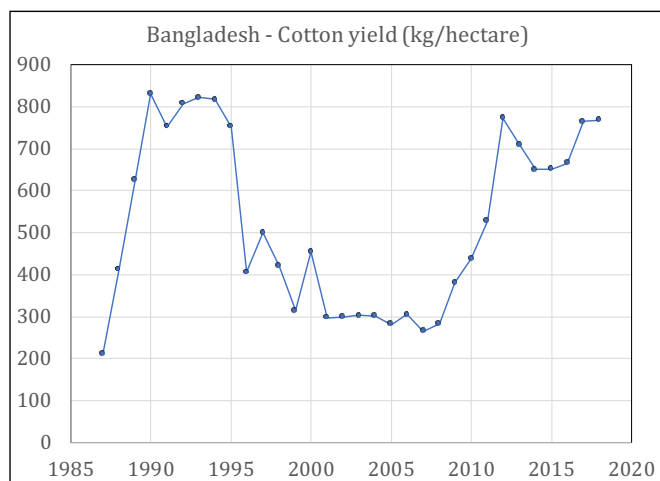
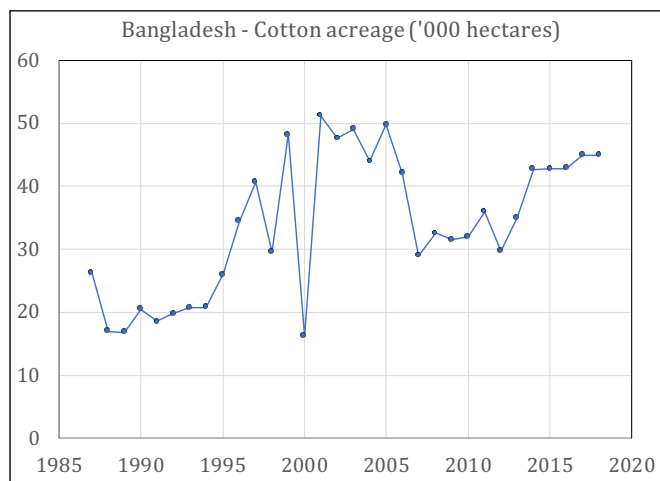
AUSTRALIA COTTON MAP**AUSTRALIA: COTTON PRODUCTION DATA 2017 (estimates)**

S.No		Area ('000 Hectares)	Production (M Tonnes)
1	New South Wales	310	0.59
2	Queensland	190	0.37
3	Western Australia	2	0.004
	AUSTRALIA	502	0.96

Bangladesh

Cotton in Bangladesh

The average cotton acreage during the period 2008 to 2018 was 38,000 hectares at an average lint yield of 601 Kg per hectare.



Structure of Cotton Research

The Cotton Development Board (CDB), Dhaka is responsible for research on various aspects of cotton production. The Board is under the Ministry of Agriculture. The responsibility of cotton research was transferred from the Bangladesh Agricultural Research Institute (BARI) to the CDB in 1991. The main activities of the CDB are research, extension, seed production, training, marketing and ginning and any other R&D activities important for cotton production.

The Cotton Development Board (CDB) has been conducting research on different aspects of cotton production since 1991. The main areas of cotton research in Bangladesh include development of hybrid-cotton and short

duration high yielding cotton varieties with desirable fibre characteristics; generation of agronomic management technologies to increase productivity; improving soil fertility by integrated management of organic and inorganic fertilisers and identification of bio-pesticides in controlling cotton insect pest and cotton disease management. Besides, research on stress management has been prioritised to expand cotton cultivation in the hill, char, saline and drought areas combining traditional knowledge and skill with biotechnology tools.

Two types of cotton are produced in Bangladesh e.g. Upland cotton (*Gossypium hirsutum*) and Hill cotton (*Gossypium arboreum*). Upland cotton is grown in about 30 districts of plain areas and Hill cotton is grown in three districts of Chittagong hill tract areas as 'jhum' cultivation which is characterised by mixed cropping. Cotton hybrids are being cultivated in Bangladesh for the last few years through Public-Private Partnership (PPP). Within this initiative, Supreme Seed Co. Ltd. has imported hybrid seed from China. The Cotton Development Board is responsible for adaptability trials. Cotton hybrids are widely accepted by the farmers due to high yields (3-4 t/ha seed cotton), high Ginning Out Turn (GOT) and superior fibre characteristics.

The National Committee on Biosafety (NCB) conducted 'contained testing' of biotech hybrids of cotton from July 2015 at Sreepur Research Farm. With the permission of Ministry of Agriculture (MoA), Material Transfer Agreement (MTA) was signed between the Cotton Development Board and Hubei Provincial Seed Group Co. Ltd., Wuhan, China to make available *Bt*-hybrid seeds for contained trials.

The Cotton Development Board has research programs in five disciplines, plant breeding, agronomy, soil science, entomology and plant pathology.

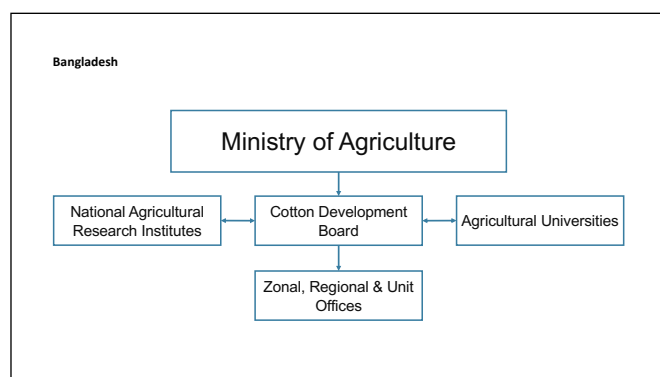
The Board has five cotton research centres/farms/stations at Sreepur-Gazipur; Sadarpur-Dinajpur; Jagadishpur-Jessore; Mahigonj-Rangpur and Balaghata-Bandarban with three Hill-cotton research sub-stations at Raicha-Bandarban; Kaokhali-Rangamati and Matiranga-Khagrachari.

The total manpower of these five farms is 60 including 33 researchers.

The main and regular source of funding is the revenue budget of the Bangladesh Government. Besides, some important research activities are supported under the annual development project of the Bangladesh Government.

Variety Approval and Seed Supply

The most promising progenies are tested in Preliminary Yield Trials (PYT), Advance Yield Trials (AYT) at regional cotton research Centres. The most superior genotypes are compared at different zones of the Cotton Development Board under Candidate Variety Trials (CYT). The best genotypes are released as new varieties. So far, the Board has



released 16 open-pollinated *G. hirsutum* (upland) varieties, three varieties for Hill cotton (HC-1, HC-2 and HC-3) and one hybrid.

'Planting seeds' of varieties are produced at the Cotton Development Board Research Centres and distributed to

farmers through the extension wing of the Board. 'Hybrid seeds' are supplied to the farmers through Public-Private Partnership.

Fertiliser and Pesticide Supply

Farmers purchase fertilisers and pesticides directly from the local authorised fertiliser dealers. The Board unit of-fices help farmers in procuring fertilisers and pesticides.

Technology Transfer

The extension wing of the Cotton Development Board is responsible for technology transfer to farmers by adopting various tools like field demonstrations, field days, farmer rallies, farmer gatherings, farmer motivation meetings, trainings, workshops/seminars, publication of booklets/leaflets and broadcasts on radio/television.

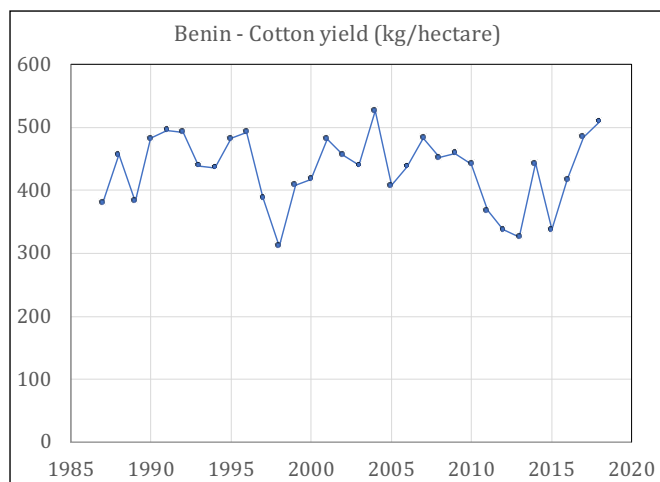
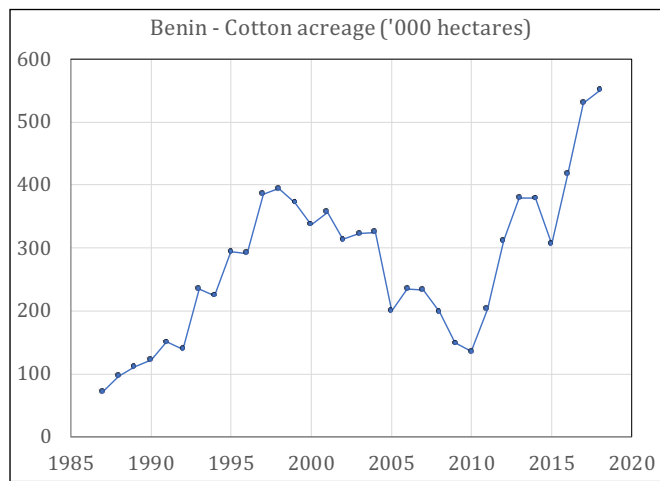
KEY CONTACTS IN BANGLADESH

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Cotton Development Board Khamarbari, Farmgate, Dhaka, Bangladesh, Postal Code-1215 www.cdb.gov.bd	Dr. Md. Farid Uddin Executive Director Email: mfaridcdb@gmail.com Tel: 880-2-55028206 / Fax: 880-2-8114743
Cotton Research Centre, Sreepur, Gazipur	Md. Khalequzzaman, Scientific Officer, Email: khalequzzaman30@yahoo.com
Cotton Research Centre, Sadarpur, Dinajpur	H.M. Syfullah Azad Scientific Officer, Email: syfullahazad@gmail.com
Cotton Research Centre, Jagadishpur, Jessore	M. D. Abed Ali, Scientific officer Email: abed.ali1972@gmail.com
Cotton Research Station, Mahigonj, Rangpur	Md. Rezaul Amin Principle Scientific Officer Email: mramin1968@gmail.com
Hill Cotton Research Centre, Balaghata, Bandarban	Mong Sanu Marma Scientific Officer Email: marma_mong@yahoo.com
Farmers Associations	None
Cotton Ginners Association	
Golam Saber Lal Al-Madina Ginning industry Harisankarpur Kushtia, Bangladesh	
Trade and Textile Associations	
Bangladesh Cotton Association Mahtab Centre (12th Floor) 177, Shahid Syed Nazrul Islam Sharani Bijoy Nagar, Dhaka-1000, Bangladesh www.bangladeshcotton.org	Mehdi Ali, President Tel: +8802 9335731 Fax: +8802 8301553
Bangladesh Textile Mills Association - BTMA. Level-8, UTC Bhababn. 8, Panthapath, Kawran Bazar. Dhaka-1215, Bangladesh	Tapan Chowdhury, President, Tel: 8833047-56 Fax: 880-2-8828608-9 Email: info@squaregroup.com

Benin

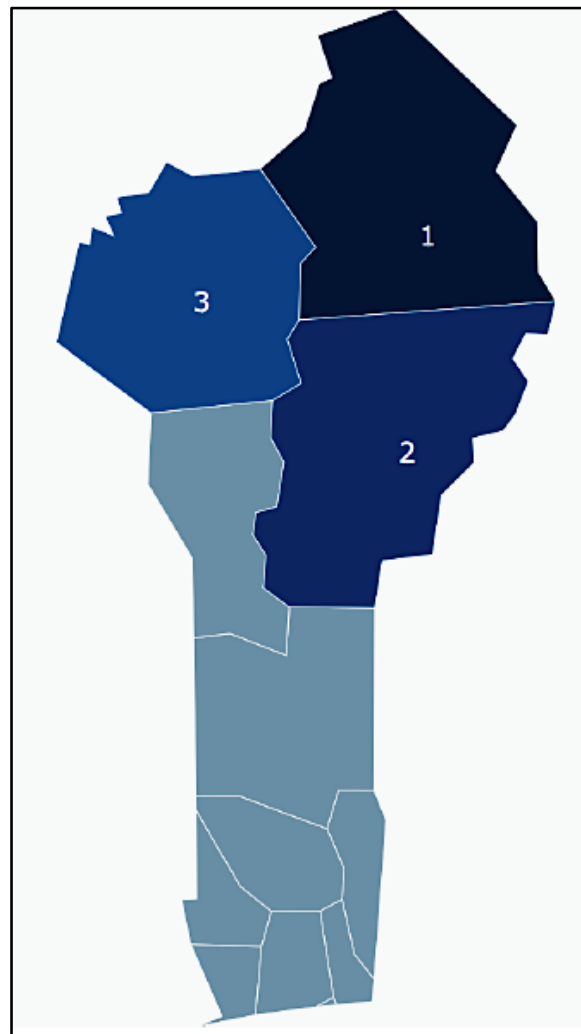
Cotton in Benin

The average cotton acreage during the period 2008 to 2018 was 324,000 hectares at an average lint yield of 416 Kg per hectare.



The northern and central regions of Benin are known as the cotton belt because of the intensive cotton production in these areas. Cotton production is mainly done in small-scale farms. Generally, cotton contributes to a large part of the export earnings, sometimes to an extent of 70%. In 2016 raw cotton accounted for 17.74% of the export earnings. Agriculture provides livelihood and employment to more than 70% of the population who live in the rural areas.

BENIN COTTON MAP



BENIN: COTTON PRODUCTION DATA 2017 (estimates)

S.No	Province	Area ('000 Hectares)	Production (M Tonnes)
1	Alibori	212	0.089
2	Borgou	90	0.037
3	Atakora	85	0.034
4	Others	63	0.025
	BENIN	450	0.185

Structure of Cotton Research

Research on cotton is carried out at the National Institute of Agriculture Research (INRAB) and the International Institute of Tropical Agriculture (IITA). Cotton production aspects are covered under the Ministry of Agriculture, Livestock breeding and Fishing (MAEP). The INRAB works on germplasm collection and conservation, varietal development, supply of improved seeds, agronomy, regeneration of soils with organic Fertiliser, insect pest and nematode management and disease control.

Fertiliser and Pesticide Supply

The l'Association Interprofessionnel du Coton (AIC), is the main supplier of fertilisers and pesticides. In 2013, the Government of Benin established a new management sector called 'Cadre Institutionnel Transitoire de Gestion de la

Filiere Cotton' to revive the cotton sector through training programmes to small farmers, public-private partnerships (PPPs), and farmer's organisations. The Cadre Institutionnel Transitoire de Gestion de la Filiere Cotton also created village cooperatives and strengthened input committees.

Technology Transfer

Extension services are provided by the CerPA (Regional Centres for Agriculture Promotion) through trainings at the department level and extension services to farmers. Several international organisations such as the United Nations Development Programme (UNDP), The World Bank, FAO, United Nations Industrial Development Organisation (UNIDO), the German Technical Cooperation (GTZ) and the Agence Francaise de Developpement (AFD) support research projects and technology transfer.

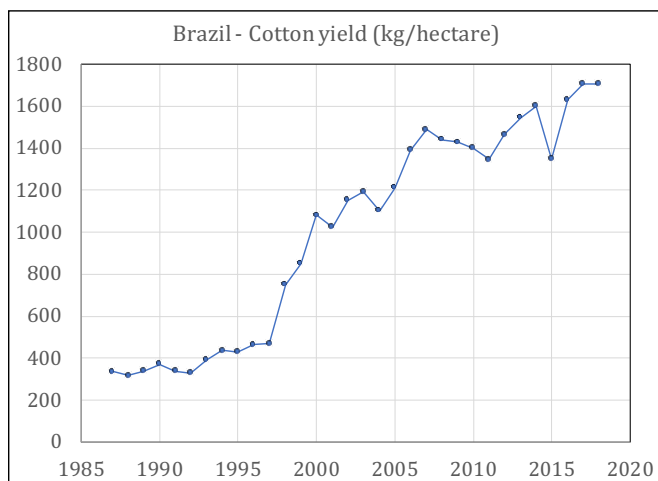
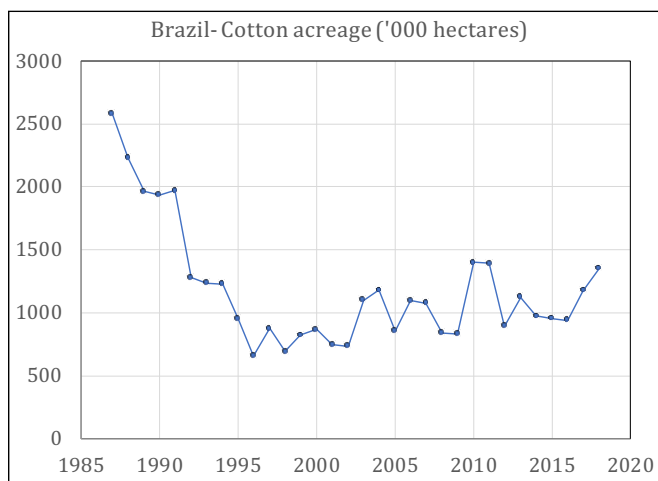
KEY CONTACT IN BENIN

Institution / Mailing Address	Contact Person, Position
Textile Association	
Association Cotonnière Africaine 06 BP 2944 PK3 AKPAKPA Cotonou (Bénin) www.africoton.org	IYA Mohammed, Président Tel: +229-21 33 73 31 Mobile: +229-90 93 85 31 Fax: +229-21 33 73 31 E-mail: contact@africoton.org

Brazil

Cotton in Brazil

The average cotton acreage during the period 2008 to 2018 was 1,081,000 hectares at an average lint yield of 1511 Kg per hectare.



Structure of Cotton Research

The Brazilian Agricultural Research Corporation - EMBRAPA (Empresa Brasileira de Pesquisa Agropecuária) is a public institution with 9,767 employees located in 46 research and service units. It also develops scientific cooperation programs - LABEX in North America, Europe and Asia, as well as technical cooperation in Africa and South America. The Research team consists of 2,424 researchers, 84% with PhD or post-doctorate in universities in Brazil and abroad. Under the guidance of the Directorate of Research and Development, it operates in a network with institutions of the National System of Agricultural Research - SNPA and with researchers from various parts of the world. EMBRAPA Cotton (Embrapa Algodão), located

in Campiña Grande, Paraíba, is one of the main research units and employs 216 people, of whom 61 are researchers and at least 40 of them are full-time. The main source of funding is the Government of Brazil. The other resources are research contracts with foundations and private institutions and / or private companies. Other institutions involved in cotton research are:

- **Mato Grosso Institute of Cotton – IMAmT** (Instituto Matogrossense do Algodão): The state of Mato Grosso is responsible for over 60% of the Brazilian cotton growing area. It is a private institution maintained by cotton farmers of the State of Mato Grosso, that is mainly involved in cotton breeding. The Cotton Farmers Association of the State of Mato Grosso - AMPA and private companies provide funding for the Institute.
- **Mato Grosso Foundation – FMT** (Fundação Mato Grosso) is an important private research institution of Mato Grosso state, located in the main cotton producing area of Brazil, which conducts research in cotton breeding, soil fertility, control of pests, diseases and weeds. Cotton farmers association and other private companies provide funding for the FMT.
- **Bahia Foundation** (Fundação Bahia) is a private institution of Bahia state that works with Embrapa Cotton as a partner. The Foundation develops projects mainly in cotton breeding and control of pests and diseases. Cotton farmers association and private companies fund the Foundation.
- **Goiás Foundation** (Fundação Goiás) is a private institution that develops cotton breeding projects, soil fertility, pest and disease control and agronomy. The Goias farmers association and private companies fund the Foundation.
- **Agronomic Institute of Campiñas – IAC** (Instituto Agrônomo de Campiñas) is one of the oldest institutions on agricultural research in Brazil. The sources of funding are the Government of São Paulo state, contracts with cotton farmer's associations and private foundations. Five researchers are devoted to cotton research.
- **Agronomic Institute of Paraná – IAPAR** (Instituto Agrônomo do Paraná) is a traditional institution of Paraná state that develops projects and conducts research on several crops, including cotton. There are two researchers working with cotton in plant pathology and cotton breeding. The Government of Paraná State funds it.
- **The Agricultural Science Institute of the Federal University of Uberlândia – UFU** (Instituto de Ciências Agrárias, da Universidade Federal de Uberlândia) is an important University in the Cerrado region that has undergraduate and post graduate courses on agronomy and develops experiments in cotton breed-

ing and plant pathology for the state of Minas Gerais.

- **The College of Agricultural Sciences of the Federal University of Large Dourados – UFGD** (Faculdade de Ciências Agrárias, Universidade Federal da Grande Dourados) is an important institution in the Mato Grosso do Sul state, in the Cerrado region. This institution has an important research program on cotton pest control.
- **The High School of Agriculture “Luiz de Queiroz”, of the University of São Paulo – ESALQ-USP** (Escola Superior de Agricultura “Luiz de Queiroz”, da Universidade de São Paulo) receives funding from the Government of São Paulo state and contracts with private institutions. It is one of the most important universities in Brazil. It is located in the city of Piracicaba. It has important post graduate programmes in several areas, including research in cotton agronomy, pest and weed control.
- **Federal University of Viçosa – UFV** (Universidade Federal de Viçosa) gets resources from the Government of Brazil and private companies. The University is located in Minas Gerais state and has a research program on cotton agronomy and weed control.
- **Minas Gerais Agricultural Research Corporation - EMPAMIG** (Empresa de Pesquisa Agropecuária de Minas Gerais) is supported by the federal government. It is a public institution of Minas Gerais State that develops agricultural research with several crops including cotton. It operates a research network on cotton together with other stake holders.
- **National Service of Industrial Education / Industry Technology Centre of Chemical and Textile - SENAI / CETIQT** (Serviço Nacional de Aprendizagem Industrial / Centro de Tecnologia da Indústria Química e Têxtil): The institution is responsible for training workers of the textile industries and research in cotton fibre quality and fashion. Similar work is also undertaken at the Blumenau Foundation of Textile Studies (Fundação Blumenauense de Estudos Têxteis). The textile industry and the government jointly fund activities at the National Service for Industrial Apprenticeship / Technology Centre of Chemical and Textile Industry.

Variety Approval and Seed Supply

The company that develops a variety runs trials in different regions, fills application forms containing descriptors and main characteristics and applies to the National Register of Cultivars - RNC of the Ministry of Agriculture, Livestock and Food Supply - MAPA. After obtaining registration, the new variety seeds can be sold to cotton farmers. The company that obtains the new variety can obtain

intellectual property rights of the new variety from MAPA. Based on the Brazilian Cultivar Protection Law, it can receive royalties from cotton farmers who use the seeds of the IPR protected variety. The cotton seed system in Brazil is mostly run by private companies and to some extent by some government owned institutions. Seed production is an activity regulated by the MAPA. The seed producer needs to be registered and authorised by the National Register of Seeds and Plant Cuttings – RENSEM. Seeds have the following classes according to the generations:

- Genetic or breeder seed is produced by the institution that has the property of the genetic material. It is supposed to be genetically purest.
- Basic seed is harvested from a field planted with breeder seed.
- Seed certification of first generation (C1) is done for seed harvested from a field planted with basic seed.
- Seed certification of second generation (C2) is done for seed harvested from a field planted with C1 seed. C2 seeds are produced by the company that has registration of the variety, but the rights for multiplication are usually transferred to third parties.

Breeder seed is produced by the company that has the registration of the variety, but the right is usually transferred to third parties for multiplication. Marketing is usually made through a network of private sellers and the companies' representatives. It is common to get seed and pay at the time of selling cotton. A seed company can hire cotton farmers to produce seeds, and sometimes they can be authorised to sell seeds to other cotton farmers. It is possible to obtain seeds directly from companies that produce seeds. In regions, where private seed companies do not exist, usually in areas with predominance of small farmers, the local government buys seeds from private companies or government owned institutions and provides them to farmers. Very often small cotton growers produce their own seed or use the seed harvested in their fields. The major seed companies in Brazil are Bayer Seeds; Mato Grosso Foundation (also called TMG – Tropical Breeding Genetics); Mato Grosso Institute of Cotton; Embrapa Cotton (public), and Agronomy Institute of Campiñas - IAC (public).

Fertilisers and Pesticide Supply

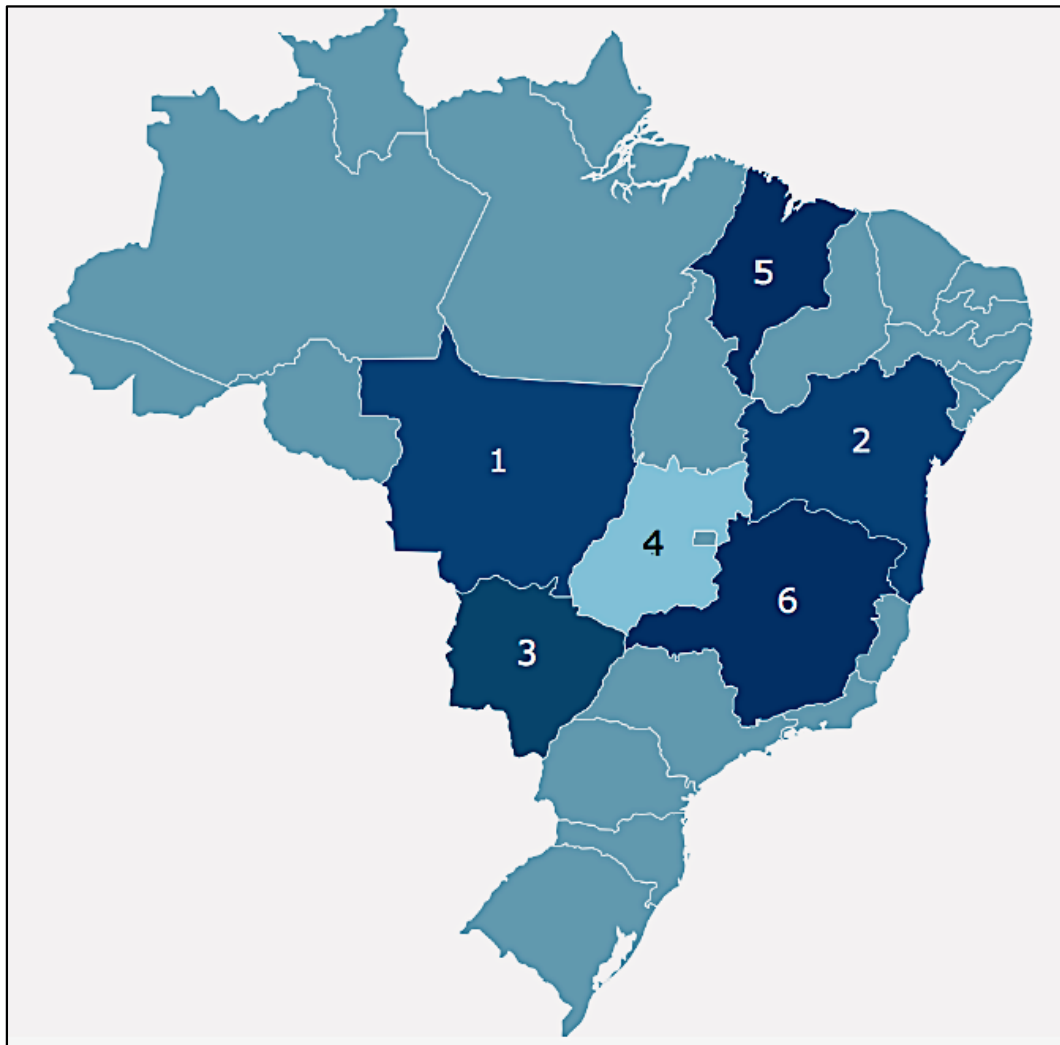
There is a well-structured Fertiliser and pesticide supply chain. Because farmers cultivate very large areas, Fertiliser is bought in large quantities, like truckloads. Inputs are usually bought in advance and paid at the time of selling cotton. Most farmers cannot blame lack of access to inputs unless there is a serious financial problem with the farm. Major pesticide companies are: Bayer CropScience; Dow Agroscience; BASF; Syngenta; Ithara; FMC, and DuPont.

Technology Transfer

The technical assistance in Brazil is predominantly private. There are technicians with very specialised knowledge in cotton production who offer technical support to farmers. They are paid directly by the farmer and can associate their payments with results (yield, net income, etc.). There are companies with multiple technicians that offer

services in several disciplines. Regarding small cotton farmers (about <2% of cotton production), governmental extension Institutions (EMATER) adopt several extension strategies, including participatory methods whereby farmers from a specific production region can visit a field where good agronomical practices are employed, so as to enable them to observe those agronomical practices and adopt in their fields.

BRAZIL COTTON MAP



BRAZIL: COTTON PRODUCTION DATA 2017 (estimates)

S.No	Province	Area ('000 Hectares)	Production (M Tonnes)
1	Mato Grosso	750	1.237
2	Bahia	270	0.427
3	Mato Grosso Do Sul	30	0.054
4	Gias	30	0.048
5	Maranhao	22	0.036
6	Minas Gerias	18	0.029
	BRAZIL	1,140	1.853

KEY CONTACTS IN BRAZIL

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Embrapa Algodão: Rua Oswaldo Cruz, 1143, CP 174-CEP 58107-720 – Campina Grande-PB-Brasil. http://www.cnpa.embrapa.br	Dr. Sebastião Barbosa, General Chief. Email: chgeral@cnpa.embrapa.br . Tel: 55 83 3182-4300 Fax: 55 83 3182-4367
Instituto Agronômico de Campinas Av. Theodureto de Almeida Camargo, 1.500, CP 28, CEP: 13075-630 – Campinas-SP, Brasil http://www.iac.sp.gov.br	Dr. Luiz Henrique Carvalho. Researcher Tel: 55-19 324-5188 Email: cpgran@iac.sp.gov.br
Instituto Agronômico do Paraná Rodovia Celso Garcia Cid, km 375 - CEP 86047-902 - Trêsmarcos - Caixa Postal 481, Londrina-PR, Brasil http://www.iapar.br	Dr. Wilson Paes de Almeida. Coordinator of Cotton Program, Tel: 55 43 3376 2000 Fax: 55 43 3376 2101 Email: wpalgo@iapar.br
Universidade de São Paulo-Escola Superior de Agricultura Luiz de Queiroz, Departamento de Produção Vegetal Av. Pádua Dias, 11, CP 9, CEP: 13418-900 – Piracicaba – SP – Brasil http://www.esalq.usp.br/departamentos/lpv/	Prof. Dr. Ederaldo José Chavegatto. Teaching staff and researcher. Tel: 55 19 3429-4185 Tel: 55 19 3429-4115 Fax: 55 19 3429-4375 Email: ejchiave@esalq.usp.br
Fundação Mato Grosso Av. Antonio Teixeira dos Santos, 1.559, Jardim Universitário, CP 79, CEP: 78750-000, Rondonópolis-MT, Brasil http://www.fundacaomt.com.br	Dr. Paulo Hugo Aguiar. Researcher in cotton breeding Tel: 55 66 3439.4100 Fax: 55 66 3439-4100 Email: pauloaguiar@fundacaomt.com.br
Empresa de Pesquisa Agropecuária de Minas Gerais Rod. BR 050, km 63 Sentido Uberlândia / AraguariZona Rural, Uberlândia – MG CEP: 38415-517 http://www.epamig.br	Dr. Marcelo Abreu Lanza. Researcher in cotton breeding Tel: 55 34 3321 6699 Email: mlanza@epamig.br
Universidade Federal de Viçosa Av. PH Rolfs, s/n, Campus Universitário, CEP: 36570-000, Viçosa-MG Brasil http://www.ufv.br	Prof. Dr. Paulo Geraldo Berger. Researcher and teaching staff Tel: 55 31 3899-2613 Fax: 55 31 3899-2614 Email: pberger@ufv.br
Fundação Goiás Alameda Zeca Valeriano, 2.932 Parque Industrial Ipeguary, Santa Helena de Goiás-GO, Brasil CEP: 75.920-000 http://www.fundacaogo.com.br	Dr. Américo Vaz de Lima Filho. President Tel: 55 64 3641-1885 Fax: 55 64 3641-1770
Fundação Bahia Rodovia BR 020/242, Km 50,7, S/N, 11, Zona Rural, CEP:47850-000, Luis Eduardo Magalhães-BA, Brasil. Tel: 55 77 3639 – 3132 http://www.fundacaoba.com.br	Dr. Murilo Barros Pedrosa. Researcher in cotton breeding Tel: 55 77 3639 3132 Email: algodao@fundacaoba.com.br
Instituto Mato-Grossense do Algodão Av. Rubens de Mendonça, 157. Sala 405, Ed. Mestre Ignácio. Baú, Cuiabá-MT. CEP: 78008-000 http://www.imamt.com.br	Dr. Álvaro Salles. President Tel: 55 65 3321-6455 Tel: 55 65 3321 6482 Email: alvaro@facual.org.br
Universidade Federal da Grande Dourados Rodovia Dourados-Itahum, Km 12, CP 533 – Dourados, Mato Grosso do Sul, Brazil. CEP: 79804-970 http://www.ufgd.edu.br	Prof. Dr. Paulo Eduardo Degrande. Researcher in Entomology and teaching staff Tel: 55 67 3411 3817 Email: paulodegrande@ufgd.edu.br

Farmers Organisations

Associação Brasileira dos Produtores de Algodão-ABRAPA SIG Quadra 01 - Lotes 495, 505 e 515 – Ed. Barão do Rio Branco - Terraço 02 - 4º andar - Brasília-DF - CEP 70610-410 http://www.abrapa.com.br	Mr. João Carlos Jacobsen Tel: 55 61 3028-9700 Tel: 55 61 3028-9706 Email: faleconosco@abrapa.com.br
Associação Baiana dos Produtores de Algodão-ABAPA Av. Ahylon Macedo, 11 – Barreirinhas – Barreiras – BA CEP 47806-180 http://www.abapaba.org.br	Ms. Celestino Zanella President. Tel: 55 77 3614-9000 Fax: 55 77 3614-9000 Email: abapa@abapaba.org.br
Associação Mato-Grossense dos Produtores de Algodão-AMPA Rua B s/nº, esquina com rua 2 – Ed. FAMATO – Centro Político Administrativo – Cuiabá – MT CEP 78050-970 http://www.ampa.com.br	Mr. Gustavo Viganó Piccoli President Tel: 55 65 3925-1800 Fax: 55 65 3925-1807 Email: ampa@ampa.com.br
Associação Mineira dos Produtores de Algodão-AMIPA Rua Major Gote, 585 sala 501 – 5º andar – Patos de Minas – MG CEP 38702-054 http://www.amipa.com.br	Mr. Ângelo Dias Munari, President Tel: 55 34 3821-5828 Fax: 55 34 3821-5828 Email: amipa@amipa.com.br
Associação Sul Mato-Grossense dos produtores de Algodão- AMPASUL Rodovia MS 306 Km 108 Caixa Postal 134 – Chapadão do Sul – MS CEP 79560-000	Mr. Darci Agostinho Boff, President Tel: 55 67 3562 3498 Tel: 55 673652 4563 Fax: 55 67 3562 3498 Email: ampasul@ampasul.com.br
Associação dos Cotonicultores Paranaenses-ACOPAR Estrada Oswaldo de Moraes Côrrea, 1000 – Maringá – PR CEP 87065-240 http://cooperativa-central-algodao-ltda-coce.br	Mr. Almir Montecelli, President Tel: 55 43 3258-4500 Fax: 55 43 3258 4500 Email: acopar-pr@bol.com.br
Associação Paulista dos Produtores de Algodão-APPA Av. Dr. Soares de Oliveira, 344 Cond. Ed. Abdala Jorge sala 301 3º andar – Ituverava – SP CEP 14500-000 www.appasp.com.br	Mr. Ronaldo Spirlandelli de Oliveira, President Tel: 55 16 3839 2366 Fax: 55 16 3839 2366 Email: appasp@appasp.com.br
Associação Maranhense dos Produtores de Algodão-AMAPA Rua Bernardo Pires, 128 5º andar – Porto Alegre – RS CEP 90620-010	Mr. Arlindo Moura, President Tel: 55 51 3230 7781 Fax: 55 51 3230 7750 Email: arlindomoura@slcagricola.com.br
Associação Piauiense dos Produtores de Algodão-APIPA Rod. Sebastião Leal, PI 247, Km 50 – Zona Rural, Sebastião Leal -PI CEP: 64.873-000	Mr. Amilton Bortolozzo President Tel: 55 86 3221 7100 Email: amilton@canel.com.br
Associação Goiana dos Produtores de Algodão-AGOPA Rua da Pátria, 230, Santa Genoveva, Goiânia-GO, CEP: 74670-300 www.agopa.com.br	Mr. Luiz Renato Zapparoli, President Tel: 55 62 3241 0404 Email: agopa@agopa.com.br

Ginners Organisations

None

Spinners Organisations

Associação Brasileira da Indústria Têxtil e de Confecção –ABIT Rua Marquês de Itu, 968 - Vila Buarque CEP 01223-000 - São Paulo – SP	Mr. Rafael Cervone, President Email: abit@abit.org.br Tel: 55 11 3823 6100 Fax: 55 11 3823 6122
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Trade and Textile Associations

ABIT - Brazilian Textile and Apparel Industry Association. Rua Marquês de Itu, 968 01223-000 São Paulo - SP www.abit.org.br	Fernando Pimentel, Executive Director Tel: (+55-11) 3823 6114 Fax: (+55-11) 3823 6120 Email: presidencia@abit.org.br
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Bulgaria

Structure of Cotton Research

The Field Crops Institute-IPK, Chirpan, previously known as the Institute of Cotton and Durum Wheat, was established in 1925. The Institute is a scientific organisation within the system of the Agricultural Academy at the Ministry of Agriculture and Food, conducting research, application and service activities in the field of agriculture. Systematic breeding, seed production and agro-technical research is conducted on cotton, durum wheat, barley, corn, sunflower, vetch, alfalfa and others. The Field Crops Institute operates within the framework the State Agricultural Policy and the Common Agricultural Policy of the European Union. The Institute organises and conducts scientific and applied research to develop new varieties and technologies for growing cotton, durum wheat and other major field crops; variety maintenance; preservation and conservation of the gene pool; runs graduate programmes; develops strategies and provides information and counselling.

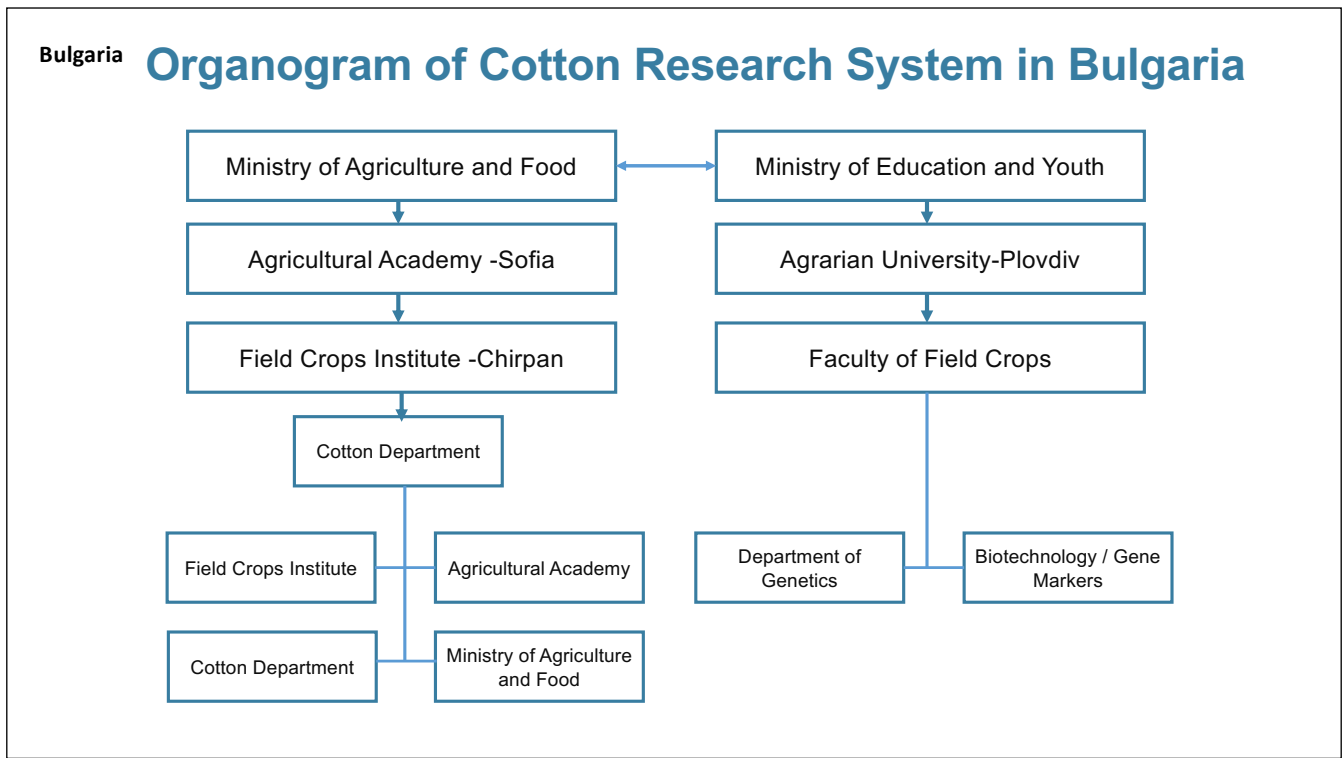
Since 2000, the Cotton Department of the Institute, has developed new cotton varieties Beli Iskar, Beli Lom, Boyana and Denista possessing high genetic potential for yield and lint outturn. Varieties were developed by intraspecific hybridisation within the *G. hirsutum* L. Interspecific hybridisation of the *G. hirsutum* L. and *G. barbadense* L. species was used to improve cotton fibre quality. Experimental

mutagenesis based on usage of gamma-rays, ultra-sound and chemical mutagens were also used to obtain Trakia, Helius, Vicki IPTP, Plovdiv and Filipopolis varieties exceeding the standards in earliness and productivity. Izabell variety - brown cotton is an achievement of the Institute breeding program to create a new generation of varieties of naturally coloured fibre. Organic and sustainable cotton production systems were also developed. Optimised use of agrochemical inputs has been standardised.

The Experimental and Production Centre currently owns 302 hectares and also handles about 1,400 hectares on lease. The Institute is the main producer of pre-basic and basic cotton and durum wheat seeds in Bulgaria. Stock production includes cotton seeds. The Field Crops Institute is an independent legal entity. It is financed by state budget, proceeds of implementation of licenses for new varieties, revenue from contracts for research projects with organisations, individuals or legal entities and income from production and other activities.

Variety Approval and Seed Supply

New cotton varieties are approved by the Executive Agency for Variety Testing, Field Inspection and Seed Control - EAVTFI&SC. State institutions (Field Crops Institute and Agri University in Plovdiv) and private companies (Holding VENO in Burgass) apply to the EAVTFI&SC to obtain 'variety registration'. Production permission normally takes 2-4 years before registration. Distinctness, Uniformity and Stability (DUS) and trials data (agronomic, tech-



nological, pathological properties) are provided with the application. The Variety Testing Directorate at EAVTFI&SC carries out Value for Cultivation and Use (VCU) and Distinctness, Uniformity and Stability (DUS) tests for the candidate varieties. If the candidate variety is registered for the first time, the VCU test is established for 2-3 years at minimum of three locations and the DUS test is compulsory for two years. Test results for each variety are reported to the Variety Testing Directorate. The reports are submitted to the Expert's Commission to discuss the results and approve varieties.

For certification, the owners of the varieties apply to the Bulgarian Patent office with an application form that expresses their requests regarding variety certification. The Variety Testing Directorate submits the documents revising the results and the decision of the Expert's Commission. The Bulgarian Patent makes expert's report and gives certificate to the owners ('The Variety Owners' Certificate). Registered varieties are published in the official newspaper and are included in the European Common Catalogue of Varieties of Agricultural Plant Species.

Planting seeds are classified as pre-basic, basic seeds, standard and commercial seeds. The public and private sector seed institutions possessing the 'Variety Owners' certificate produce pre-basic and basic categories. The standard seeds are distributed to farmers by a ginning mill

in Khaskovo. The Ministry of Agriculture and Food, Executive Agency for Variety Testing, Field Inspection and Seed Control, Field Inspection and Seed Control Directorate and Central Seed Testing Laboratory Directorate are responsible for quality control of seed.

Fertiliser and Pesticide Supply

Farmers buy fertilisers and pesticides from private firms/distributors. The private firms either import fertilisers or procure them from the fertiliser plants in Dimitrovgrad and Stara Zagora. The fertiliser plants don't sell fertilisers directly to the farmers. Pesticides are marketed by CIBA Bulgaria, BASF Bulgaria, Syngenta Bulgaria, Cyanamid Bulgaria and Bayer Bulgaria.

Technology Transfer

New developments are transferred to farmers in various ways: directly through meetings, open days, specialised courses in European programs, exhibitions, presentations and other meetings organised by the Agricultural Academy together with the Field Crops Institute, National Service for Agriculture and District Services for Agriculture. Technology transfer is also facilitated by the extension services through special newspapers, magazines and direct contacts with scientists of the experimental and production station at the Institute.

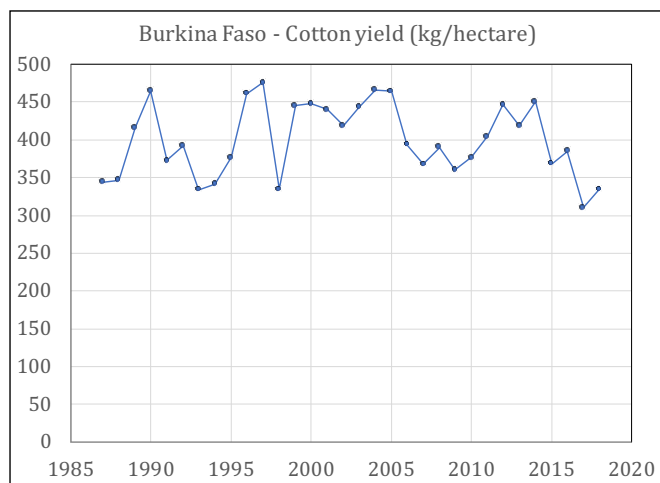
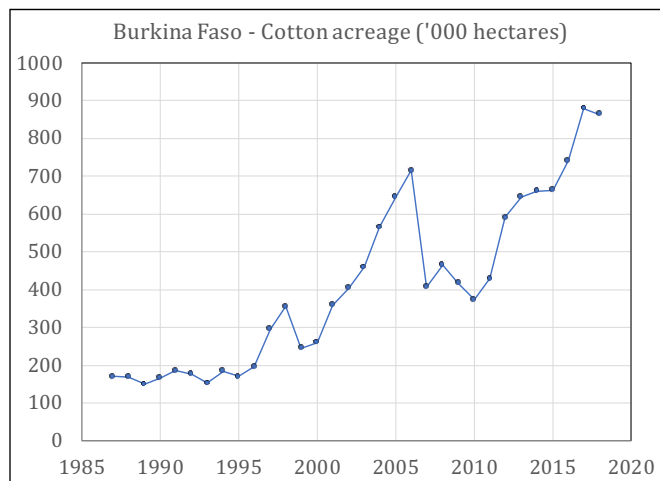
KEY CONTACTS IN BULGARIA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Field Crops Institute (FCI) 6200 Chirpan, Bulgaria	Valkova, Nelly Kirilova, Director Email: nelivalkova@abv.bg
Farmers Organisations	
Association of Cotton Producers and Cotton Processors	Bozhinov, Bozhin Maximov Email: bojinov@writeme.com
Ginners Organisations	
Ginning mill "Textile fabrics" AD 64 Saedinenie Street 6300 Khaskovo, Bulgaria	Kostadinov, Dimitar Engineer
Textile Organisations	
Bulgarian Association of Apparel and Textile Producers and Exporters (BAATPE) 36 "Dragan Tsankov" Blvd. http://www.bgtextiles.org	Email: association@bgtextiles.org

Burkina Faso

Cotton in Burkina Faso

The average cotton acreage during the period 2008 to 2018 was 612,000 hectares at an average lint yield of 386 Kg per hectare.



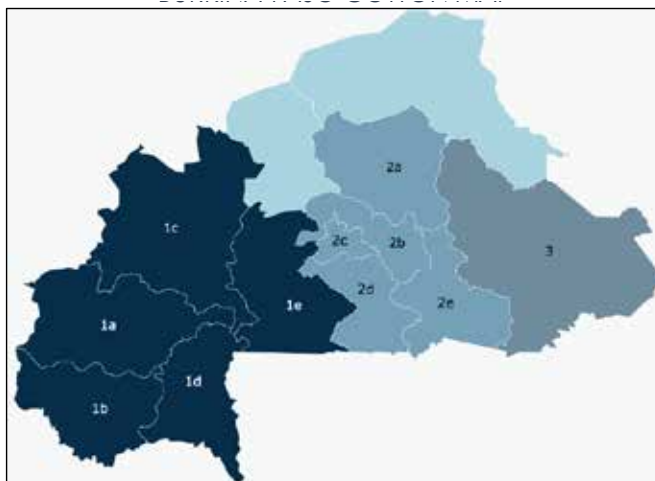
Structure of Cotton Research

Environmental and Agricultural Research Institute (Institut de l'Environnement et de Recherches Agricoles- INERA) conducts research on cotton. INERA functions under the CNRST (Centre National de Recherches Scientifiques et Technologiques). It focuses on all aspects of agricultural research including cotton. Research is carried out in projects under four departments. 1. Animal production, 2. Crop production, 3. Forestry and 4. Natural resources management.

University of Ouagadougou - Université de Ouagadougou (UO) was established in 1974 as a public sector university. Research on cotton is mainly conducted through thesis dissertation.

Polytechnique University of Bobo Dioulasso – Université Polytechnique de Bobo Dioulasso (UPB) was established in 1966. It has a mandate on human resource development to strengthen the National Agricultural Research System (NARS). The university also conducts research in agricultural sciences including some aspects of cotton.

BURKINA-FASO COTTON MAP



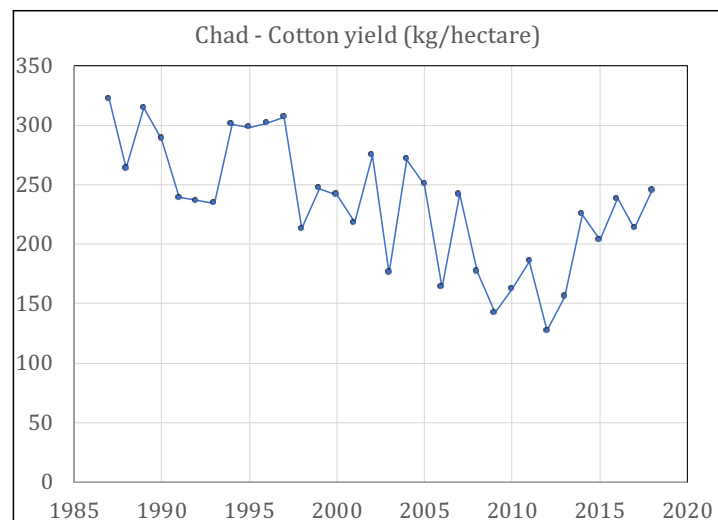
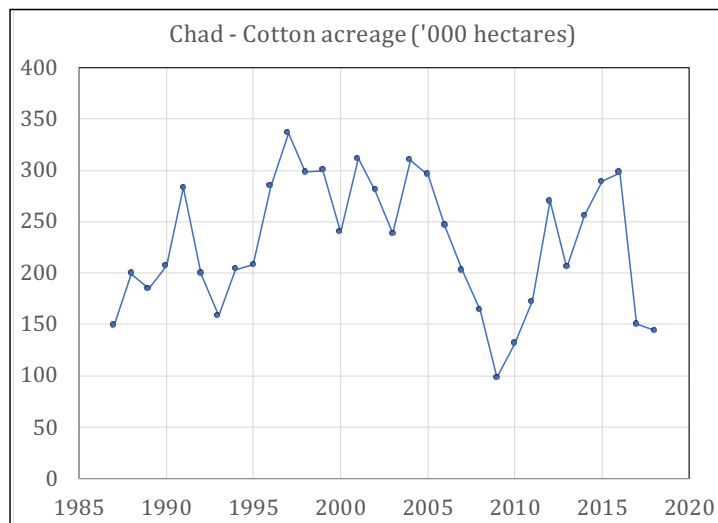
BURKINA-FASO: COTTON PRODUCTION DATA 2018 (estimates)

S.No	Region	Area ('000 Hectares)	Production (Million Tonnes)
1	SOFITEX: Bobo-dioulasso region	615	0.245
2	FASO-COTTON: Ougadougou region	90	0.042
3	SOCOMA: Fada n'Gourma region	45	0.018
	BURKINA FASO	750	0.305

Chad

Cotton in Chad

The average cotton acreage during the period 2008 to 2018 was 198,000 hectares at an average lint yield of 183 Kg per hectare.



Structure of Cotton Research

CotonTchad SN (Société Cotonnière du Tchad - Société Nouvelle), Mondou plays an important role in cotton research. Cotton research in Chad is the responsibility of the Chadian Institute for Agricultural Research for Development-ITRAD (l'Institut Tchadien de Recherche Agronomique pour le Développement). It is financed by the state under the Ministry of Agriculture. The CotonTchad SN

which finances cotton research and the work is coordinated with ITRAD by the Directorate of Cotton Production of CotonTchad SN. ITRAD has a partnership agreement with CotonTchad SN to exchange information and results in consideration of the annual financial support paid by the CotonTchad SN.

Variety Approval and Seed Supply

Varieties are developed by researchers but approved by the CotonTchad SN according to the needs of spinners for the international market while also taking into account the interests of the Chadian cotton producers. The pre-foundation seeds are produced at the Bebidja research station. They are sent for multiplication at the farm of Bekamba and in the factory areas of Kyabé and Gounou Gaya. Pure seeds are multiplied at farm level in selected areas. The seed-cotton produced from these seeds is ginned at plants in Kyabé and Sarh for East Area (STAMF variety) and Pala Kelo and for the West Zone (A51 variety). Planting seeds are bagged and shared in the factories on seed plan designed by the Cotton Field Officers. Each plant in turn sets up a seed-plan based on the requirements of village associations who submit applications to field officers of the CotonTchad SN. Planting seeds are supplied to farmers free of charge. No other enterprise, public or private has the authority to produce and market planting seeds.

Fertiliser and Pesticides Supply

CotonTchad SN controls fertilisers mainly Urea, Nitrogen, Phosphorus, Potash, Sulphur and Boron. CotonTchad SN supplies fertilisers at a price to be recovered at the time of seed-cotton procurement from farmers. Distribution is done in the same manner as the planting seed when seed-cotton is procured. Farmers get pesticides in the same way as Fertiliser. The costs are recoverable on credit payment. The main supplier of pesticides is CotonTchad SN but lately ARYSTA Life Science and group SOSEA/SAVANA have also become active.

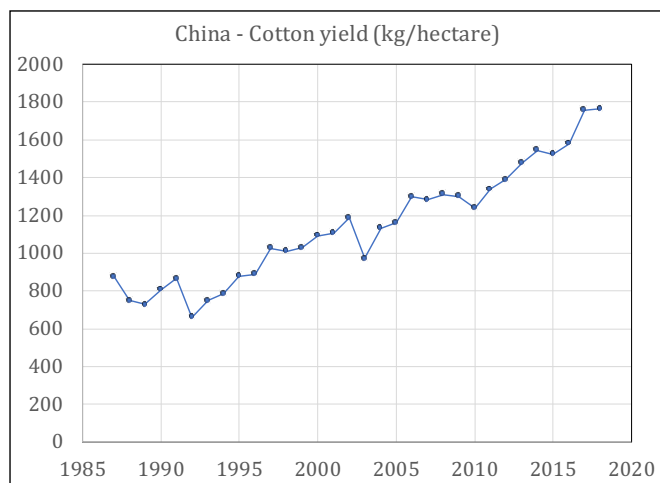
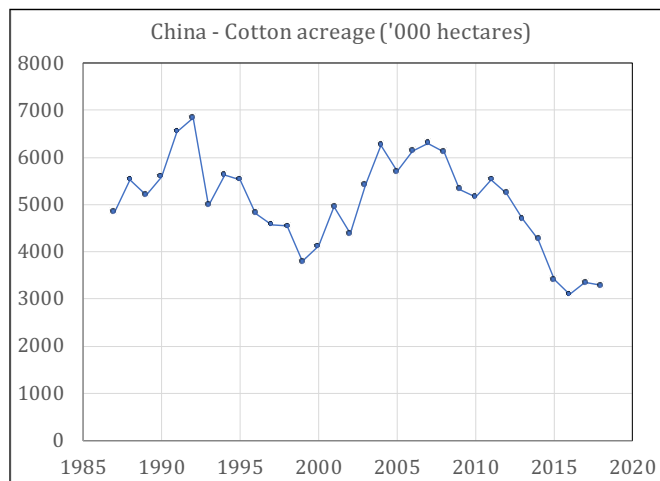
Technology Transfer

Research innovations are disseminated by the National Rural Development Office-ONDR (l'Office National de Développement Rural). Technologies are relayed by the field staff/cotton field officers, cotton liaison officers and gin factory supervisors.

China

Cotton in China

The average cotton acreage during the period 2008 to 2018 was 4,502,000 hectares at an average lint yield of 1511 Kg per hectare.



Structure of Cotton Research

The cotton research system is comprised of national research institutes, provincial research institutes and universities. National research institutes and universities are mainly engaged in fundamental research. However, provincial research institutes are mostly engaged in research on applied techniques.

The national research institutes mainly include the Institute of Cotton Research of the Chinese Academy of Agricultural Sciences (CAAS) and Biotechnology Research Institute of CAAS. Universities include China Agricultural University, Huazhong Agricultural University and Nanjing Agricultural University. Provincial research institutes mainly include the Cotton Research Centre of Shandong Academy

of Agricultural Sciences, Shandong Cotton Research Centre of the Shandong Province Academy of Agricultural Sciences, Institute of Cash Crop Research of the Hubei Province Academy of Agricultural Sciences and Cash Crops Research Institute of the Xinjiang Academy of Agricultural Sciences. The Ministry of Agriculture and Rural Affairs of China established a long-term and stable large-scale project called China Cotton Research System in 2007 to carry out scientific research on cotton science and technology. Institute of Cotton Research, Anyang, Henan also focuses mainly on cotton research.

Research is coordinated by the state council and is largely funded by the state agencies such as the Ministry of Science and Technology, Ministry of Agriculture and Rural Affairs and the National Natural Science Foundation of China. In recent years, some enterprises and private sectors have invested money in cotton research, especially in cotton breeding.

Variety Approval and Seed Supply

Before commercialisation, seeds pass through a series of approval processes. First, the developer of a variety submits an application form, variety breeding report, variety comparison test report, authenticity commitment and genetic modification test report to a Variety Approval Committee, after completing at least two years and multi-location testing in an ecological area. The genetic modification safety certificate is a must for genetically modified seeds. If the application is accepted, a designated institution will carry out 'variety testing'. Variety tests include regional trials, production tests and Distinctness, Uniformity and Stability (DUS) tests. The regional trials are for at least two production periods and production tests are at least for one production year. Finally, the variety test results are submitted to the Variety Approval Committee. Variety certificate is accorded after the variety has passed the first review, publicity review and the final review.

Suppliers of planting seeds include companies and associations in China. Generally, the seed companies have their own subsidiary companies. They rely on agents and distributors for seed selling. The major cotton seed supplier is the China National Seed Group Co. Ltd., which is a state-owned key enterprise in China. The primary purpose of the Company is to integrate breeding, production and promotion of crop seeds. It deals with business in crops such as rice, corn, wheat, vegetables and oilseed crops.

The private seed companies are Yuan Longping High-tech Agriculture Company Ltd; Xinjiang Tahe Seed Company Ltd; Hebei Guoxin Seed Company Ltd; Gansu Dunhuang seed Company Ltd; Shandong Denghai seed Company Ltd; Wanxiang Doneed Company Ltd; Hefei Fengle Seed Company Ltd; Zhongmian Seed Technologies Company Ltd; Beijing Origin Seed Technology Inc. and Shandong Yinxing Seed Science and Technology Company LTD.

Fertiliser and Pesticide Supply

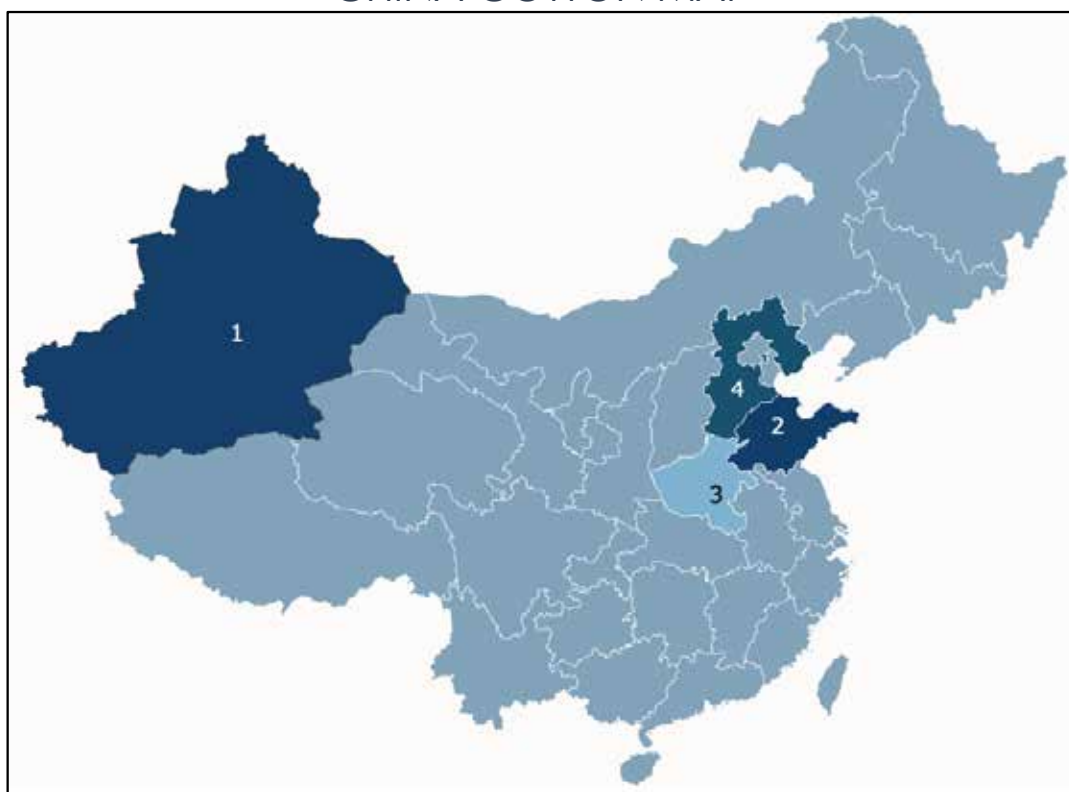
The market competition is fierce in agricultural materials in China, thus farmers can buy fertilisers conveniently. Some farmers also buy fertilisers on credit from sellers or their affiliated agencies.

Farmers procure pesticides and fertilisers mostly on credit. Some major companies are Zhejiang Xin'an Chemical Industrial Group Company Ltd; Jiangsu Yangnong Chemical Company Ltd; Zhejiang Jinfanda Biochemical Company Ltd; Shenzhen Noposion Agrochemicals Company Ltd. and Hubei Sanoda Company Ltd.

Technology Transfer

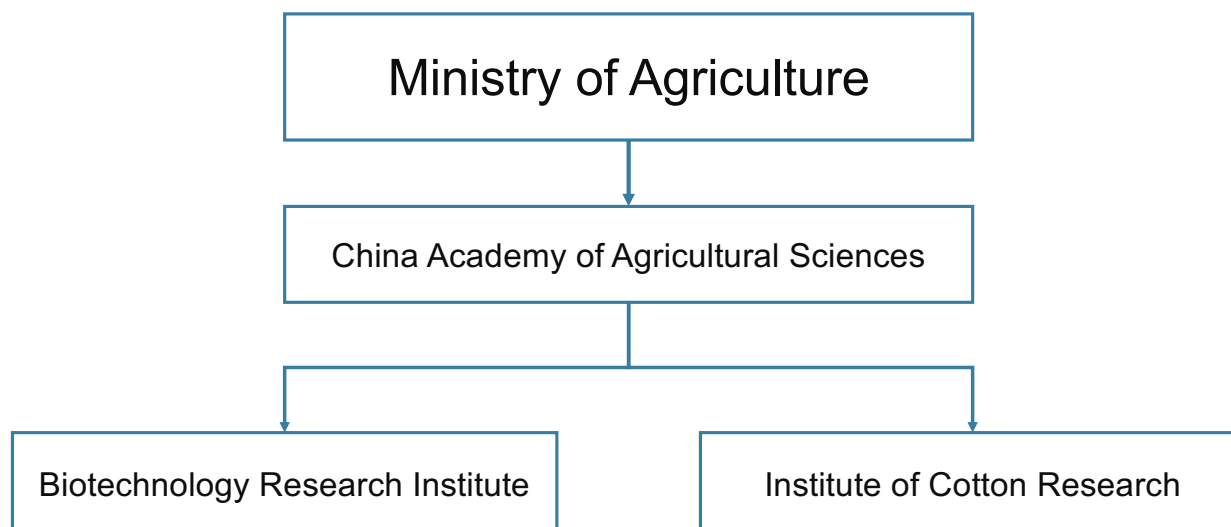
New developments are transferred to farmers by the National Agro-Tech Extension Service Centre of the Ministry of Agriculture, Government agencies and a few private companies. Extension agencies offer technical guidance and demonstrate advantages of the new technologies. National and local governments also encourage research institutions and colleges to take part in the transfer of technology.

CHINA COTTON MAP



CHINA: COTTON PRODUCTION DATA 2017 (estimates)

S.No	Province	Area ('000 Hectares)	Production (M Tonnes)
1	Xinjiang	1,960	4.08
2	Shandong	340	0.43
3	Henan	290	0.32
4	Hebei	280	0.27
	Others	360	0.39
	CHINA	3,230	5.49

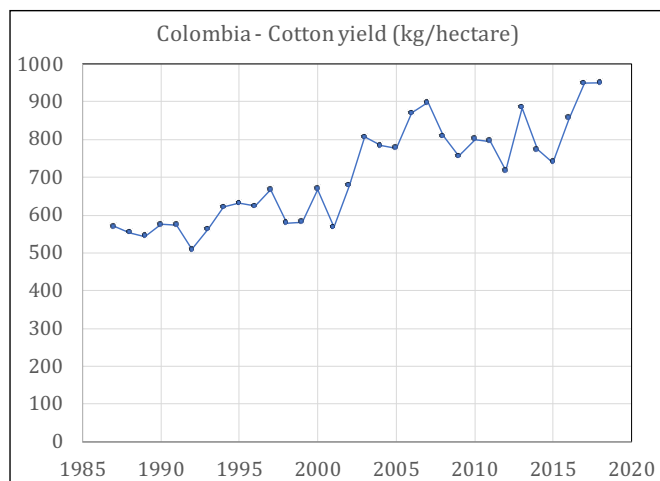
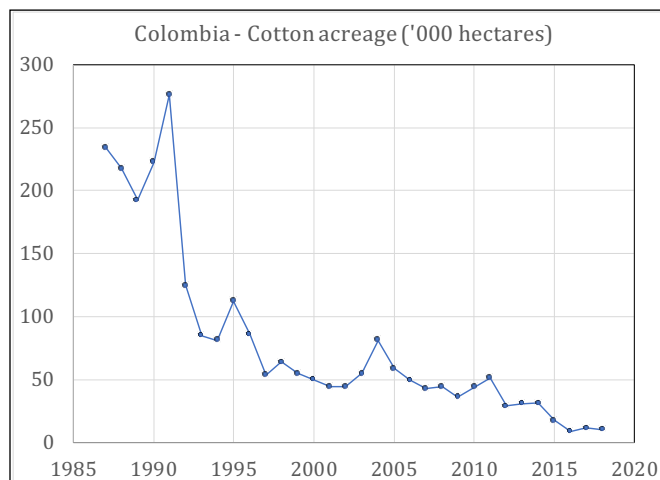
China**KEY CONTACTS IN CHINA**

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Institute of Cotton Research of CAAS http://www.cricaas.com.cn/	No 38 Huanghe st, Anyang, Henan, China Email: crichina@cricaas.com.cn
Cotton Research Centre, Shandong Academy of Agricultural Sciences http://www.cotton.sd.cn/	No.22 Gongye-Beilu, Jinan, Shandong, China Email: scrckb@163.com
Farmers Associations	
Guoxin Rural Technical Service Association http://www.guoxin.org.cn/	Jingkai Nanlu, Hejian, Hebei, China
Ginners Association	
China Cotton Association http://www.china-cotton.org/	No.45 Fuxingmennei St.Beijing, China Email: info@china-cotton.org
Trade and Textile Associations	
China Cotton Association Add:No.45 Fuxingmennei St.Beijing,100801	Zhou Shengtao, President Tel:0086-10-66050406 66052674 Fax:0086-10-66053496 Email: info@china-cotton.org
China National Textile & Apparel Council 18 North Street. Chaoyangmen, Chaoyang District. 100020, Beijing Web: english.ctei.cn	Ruizhe Sun, President Tel: (+86-10) 8522 9001/9205 Fax: (+86-10) 8522 9283 Email: foreignaffairs@cntac.org.cn

Colombia

Cotton in Colombia

The average cotton acreage during the period 2008 to 2018 was 29,000 hectares at an average lint yield of 820 Kg per hectare.



Structure of Cotton Research

The Colombian Agricultural Research Corporation-CORPOICA (Corporación Colombiana de Investigación Agropecuaria) carries out research work within the National research agenda. This entity works on the development of new varieties and the dynamics of crop diseases and pests. Conalgodón, Bogotá works exclusively on cotton research.

CORPOICA also works on genetic improvement, mainly by breeding varieties adapted to the region's climate, as well as Ramulosis resistant varieties. In 2018, the CORPOICA provided two transgenic varieties to cotton farmers: NEVADA 123 & OASIS 129. The institute is working on the development of transgenic cotton that confer resistance to boll weevil, *Anthonomus grandis*. The institute produces bio-fertil-

isers based on nitrogen, phosphorus and potassium solubilising bacteria and *Lecanicillium lecanii* based bio pesticides for whitefly (*Bemisia tabaci*) control.

The Ministry of Agriculture of the Government of Colombia provides funds for projects. Funding sources are available for projects submitted to Colciencias and the Ministry of Agriculture in accordance with AGROSAVIA's technological agenda.

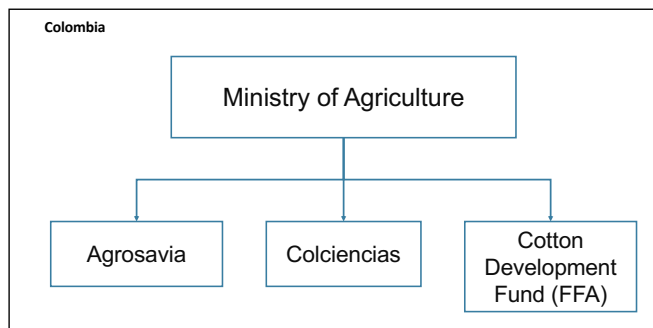
Variety Approval and Seed Supply

The Colombian Agricultural Institute-ICA (Instituto Colombiano Agropecuario) is in charge of regulating, monitoring and controlling production, multiplication, marketing, importing and exporting of planting seeds used in the national agricultural production. Therefore, it sets out general guidelines for the agronomic assessment of planting seeds in the country. All material intended for the production of seeds that are certified and/or marketed in the country must first obtain approvals based on agronomic assessment. To obtain the varietal approvals through agronomic assessment, interested entities, whether public or private, submit the varieties for testing in the designated agro-ecological area intended for commercialisation. ICA or ICA-authorized persons or entities monitor the assessment. ICA provides a report of agricultural performance of the varieties compared with the control or controls (standards of comparison) used.

Prior to the agronomic evaluation, some steps are implemented with no monitoring from ICA. These are performance tests in observation plots that the company must carry out generally, concurrently to determine agricultural potential of the variety. To obtain a varietal approval the following stages are required:

- Agronomic assessment test: in this test, field and laboratory data about growing period, agricultural traits, as well as yield and fibre quality characteristics are collected.
- Semi-commercial test: in these tests, the characteristics of the entire plant, leaves, flower, boll, seed, yield and fibre quality are taken into account.

The genotypes that are found better than controls in one or more characteristics are registered with the ICA for market-



ing the seed. Registration is done in the agro-ecological area for which the favourable assessment concept was issued.

Genetically modified biotech varieties are imported. Seed companies present in cotton areas are BASF (Fibre Max varieties) and AGROSAVIA. The supply or sale of seed is made through trade associations that are the only ones authorised to market seeds.

Fertiliser and Pesticide Supply

Fertilisers and pesticides are obtained directly from trade associations or agricultural input shops. The leading pesticide companies are Bayer, Syngenta, Monsanto, Dow Agro-Sciences, Arista, Cheminova, Anasac and Invesa.

Technology Transfer

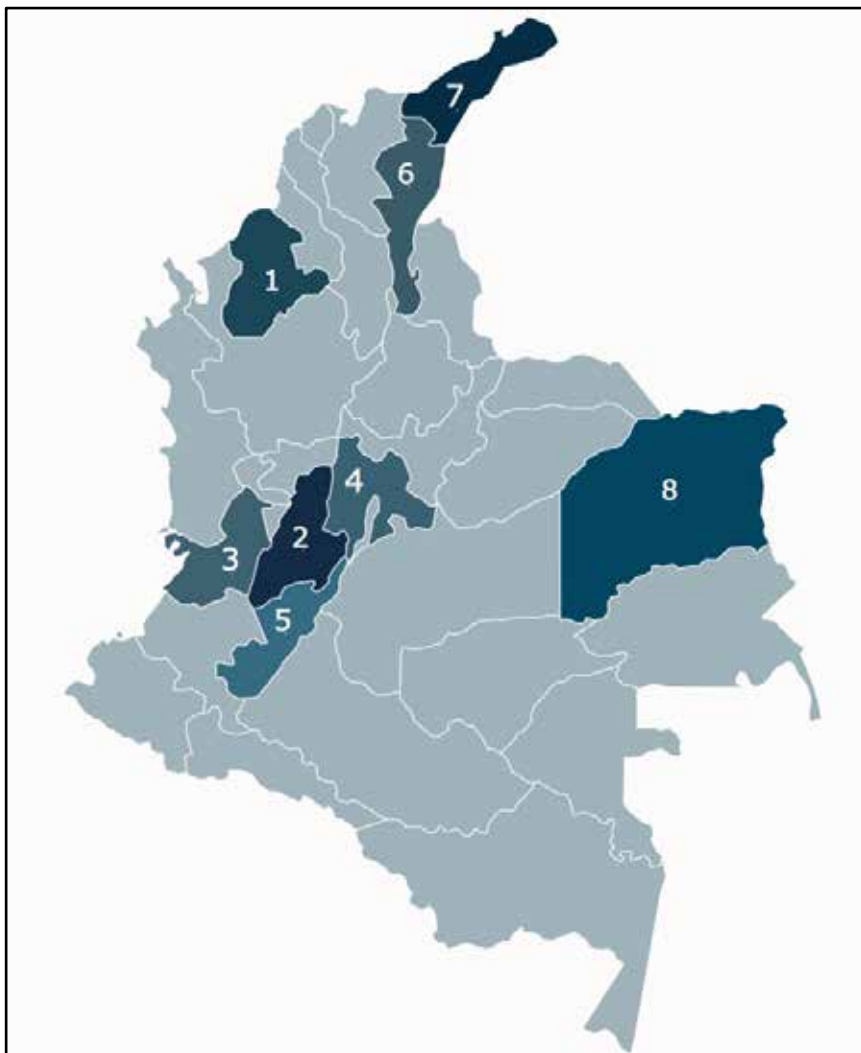
AGROSAVIA's technology transfer department disseminates its research findings through field days, specialised meetings, training, and technical lectures. Likewise, input producing companies disseminate technologies through the same mechanisms. Technical assistant professionals from different trade associations also disseminate AGROSAVIA's technologies.

In some municipalities, the *Umatas* (Agricultural Technical Assistance Units for Municipalities) are responsible to disseminate the new agronomic crop management techniques to producers. Likewise, the Cotton Development Fund (FFA, for its acronym in Spanish), which operates under the EP-SAGRO, coordinates training workshops and meetings for producers and agronomists in different cotton areas, especially at the beginning of the sowing season.

KEY CONTACTS IN COLOMBIA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
AGROSAVIA - TURIPANA www.corpoica.org.co	Jorge Torrez Cadena, Director Turipaná Centro de Investigación Email: jcadena@corpoica.org.co
AGROSAVIA - NATAIMA	Lorenzo Peláez Suarez, Director Nataima Centro d Investigación Email: jpelaiez@corpoica.org.co
Producers Organisations from the Costal area	
Coopiagros	José David Ramos, Manager Email: coopiagros Ltda@edatel.net.co
Agroinsumos San Carlos	Fray Domingo Monterrosa Email: agro.insumosancarlos@hotmail.com
Cultivos y Potreros de la Costa	María Paulina Márquez Nerio Email: Cultivosypotrerosdelacosta@hotmail.com
Alyamsa del Sinú Ltda	Alcibíades Manchego Jaramillo Email: alyamsa Ltda@yahoo.com
Agrovet de la Costa	Hernando Hernández Barreto Email: Agrovet_delacosta@yahoo.com
Sociedad Campo Seguro	
Comerfisa	Luis Fernando Miranda Diaz Email: sociedadcamposeguro@hotmail.com
Granos y Motas	Alfonso Elias Hernandez Email: Comerfisa@gmail.com
Coajira	Jose Julian Garcia Guerra Email: jjuliangg@hotmail.com
Ginners Organisations	
Compañía agroindustrial del Sinú SA	Jose Ramón Molina Pelaez Email: Coajira@hotmail.com
Desmotadora Coopiagros	Jorge Rojas Email: ciaagroindustrial@gmail.com
Fibras del Sinú	José David Ramos Email: coopiagros Ltda@edatel.net.co
Desmotadora Coagrocor	John Vidal Berrocal

COLOMBIA COTTON MAP

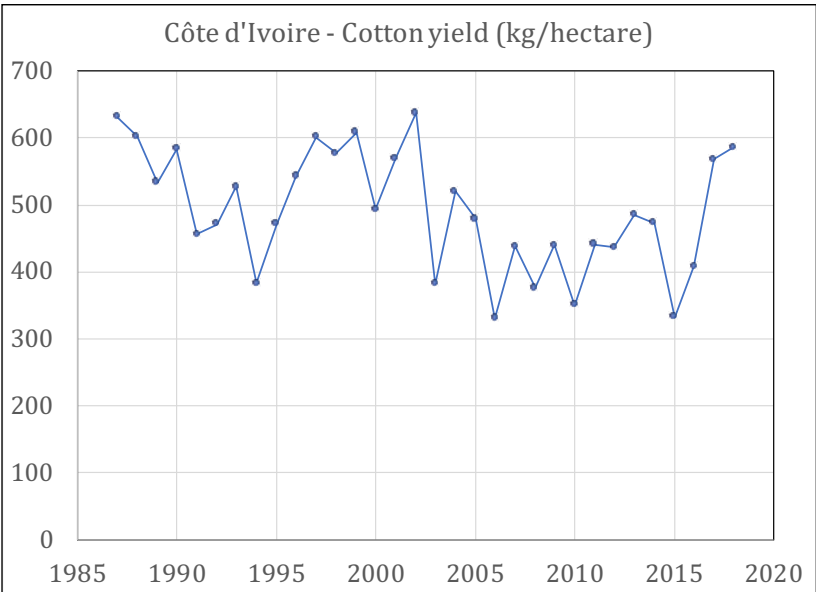
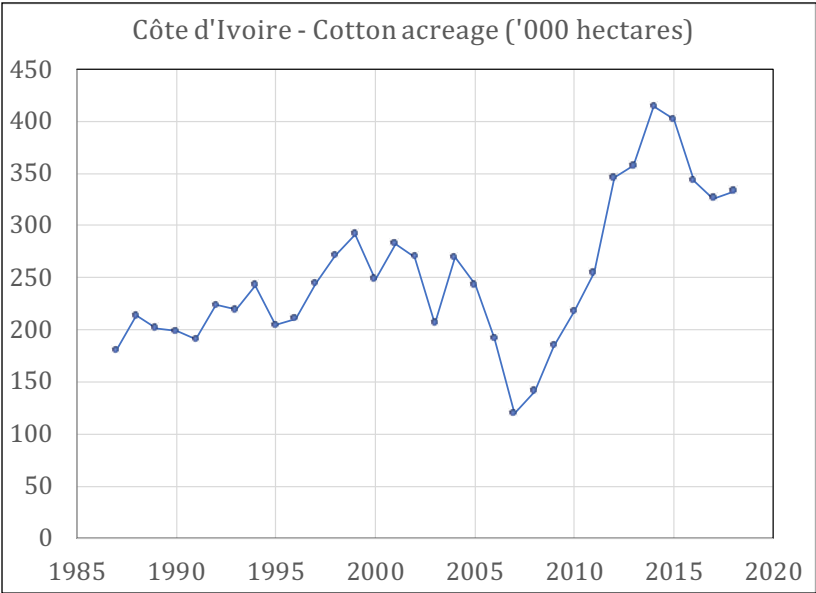
**COLOMBIA: COTTON PRODUCTION DATA 2017**

S.No	Province	Area (Hectares)	Production (Tonnes)
1	Cordoba	4,463	3,352
2	Tolima	3,615	3,877
3	Valle Del Cauca	398	566
4	Cundinamarca	380	356
5	Huila	362	401
6	Cesar Norte	291	125
7	Guajira	224	197
8	Vichada	177	181
9	Bolívar	64	46
10	Magdalena	60	24
11	Sucre	10	5.9
12	Cesar Sur	7	4.9
	COLOMBIA	10,050	9,137

Côte d'Ivoire

Cotton in Côte d'Ivoire

The average cotton acreage during the period 2008 to 2018 was 302,000 hectares at an average lint yield of 445 Kg per hectare.



Structure of Cotton Research

The National Agricultural Research System (NARS) evolved significantly over the years in Cote d'Ivoire, especially after restructuring initiatives by the Government in the 1990s. The National Centre for Agricultural Research (CNRA) was established in April 1998. The CNRA was created by merging three former institutes of agricultural research: Agronomic Research Institute in Forest Zone (IDEFOR), Agronomic Research Institute in Savannah Zone (IDESSA) and the Ivorian Centre for Technological Research (CIRT). Over the years, the CNRA evolved as Côte d'Ivoire's principal agricultural research agency. Its research mandate includes crops, livestock, forestry, and post-harvest processing, as well as technology transfer and human resource development.

There are two Universities which also conduct research on cotton projects. The Department of Sciences and Nature-Unité de Formation et de Recherche des Sciences de la Nature and the Université de Abobo-Adjamé conduct research on cotton.

Fertiliser and Pesticide Supply

Fertilisers and pesticides are provided by ginning companies and also through private traders. The Government intervenes to ensure quality inputs and seeds.

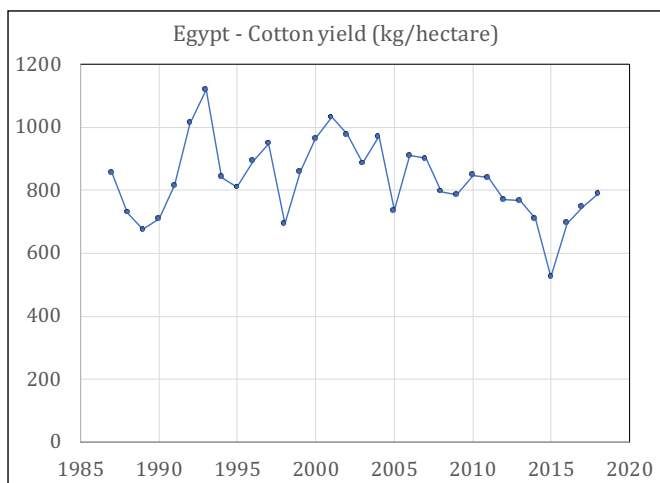
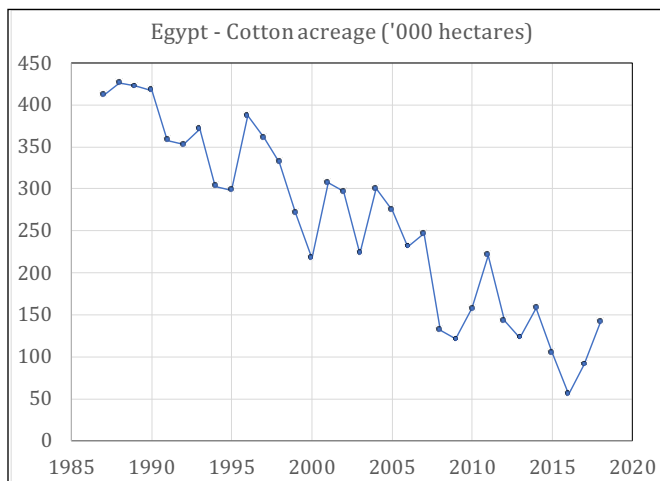
Technology Transfer

The Inter-Professional Fund for Agricultural Research and Extension (FIRCA) is the main agency that undertakes technology transfer. However, ginning companies provide extension services through a network of extension agents who control input distribution and credit recovery. The extension agencies support producer organisations and provide technical advice to farmers. The village level cooperatives supervise technology dissemination, input distribution, and loan distribution through the establishment of a "farmer notebook".

Egypt

Cotton in Egypt

The average cotton acreage during the period 2008 to 2018 was 132,000 hectares at an average lint yield of 751 Kg per hectare.



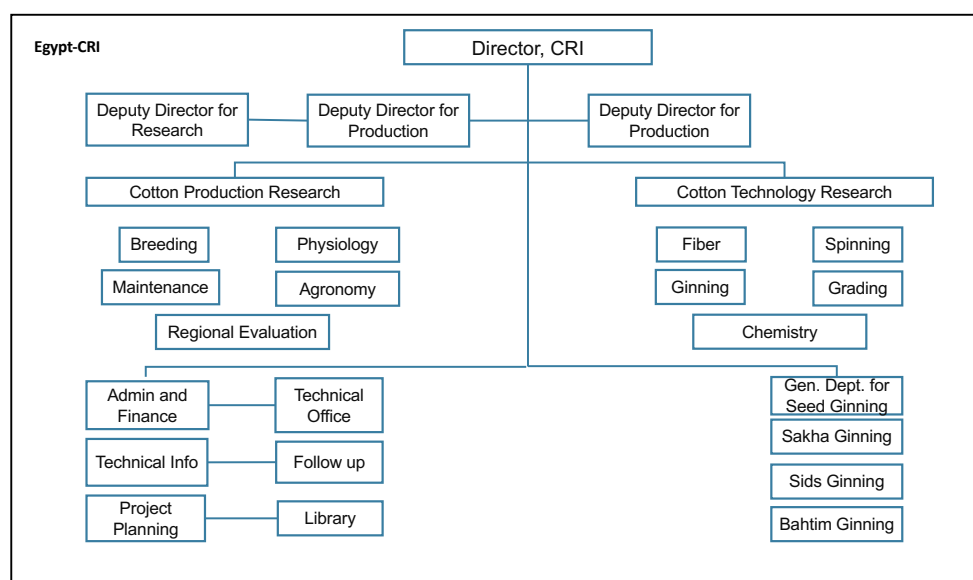
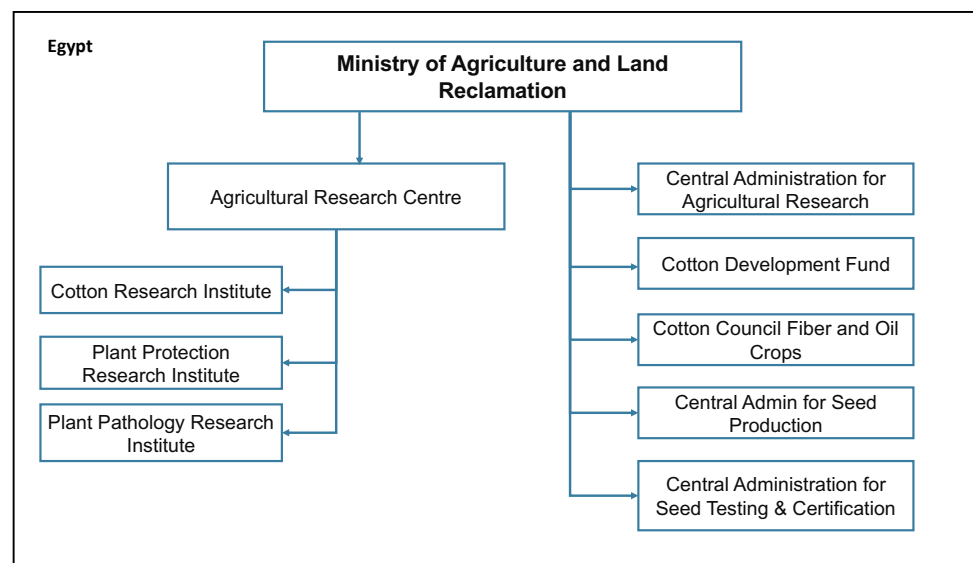
Structure of Cotton Research

Cotton Research Institute (CRI), Agricultural Research Centre, Giza, Cairo, was established in 1912. The Institute is a scientific organisation within the Ministry of Agriculture and land reclamation. It conducts research, application and service activities in the field of agriculture. Systematic breeding, seed production and agro-technical research are conducted on cotton. The CRI is a "nonprofit organisation". It operates within the framework of Egypt Agricultural Policy and Associated Universities, Academy of Scientific Research and Technology, Textile industries and Cotton Trade Association and the Farmers Association. The CRI is responsible for cotton breeding and technology development programs. CRI carries out field and

lab trials on cotton, aiming to improve production and quality, besides studying cotton production technologies, quality and processing problems, suggesting solutions and regulations required to maintain and improve cotton production. The CRI consists of two main branches i.e. production and technology. The cotton production research branch includes plant breeding, variety maintenance, regional evaluation, agronomy and physiology sections. The cotton technology department comprises the spinning, fibre, cotton chemistry, grading, and ginning sections. The CRI cooperates with some institutions and authorities including research institutions belonging to the Agricultural Research Centre, such as the Agricultural Genetic Engineering Research Institute, the Plant Protection Research Institute, the Plant Pathology Research Institute and the Soil and Water Research Institute. The Institute also extends full cooperation to the Council of Cotton, Fibres and Oil Crops, Cotton Arbitration & Testing General Organisation (CATGO), the Alexandria Cotton Exporters' Association (ALCOTEXA), the Academy of Scientific Research and Technology and to public, private investment sectors and spinning and weaving companies. The Institute gets funding from the Government and also generates some of its budget from seed sales.

The CRI focuses on breeding and introducing new cotton varieties that are superior to the commercially grown varieties in yield and quality potential, considering the compatibility of these new varieties with the requirements of exports, domestic and international textile industry. Emphasis is placed on breeding early maturing short season varieties with resistance to pests, salinity and heat, especially in north Delta. Plant breeders also maintain genetic purity, yield potentials and fibre quality of the commercially grown varieties. The CRI stipulates the most suitable agro-climatic zones for each variety, with a view to draw the best map for each of the varieties. It identifies the most suitable agronomic package for each variety and designates its zone to maximise yield potentials under the diverse environmental conditions. Quality assessment techniques are constantly improved, besides annually evaluating the spinning properties of the commercial varieties and providing textile industry with full information about Egyptian cotton quality and its spinning efficiency. The CRI studies problems faced by the cotton industries. It develops technical recommendations for cotton producers and manufacturers.

There are several sections involved in the cotton research in organisations such as the Cotton Research Institute, Plant Pathology Research Institute, Plant Protection Research Institute, Central Administration for agriculture extension, Cotton Development Fund, and the Cotton Council, Fibre and Field Crops. The CRI has seven research stations covering the cotton area from north to south of Egypt.



my Research Institute and Agricultural Genetic Engineering Research Institute.

The Central Administration for Seed Production coordinates seed production. The CRI produces breeder seeds (generation one) and foundation seeds (generation two). The cooperatives receive the foundation Seeds and distribute them to a set of 'elite' farmers, who follow the production recommendations developed by the 'extension service', to obtain the highest possible yields of certified seeds (generation three). All seed cotton bags are delivered to the cooperative warehouse upon harvesting in coloured and signed bags. The seed cotton is transported to cotton gins wherein the seeds will be separated into their respective bags, for seed testing, germination, and fibre quality evaluation.

Seeds are selected, graded, labelled as certified seeds and returned to the central administration for seed testing and certification. After testing for germination and other characteristics, the central administration for seed testing and certification returns the seeds back to the cooperatives for

distribution to lead farmers who act as 'seed multipliers' to produce registered commercial seeds for general distribution. These seeds have a different coloured bag, different markings and are labelled as 'registered commercial' seeds.

Fertiliser and Pesticide Supply

There is a well-structured Fertiliser and pesticide supply chain. Farmers can purchase fertilisers and pesticides directly from the agricultural cooperatives or local authorised fertiliser dealers. Recommended fertilisers are available in the open market, through cooperatives and branches of the Principle Bank of Development and Agricultural Credit. The Agricultural Pesticide Committee is responsible for approval of suitable pesticides. The Principle Bank of Development and Agricultural Credit also provides pesticides. Major pesticide companies are Al-Gamhouriya, Bayer-Egypt, BASF-Egypt and Syngenta Egypt.

Variety Approval and Seed Supply

After initial selection of strains or types that give evidence of special merit and thus could be regarded as promising, the CRI puts the promising strains into the testing process using the most appropriate procedures so as to judge their production, pest resistance and quality. A new variety is subjected to market judgment. It should satisfy both producers and spinners, through improvements over the old variety in production and quality merits. Documentation is provided to the Variety Approval Committee (VAC) to obtain intellectual property rights. After the CRI identifies the "breeder seed" of a new variety, further scrutiny is conducted through an approval processes before the variety is commercialised. Variety approval is accorded by the Variety Registration Committee (VRC) which comprises of four concerned institutions, i.e., Plant Protection Research Institute, Plant Pathology Research Institute, Agro-econo-

Technology Transfer

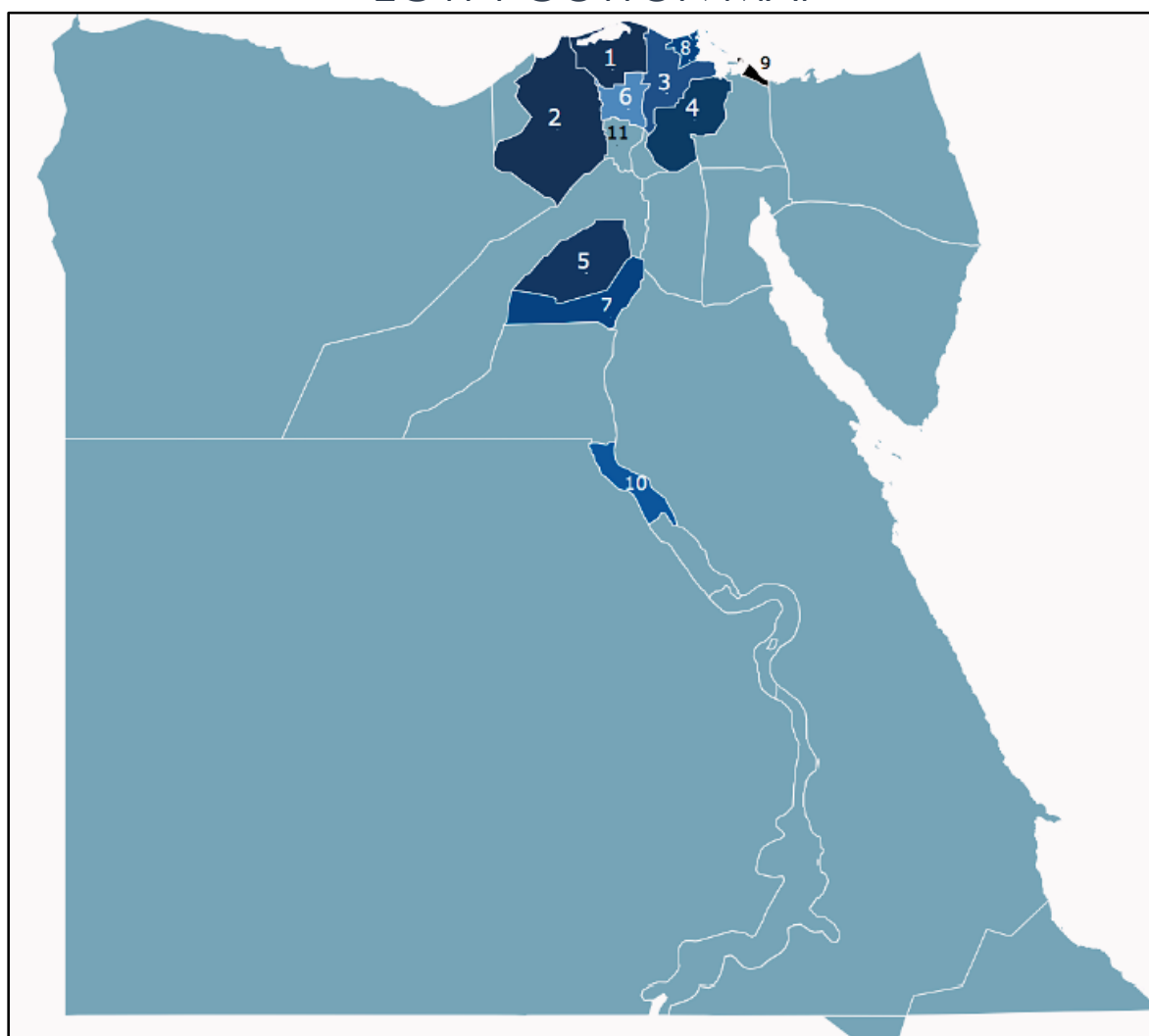
The CRI coordinates transfer of technology activities to ensure integration between research and application of results in cotton production, ginning and manufacturing. The CRI effectively liaises with research institutions, agricultural extension agencies and spinning companies to fulfil its extension tasks. The Cotton development fund with the Cotton Research Institute, central administration

for agricultural extension, organises agricultural extension courses and training courses for farmers. New developments and recommendations are transferred to farmers in various ways: directly through meetings, open field days, national campaign for cotton development, special newspapers, TV agricultural channels, magazines and direct contacts with scientists by the Extension services and Experimental and production Station at the Institute.

KEY CONTACTS IN EGYPT

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Cotton Research Institute	Prof. Dr. Hesham Hammoud, Director. Email: heshamao@yahoo.com Prof. Dr. Mohamed Negm Head of Spinning Res. Dept. Email: negmmohamed@icloud.com
Cotton Council, Fibre & oil Crops	Prof. Dr. Mohamed Aziz, Chairman Email: azizcotton@yahoo.com
Cotton Development Fund	Prof. Dr. Adel Alakhdar, Director Email: adelelakhedar@yahoo.com
Farmers Associations	
Internal Cotton Trade Committee	Mr Walid Ahmed Al-Sa'adany President Email: masoudeid@gmail.com
Trade & Textile Associations	
Alexandria Cotton Exporters' Association "ALCOTEXA"	Eng. Nabil El-Sentrisy, President Email: alcotexa@tedata.net.eg
Cotton Arbitration & Testing General Organization, CATGO	Eng. Mohamed Khedr, Chairman Email: info@catgo.gov.eg
Cotton Egypt Association	Eng. Khaled Schuman, CEO Email: info@cottonegyptassociation.com
Cotton & Textile Industry Holding Co. "CTIHC"	Dr. Ahmed Moustafa Mohamed Chairman Email: ctihc_egypt@hotmail.com ahmedmoustafa1654@hotmail.com
Modern Nile cotton	Mr. Ahmed Khaled Elbosaty Chairman & Managing Director Email: elbosaty@modernnile.com
Arab Cotton Ginning Co. ACGC	Mr. Mohsen Hassan, CEO Website: http://www.arabcot.com
Egyptian Chamber of Textile Industries – ECTI. Federation of Egyptian Industries – FEI. 1195 Cornich Elnile. Federation of Egyptian Industries Bldg. Cairo 11221	Khaled El Behairy, Director General Tel: (+20-2) 2577 4425 Fax: (+20-2) 2579 3289 Email: kbehairy@fei.org.eg

EGYPT COTTON MAP

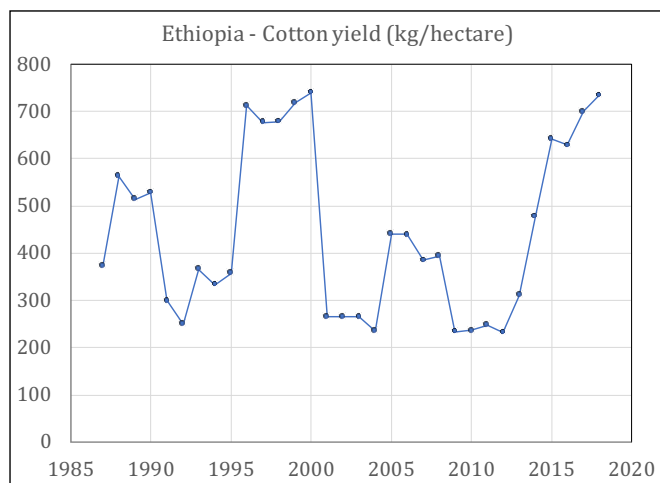
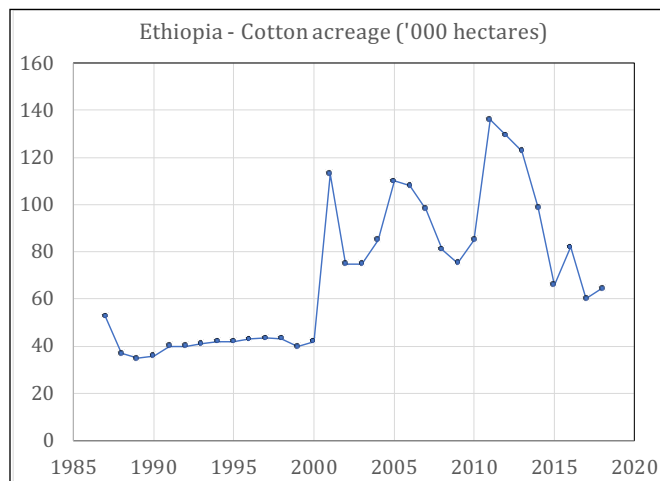
**EGYPT: COTTON PRODUCTION DATA 2018** (estimates)

S.No	Province	Area ('000 Hectares)	S.No	Province	Area ('000 Hectares)
1	Kafr Elsheikh	44.7	10	Asyout	1.9
2	Elbhera	24.2	11	Elmnoufia	1.0
3	Eldakahlia	21.8	12	El Nubareya	0.8
4	Elsharkia	20.8	13	Ismalia	0.7
5	Alfayom	6.8	14	Alexandria	0.7
6	Elgharbia	6.0	15	Elmenia	0.7
7	Bani Swaef	4.3	16	Souhag	0.4
8	Domietta	3.7	17	Elkalyoubeya	0.0
9	Portsaid	2.6	18	Alwady Algaded	0.0
EGYPT					141.1

Ethiopia

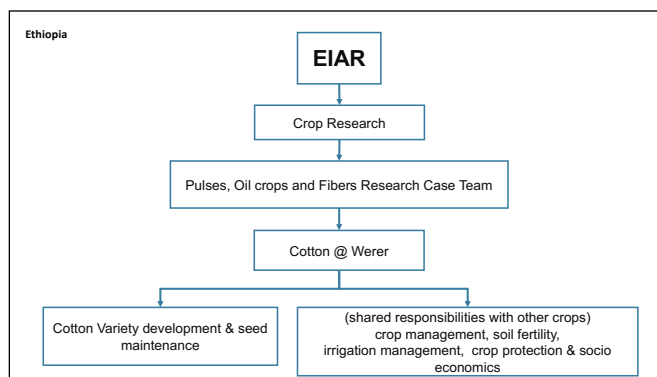
Cotton in Ethiopia

The average cotton acreage during the period 2008 to 2018 was 91,000 hectares at an average lint yield of 440 Kg per hectare.



Structure of Cotton Research

The Ethiopian Institute of Agricultural Research (EIAR) under the Ministry of Agriculture is mandated for agriculture research. EIAR has Centres of excellence for most commodities including one for cotton at Werer Agricultural Research Centre (WARC). Research sub-centres on most commodities are available at different regions/states. However, cotton does not have any sub-centre. The commercial cotton farms serve as testing and demonstration sites for cotton research. A limited level of collaboration exists with few of the regional governments in testing and adoption of new cotton technologies. Regional governments are responsible for research activities in specific districts of their regions. The Regional Agriculture Research Institutes of EIAR are located at Amhara, Tigray, SPNN and Gambela. Seed or chemi-



cal-companies approach both regional and federal research institutes for testing of their products. The Ethiopian Cotton Producers, Ginners and Exporters Association (ECPGEA), Addis Ababa also support research projects.

The Ethiopian Textile Industry Development Institute (ETIDI) Project was established in 2013 as an International Project for capacity building and benchmarking. The main objectives were to strengthen the capabilities of ETIDI in Training, Consulting, Research and Marketing Support Services for the Ethiopian Apparel Industry and to transform it into a Centre of Excellence through a twinning arrangement with the National Institute of Fashion Technology (NIFT), India. The NIFT conducted capacity building programmes in Ethiopia and faculty training programmes in India for Ethiopian officers. The first phase of the Project ended on 27th April, 2018. The second phase of the project is expected to start soon.

The federal and regional governments provide almost all funds for cotton research. Additional funding comes from international donors or research institutes (rare for cotton). Input suppliers like seed and chemical companies get paid-testing services based on number of samples and locations to be tested.

Variety Approval and Seed Supply

A company submits an application to import sample of seeds for research purposes. If the technologies are proven elsewhere globally, an additional application goes to the National Variety Release/Registration Committee (NVRC) under the Ministry of Agriculture along with the performance data of the varieties. The company signs an agreement with EIAR for paid-testing of varieties. A technical committee is assigned by NVRC to evaluate the performance of a variety. One-year multi location trial data will be generated by EIAR/WARC to be submitted to NVRC. If the technologies are germplasm or not proven technologies elsewhere a two-year multi location trial data is generated by EIAR/WARC to be submitted to NVRC. The NVRC will issue a registration or an approval or release a variety based on the technical committee recommendations and multi-location test reports of WARC.

Breeder seeds from the research farms are provided to li-

censed commercial cotton farmers to multiply 'certified' or 'commercial' or 'improved seeds' under supervision of the federal or regional seed quarantine officers. The licensed seed suppliers are Hiwot Farm mechanisation, Afri-Seed company, Getafam Mechanised farming plc., Africa global farming plc., Mehamed seed processor and supplier and Selam farmers union. Seeds are also supplied by gin owners after obtaining them from private commercial cotton farms.

Fertiliser and Pesticide Supply

Except a few small holders, Ethiopian cotton farmers rarely use fertilisers. The government office of Agricultural Inputs Supply Enterprise (AISCO) at Addis Ababa is the main importer and distributor of fertilisers through government channels, like Bureau of Agriculture and Extension offices. Individual companies, farmers associations, cooperatives and unions are also main actors playing significant role in consolidating the demand, purchase and distribution mechanisms.

Commercial farms have direct contact and access to pesticides dealers and distributors. Small holders have access to inputs through farmers' cooperatives or unions and through agricultural extension service providers of the District Agricultural Office (DAO).

The main input suppliers in Ethiopia are Chemtex private ltd C., FS Private Limited Company, General Chemical & Trading Private Company, Makobu Enterprises, Chemtrade International, Tensae International Business Ent., Lions International Trading Private Company, Adami-Tulu Pesticides Processing Factory, Markos Private Limited Company, BASF Trade Representative Office and Mekamba Private Limited Company.

Technology Transfer

The Government agricultural extension service providers in the districts conduct training programmes to cotton farmers at the grass-root level. The cotton development sector of the Ethiopian Textile Industry Development Institute (ETIDI) provides intensive training to cotton farm experts employed by commercial investors. The capacity building programmes are focused on water management, farm machinery management, farm management, good agronomic practices and IPM.

One of the main challenges of the Ethiopian cotton sector is lack of proper technology transfer mechanisms. Most of the government institutions are busy with technology transfer of food crops. Cotton production is dominated by old technologies.

KEY CONTACTS IN ETHIOPIA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Ethiopian Textile Industry development Institute	
Cotton development Sector	Mr. Mesele Mekuriya Deputy Director General Tel. +251-11-391-107 Fax: +251-114 39 50 03
Cotton Development Directorate	Mr. Samson Asefa Director Tel. +251-11-391-754 Fax: +251-114 39 50 03 Email: samsonasefa94@gmail.com
Cotton Quality research and Inspection Directorate	Director Tel. +251-11-391-107 Fax: +251-114 39 50 03
EIAR Head Quarter P.O.Box 2003	Dr. Diriba Director Crop Research http://www.eiar.gov.et/crops Tel +251-11-6462633-41 Fax: 251-11-6461294
Federal under EIAR	
Werer Agricultural Research Centre Assosa Agricultural Research Centre Pawe Agricultural Research Centre	
Regional	
Amhara Regional Agri. Res. Ins.	Tel: +251 582205200
Tigray Regional Agri. Res. Ins.	Tel: +251 344417798
SPNN Regional Agri. Res. Ins.	Tel: +251 462202034
Gambela Regional Agri. Res. Ins.	Tel: +251 475510014
Farmers Associations (cooperative unions)	
Metem/Cmia/Dansh Aurora and Selam Shelemela /Organic cotton producers/ www.ethiopiancotton.et	Asefa Aga Email: asefaaga@yahoo.com
Ginners Association	
ECPGEA	

France

Structure of Cotton Research

The Centre of International Cooperation in Agricultural Research for Development-CIRAD (Centre de Coopération Internationale en Recherche Agronomique pour le Développement) Montpellier has five units working on the cotton sector.

- Agroecology and Sustainable Intensification of Annual Crops - UPR Aïda (Agroécologie et intensification durable des cultures annuelles)
- Genetic Improvement and Adaptation of Mediterranean and Tropical Plants-UMR Agap (Amélioration génétique et adaptation des plantes méditerranéennes et tropicales)
- Innovation and Development in Agriculture and Food-UMR Innovation (Innovation et développement dans l'agriculture et l'alimentation)
- Environmental Microorganisms Plants Interactions-UMR IPME (Interactions plantes micro-organismes environnement)

- Territories Environment, Remote Sensing and Spatial Information-UMR Tetis (Territoires environnement, télédétection et information spatiale)

Funding comes from the French public sector (subsidy for public service charges, ANR), national public funding (cotton companies, etc.), international public funding (European Union, African Union, etc.) and private funding (cotton associations, seed companies, processing, etc.).

Seed Supply

CIRAD is a co-breeder of cotton varieties in many countries and many such varieties are registered with the African Intellectual Property Organisation.

Technology Transfer

In sub-Saharan Africa, scientific and technical partnership with National Agricultural Research Systems and cotton companies is the source of technology transfer to end-users.

KEY CONTACTS IN FRANCE

Institution / Mailing Address	Contact Person, Position
Centre de Coopération Internationale en Recherche Agronomique pour le Développement-CIRAD, TA B-102/02, Avenue Agropolis, Cedex 5, 34398 Montpellier http://www.cirad.fr	Bachelier, Bruno Correspondant filière coton Email: bruno.bachelier@cirad.fr Telf: 33-467615637
	Belot, Jean-Louis Annual Cropping Systems Research Unit Email: jeanbelot@imamt.com.br
Trade and Textile Associations	
Union des Industries Textiles (U.I.T.) 37, rue de Neuilly. 92110 Clichy. France www.textile.fr	Emmanuelle Butaud-Stubbs, Delegate General Tel: (+33-1) 4756 3125 Fax: (+33-1) 4737 0620 Email: ebutaud@textile.fr

Germany

Structure of Cotton Research

Germany is not a cotton producing country therefore there is no specific national research on cotton production. Germany's focal point for cotton is Fibre technology, cotton processing, including the textile industry and with even higher importance the textile machinery manufacturing industry. Research is also undertaken on cotton based new products for consumers, textile products and new clothing designs.

- The Bremen Fibre Institute (Faserinstitut Bremen) conducts laboratory research on innovative cotton-based products and on methods for tracing cotton from the field to the final consumer. It also conducts on-line cotton testing and harmonisation to contribute to the ICAC's activities on Commercial Standardisation of Instrument Testing of Cotton (CSITC) and to the ITMF International Committee on Cotton Testing Methods.
- The Institute for Textile and Process Engineering (Institut für Textil- und Verfahrenstechnik – ITV) in Denkendorf, and the Institute for Textile Technique (Institut für Textiltechnik der RWTH Aachen -IT) in Aachen, focus on sustainable and resource-efficient processing of cotton from fibres to yarns and fabrics until end products. Research is also conducted on recycling of fibres, which is becoming increasingly important. Research is not only based on processing but also on the machinery used for cotton processing.
- The Saxon Textile Research Institute (STFI) in Chemnitz works on fibre recycling.

- The Institute for Textile and Process Engineering-DTNW (Deutsches Textilforschungszentrum Nord West) in Krefeld conducts research on chemical and enzymatic treatment of cotton textiles e.g. easy-care finishing and application of cotton textiles for medical usage.

Germany based international companies such as Bayer Crop Science and BASF carry out additional research in all areas of cotton production, including i.e. genetics, biotechnology, pests and disease control. Their research is organised throughout various locations of the companies. Usually their research is on basic problems such as weeds, insect pests and diseases, which includes cotton associated challenges.

German textile research with its 16 textile research institutes (including Faserinstitut Bremen, ITA Aachen, DITF Denkendorf, DTNW Krefeld, ITM Dresden, STFI Chemnitz) is coordinated by Forschungskuratorium Textil. A specific source of project funding is the German Federation of Industrial Research Associations (AiF), based on funding from the German industry and the Federal Ministries of Economics and Technology (BMWi). The annual Aachen-Dresden International Textile Conference is focusing on textile technology developments.

Research projects are directly funded partly by the industry, partly by national funding sources such as AiF, and partly by international sources like the European Union.

Technology Transfer

For the international exchange of research information and transfer of knowledge on cotton, the Bremen Cotton Exchange and the Faserinstitut Bremen organise an International Cotton Conference in Bremen every second year in the month of March.

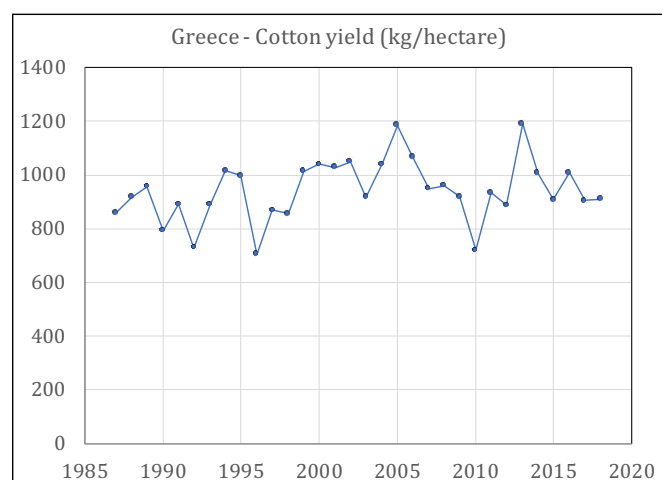
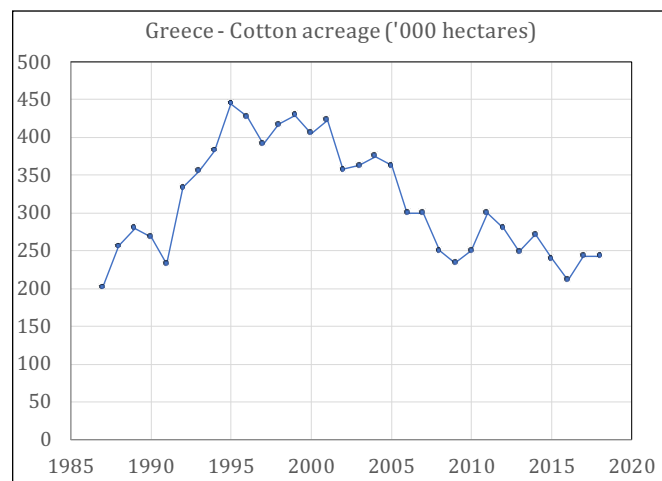
KEY CONTACTS IN GERMANY

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Faserinstitut Bremen e.V. in coop. with ICA Bremen Am Biologischen Garten 2 28359 Bremen, Germany www.faserinstitut.de www.ica-bremen.org	Prof. Dr.-Ing. Axel S. Herrmann, Institutsleiter. Mr Axel Drieling, Senior Manager Cotton, Tel: +49-421-218-58700 Tel: +49-421-218-58650 Email: drieling@faserinstitut.de
Institut für Textiltechnik der RWTH Aachen (ITA) Otto-Blumenthal-Straße 1, 52074 Aachen, Germany www.ita.rwth-aachen.de	Univ.-Prof. Prof. h.c. Dr.-Ing. Dipl.-Wirt.Ing Thomas Gries, Director, Tel: +49-241-80-23400 Email: ita@ita-rwth-aachen.de
Deutsche Institute für Textil- und Faserforschung (DITF) Denkendorf Körschtalstr. 26 73770 Denkendorf, Germany www.ditf.de	Prof. Dr.-Ing. Götz T. Gresser, Director and Member of Executive Board Textile Technology and Process Engineering, Tel: +49-711-9340-216 Email: goetz.gresser@ditf.de
Deutsches Textilforschungszentrum Nord-West e.V. (DTNW) F&E DTNW gGmbH Adlerstraße 1, 47798 Krefeld, Germany www.dtnw.de	Prof. Dr. J.S. Gutmann, Executive Director, Tel: +49-2151-8430 Email: jochen.gutmann@dtmw.de
Institut für Textilmaschinen und Textile Hochleistungswerkstofftechnik (ITM) an der TU Dresden, Hohe Straße 6 01069 Dresden, Germany tu-dresden.de/mw/itm	Univ.-Prof. Dr.-Ing. habil. Dipl.-Wirt. Ing. Chokri Cherif, Director, Tel: +49-351-463 39300 Email: chokri.cherif@tu-dresden.de
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Spinners Organisations	
Industrieverband Veredlung – Garne – Gewebe - Technische Textilien e.V. (IVGT) Mainzer Landstr. 55, 60329 Frankfurt, Germany www.ivgt.de	Michael Pöhlig, Hauptgeschäftsführer michael.poehlig@ivgt.de ; Stefan Schmidt, Forschung Tel: +49-69-2556-1732 Tel: +49-69-2556-1723 Email: stefan.schmidt@ivgt.de
Trade and Textile Associations	
Industrieverband Veredlung-Garne-Gewebe- Technische Textilien e.V. Mainzer Landstrasse 55 DE - 60329 Frankfurt Web: www.ivgt.de	Klaus-Jürgen Kraatz, Managing Director Tel: (+49-69) 2556 1700 + 1730 Fax: (+49-69) 2556 1725 Email: info@ivgt.de

Greece

Cotton in Greece

The average cotton acreage during the period 2008 to 2018 was 252,000 hectares at an average lint yield of 940 Kg per hectare.



Structure of Cotton Research

The Hellenic Agricultural Organisation (HAO) – DEMETER was established in 2011 by merging the National Agricultural Research Foundation (NAGREF) of Greece, established in 1989, with three other Greek organisations of the agricultural sector. The HAO is a public sector organisation that enjoys administrative and financial autonomy and supervised by the Ministry of Rural Development and Food. It is governed by a Management Board and a Scientific Committee. The organisation conducts research on integrated crops management and development, environment and ecosystems protection, livestock improvement and breeding, organic agriculture, animals, fisheries, forestry and public health protection and implements the application of new technologies. The target groups serviced by the organisation are farmers, consumers, educational organi-

sations, local authorities, non-governmental organisations, research organisations, students, researchers and SMEs.

The HAO institutes that deal with cotton research are listed below:

- **The Institute of Plant Breeding and Genetic Resources (IPBGR)** is a research institute located in Themi, Thessaloniki. It focuses on plant breeding, local varieties, plant protection, crop development, conservation of genetic resources and propagation of rare and endangered species. The Greek Gene Bank (GGB) is responsible for collection, conservation, characterisation, and documentation of plant genetic resources of Greece. The GGB participates in national and EU fora (ECPGR, EURISCO, etc.), as well as in networks on genetic resources conservation. It undertakes expedition collections in Greece, and provides consulting to MRDF. The GGB collections are conserved mainly as seed samples in cold-chamber facilities at Themi.
- **The Institute of Industrial and Forage Crops** is located in Centre Greece. The institute focuses on innovation, research, knowledge diffusion, technology and advisory services on soil/water resources, plant production, pest management and good agricultural practices.
- **The National Centre for Quality Control, Classification and Standardisation of Cotton** and its laboratories in Karditsa and Orchomenos, are in the division of the **Institute of Industrial and Forage Crops of the Hellenic Agricultural Organisation “DEMETER”**. The laboratory of Karditsa provides services in quality control of cotton for the manufacturing industry (ginning), cotton seed companies, cotton merchants and other customers. It participates in international inter-laboratory tests (CSITC, BCRT, 7 tests / year). According to the Ministerial Decision (ΦΕΚ 1058 / ΤΒ / 2014) it is responsible for:
 - The implementation of cotton Standardisation and Classification – in the country with modern methods and international standards.
 - Arbitration in the fields that the Centre is accredited.
 - Collaboration with other relevant services of the Ministry of Rural Development and Food, organisation of actions for the improvement of the quality and competitiveness of the product, as well as educational and research projects.
 - Building a database for the quality of Greek cotton and the publication of relevant reports.

The following Greek Universities, conduct cotton research:

- Aristotelian University of Thessaloniki- School of Agriculture (www.agro.auth.gr)
- Agricultural University of Athens (www2.aua.gr)

- University of Thessaly- School of Agricultural Sciences (www.agr.uth.gr)
- Democritus University of Thrace – School of Agricultural Sciences (www.agro.duth.gr)

Many private companies also conduct cotton research.

The Ministry of Rural Development and Food has the responsibility of coordination of cotton research in Greece. The National and European Union fund programmes on cotton research in Greece. The Ministry of Rural Development and Food approves and funds special agricultural programs for the development of new cotton varieties. The programmes are assigned to the HAO - DEMETER. A few projects are also funded by private companies, cooperatives and Regional Operational Programmes.

Variety Approval and Seed Supply

The Variety Research Institute of Cultivated Plants (VRICP) is responsible to examine all varieties that are intended to be cultivated in Greece. The procedure and methodology followed for registration of conventional varieties of field crops and vegetables are in accordance with general and specific technical rules harmonised with the Community Instructions 2002/53(70/457) and 2002/55 (70/458). Every cotton variety is examined in the cotton belt, for two years by the Variety Research Institute of Cultivated Plants and compared with check varieties. The agronomic and quality data are checked on the basis of standard Rules and Regulations from the committee of the Ministry of Agriculture. The committee proposes which variety is suitable for cultivation in Greece and after that the variety is registered in the National Catalogue. After registration, the variety can be cultivated in Greece and in the European Union countries for ten years.

The HAO – DEMETER is the only public organisation that is mandated for seed propagation and seed supply to farmers, but its share in local cotton market is very low. The main supply systems are catered by the private seed companies who propagate cottonseeds and also import cotton seeds. The private companies promote seeds through agronomists and sell the seeds through private stores. The seed companies in Greece are members of Greek Seed Traders and Producers (www.sepy.gr) and a majority of them deal with cotton.

In Greece, seed companies import planting seed from abroad and only a few multiply seed in Greece. The major cotton seed companies in Greece are Alapis CropScience, Delta and Pine Land, Monsanto Agricultura España, Zermain Gedera, CSIRO Australia, Bios Agrosystems

ABEE, Spyrou AEBE, Golden West Seed Research Co., Hazera Genetics Ltd., Associated Farmers Delinting, Agris AE, Phytogen Co., Ipha Seeds AEBE, Boswell J. G. Company and ELGO-DEMETER NAGREF – Cotton and Industrial Plants Institute (public).

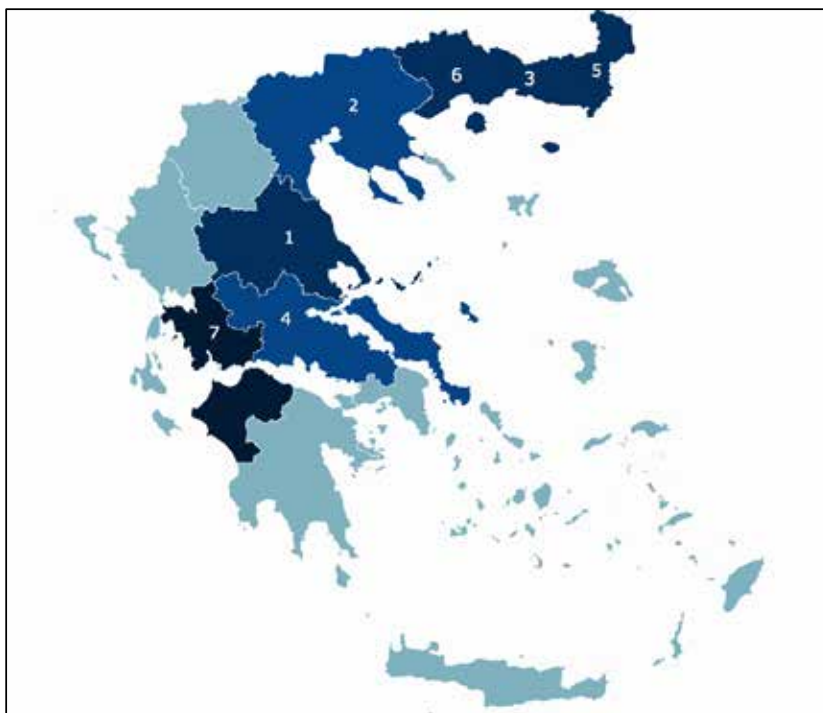
Fertiliser and Pesticide Supply

There are a few industries in Greece that produce fertilisers but most of the companies import fertilisers from abroad, mainly from Europe. Farmers buy fertilisers, seeds and pesticides from private stores. Most farmers apply a mean dose of 120 Kg/ha N, 80 Kg/ha P and 80 Kg/ha K. Farmers buy pesticides and other plant protection products mainly from private stores and cooperative stores. The major companies who supply pesticides are BASF, Bayer CropScience, FMC Hellas, Intrachem Hellas, Monsanto, Sigma Agro Abee, Syngenta Hellas Αεβε, Veterin Abee, Agribus A.E., Efthymiadis N & K, Dupont, Ipsilon A.E., Chellafarm S.A. And Alapis.

Technology Transfer

In every region of Greece there is an agricultural department where the farmers can find available information related to cotton and other crops. Also, some cooperatives have departments with educated personnel responsible to help farmers. Another way to transfer the new technology is the agronomists who are owners of stores that sell agricultural supplies to farmers. New developments related to new cotton varieties or cultivation practices are also popularised through articles published in specialised issues (agricultural newspapers and magazines), local scientific journals and international websites.

GREECE COTTON MAP



GREECE: COTTON PRODUCTION DATA 2017-18 (estimates)

S.No	Regions	Area ('000 Hectares)	Production (M Tonnes)
1	Thessaly	81.3	0.097
2	Central Macedonia	67.8	0.081
3	Thrace	37.3	0.028
4	Central Greece	33.1	0.035
5	Evros	31.4	0.021
6	East Macedonia	3.4	0.004
7	West Greece	2.3	0.003
	Others	0.0	0.002
	GREECE	256.5	0.270

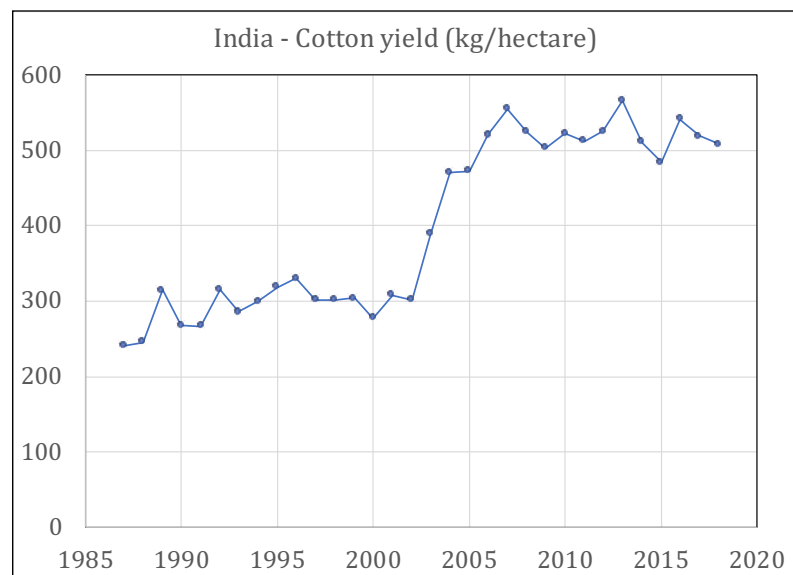
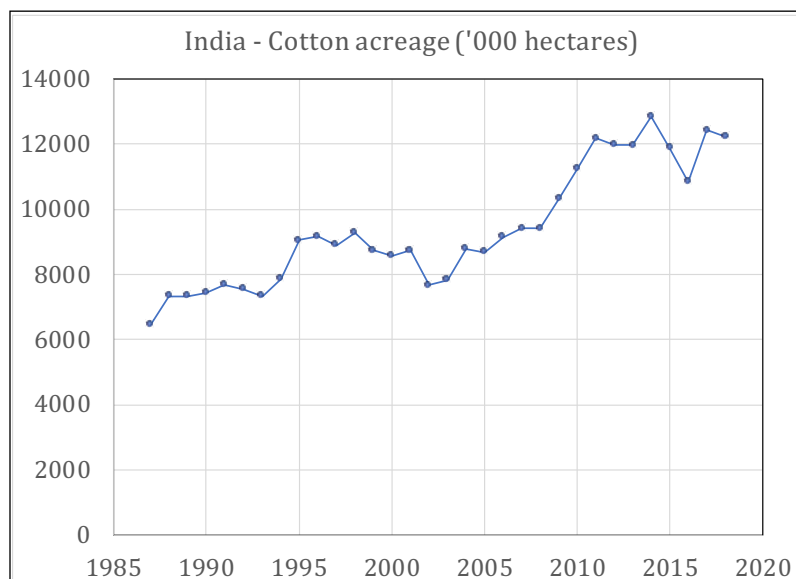
KEY CONTACTS IN GREECE

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Hellenic Agricultural Organization Demeter (formerly NAGREF) Athens www.nagref.gr, www.ipgrb.gr	Kalivas, Apostolos Assistant Research Scientist Tel: 30-2310-799444 Tel: 30-2310-796513 Email: kalyvas@ipgrb.gr
Plant Protection Institute Hellenic Agricultural Organization Demeter PO Box 2228 71003 Heraklion, Crete	Gitsopoulos, Thomas Email: gitsopoulos@nagref.gr
University of Thessaly Argonafton & Filellino 38221 Volos	Bartzialis, Dimitrios Email: dbartz@uth.gr
Classification and Standardization Centre of Karditsa Hellenic Agricultural Organization Demeter (former NAGREF) ethiage@otenet.gr	Mohamed, Darawsheh
Aristotelian University of Thessaloniki Thessaloniki	Athanasios Mavromatis Email: amavromat@agro.auth.gr
Cotton and Industrial Plants Institute Hellenic Agricultural Organization Demeter (former NAGREF) Sindos 57400, Thessaloniki Fibre Technology http://www.cottoninstitute.gr	Tsaliki, Eleni Email: tsaliki.cotton@nagref.gr
Farmers Organization	
Panhellenic Confederation of Agricultural Union Cooperatives Arcadias 26 & Mesogeion Athens 11526 http://www.paseges.gr	President Tel: 30-210-7499400 Tel: 30-210-7799313
Ginning Organization	
Hellenic Ginners and Exporters Association	President Tel: 30-2310-520502

India

Cotton in India

The average cotton acreage during the period 2008 to 2018 was 11,573,000 hectares at an average lint yield of 519 Kg per hectare.



Structure of Cotton Research

The Central Institute for Cotton Research, Nagpur, Maharashtra, the Central Institute for Research on Cotton Technology (CIRCOT) and the All India Coordinated Research Project on Cotton (AICCRP) mainly coordinate cotton research in India.

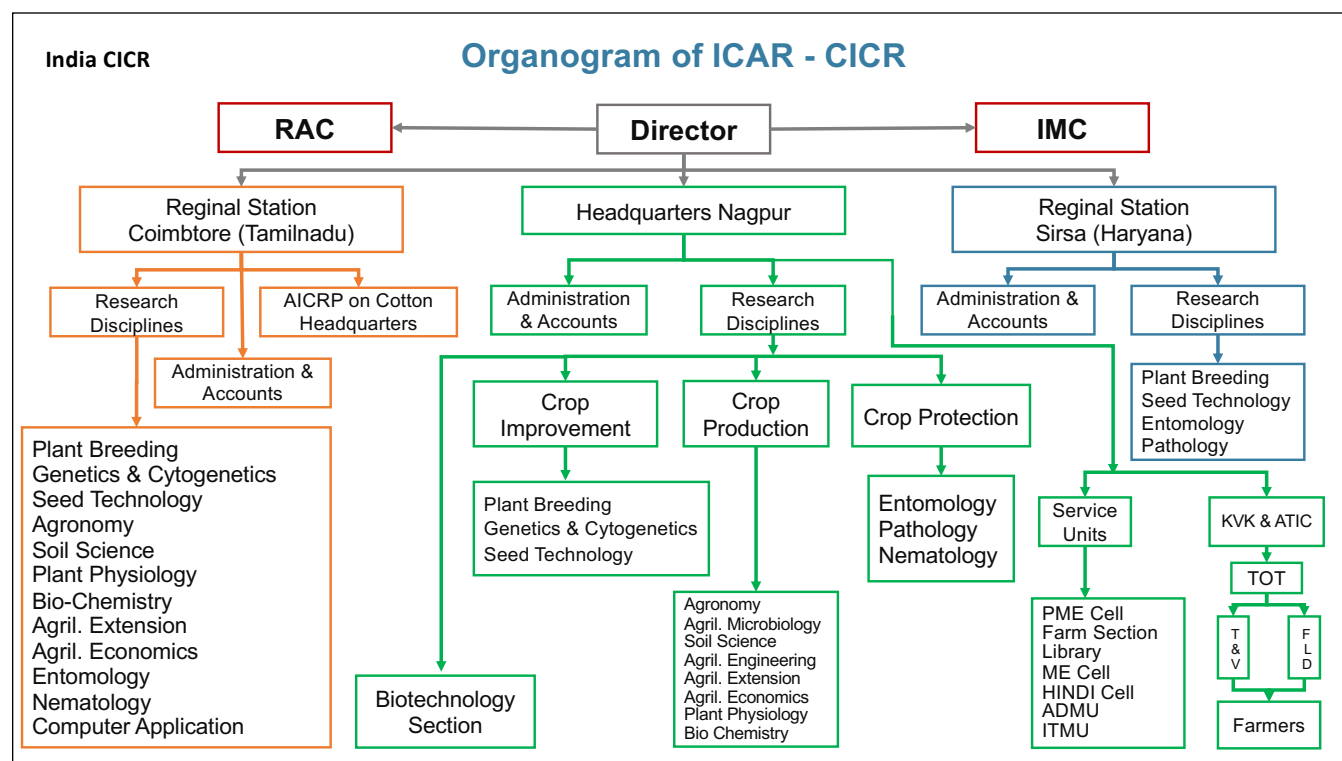
Cotton research in India is conducted by the scientists

working under the National Agricultural Research and Education System (NARES) comprising of Central Government Research Institutes of the Indian Council of Agricultural Research (ICAR) and the State Government Agricultural Universities. The Indian Council of Agricultural Research (ICAR), operates under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India while the State Agricultural Universities function under the federal State governments.

There are two research institutes under the ICAR: The ICAR-Central Institute for Cotton Research (CICR) for production research and the ICAR-Central Institute for Research on Cotton Technology (CIRCOT) for research on post-harvest technology and cotton value-chain. Through funding support from the Central Government, the ICAR supports the All India Coordinated Research Project on Cotton (AICCRP on Cotton) which has a network of research programmes conducted by the scientists of the State Agricultural Universities in cotton growing states.

THE ICAR-Central Institute for Cotton Research (CICR) Nagpur, is a premier institution of cotton production research in India under the aegis of Indian Council of Agricultural Research (ICAR), New Delhi. It was established in 1976 with headquarters at Nagpur (Maharashtra) and two Regional Stations at Coimbatore (Tamil Nadu) and Sirsa (Haryana). The institute has a total sanctioned staff strength of 271, with 81 scientists, 72 technical staff, 48 administrative staff and 70 supporting staff. The institute has a 425-acre research farm at Nagpur, 55-acre farm at its regional station Sirsa and 88-acre farm at regional station Coimbatore. The CICR conducts basic and strategic research on cotton to improve yield, fibre quality and by-products. The institute has a mandate to create new genetic variability for location-specific adoption in cotton-based cropping systems. Scientists of the institute assist in the transfer of modern cotton production technology to various user agencies.

The ICAR-Central Institute for Research on Cotton Technology (CIRCOT), Mumbai, is a premier institution on cotton post-harvest processing and value-addition research. The institute has a total sanctioned staff strength of 266, with 50 scientists, 112 technical staff, 47 administrative staff and 57 supporting staff. The CIRCOT was originally established in the year 1924 by the then Indian Central Cotton Committee (ICCC) under the name of Technological Laboratory (TL) with the twin objective of



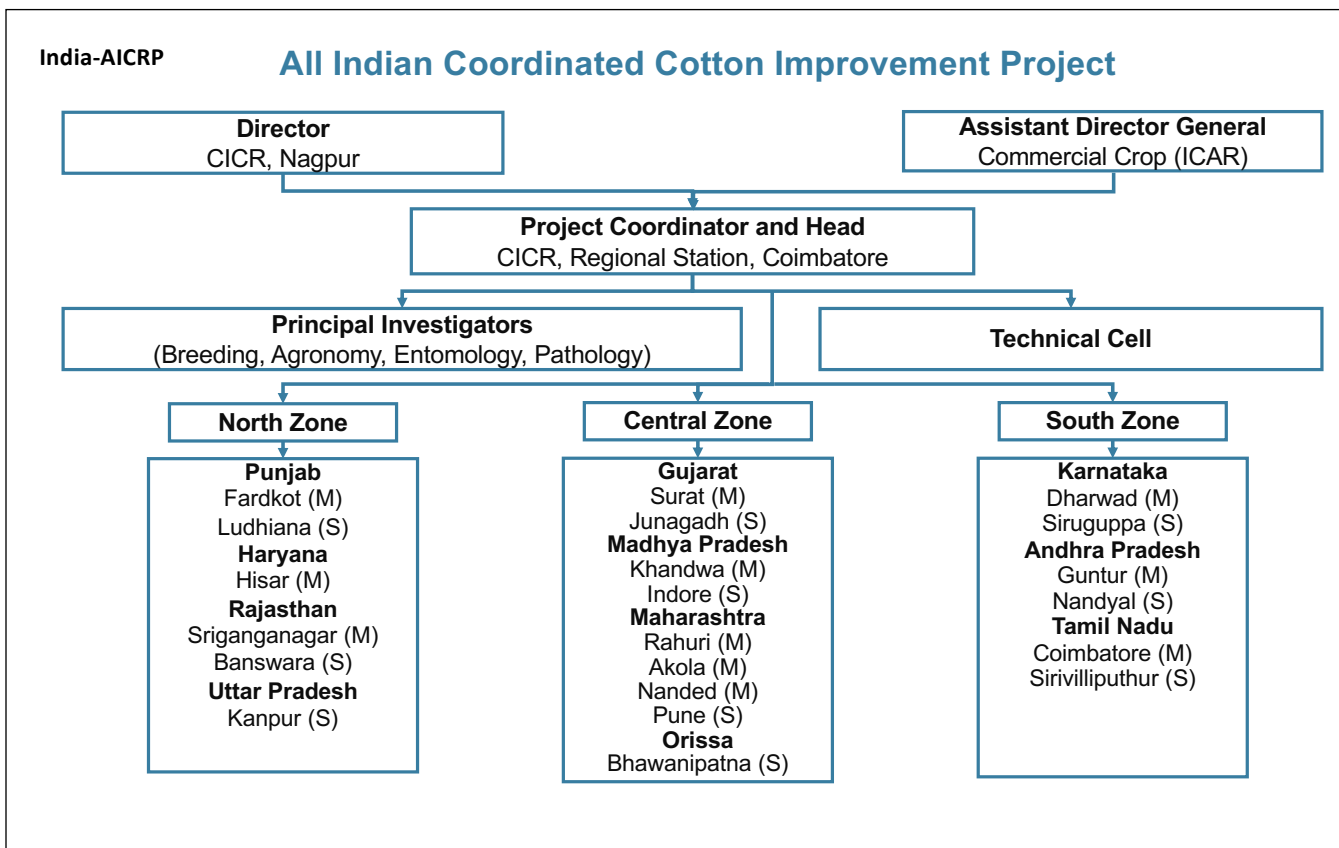
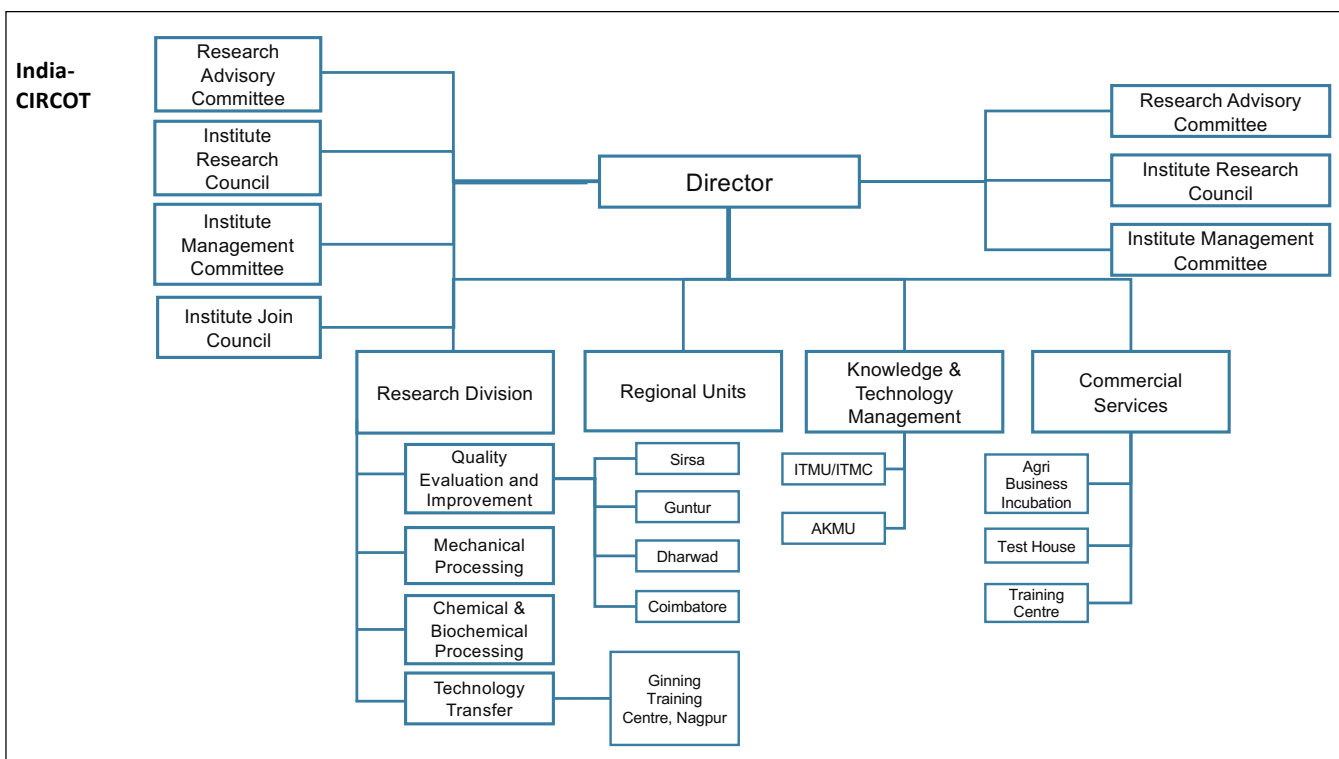
assisting cotton breeders in the development of new varieties by evaluating various fibre quality parameters and carrying out research on their spinning potential. The administrative control of the Technological Laboratory was transferred to the Indian Council of Agricultural Research (ICAR) In 1966, and the name of the Institute was changed to Cotton Technological Research Laboratory (CTRL). The mandate for research and development widened to all aspects of post-harvest technology of cotton and value addition to cotton by-products and processing of wastes. Later from 1st April 1991, the Institute was renamed as Central Institute for Research on Cotton Technology (CIRCOT). The Institute provides service to the trade and industry by imparting training on cotton quality evaluation and ginning and also by offering quality assessment support for fibre, yarn and fabrics on commercial terms.

The Institute has four major research divisions namely Mechanical Processing Division (MPD), Quality Evaluation and Improvement Division (QEID), Chemical and Biochemical Processing Division (CBPD) and Transfer of Technology Division (TTD). The Ginning Training Centre (GTC) of CIRCOT located in Nagpur serves the ginning industry by training gin fitters and technicians employed in ginning-pressing units dispersed all over India. In addition to training, this centre offers technical consultancy services to gin manufacturers. There are five regional units of the institute located at Coimbatore, Guntur, Dharwad, Surat and Sirsa.

The All India Coordinated Research Project on Cotton (AICCIP) was established by the ICAR in 1967 at Coim-

batore, India to improve both quality and quantity of cotton considering the needs of domestic textile industry and demand for exports. The AICCIP was formed from the Indian Central Cotton Committee (ICCC) that coordinated cotton research in India from 1921 to 1966. The AICCIP is now called the All India Coordinated Research Project (AICRP) on cotton. It was designed to give new thrust and direction to cotton research through multi-disciplinary and multi-Centre approaches with the active involvement of State Agricultural Universities. Currently, the AICRP on cotton project operates over 21 participating Centres involving 16 State Agricultural Universities including more than 10 voluntary Centres that are involved in cotton research. The ICAR-Central Institute for Cotton Research, Nagpur and its Regional Stations located at Coimbatore and Sirsa provide basic research support and also take part in research and evaluation activities of the AICRP on Cotton. The ICAR-Central Institute for Research on Cotton Technology (ICAR-CIRCOT), Mumbai and its regional units located at Sirsa, Surat, Nagpur, Dharwad, Guntur and Coimbatore are closely associated with AICRP on Cotton in assessing fibre quality parameters of cotton besides ensuring appropriate value addition to cotton.

The Project Coordinator AICCIP is responsible for coordinating the research programmes being conducted at different centres. The Project Coordinator ensures concurrent testing of cotton varieties and hybrids under strict coding besides supervising the development of location specific cotton production and plant protection technologies. The AICRP has the responsibility of maintenance



and production of nucleus and breeder seeds, screening of cotton genotypes for resistance to major pests, diseases, salinity and drought tolerance. Research activities are implemented with the active supervision and cooperation of four principal investigators from crop improvement, agronomy, entomology and pathology disciplines under the overall supervision of the Project Coordinator.

ICAR research Institutes receive funding from the Ministry of Agriculture, Government of India. Besides, external funds granted by other ministries are also utilised for special research programs. Research institutions under the state agricultural universities receive 75% of the total budget from ICAR and remaining 25% from the respective State Governments.

Variety Approval and Seed Supply

For commercial release of any variety/hybrid in India, the entries are evaluated in multi-location trials under the concerned crop-specific All India Coordinated Research Projects for at least one year for State release or at least for three years for Central release across different States. During the multi-location evaluation, the performance of the genotype is evaluated for yield, yield attributes, quality characters, reaction to pest and diseases etc. and is compared with the various check varieties/hybrids viz., National check, zonal check and local check. Later the agronomic requirements of the genotype are standardised for appropriate geometry and nutritional requirements. A proposal for the identification of the genotype is submitted to either Central Variety Identification Committee, which assembles every year during the annual group meeting or to the State Variety Identification Committee. Based on the recommendation, the proposal is submitted to the Central Sub-Committee on Crop Standards, Notification and Release of Varieties along with DNA fingerprinting data. Accordingly, the variety is notified in the Official Gazette of India.

During 2002 to 2017, the Genetic Engineering Appraisal (previously 'approval') Committee (GEAC), under the Ministry of Environment, Government of India approved the commercial cultivation of *Bt*-cotton hybrids, which could be marketed by the private seed companies. This was a deviation from the standard procedure described above.

Seed production is carried out by the public seed companies such as the National Seed Corporation, State Seed Corporation of the concerned State and State Seed Farms of the concerned State. In India, different categories of seeds are produced. Nucleus seeds are the basic seeds of any variety or parental line of the hybrids and are maintained by the concerned breeder or the sponsoring institution. The nucleus seeds are used as the source for Breeder seed production. Both the nucleus and breeder seeds are produced strictly under the supervision of the concerned breeder or designated breeders. For cotton,

the isolation distance for the nucleus and breeder Seed production is 50 meters. The breeder seeds are used as a source for the foundation seed, which is then used for the production of certified seeds. The foundation and certified seed categories are produced by the National Seed Corporation (NSC), State Seed Corporations (SSC), State Seed Farms (SSF), private seed producers, etc. Private seed producers have to be registered with State Seed Certification Agency (SSCA) of the concerned state. The foundation and certified seed production plots are monitored by the Seed Certification Agency (SCA) at the prescribed period of crop growth and during seed processing. Certified seed is used for commercial cultivation. In India, seed certification is voluntary and is done only for notified varieties / hybrids. Alternately, most of the private seed companies sell their seeds as truthfully labelled seeds (TFL), wherein the seed producers themselves declare the quality of seed being sold in their label. Major private seed companies are Mahyco, Nuziveedu Seeds, Rasi Seeds, Ankur Seeds, Tulasi seeds, Krishidhan Seeds, Namdhari Seeds, JK Seeds, etc.

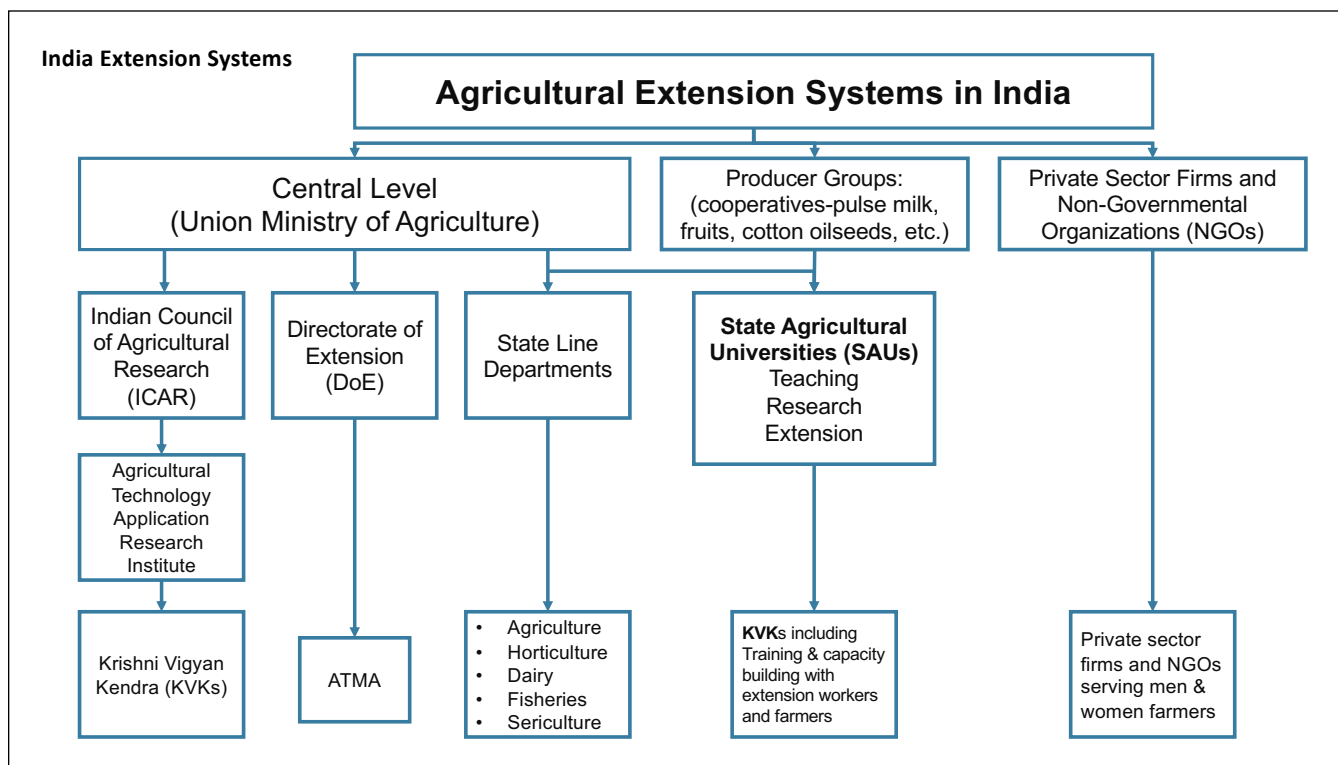
Fertiliser and Pesticide Supply

The Department of fertilisers has been entrusted with the responsibility of ensuring movement, distribution and allocation of subsidised chemical fertilisers, from various Fertiliser plants and ports in accordance with the state-wise requirement assessed by the Department of Agriculture & Co-operation (DAC). The distribution of imported urea is made keeping in view the requirements of each of the state. Major pesticide manufacturers and suppliers are UPL, PI, Rallis, Meghmani, Dhanuka, Sudarshan, Exel, Nagarjuna, Bharat Rasayan, Pushak and Bhagiradh. Farmers purchase pesticides from shops run through dealer networks.

Technology Transfer

Agriculture extension and technology transfer are the responsibilities of the State Agricultural Departments since agriculture is a state subject. However, the central government also implements several technology transfer plans through state governments. Agricultural extension in India is supported and funded by the national government mainly through the Ministry of Agriculture (MoA), but State Agricultural Departments have their own allocations. Agricultural extension and technology transfers are facilitated through three major systems.

- 1) The Ministry of Agriculture, Government of India comprising of the ICAR and the Directorate of Extension (DoE) through the Krishi Vigyan Kendra (KVKs) and, more recently, the Agricultural Technology Management Agency (ATMA) at the District level
- 2) The State Departments of Agriculture (DoA), including the State Agricultural Universities (SAUs)



- 3) Private agencies such as Krishi seva kendras or private agro-input dealers, producer groups, cooperatives and federations and civil society organisations, such as the Non-governmental Organisation (NGOs).

The Agricultural Extension Division under the ICAR is responsible for technology assessment, demonstration and capacity development through a national network of 11 Agricultural Technology Application Research Institutes (ATARIs) and 700 Farm Science Centres called Krishi Vigyan Kendras (KVKs). The mandates of ATARIs are coordination, monitoring of technology application, frontline extension education programmes, strengthening agricultural extension research and knowledge management. The Agricultural Extension Division at the national level is headed by Deputy Director General (DDG, Agricultural Extension) and supported by two Assistant Director Generals (ADGs), three Principal Scientists, one Deputy Secretary and one Under Secretary.

The 700 Krishi Vigyan Kendras (Farm Science Centres) are distributed across India with 458 in SAUs, 105 with NGOs, 64 under ICAR institutes, 36 under State Governments, 18 under Central Agricultural Universities, 8 under Deemed Universities and 11 under different private agencies. The KVKs operate with a mission for farmer-centric growth in

agriculture through application of appropriate technologies in specific agro-ecosystems. They conduct on-farm testing to assess the location specificity of agricultural technologies under various farming systems; organise Frontline Demonstrations to establish production potential of technologies on the farmers' fields and conduct programmes for capacity development of farmers and extension personnel to update their knowledge and skills on modern agricultural technologies.

The Indian Council of Agricultural Research launched the Frontline Demonstration (FLD) Program in 1995 and the All India Coordinated Cotton Improvement Project was entrusted with the task of implementing the program in cotton. Several demonstrations are conducted every year to popularise new varieties and hybrids with improved agronomic and crop protection techniques. This project is also involved in organising extension programs for disseminating the recent agricultural technologies and crop management practices to bridge up the gap between farmers and the research institutes. The coordinating Centres organise Farmer Camps (Krishi Melas) during the cropping season to disseminate packages of practices and newer technologies to farmers.

KEY CONTACTS IN INDIA

Research Organisations

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Central Institute for Cotton Research Post Bag No.2, Shankar Nagar Post Office Nagpur - 440010, Maharashtra	Waghmare V.N Acting-Director Email: director.cicr@icar.gov.in Tel: +91 712-275536 Fax: +91 712-275529
Central Institute for Research on Cotton Technology Adenwala Road, PB No 16640, Matunga (East), Mumbai 400019, Maharashtra	Patil, P.G., Director Tel: +91 24127273/76, Tel: +91 24184274/75 Fax: 24130835/24157239 Email: director.circot@icar.gov.in
Ginning and Training Centre Central Institute for Research on Cotton Technology Amaravati Road, Nagpur	Shukla, S.K. Head Email: gtc_ngp@rediffmail.com
Regional Station ICAR-CICR Central Institute for Cotton Research Lawley Road, Coimbatore 641003, Tamil Nadu www.aicrip.cicr.org.in	Prakash, A.H. Project Coordinator and Head Tel: +91 0422-2430045 Tel: +91 0422-2431238 Email: cicrbe@gmail.com
Regional Station, ICAR- Central Institute for Cotton Research, Sirsa 125055, Haryana	Monga, Dilip Head Tel: +91 1666-220428 Tel: +91 1666-230271 Email: dmonga2009@gmail.com, Email: cicrsirsa@yahoo.com

Ginners Organisations

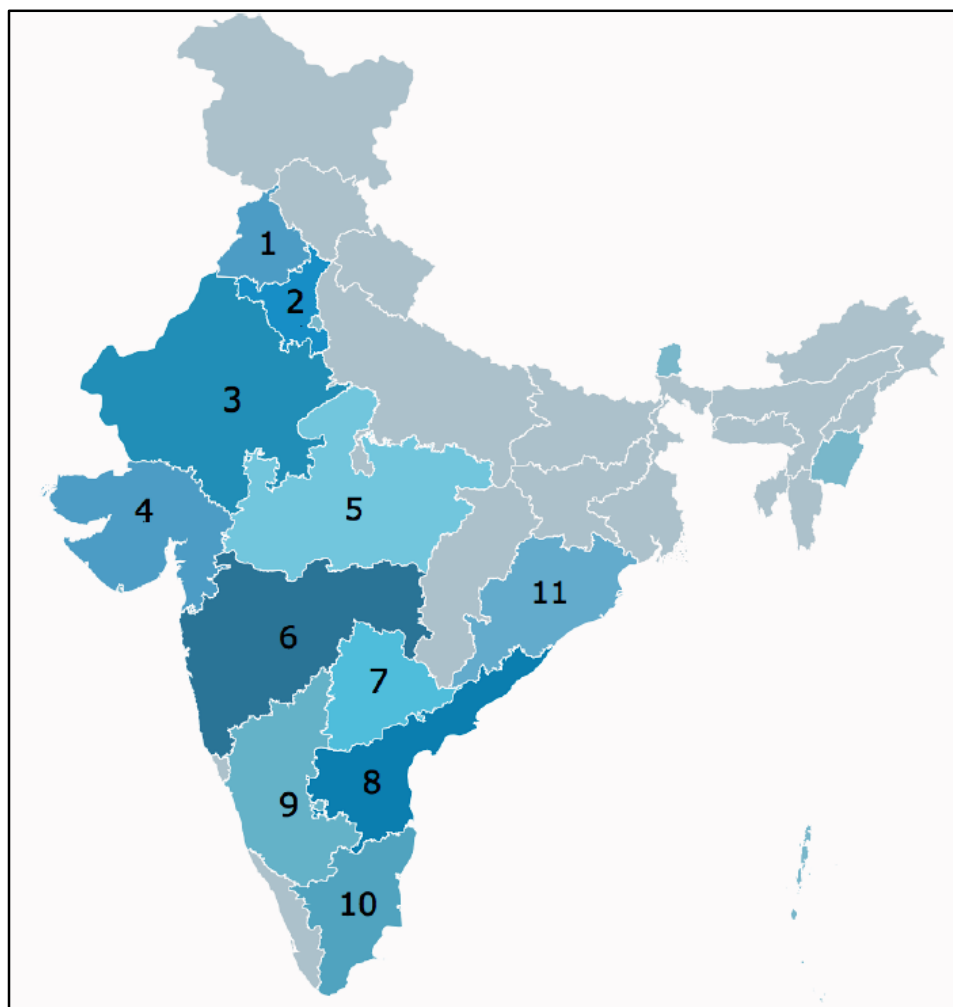
Saurashtra Ginners Association, UL-3, Panorama Complex, Opp. Bal Adalat, Gondal road, RAJKOT – 360002	Mr. Bharat Wala, President, Hadamtala, Tel: +91 281 3045402 Fax: +91 281 3045402 Mobile: 98250 77522 Email: info@sgaindia.org
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Madhyanchal Cotton Ginners & Traders Association	Shri Manjeet Singh Chawla President
Maharashtra Cotton Ginners' Association	Shri B.S. Rajpal President
Khandesh Gin Press Factories & Traders Development Association, Chaleesgaon Road, Dhule, Maharashtra	Pratap Jain, President
Karnataka Cotton Association	Shri Omprakash Jain President
Madhya Pradesh Cotton Merchants' Association	Shri Vinod Jain, Joint Secretary
Maharashtra Rajya Sahakari Ginning & Pressing Association	Shri Sunil Kedar, Chairman Tel: +91 9422108360 Tel: 9970252880 Tel: +91 712-272611

Trade and Textile Associations

The Southern India Mills' Association 41, Race Course, Coimbatore – 641018 www.simamills.org	Dr. K. Selvaraju, Secretary General Email: info@simamills.org, Tel: +91 0422-4225333 Tel: +91 0422-2571032 Mobile: +91 97905 88882
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The Rajasthan Textile Mills Association B-1, Nawalkha Apartment, Bharat Mata Path, Jamnalal Bajaj Marg, C-Scheme, Jaipur - 302001	Shri A.K. Jain, Secretary, Email rtma@bsnl.in, rajrtma@gmail.com Tel: +91 0141-2372162 Tel: +91 98873 03063
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The Millowners' Association, Mumbai Thakur House, 1st Floor, Datta Raul Marg, Off. Gokhale Road, (South) Dadar (West), Mumbai - 400028	Shri Rajendar Rewari, Chairman Shri T.V. Bhavdas, Secretary Tel: +91 022-24314939 Tel: +91 022-24314869 Tel: +91 022-24314704 Tel: +91 022-24314755 Email: mahatextile2@gmail.com
Northern India Textile Mills' Association PHD House, Sector 31 A, Chandigarh - 160031 0172-2637573, +91 81466 77291	Shri Rajiv Garg, President Tel: +91 0161-4692500 Email: nitmag@nitma.org, www.nitma.org Email: nitmasg@nitma.org,
The Maharashtra Mofussil Mills's Association Thakur House, 1st Floor, Datta Raul Marg, Off. Gokhale Road (South), Dadar (West) Mumbai - 400028 moa@vsnl.net,	Shri Rajiv Patodia, Chairman Tel: +91 022-22041408 / Tel: +91 022-24314704 / Fax: +91 022-24314869 Email: mahatextile2@gmail.com
Federation of Gujarat Industries FGI Business Centre, Gotri-Sevasi Road, Khanpur, Near Sevasi, Vadodara - 391101	Smt. Amit Patel, President Tel: +91 0265-2357508 Tel: +91 0265-2372904 Tel: +91 0265-2372901-03 Tel: +91 98791 13901 Email: info@fgi.co.in
Eastern India Textile Mills' Association 2, Church Lane, 5th Floor, Kolkata - 700001	Shri P.K. Patodia, President Tel: +91 022-22101781 / Tel: +91 022-22835182 / Mobile: +91 98318 88852 Email: eitma@vsnl.net
Ahmedabad Textile Mills Association Ashram Road, P.B. No. 4056 Navrangpura, Ahmedabad - 380009	Shri Naishadh Parikh, President Tel: +91 079-22742508 Tel: +91 079-26582273-74 Tel: +91 079-26588574 Email: naishadh@parikh.com
The Textile Association (India) A-24, Anand CHS Ltd. 17, Juhu Lane, Andheri (W). Mumbai -400 058	Sengupta T.K President Tel: +91 022-2624 7485 Fax: +91 022-2671 9124 Mobile: +91-9820575058 Email: Sengupta_tk@hotmail.com
Cotton Association of India 2nd floor, Cotton Exchange Building, Opp Cotton Green Railway Station, Cotton Green, Sewri, Mumbai, Maharashtra 400033	Atul Ganatra, President Tel.: +91 22-3006 3400 Fax: +91 22-2370 0337 Email: cai@caionline.in www.caionline.in
Confederation of Indian Textile Industry (CITI) 6th Floor, Narain Manzil 23, Barakhamba Road. New Delhi-110 001 www.citiindia.com	S. Sunanda, Secretary General Tel: (+91-11) 23325012 Fax: (+91-11) 41519602 Email: mail@citiindia.com

INDIA COTTON MAP

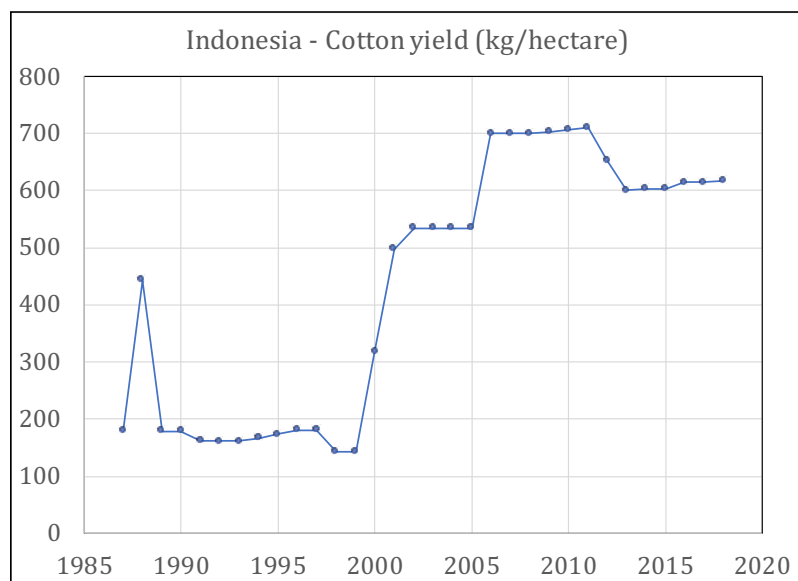
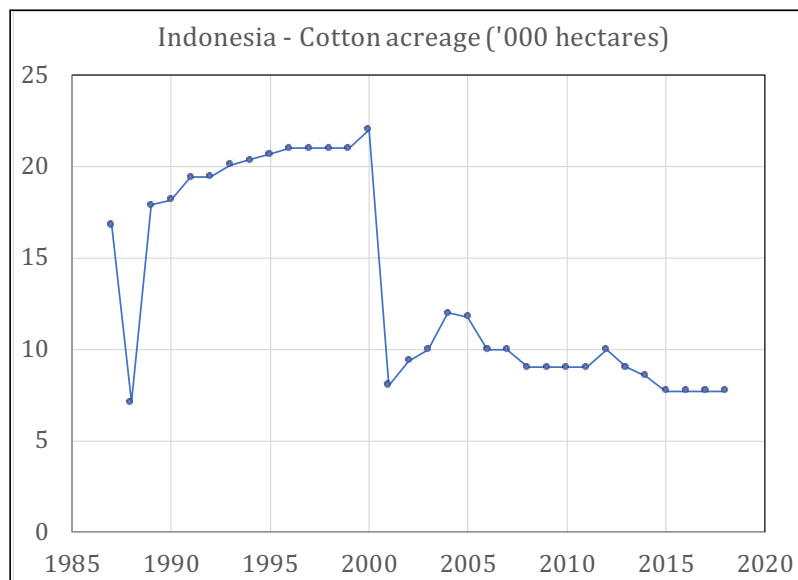
**INDIA: COTTON PRODUCTION DATA 2017 (estimates)**

S.No	State	Area ('000 Hectares)	Production (M Tonnes)
1	Punjab	291	0.20
2	Haryana	669	0.38
3	Rajasthan	584	0.37
4	Gujarat	2,623	1.77
5	Maharashtra	4,207	1.45
6	Madhya Pradesh	603	0.35
7	Telangana	1,897	0.93
8	Andhra Pradesh	644	0.35
9	Karnataka	546	0.31
10	Tamil Nadu	185	0.09
11	Orissa	145	0.06
	Others	50	0.03
	INDIA	12,444	6.29

Indonesia

Cotton in Indonesia

The average cotton acreage during the period 2008 to 2018 was 9,000 hectares at an average lint yield of 648 Kg per hectare.



Structure of Cotton Research

The Indonesian Sweetener and Fibre Crops Research Institute (ISFRI) East Java and the Indonesian Atomic Energy Agency undertake research on cotton. Research at the Indonesian Atomic Energy Agency is limited to varietal development only. The ISFRI is one of the technical implementation units on cotton under the coordination of Indonesian Centre for Estate Crops Research and Development (ICECRD). The main function of ISFRI is to conduct

research on genetics, plant breeding, seed production, exploration, conservation, characterisation and the utilisation of germplasm of tobacco and fibre industrial crops. The ISFRI conducts research on agronomy, morphology, physiology, ecology, entomology and phytopathology of tobacco and fibre industrial crops. It also prepares information, documentation, and dissemination of tobacco and technologies on tobacco, cotton, kapok, kenaf, jute, rosella, jute, gave (sisal) and abaca.

The Government provides funds for research, with occasional collaborative research with companies also brings some additional funding.

Variety Approval and Seed Supply

The Indonesian Sweetener and Fibre Crops Research Institute has a breeding program to develop high yielding varieties of cotton which have fibre qualities suitable for the domestic market. New cotton cultivars are tested and released after obtaining approval from the Varietal Authorisation Institute (VAI). The Institute has released 20 varieties since 1985.

The Indonesian Sweetener and Fibre Crops Research Institute produces foundation seeds. The Indonesian Protection and Seed Supervision Institution supervises the seed production process and certifies the seeds. Certified seed is multiplied by the Province Plantation Office for Cotton Farmers or private companies, who process cotton fibres. Indonesia does not have specialised public or private seed companies.

Fertiliser and Pesticide Supply

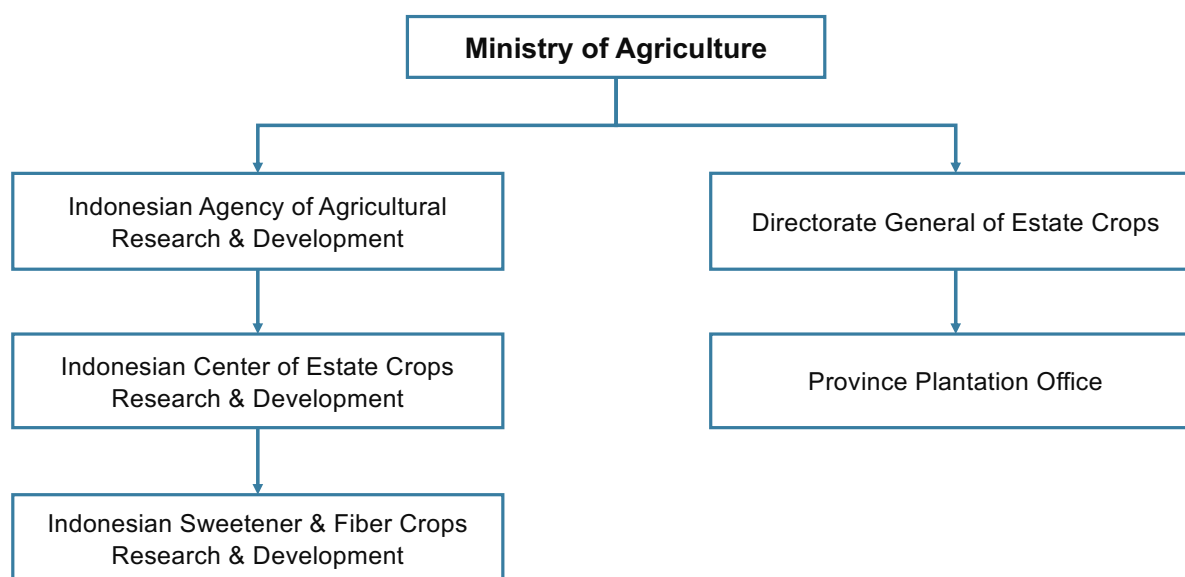
Fertilisers and pesticides are usually partly subsidised by the government and supplied by private companies who deal with cotton production. The farmers pay after their cotton is sold.

Technology Transfer

The Indonesian Sweetener and Fibre Crops Research Institute develops new varieties and cotton crop management technologies. The new technologies/varieties are introduced through demonstration plots in farmer's fields followed by open field trials to disseminate the technologies. The Directorate General of Estate Crops or its representative (Province or Local Plantation Office) usually coordinates the process.

Indonesia

Organogram of Cotton Research System



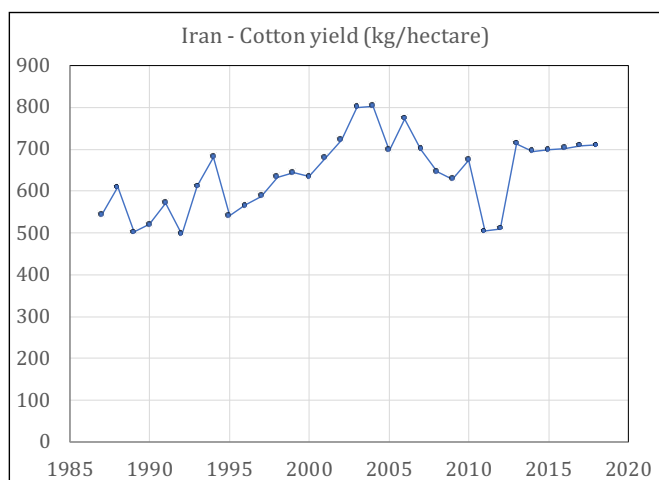
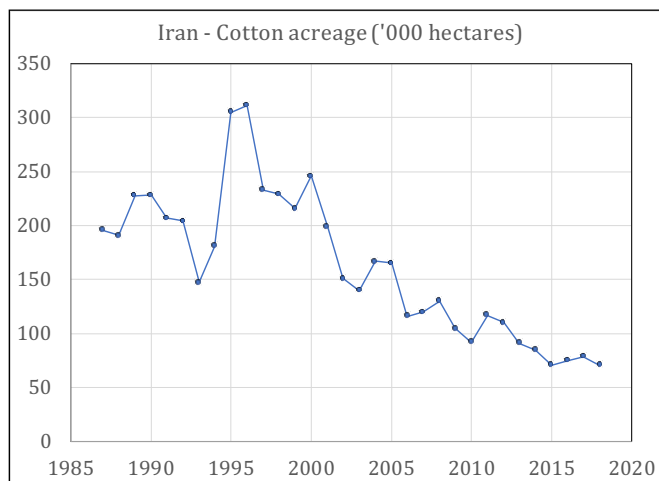
KEY CONTACTS IN INDONESIA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Indonesian Sweetener and Fibre Crops Research Institute (ISFCRI) Jl. Raya Karangploso Km4 Malang East Java Indonesia. Po Box 199 Malang balittas.litbang.deptan.go.id	Name: Dr. Ir. Mohammad Cholid Position: Head office, Email: balittas@litbang.deptan.go.id Tel: +62341491447 Fax: +62341 485121
Trade and Textile Associations	
Asosiasi Pertekstilan Indonesia - API (Indonesia Textile Association) Graha Surveyor Indonesia 16th Floor Jl. Gatot Subroto Kav. 56. Jakarta - 12950 www.indonesiatextile.id	Ade Sudrajat, Chairman Tel: (+62-21) 527 2171 Fax: (+62-21) 527 2166 Email: sekretariat@bpnapi.org

Iran

Cotton in Iran

The average cotton acreage during the period 2008 to 2018 was 93,000 hectares at an average lint yield of 653 Kg per hectare.



Structure of Cotton Research

The Cotton Research Institute (CRI) under the Agricultural Research, Education and Extension Organisation of the Ministry of Jihad-e-Agriculture is responsible for research on cotton. The Cotton Research Institute (CRI) was established in 1997 at Gorgan, with an independent branch in Varamin. At present, there are five research departments in Gorgan, two research departments in Varamin, and five cotton research stations in several cotton producing regions. Before the establishment of the Seed and Plant Improvement Institute in 1959, Varamin Plant Breeding Corporation was the only responsible agency for cotton research in Iran. In 1979, research activities on cotton were shifted to the Seed and Plant Improvement Institute in the Cotton Research Department. Cotton and Oil Seeds Development Organisation, Teh-

ran plays an important role in supporting cotton research.

The Agricultural Research, Education and Extension Organisation provide funds for research. One of the Deputy Ministers of Jihad-e-Agriculture heads the Agricultural Research, Education and Extension Organisation.

Variety Approval and Seed Supply

New cultivars are developed by the researchers of the Cotton Research Institute of Iran or the private sector. The Cotton research Institute approves varieties while the 'Seed Committee' of the 'Seed and Plant Certification and Registration Institute' is responsible for variety registration and seed supply. The tasks of cotton varietal production are assigned to the private sector according to the annual order of the Director General of Cotton and Oilseeds in the Ministry of Agricultural Jihad. Companies produce the approved varieties and distribute the requisite quantities to various provinces.

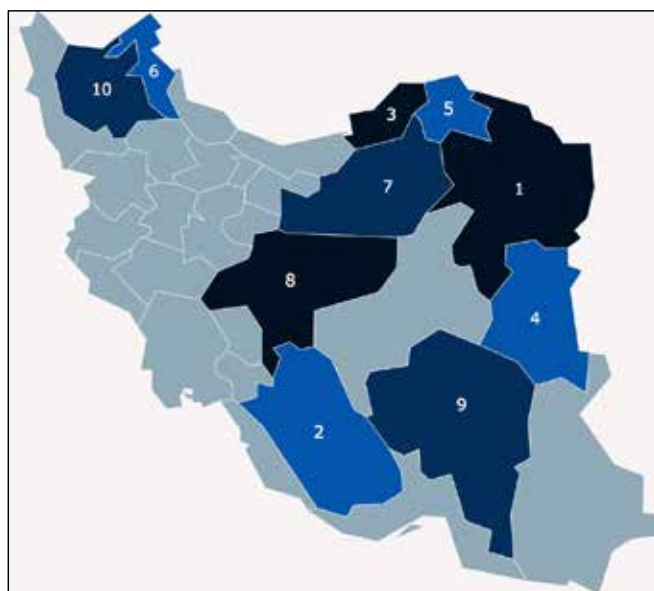
Fertiliser and Pesticide Supply

Different state organisations and private companies provide fertilisers and pesticides. Fertilisers are distributed by different state agencies as well as private companies to the farmers based on the results of their soil analysis or based on the information which are taken from the soil fertility maps.

Technology Transfer

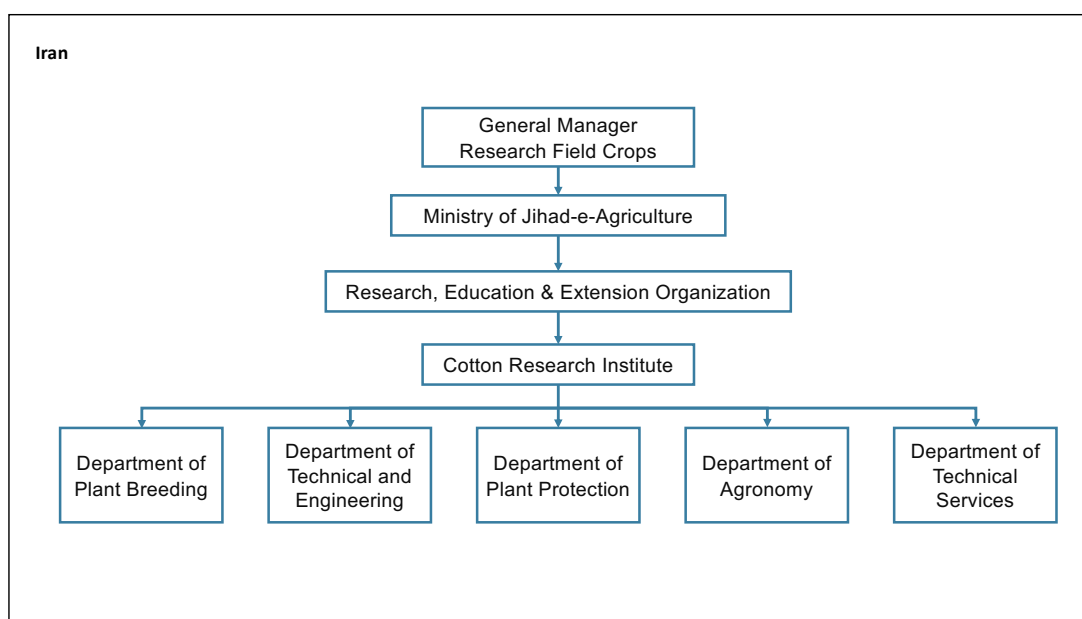
All the new developments are transferred to farmers by the Extension Management Centres in different provinces, which work under the supervision of the Agricultural Research, Education and Extension Organisation (AREEO).

IRAN COTTON MAP



IRAN: COTTON PRODUCTION DATA 2018 (estimates)

S.No	Province	Area ('000 Hectares)	Production (M Tonnes)
1	Khorasan-e-Razavi	22.9	0.019
2	Fars	14.2	0.012
3	Golestan	12.6	0.011
4	Khorasan-e-Jonobi	6.9	0.006
5	Khorasan-e-Shaomali	6.0	0.005
6	Ardabil	3.4	0.003
7	Semnan	1.3	0.001
8	Isfahan	1.2	0.001
9	Kerman	1.0	0.001
10	Azarbayjan-e-eSharghi	0.5	0.000
	Others	1.1	0.001
	IRAN	70.9	0.060

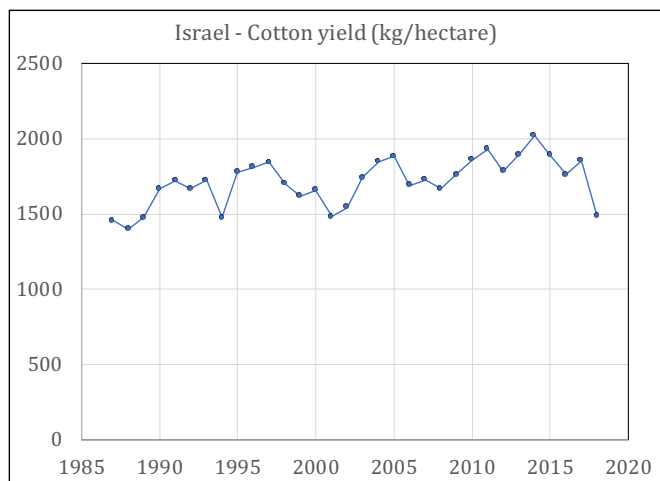
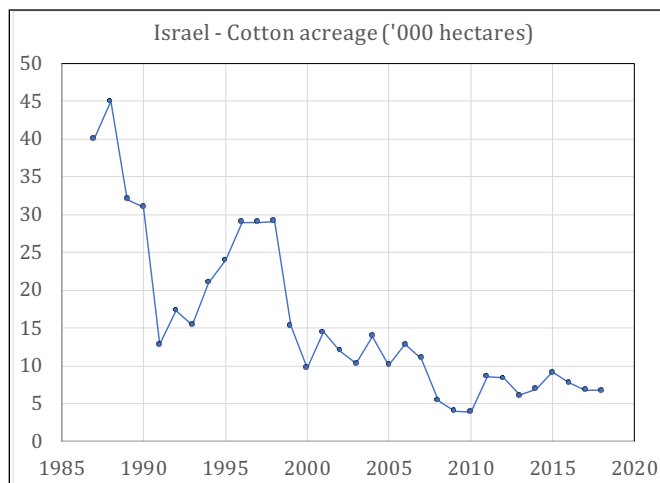
**KEY CONTACTS IN IRAN**

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Cotton Research Institute of Iran Shahid Beheshti Street. Gorgan, Iran www.cri.areeo.ac.ir	Dr. Ghorban Ali Roshani Head of the Institute Email: gh_roshani@yahoo.com Pin Code: 4916685915
Farmers Associations	
Iran's Union of Cotton Cooperative Companies www.unicot.org	Mr. Faramarz Shabani. Managing director Email: info@unicot.org
Ginners Association	
Ginners union of Golestan province	Mr. Asdollah pakseresht Managing director

Israel

Cotton in Israel

The average cotton acreage during the period 2008 to 2018 was 7,000 hectares at an average lint yield of 1810 Kg per hectare.



Structure of Cotton Research

The following institutions/organisations are involved in cotton research and development work:

- Agricultural Research Organisation (ARO), the Volcani Centre: the ARO is the central governmental research institute for agriculture in Israel
- Faculty of Agriculture, the Hebrew University of Jerusalem, Rehovoth
- Extension services, Ministry of Agriculture
- Southern Research and Extension Laboratory
- Valley of Jezreel, Research and Extension Laboratory
- Eden Experiment Farm, Beit Shean Valley Council
- Migal - Galilee Technology Centre, P.O. Box. 831 Kiryat Shmona 11016 Israel
- Katif Research Centre for Coastal Deserts R&D, Sedot Negev, 85200, Israel

The Ministry of Agriculture is the main source of funding on research in cotton. The Cotton Production and Marketing Board, which is also responsible for coordination is a small funding source. Israel Cotton Board, Herzelia plays an important role in the cotton sector.

Seed and chemical companies also contribute partly to cotton research.

Variety Approval and Seed Supply

Seed companies develop new varieties by participating in the nation-wide variety testing trials for at least three years. Spinning experiments on candidate varieties are usually performed abroad. Semi-commercial field trials are conducted on 500 hectares. Planting seeds are provided by Israel seeds, Ltd., Agridera Seeds & Agriculture Ltd. and Hazera-Seeds.

Fertiliser and Pesticide Supply

Fertiliser supply is directly from the Fertiliser companies or through central agricultural supply companies i.e. Deshen Gat, Haifa Group, and others. The pesticide supply to cotton growers is central through the Israel Cotton Board. The main companies are Adama - Makhteshim-Agan Industries; Lidor Chemical, Luxembourg and Agrica-C.T.S.

Technology Transfer

New technologies are transferred to growers with the cooperation of the agricultural R&D institutions, extension services and private companies.

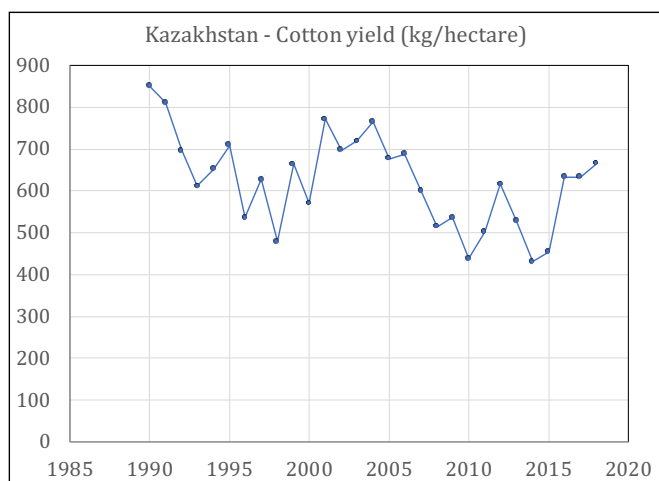
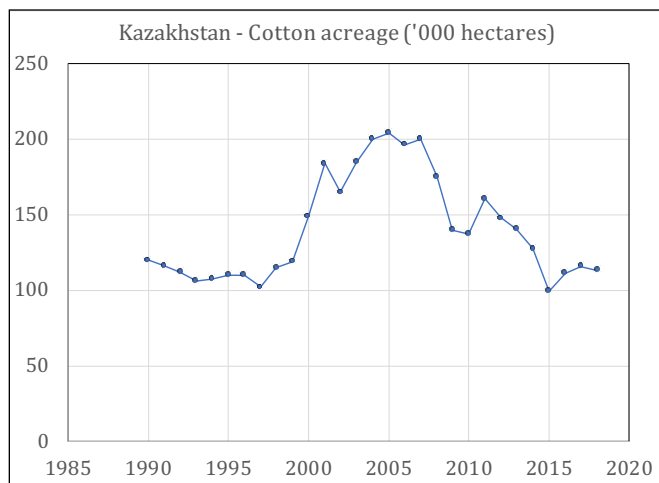
KEY CONTACTS IN ISRAEL

Institution / Mailing Address	Contact Person, Position
Research Organisations	
ARO, HaMaccabim Road, Rishon-Lezion. P.O.B. 30, Beit-Dagan, 50250, Israel	Dr. Rami Horowitz, Researcher hrami@volcani.agri.gov.il Tel: +972-8-6246825
Robert H. Smith Faculty of Agriculture, Food and Environment. The Hebrew University of Jerusalem POB 12, Rehovot 76100, Israel	Prof. Yehoshua Saranga, Researcher Tel: +972- 8-9489041 Email: saranga@agri.huji.ac.il
Extension services. HaMaccabim Road, Rishon-Lezion. P.O.B. 30, Beit-Dagan, 50250, Israel	Mr. Hanan Bazak, Director Tel: +972-3-9485345 Email: hanbazak@shaham.moag.gov.il
Ginners Organisations	
The South Gin	
The Jezreel Valley Gin	

Kazakhstan

Cotton in Kazakhstan

The average cotton acreage during the period 2008 to 2018 was 133,000 hectares at an average lint yield of 541 Kg per hectare.



Structure of Cotton Research

The National Agrarian Scientific Educational Centre of the Ministry of Agriculture of the Republic of Kazakhstan is the only authorised organisation for agricultural research. All scientific research in the field of agriculture is coordinated by the Ministry of Education and Science of the Republic of Kazakhstan.

KazAgroInnovatsiya (КазАгроинновация) Atakent of the Ministry of Agriculture of the Republic of Kazakhstan is responsible for research on cotton. Scientific research in the Republic of Kazakhstan is funded mainly from the republican budget according to the 255 "Budget Program", in accordance with the rules of basic-grant and program-targeted funding, approved by the Government of the Repub-

lic of Kazakhstan dated May 25, 2011 No. 575. The Centre gets funds from the government through the state budget. Program-oriented funding is made on scientific research that addresses important public-policy objectives. Funding can also be received from the regional budget program 019 for introduction of new scientific developments in a particular area. Funding is also provided under the regional budget program 019 for new scientific developments. Private financing is also done by farmers and cotton producers.

Variety Approval and Seed Supply

The State Commission for Crop Variety Testing of the Ministry of Agriculture is responsible for inclusion of varieties in the State Registry of Varieties. Amendments are made only with the permission of the Ministry. In Kazakhstan, new cotton varieties are tested for three years in government trials. Ultimate approval comes from the government after which varieties can be grown on a commercial scale. There are special seed production farms in the country where quality seeds are produced and supplied to cotton growers. Recommendations for the use of varieties for specific soil and climatic conditions are prepared and published by the state testing regional inspectorate of the State Commission. The 'official gazette' is annually published by the 'State Commission for Variety Testing of Crops' under the Ministry of Agriculture.

The cotton seed system is a combination of functionally interrelated government agencies, scientific organisations and seed production agencies. The process involves state variety testing, approvals of varieties, variety renewal, mass production of seeds, harvesting, processing, examination of seed quality, storage, transportation, sale and use of seeds.

Seed of new varieties are sown in nurseries of elite-seed farms and multiplied subsequently to be called as 'first reproduction seeds' to be supplied to farmers and producers of cotton farms. The largest seed farms are Nysan, Ketebay, Kaynar and Karash. The specialised seed farms are Nuralyzhol-Zh, Bakytzhan, Tumar BS, Tan-Sholpan, Almas-O, Bagdat, Nur Salmat LLP, Altynbek-MY, Aygozha-Kultura and Pernebay.

In recent years, at the suggestion of farmers and cotton producers, seeds from foreign countries are being tested for specific climatic conditions of different regions

Fertiliser and Pesticide Supply

Farmers get fertilisers from domestic producers of nitrogen fertilisers 'KazAzor LLP' where the Government provides subsidies amounting to 40%. Foreign joint stock companies of Uzbekistan 'Maxam-Chirchik,' 'Navoiyazot' also supply mineral fertilisers, at their own expense without subsidies.

Farmers buy pesticides from licensed dealers or stores. Farmers get a subsidy on herbicides. Locally produced herbicides are subsidised by 50% of the purchase price of herbicides. Foreign products are subsidised by 30% of the purchase price of herbicides.

Farmers get pesticides (insecticides and miticides) from the state free of charge after confirmation of pest economic threshold levels by the local supervisory authority. The main pesticide companies are Syngenta Crop Protection, BASF, Bayer Crop Science, August (Russia), Agrochemicals (Kazakhstan), Astana-Nan (Kazakhstan), Shchelkovo Agrochem (Russia), Moir Kemsayens Co. (China), Monsanto and Dow AgroSciences.

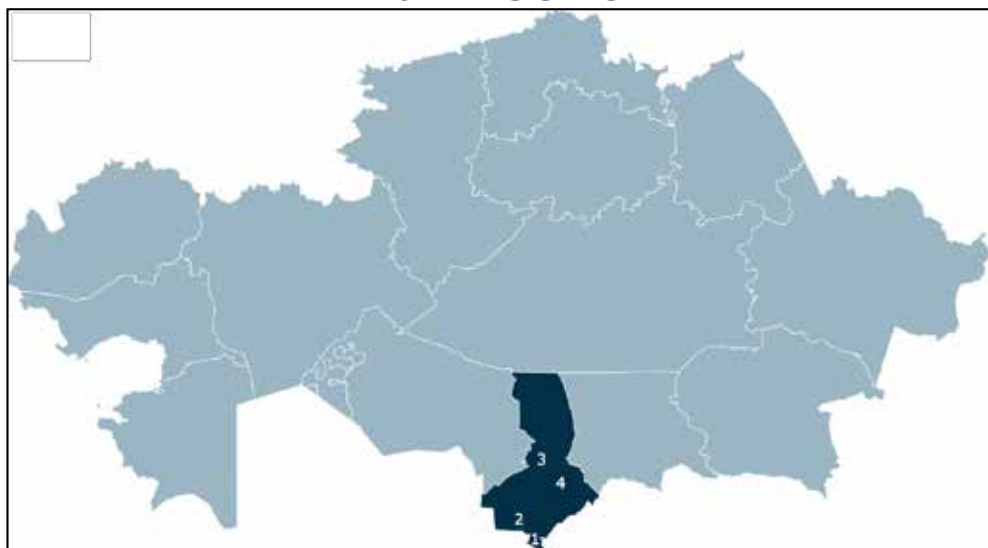
Technology Transfer

Technology transfer is carried out through competitive bidding for program-targeted funding of research for each of the specific soil-climatic zones. The transfer of scientific achievements, developments and innovative technologies in the cotton industry is carried out in an organised manner at KazNII Cotton Growing Company LLP, through the Maktaaral Knowledge Distribution Centre, as well as under the regional budget program 019 "Implementing Scientific Developments in Production".

KEY CONTACTS IN KAZAKHSTAN

Institution / Mailing Address	Contact Person, Position
Research Organisations	
KazaAgroInnovations, Ministry of Agriculture, Labaratonnaya Street, Village Atakent, Maktaaral Region, South Kazkahstan Oblast 160525	Umbetayev, Ibadulla Director General Tel: 7-72541-33709, 33303 Email: Kazcotton1150@mail.ru

KAZAKHSTAN COTTON MAP



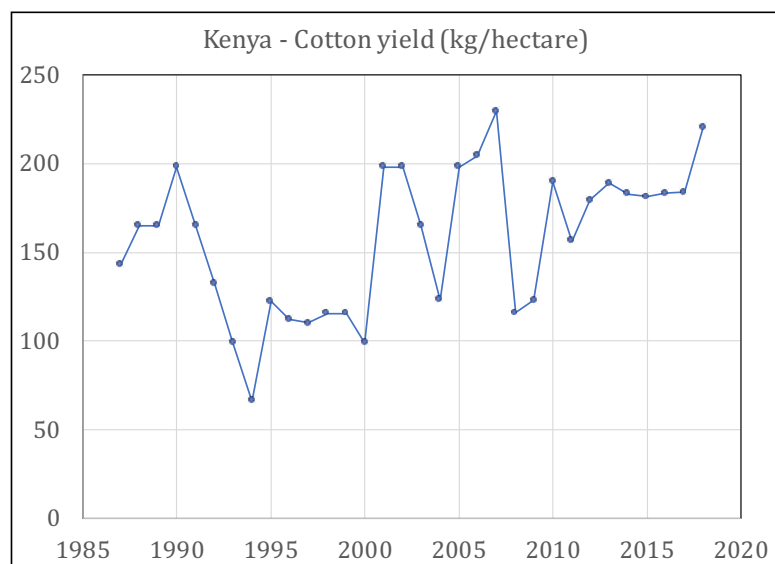
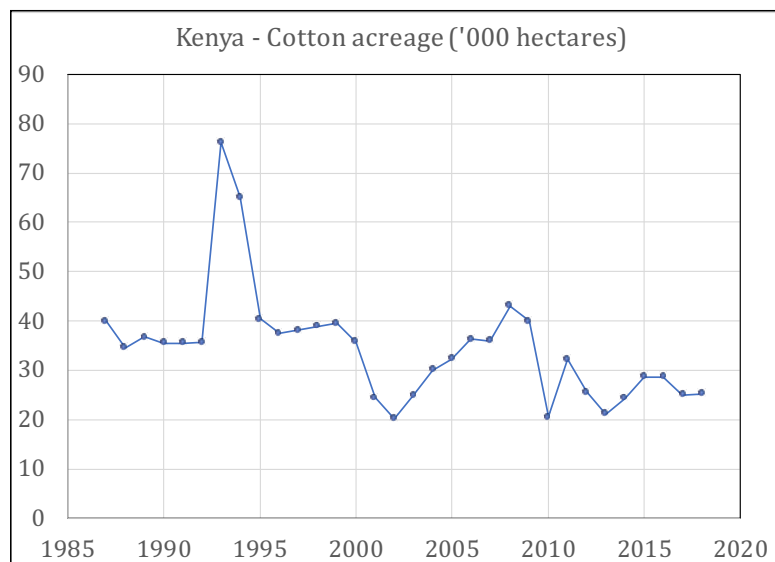
KAZAKHSTAN: COTTON PRODUCTION DATA 2017-18 (estimates)

S.No	Districts	Area ('000 Hectares)	Production (M Tonnes)
1	Maktaaral	86.8	0.046
2	Shardara	24	0.012
3	Ordabasy	8.4	0.004
4	Turkistan	8.4	0.004
5	Others	1.41	0.001
	KAZAKHSTAN	129.01	0.067

Kenya

Cotton in Kenya

The average cotton acreage during the period 2008 to 2018 was 29,000 hectares at an average lint yield of 173 Kg per hectare.



Structure of Cotton Research

Kenya Agriculture and Livestock Organisation (KALRO) is the main national institution that coordinates research programs in food crops, horticultural and industrial crops, livestock and range management, land and water management, and socio-economics. In addition, international agriculture research organisations such as the International Plant Genetic Resource Institute (IPGRI),

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) and International Centre for Insect Physiology and Ecology (ICIPE) assist with research projects. There are also specialised policy research institutions that are linked to Government institutions whose work is to help analyse trends in the agricultural sector. They include; Tegemeo Institute

(Egerton University), Kenya Institute for Public Policy Research and Analysis (KIPPRA, linked to the Ministry of Planning) and the Public Policy and Research (privately managed Institute).

Cotton research has been confined to public institutions characterised with inadequate funding. Productivity of the local varieties has continuously been declining over the years. However, there are new partnerships that have been initiated with development agencies to reverse this trend.

Fertiliser and Pesticides Supply

The usage of fertilisers and pesticides is low, mainly because of low affordability especially by the small holder growers.

Technology Transfer

The main extension services and supply of inputs, especially fertilisers are coordinated by the public sector agencies through various targeted support programs under the ministry of agriculture in the 47 county governments. Technologies are also disseminated by private extension providers under various high value crop programs, non-governmental organisations (NGOs) and agro-chemical companies. Cotton extension service is managed within an overall framework monitored by the Government agencies.

Linkages between the actors in the extension and input supply system are inadequate wherein each actor is driven by own interests, some of which are conflicting. This leads to skewed extension approaches and uncoordinated input supply systems that result in inadequate amount of inputs to crops such as cotton and negligence of the cotton value chains.

The government has initiated various interventions in revitalisation of extension services through programs such as National Agricultural Livestock Extension Programme (NALEP), Training and Visits (T&V), Participatory Rural Appraisal (PRA), Rapid Results Initiative (RRI) and Farm-

er Field Schools (FFS). The Farmer Field School (FFS) is the latest approach that draws on participatory methods, both in terms of its bottom-up focus, farmer experimentation and enabling problem-solving capabilities at the farmers' level. The method empowers farmers to handle their own on-farm decisions using experiential learning techniques developed for non-formal adult education.

There are policy deficiencies in the many extension mechanisms used in the country, especially on how to involve farmers in designing effective agricultural extension programs that would suit their unique production system needs. Particularly, poor linkages and coordina-

tion have been noted in farmers' participation in agricultural extension.

Agricultural extension and research policy in Kenya have suffered the following setbacks; aging and reduced staffing and funding for operations, inadequate participatory technology development, and poor packaging and information dissemination. The policy also lacks the capacity to control conflicting messages to the farmers. This comes in the form of unnecessary competition, duplication of efforts, and general lack of synergy among the many actors. Further, there are no clear mechanisms to caution growers from production uncertainties such as rainfall failure and price risks.

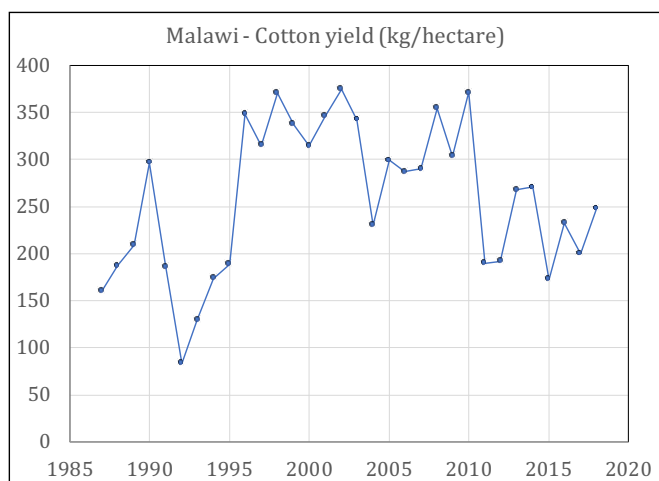
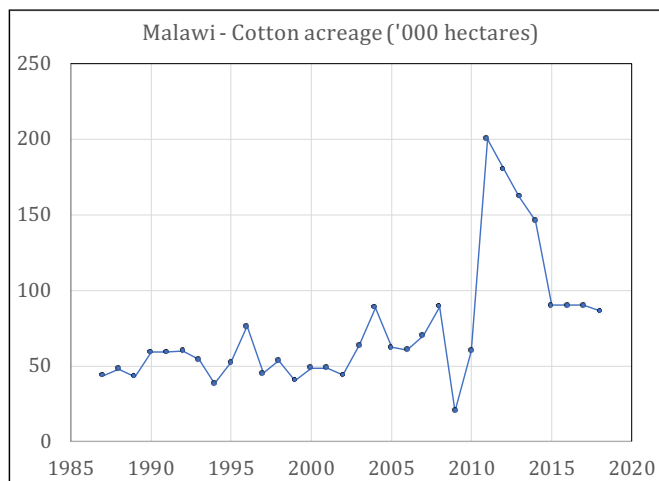
KEY CONTACTS IN KENYA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Agriculture and Food Authority (AFA) P.O. Box 37962 NAIROBI - 00100	Anthony Muriithi Interim Director General Tel: +254 724571006 Email: amuriithi@afa.go.ke Email: gikandimuriithi@yahoo.com
Trade and Textile Associations	
African Cotton & Textile Industries Federation (ACTIF). Trv Plaza, Suite 3A Muthithi Road. Westlands. P.O. Box 1249-00606, Sarit Centre. Nairobi, Kenya www.actifafrika.com	Belinda Edmonds, Executive Director Tel: (+254-733) 247 052 Fax: (+254-20) 202 2531 Email: belinda@actifafrika.com

Malawi

Cotton in Malawi

The average cotton acreage during the period 2008 to 2018 was 110,000 hectares at an average lint yield of 256 Kg per hectare.



Structure of Cotton Research

The Ministry of Agriculture, Irrigation and Water Development (MoAIWD) coordinates agricultural research through the Department of Agricultural Research Services (DARS) with support from various agencies such as the Government of Malawi and development partners, particularly the World Bank through Agricultural Productivity Programme for Southern Africa (APPSA).

The Department of Agricultural Research Services (DARS) was established in 1938 as the main agency to conduct agricultural research. It was established as a technical department in 1975 and currently functions under the Ministry of Agriculture and Food Security, Malawi Government.

DARS is head-quartered at Chitedze Research Station in Lilongwe and operates 10 research stations across the country. It has a mandate to conduct strategic and demand driven research that generates environmental-friendly technologies and information and to provide efficient regulatory and specialist services. DARS is responsible for conducting research for agricultural technology development and providing regulatory, technology dissemination and specialist services on all crops and livestock, except tobacco, tea and sugar-cane.

The Lilongwe university of Agriculture and Natural Resources (LUANR) was established by transforming the Bunda College of Agriculture and Natural Resources College (NRC) into a University through an Act of Parliament No. 22 of 2011. LUANAR became operational on 1st July 2012. LUANR conducts agricultural research including projects on cotton.

Variety Approval and Seed Supply

At present, the Malawi seed sector operates under the National Seed Policy of 1993 and without a specific strategy. A new seed policy has been drafted in 2018. Varietal approval is accorded after field trials and seed production of nucleus seeds, breeder seeds and certified seeds is supervised by the national Seed Commission.

Seed certification is a legally sanctioned system in Malawi wherein the seed production process is regulated to ensure that farmers get high quality seeds, true to identity, with high purity and germination capacity and free from certain pests and diseases. The National Seed Commission is responsible for enforcement of the Seed Act that includes commissioning of tests for Distinctness, Uniformity and Stability (DUS) and Value for Cultivation and Use (VCU) as part of its certification, quality control and regulatory activities and undertake the necessary applied research including training and licensing of seed inspectors and seed analysts in seed technology in both private and public sectors to meet the needs of the Malawian seed industry. Seed certification and quality control involves registration of seed growers, seed field inspections, seed sampling, laboratory seed testing, and conducting pre and post control plots. It also involves monitoring of seed processing plants and seed markets.

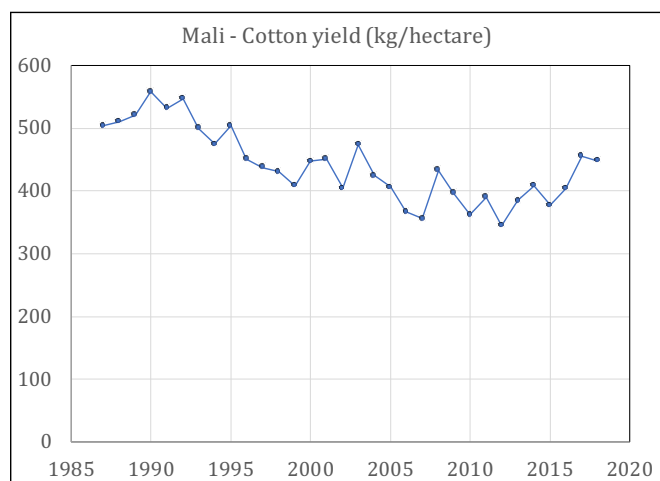
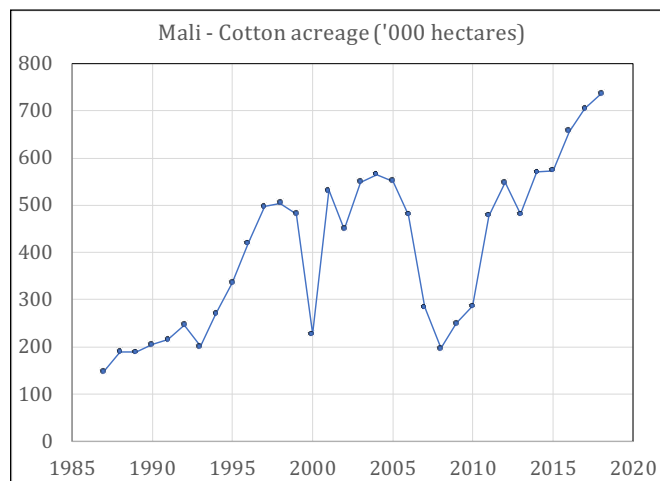
Technology Transfer

The Agricultural Research and Extension Trust (ARET) is a non-profit agency that conducts research, capacity building, human resource development and technology transfer. Though private sector research is negligible in Malawi, technology transfer is also assisted by the Civil Society Agriculture Network (CISANET); Farmers Union of Malawi (FUM) and National Smallholder Association of Malawi (NASFAM) and Seed Trade Association of Malawi (STAM).

Mali

Cotton in Mali

The average cotton acreage during the period 2008 to 2018 was 498,000 hectares at an average lint yield of 400 Kg per hectare.



Structure of Cotton Research

In Mali, the cotton program of the Institute of Rural Economy-IER (Institut d'Economie Rurale) Sikasso is responsible for planning and execution of the research program. Cotton researchers are located at four sites or areas of research. The headquarters of the Cotton Research Program are located in Sikasso. Research priorities for each Centre depend on the Centre where it is based but, in general, overall advice comes from the Scientific Department of IER located in Bamako. The Laboratory Soil-Water-Plant-LaboSEP (Laboratoire Sol-Eau-Plante) is also involved in cotton research. The reports produced are analysed annually during a program committee of the IER. The Malian Company for Textile Development-CMDT (Compagnie Malienne du Développement des Textiles) provides funding

for research while the government finances the salaries of researchers, and operating budgets of infrastructures (offices, fields used for experiments, etc.). Part of the funding also comes from services provided to agrochemical companies.

The Institute for Training and Applied Research (IFRA) (Institut de formation et de recherche appliquée) is part of the University of Mali. It depends on the Ministry of Secondary, Higher Education and Scientific Research for funding. The IFRA is located in Katibougou near Koulikoro, 60km east of Bamako. It includes 380 hectares of land extending along River Niger. It was established in 1897 and is one of the oldest agricultural training centres in Africa. It took its actual name in 1996. The mandates of IFRA are to produce agricultural engineers (baccalaureat+2+3 years) and senior technicians (baccalaureat+2 years) specialised either in agronomy or economics. The IFRA trains staff involved in rural development, provides training to rural communities and promotes scientific and technological research.

Variety Approval and Seed Supply

The Cotton Program offers new varieties to the CMDT. Performance of a variety is jointly monitored in the field along with researchers. Classification/fibre quality data from CMDT is crucial for approvals and commercial cultivation of a variety. After extensive experimental testing in rural areas conducted by field extension staff, a performance report on a particular variety is prepared and presented to the CMDT for a decision. If approved, the CMDT multiplies the variety at one of its seed-farms and supplies seed to cotton growers. Seed supply depends on the determination of cotton areas and in accordance with the village associations, based on the area of cotton requested and granted to the producer. Almost all the planting seed is delinted and treated with a fungicide.

Fertiliser and Pesticides Supply

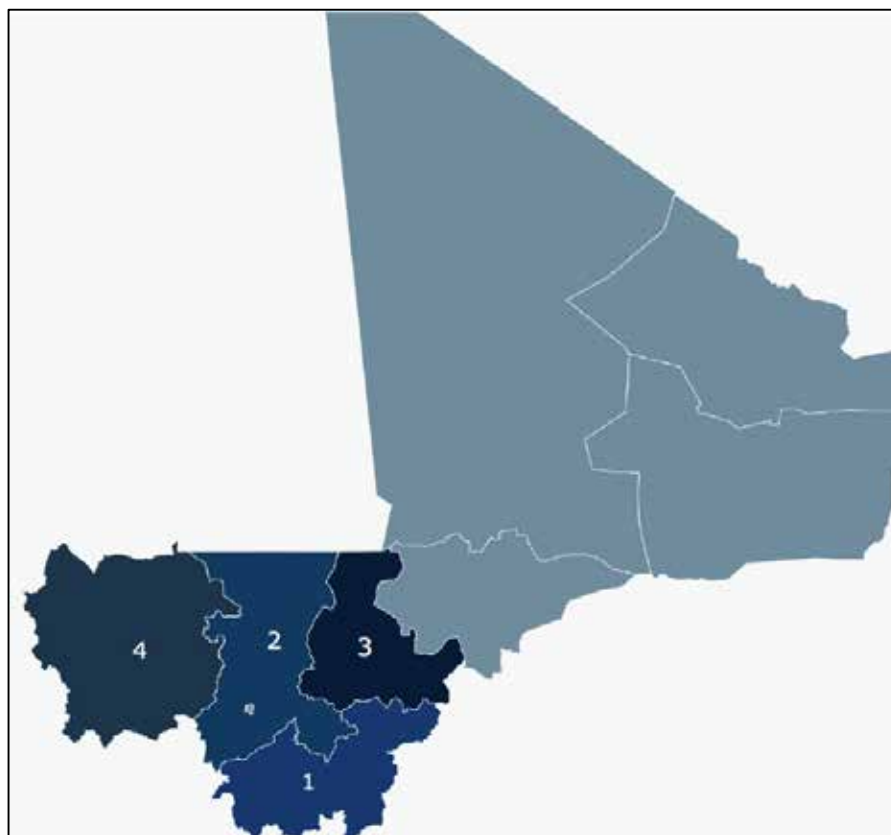
Fertilisers and pesticides are supplied by CMDT. The costs are deducted collectively from the selling price of cotton. The amount of Fertiliser to be delivered to each farmer depends on the survey data on planting area collected by CMDT.

Technology Transfer

The Development Department of the CMDT is responsible for technology dissemination. The Principal Technical Advisor (Agronomy) has one representative in the five subsidiaries of the CMDT. Under the Development Department there is a cell responsible for monitoring and organising demonstration plots across the subsidiaries. In addition to the trials and tests, this unit is responsible for overseeing the production of basic seed whose production is regionalised.

KEY CONTACTS IN MALI

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Centre de Recherche et de Formation pour l'Industrie Textile (CERFITEX) Ministry of Industry, Segou	Togola, Mamadou & Cissoko, Yamoussa
Ginners Organisations	
CTIP, Compagnie Malienne pour le Developpement des Textiles (CMDT) Bamako	Yattara, Moussa Principal Technical Advisory Tel: 223-2214675 Tel: 223-2218141 Email: mtoka2007@gmail.com
Farmers Organisations	
Chamber of Agriculture, Bamako	Togola, Bakary apcam@apcam.org
UR-SCPC (Union Régionale des Sociétés Coopératives des Producteurs de coton - filiale sud, Sikasso	Traore, Drissa Email: drissatraore67@yahoo.fr

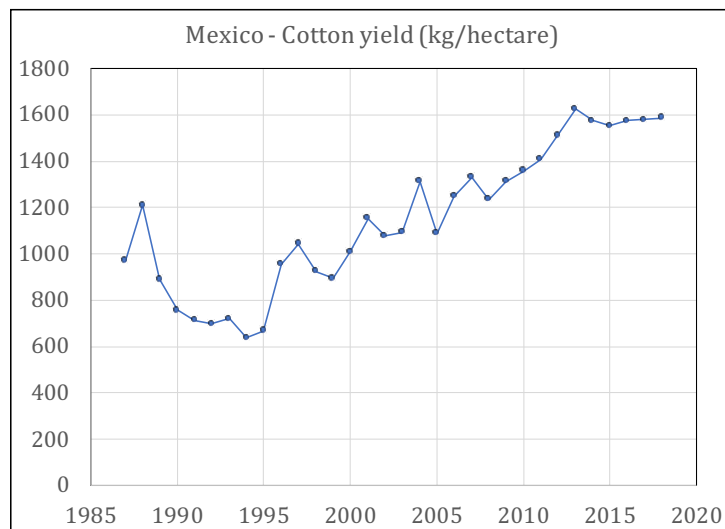
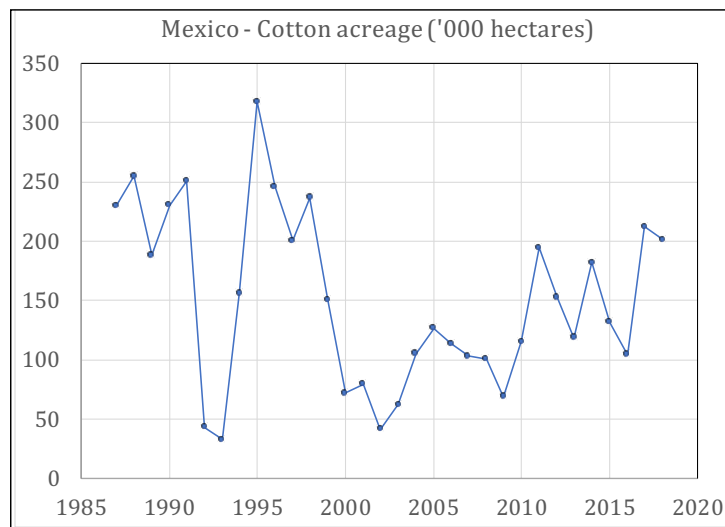
MALI COTTON MAP**MALI: COTTON PRODUCTION DATA 2017 (estimates)**

S.No	State	Area ('000 Hectares)	Production (M Tonnes)
1	Sikasso	480	0.194
2	Koulikoro	132	0.053
3	Segou	74	0.030
4	Kayes	51	0.021
	MALI	737	0.298

Mexico

Cotton in Mexico

The average cotton acreage during the period 2008 to 2018 was 144,000 hectares at an average lint yield of 1483 Kg per hectare.



Structure of Cotton Research

It is estimated that about 180 agencies deal with agricultural R&D in Mexico. The Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) is the federal agency that is responsible for formulating policies and strategies for regulating and promoting seed research, production quality, health, registration, certification and marketing. The Directorate General for Productivity and Technological Development (DGPDT) functions under SAGARPA and coordinates R&D activities through several institutions such as the National Service for Seed

Inspection and Certification (SNICS), the National Agri-food Health, Safety and Quality Service (SENASICA), the National System for Research and Technology Transfer (SNITT) and the National Institute of Forestry, Agricultural and Livestock Research (INIFAP).

The National Institute for Forestry, Agriculture, and Livestock Research (INIFAP) under the Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food is Mexico's principal agricultural research agency. INIFAP has 8 regional Centres, 5 disciplinary-based Centres, and several experiment fields and laboratories. Agricultural research in Mexico is also conducted in 141 universities, colleges, university research Centres and agricultural faculties. INIFAP's mandate is to generate scientific knowledge and technological innovation in the field of livestock and forestry.

In addition to these institutions that supporting production, other institutions promote knowledge management. These include the Autonomous University of Chapingo (UACH), the Postgraduate College (COLPOS), the Autonomous National University of Mexico (UNAM), state universities, the Colegio de la Frontera Sur (ECOSUR) and others whose activities follow research and teaching approaches aimed at studying agricultural biodiversity in Mexico. A few nonprofit agencies outsource research projects to Government institutions and University laboratories. Private funded research mostly relates to seed production. Several institutes are active in cotton research. A few such institutes are, Instituto de Ecología, Universidad Nacional Autónoma de México, Ciudad de México, Mexico, Instituto de Biotecnología, Universidad Nacional Autónoma de México, Cuernavaca, Mexico, Facultad de Agricultura y Zootecnia/Facultad de Ciencias Biológicas, Universidad Juárez del Estado de Durango, Gómez Palacio, México, Dirección de Recursos Naturales, Instituto Tecnológico de Sonora, Ciudad Obregón, Mexico and the National Laboratory of Genomics for Biodiversity (LANGEBIO) at the Centre for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), Irapuato Mexico campus.

Variety Approval and Seed Supply

The National Service for Seed Inspection and Certification (SNICS) verifies and certifies seed origin and quality to protect plant-breeders rights.

Technology Transfer

The National System for Research and Technology Transfer (SNITT) coordinates public and private scientific research, technological development and technology transfer in the farming sector.

MEXICO COTTON MAP



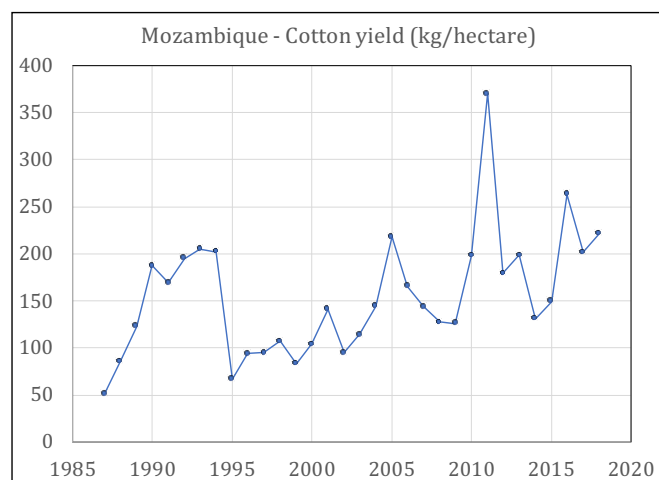
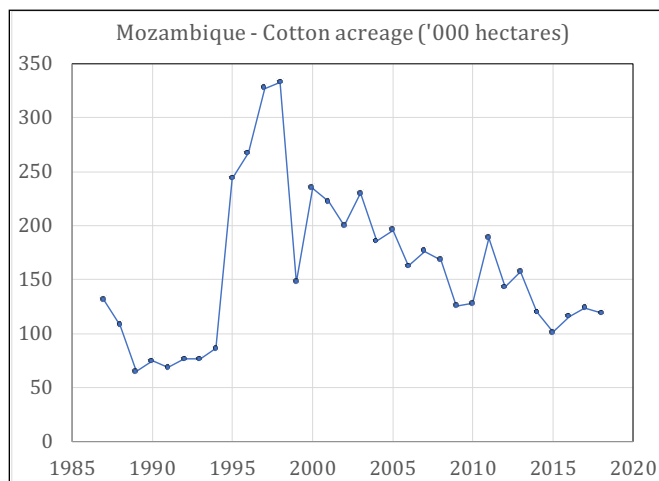
MEXICO: COTTON PRODUCTION DATA 2018 (estimates)

S.No	Province	Area ('000 Hectares)	Production (M Tonnes)
1	Chihuahua	145	0.256
2	Baja California	27	0.058
3	Coahuila	16	0.030
4	Tamaulipas	11	0.013
5	Sonora	8	0.011
6	Durango	4	0.007
	MEXICO	211	0.376

Mozambique

Cotton in Mozambique

The average cotton acreage during the period 2008 to 2018 was 136,000 hectares at an average lint yield of 197 Kg per hectare.



Structure of Cotton Research

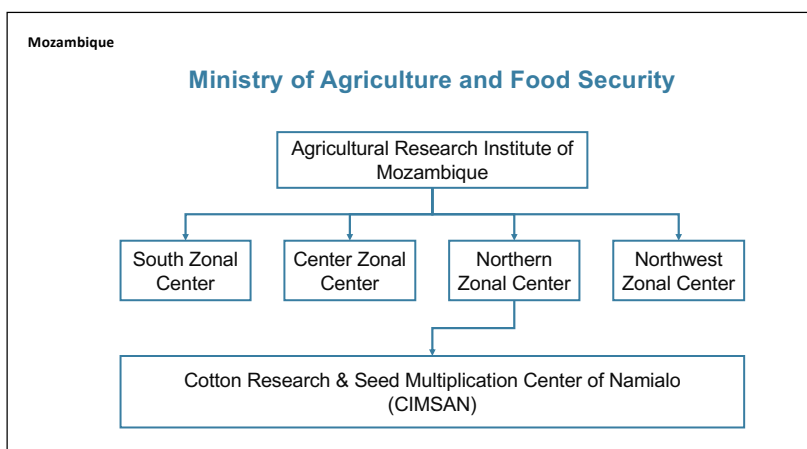
The Agricultural Research Institute of Mozambique-IIAM (Instituto de Investigação Agrária de Moçambique), Maputo, under the Ministry of Agriculture-MINAG has the legal status, administrative and scientific autonomy, with a mission to contribute to the technological solutions for sustainable development of agribusiness, food security and nutrition. The Institute was created in 2004 integrating five institutes, namely, the National Agronomic Research Institute, National Vet Research Institute, Animal husbandry Institute, Forest Experimentation Centre and Agricultural Training Centre. IIAM is organised

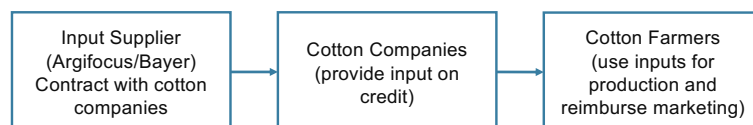
in a general directorate with four technical directorates and four zonal Centres, as defined by agro-ecological areas, (South, Centre, Northeast and Northwest). The Cotton Research and Seed Multiplication Centre of Namialo-CIMSAN of IIAM is under the Northeast Zonal Centre and is assigned to undertake research on cotton.

The Agricultural Research Institute of Mozambique – IIAM is the official body in charge of implementing cotton research programs in Mozambique. However, the Mozambique Institute for Cotton-IAM, the ginners/cotton companies and cotton farmer associations are important players in the process of setting priorities for cotton research. These research programs are set out through a cotton research unit, Cotton Research and Seed Multiplication Centre of Namialo – CIMSAN is located in Namialo village, Nampula province, which is one of the main cotton producing provinces of the country. There are 7 researchers involved on cotton research in the country (2 PhD – 1 Entomologist and 1 Genetics and Breeding; 1 MSc – Genetics and Breeding and 4 BSc – Agricultural Sciences). Five of these researchers are based in Namialo, Nampula province where the cotton research Centre is located and 2 researchers are based in Nampula city, the headquarter of the Northeast Zonal Centre of Agricultural Research Institute of Mozambique.

The Mozambique Institute for Cotton-IAM (Instituto de Algodao de Mocambique) is an autonomous government institution with the mandate for overall coordination of the cotton sub-sector throughout its value chain. The mandates include, policy and regulation, formulation and enforcement; promotion of research and technology transfer to farmers; monitoring and evaluation of both process and result based sub sector indicators; leading the technological innovation within the farming system from seed to harvest; price negotiation between companies and farmers, assessment of the quality of lint; and monitoring of the export process.

The Government allocates funds for cotton research. The Cotton Institute of Mozambique funds cotton research from the cotton industry funds.



Mozambique Input Supply**Scheme of Input Supply system in Cotton Subsector in Mozambique****Fertiliser and Pesticide Supply**

Fertilisers are not widely used in cotton production in Mozambique. However, in 2012 and 2018 OLAM Mozambique distributed NPK and urea to farmers on a trial basis. The two main input suppliers are Agrifocus Limitada and Biochem. Biochem is also supplying foliar fertilisers (Monty's Food plant 8-16-8 and 2-15-15) on a trial basis. Agrifocus contracts

with cotton companies to provide inputs. Farmers receive pesticides on credit in the beginning of the season and the price is deducted at marketing of cotton. Cotton companies usually provide pesticides for 5-7 phytosanitary treatments. Some farmers receive seed coated with systemic insecticides for protection against early season pests such as jassids and aphids. Bayer has started to supply pesticides from the 2018 season.

Variety Approval and Seed Supply

Adaptive trials of cotton varieties are set out for at least three years in different agro-ecological conditions. Once the best varieties are identified through the results obtained, a variety registration in the national catalogue is requested. The proposed variety is expected to have high performance, regarding to its value for cultivation and use, compared to the varieties under cultivation.

Research institutions produce the pre-basic seed and deliver to a private seed producing company called Mozaco. Mozaco multiplies the pre-basic seed to produce basic seed. Other private registered enterprises (Mocotex and Plexus) produce certified seeds that are delivered to farmers. Each generation of seed is certified by the National Seed Service of the Department of Seed under National Directorate of Agrarian Services, Ministry of Agriculture and Food Security.

Technology Transfer

Research results are presented and discussed annually in a meeting with the Mozambique Cotton Institute, cotton companies and farmers associations. Significant results are transferred to farmers through the public extension network and cotton company extension services that are in charge of input supply and distribution.

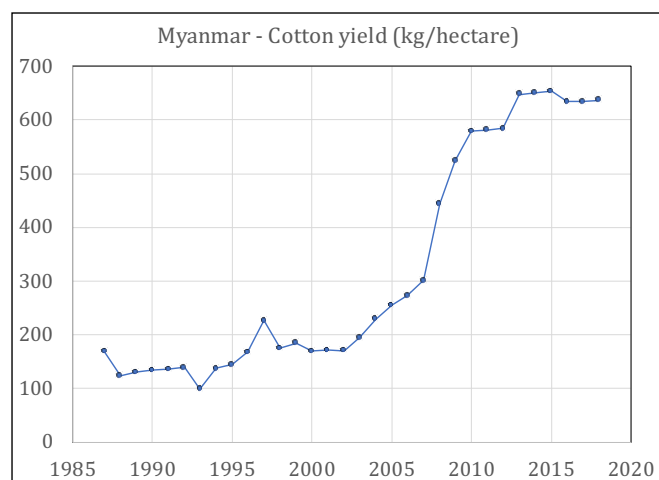
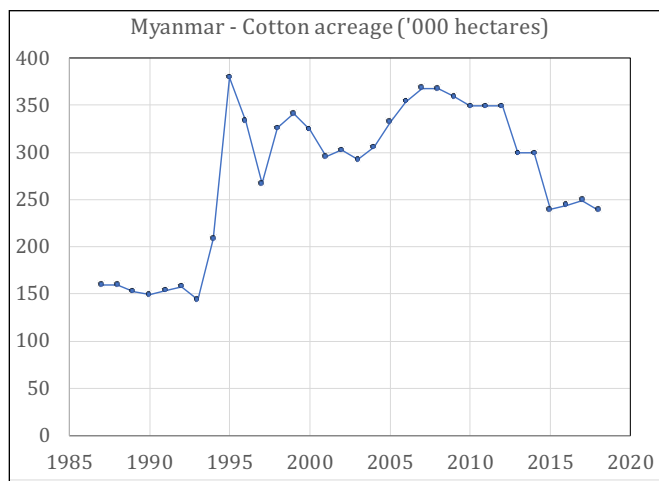
KEY CONTACTS IN MOZAMBIQUE

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Instituto de Investigação Agrária de Moçambique. Av. das FPLM No 2698. Caixa Postal 3658 Maputo-Moçambique www.iiam.gov.mz	Dr Olga Faftine General Director Email: faftine@yahoo.com Tel.: +258 21 460219. Fax: +258 21 460220
AGRIFOCUS Limitada Av. 25 Setembro edifício Time Square Bloco 2, 1º Andar - Apartado 3678 Maputo – Mozambique	Ricardo Sequeira, Managing Director Email: Ricardo.Sequeira@agrifocus.co.mz Tel: +258-21360643 (Direct) Mobile: +258-823200950
Farmers Associations	
Fórum Nacional de Produtores de Algodão (FONPA) Rua da Igreja, 35, Maputo, Mozambique www.associacaodemocambique.org	Vicente Sando Executive Director Email: fonpa.nampula@gmail.com Email: Sandovic1@gmail.com Tel: +258-823843688
Ginners Association	
Associação Algodeira de Moçambique (AAM) Angola Avenue, 2850, Maputo, Mozambique	Francisco João Ferreira dos Santos President Email: francisco.santos@jfs.co.mz Tel: +258-21467600 Fax: +258-21312494

Myanmar

Cotton in Myanmar

The average cotton acreage during the period 2008 to 2018 was 304,000 hectares at an average lint yield of 597 Kg per hectare.



Structure of Cotton Research

The Cotton and Sericulture Department (CSD) undertakes Cotton research for the key cotton growing areas in upper Myanmar. Adaptive research activities are conducted at the CSD regional cotton farms and farmers' fields.

The Department of Agriculture (DOA) in Myanmar was founded in 1906. The DOA established the Agriculture Research Institute (ARI) at Yangon in 1954, but later moved it to Yezin. The ARI was renamed as Central Agriculture research Institute (CARI) after adding crop research divisions. In 2004, it was declared as a separate department under the Ministry of Agriculture and Irrigation (MOAI). The Department of Agricultural Research Institute (DARI) is the main institution that coordinates and conducts agricultural research including cotton in Myanmar. The Department of Ag-

ricultural Research (DAR) is responsible for research. It has seven crop research centres and 17 satellite farms. The DAR is mandated to develop new high yielding crop varieties with improved quality and tolerance to biotic, abiotic stress. DAR has a biotechnology section that assists plant breeders.

The Yezin Agricultural University (YAU) was established in 1924. It is affiliated with the Ministry of Agriculture, Live-stock and Irrigation (MOALI). The YAU is located in Yezin. It has two other major campuses in Mawlamyine, Mon State and Hlegu, Yangon Region; five smaller regional campuses in Aung Pan, Hmawbi, Kyaukse, Magway and Phyu; and seven designated farms of the Myanmar Agricultural Service.

Private sector involvement in agricultural R&D in Myanmar is negligible and almost nil in the seed sector.

Variety Approval and Seed Supply

The Seed Working Group or Seed Tasking Force approve new varieties after overseeing varietal testing and evaluation. The DOA has 35 Seed Farms, 17 Research Stations, 53 Horticultural Farms, 10 Field Crops Farms and five Crop Substituting Farms. The Department of Agricultural Research (DAR) undertake the production of breeder and foundation seeds. The DOA provides foundation seeds either to private seed growers or seed companies for further multiplication and distribution to farmers. In coordination with the Department of Agricultural Research (DAR) and the Seed Divisions for major crops, the Agricultural Extension Division under the DOA is responsible for seed multiplication and distribution of registered seeds.

Technology Transfer

The Agricultural Extension Division (AED) under the Department of Agriculture (DOA) is mandated with technology transfer to farmers. It has staff many of whom operate from villages and provide advisory services and training for all crops including cotton. However due to shortage in staff, the impact of the village level extension system has less impact on small-scale farming systems. Agricultural knowledge, information and technologies (AKIT) are disseminated through agricultural education (training) and extension programs. Rural agricultural extension systems rely on farmer to farmer camps, capacity building of extension agents, mass media (newspapers, radio, television and journals), distribution of pamphlets, and training and visits by the extension agents to individuals or groups of farmers.

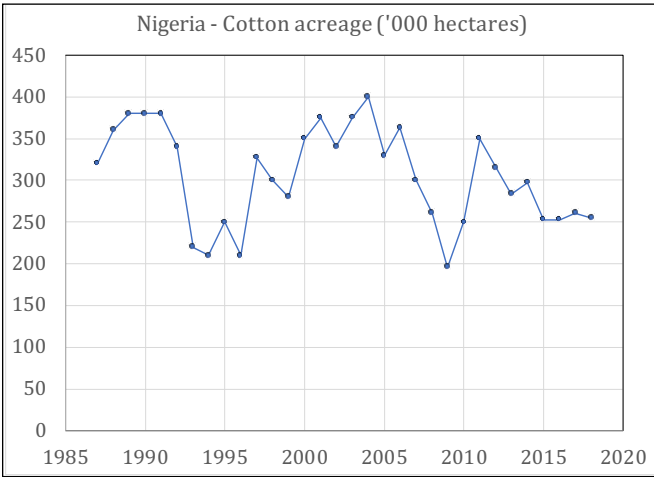
The Yezin Agricultural university has seven state agricultural institutes involved in agriculture extension training. Many other agricultural research institutes provide capacity building programmes for extension facilitators.

Myanmar has about 300 ICT companies. A multi-purpose community telecentre assisted by the Telecommunication Development Bureau (TDB) was set up at Phaunggyi village to provide information including agricultural technologies.

Nigeria

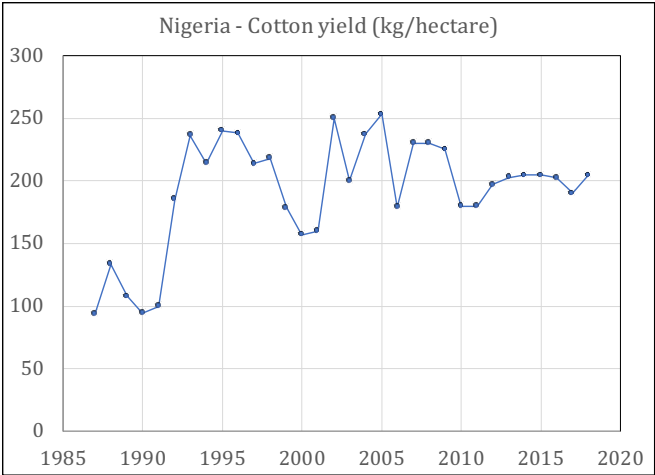
Cotton in Nigeria

The average cotton acreage during the period 2008 to 2018 was 270,000 hectares at an average lint yield of 202 Kg per hectare.



Structure of Cotton Research

The Institute for Agricultural Research (IAR) is affiliated with the Faculty of Agriculture, Ahmadu Bello University. It has a cotton research centre that is dedicated for research on plant breeding, agronomy and plant protection. The Ahmadu Bello University was established in 1962 by the Government of the then Northern Region of Nigeria. The University functions under the Federal Government of Nigeria in 1975 with a national mandate. The ABU has of ninety-six Academic Departments, twelve Faculties, and twelve Research Institutes and Specialised Centres. The university has two campuses located on 7,000 hectares of land.



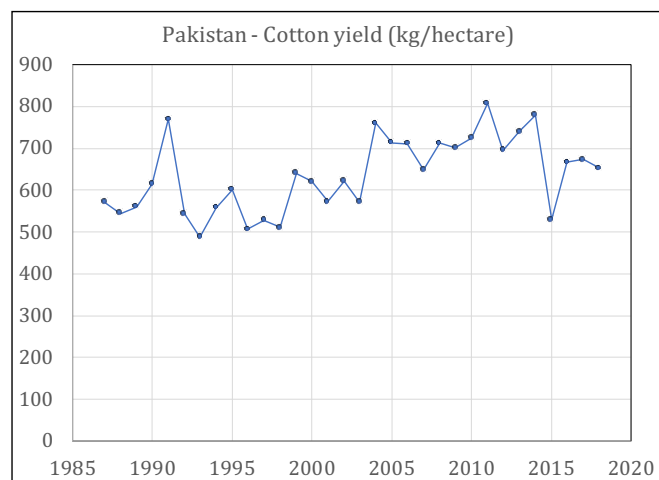
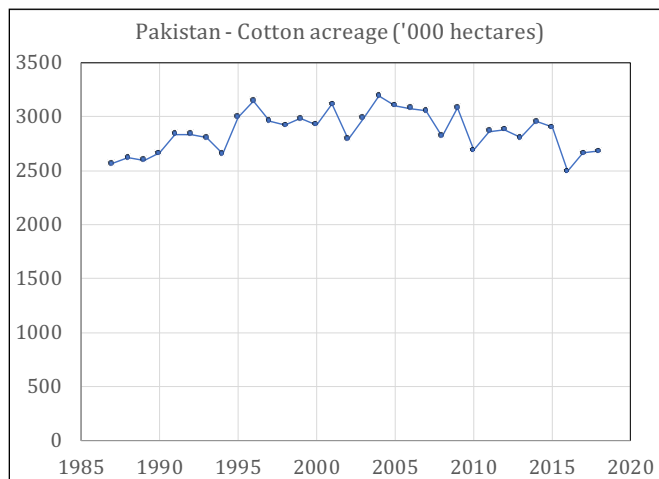
Technology Transfer

The Agricultural Development Programme (ADP) of the Ministry of Agriculture is the major public agency mandated to provide extension services to farmers. The Nigerian Federal Government provides necessary funding. In 2009, the Agricultural Research Council of Nigeria (ARCN), Abuja, directed all National Agricultural Research Institutes (NARIs) to establish adopted villages to showcase agricultural technologies developed by the research institutes. The offices of adopted villages served as Agricultural Research Outreach Centres (AROCs) managed jointly by farmers and the NARIs. A world bank project 'West Africa Agricultural Productivity Programme (WAAPP-Nigeria)' provided support for technology dissemination for a few years since 2013. Recently, a few private start-up companies such as FarmCrowdy, ThriveAgric, and Verdant AgricTech, have been using digital technologies for technology transfer to farmers in Nigeria.

Pakistan

Cotton in Pakistan

The average cotton acreage during the period 2008 to 2018 was 2,804,000 hectares at an average lint yield of 698 Kg per hectare.



Structure of Cotton Research

In Pakistan research on cotton has been given prime importance. A number of organisations conduct research on various aspect of cotton ranging from genetic engineering, pest management, varietal development, nutritional management and addressing physiological disorders at the academic and applied levels. The research institutions have better infra structure well equipped laboratories and diversity of expertise.

The following research institutions are engaged in cotton R & D work

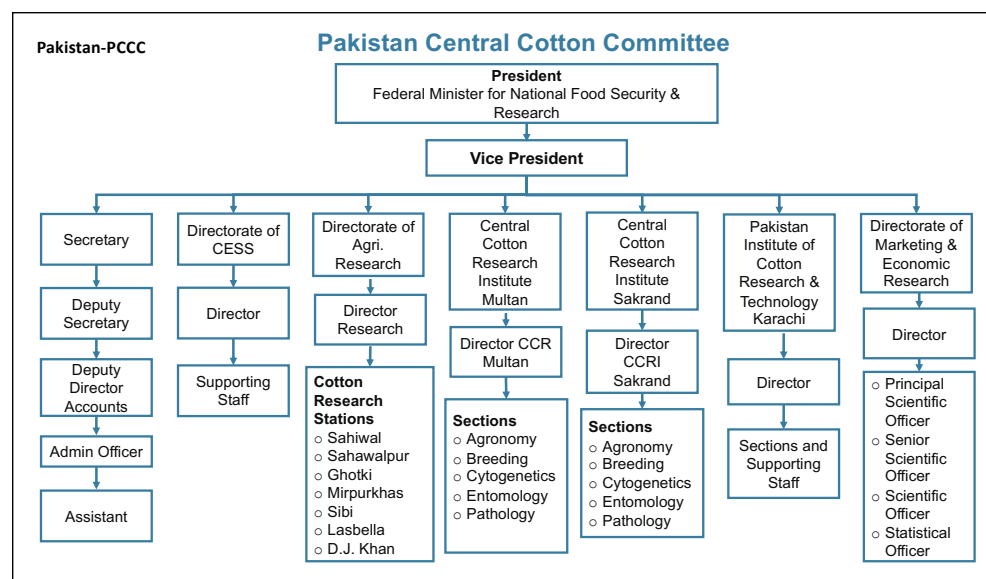
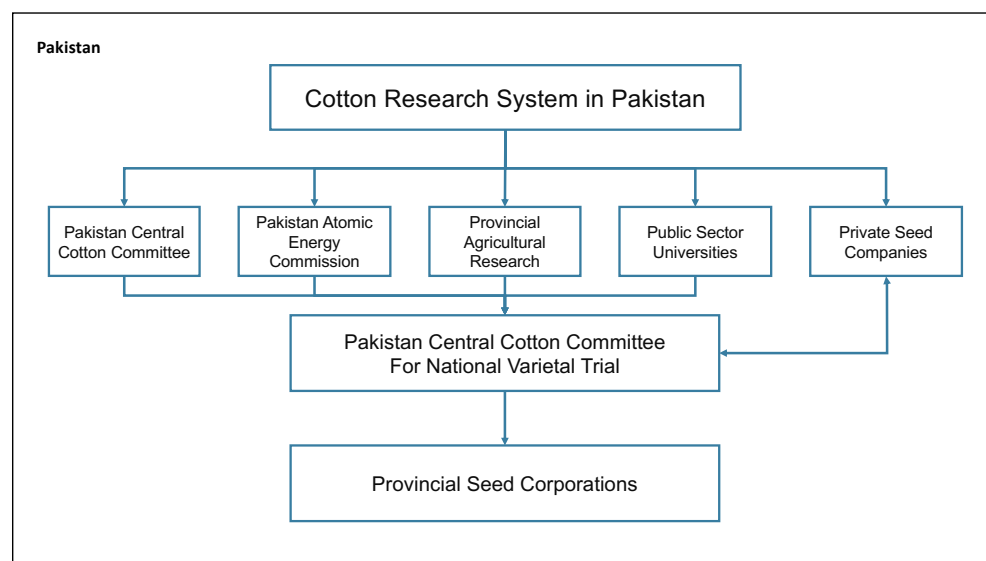
- Pakistan Central Cotton Committee (PCCC) Multan
- Pakistan Atomic Energy Commission (PAEC) Islamabad

- Agriculture universities
- Province Agriculture research department
- Sindh Agriculture research department
- Punjab agriculture research department
- Centre for molecular studies university of Punjab
- Private Seed Companies.

Research and development on cotton is mainly carried out by the public sector, i.e. at federal and provincial institutions and universities. The Pakistan Central Cotton Committee-PCCC is an autonomous organisation established under the Pakistan Cotton Cess Act for the improvement and development of growing, marketing and processing of cotton. PCCC is thus engaged in agricultural, technological and economic research on cotton and its products through its mono-crop multi-disciplinary Central Cotton Research Institutes at Multan and Sakrand, and cotton research stations throughout the cotton growing areas in the four provinces. PCCC is the apex body at the federal level for research and development on cotton. In addition to PCCC, the following institutes/organisations also deal with cotton research.

- University of Agriculture, Faisalabad.
- Sindh Agriculture University, Tandojam.
- Agriculture University, Peshawar.
- University of Agriculture Bahauddin Zakariya, Multan.
- Cotton Research Institute, Faisalabad.
- Agriculture Research Institute, Tandojam.
- Nuclear Institute for Agriculture & Biology (NIAB), Faisalabad.
- National Institute for Biotechnology & Genetic Engineering (NIBGE), Faisalabad.
- Nuclear Institute of Agriculture (NIA), Tandojam.
- Pest Warning and Quality Control of Pesticides Directorate, Lahore
- Centre of Excellence in Molecular Biology (University of the Punjab), Lahore

The Government of Pakistan and Provincial Governments provide funds to all the cotton research done by their provincial institutes/organisations. However, the private sector arranges funds for research conducted by them. PCCC derives its funding through Cotton Cess (levy). It is levied on raw cotton consumed in the country and on exports. The Directorate of Research, PCCC, coordinates all research on cotton. The program of work to be implemented by PCCC is discussed and approved by the Agricultural Research Sub-Committee of the PCCC. The Sub-Committee comprises of representatives of the above-mentioned institutions and various public and private segments of the cotton industry.



opment and seed business.

Provincial seed corporations and private seed companies have the mandate to multiply seeds, get certification from the Federal Seed Certification and Registration Department prior to marketing. The Punjab Seed Council and the Sindh Seed Council are responsible for approval of varieties in the respective provinces. In addition to these seed corporations, many private seed companies supply planting seeds. Some of the major companies are Resham Seed Corporation, Neelam Seed Corporation, Four Brothers, Rawal Seed Corporation, Thakar Agro Chemical & Seed Corporation and Mumtaz Seed Private Limited.

Fertiliser and Pesticide Supply

The fertiliser industry markets fertilisers through its dealer network in the country. Farmers obtain fertilisers from the fertiliser sale points (open market) on cash payment and/or on loan payment. Pesticide companies market

pesticide through their dealer networks in the country. Farmers obtain pesticide from pesticide dealers on cash payment and/or on loan payment. The Federal Department of Plant Protection monitors pesticides imports.

Technology Transfer

The provincial Agriculture Extension Departments are responsible for transfer of production technology to cotton growers. All extension approaches including radio, television, mobile applications, farmer meetings and newspapers are used to disseminate technologies. Some progressive farmers contact researchers directly for latest updates or advice, particularly in case of specific problems. The private seed companies are also instrumental in educating growers while promoting their varieties.

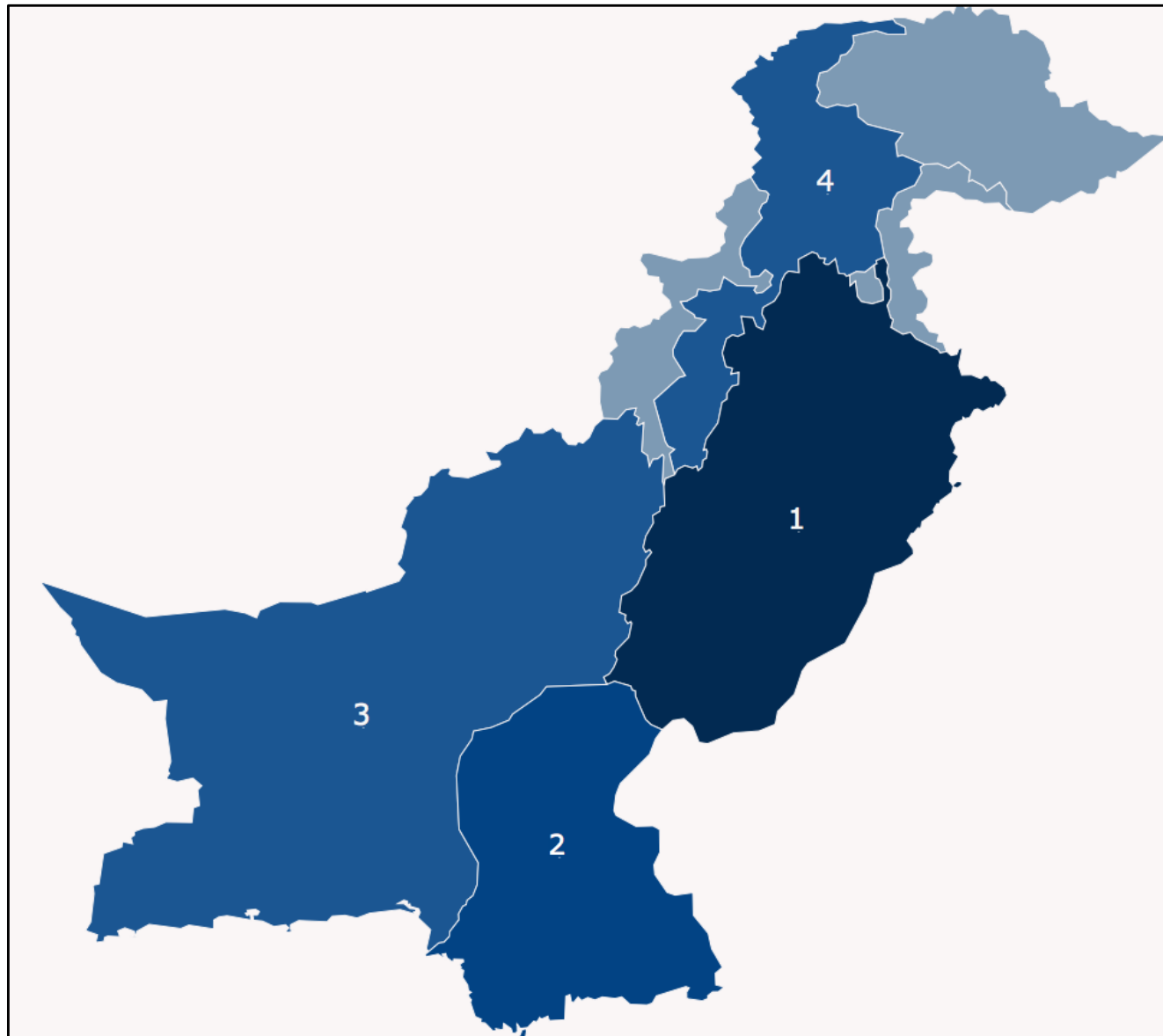
Variety Approval and Seed Supply

Provincial, private as well as federal research organisations are engaged in the development of varieties. Breeders initially submit a formal application containing origin and botanical description of a new strain to the Federal Seed Certification & Registration Department. Preliminary trials are conducted at breeders' research stations. The strain is tested in a National Co-ordinated Varietal Trial for at least 2 years at about 20 locations spread across the cotton belt of Pakistan. The Federal Seed Certification and Registration Department conducts trials for distinctness, uniformity and stability (DUS) of the new strains. For impartial testing and fair competition, adaptability trials are also conducted on larger out-station blocks. Fibre quality testing is also done at the same time. For the last few years, private seed companies are dominating varietal devel-

KEY CONTACTS IN PAKISTAN

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Federal Seed Certification Registration Department (FSC&RD) Islamabad. Nuclear Institute for Agriculture Biology	Director General Email: dgfscrd @ yahoo.com
Centre of Excellence in Molecular Biology (CEMB), Lahore Web www.cemb.edu.pk	Director E-mail: tayyab@cemb.edu.pk
National Institute of Biotechnology & Genetic Engineering (NIBGE) Jhang Rd, Faisalabad, Punjab 44000, Pakistan	Dr Shahid Mansoor, Director Dy. Chief Scientist Tel: 041-2651471. Fax: 041-9201322
Nuclear Institute for Agriculture and Biology (NIAB) P.O. Box 128, Jhang Road, Faisalabad, PAKISTAN	Dr. Iftikhar Ali, Director Tel: +92-41-2654210 Tel: +92-333-9102990 Email: director@niab.org.pk Email: ial63@yahoo.com
Nuclear Institute of Agriculture (NIA) Tandojam.	Director Email: niatjam@yahoo.com
Ayub Agricultural Research Institute Jhang Road, Faisalabad.	Dr Abid Mahmood, Director General Tel: +92-419201671 Email: dgaraari@yahoo.com
Agricultural of University, Professors Colony, Peshawar, Khyber Pakhtunkhwa, Pakistan	Prof. Dr. Zahoor Ahmed Swati Vice Chancellor Tel: +92 91 9221144 Email: riazadil@aup.edu.pk
Farmers Associations	
Pakistan Agriculture Forum Punjab	M. Aamir Ghani. Secretary General.
Sindh Aabadgar Board	Ch. Ahmed Ali Akhtar. President.
Ginners Association	
Pakistan Cotton ginners Association PCGA House, M.D.A. Road, Multan.	Chairman E-mail: pcga@pcga.org
Trade and Textile Associations	
Karachi Cotton Association The Cotton Exchange I.I Chundrigar Road, Karachi, Pakistan. Tel: +(92 21)3242-5007 Fax: +(92 21)3241-3035,	Muhammad Atif Dada, Chairman Tel: +92 3241-1548-49 Tel: +92 32417289 Fax: +92 3453-4022 Fax: +92 3241-65303 E-mail: kcapak@cyber.net.pk

PAKISTAN COTTON MAP



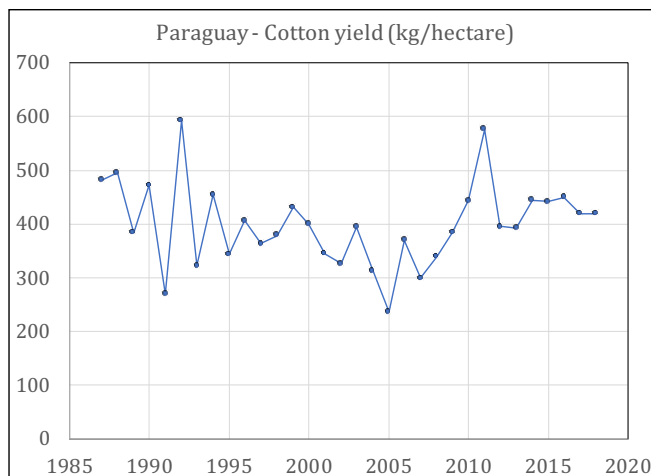
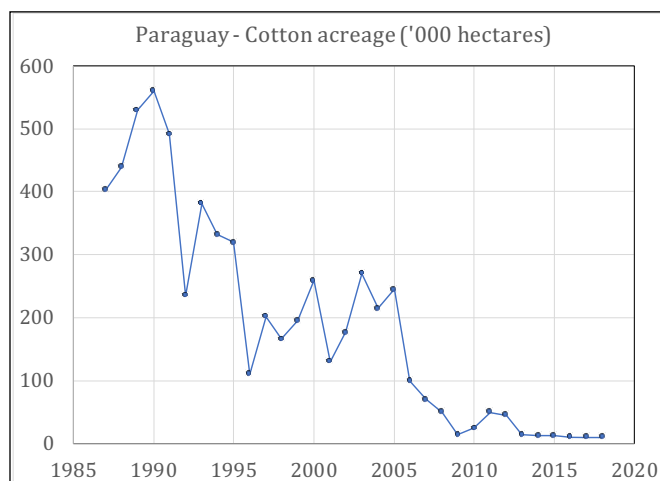
PAKISTAN: COTTON PRODUCTION DATA 2018 (estimates)

S.No	Province	Area ('000 Hectares)	Production (M Tonnes)
1	Punjab	1,947	1.38
2	Sindh	422	0.44
3	Balochistan	37	0.026
4	Khyber Pakhtunkhwa	0.2	0.003
	PAKISTAN	2,406	1.849

Paraguay

Cotton in Paraguay

The average cotton acreage during the period 2008 to 2018 was 23,000 hectares at an average lint yield of 428 Kg per hectare.



Fertiliser and Pesticide Supply

Farmers get fertilisers usually through intermediaries. Fertilisers and pesticides are generally supplied by private agencies or stores. Major pesticide companies are Syngenta and Bayer Crop Science.

Technology Transfer

Technicians of the Agriculture Extension Directorate of the Ministry of Agriculture have the responsibility to educate growers in cotton production technologies. Technology is also provided to farmers through direct contact and field days by technicians of private companies. Staff of the cotton ginning factories also reach out to growers and help them with cotton production technologies.

Structure of Cotton Research

The Institute of Agricultural Technology of Paraguay-IP-TA (Instituto Paraguayo de Tecnología Agropecuaria) leads research on cotton. Funds are provided by the federal Government from the general budget. The Faculty of Agricultural Sciences of the National University of Asunción (Universidad Nacional de Asunción) also carries out research in the fields of entomology and agronomy.

Variety Approval and Seed Supply

Commercial varieties are registered at the National Register of Cultivars governing body National Services for Quality and Health and Seeds Plan-SENAVE (Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas). Currently, the Golondrina Agricultural Society (SAGSA) and Monsanto are the only suppliers of planting seeds.

KEY CONTACTS IN PARAGUAY

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Proyecto de Investigación y Experimentación Algodonera	Coordinator Juan Carlos Cousiño. Tel: 595 982365104 Email: cousinojc@gmail.com
Facultad de Ciencias Agrarias - UNA	Ubaldo Britos. Tel: 595 981437274 Email: Investigacionfca@agr.una.py
Procesos Industriales (PROIN)	Blas Zarate. Tel: 595 981445862 Email: blaszarate@gmail.com Email: secretaria@proin.com.py
INBIO (Instituto de Biotecnología Agrícola)	Estela Ojeda. Tel: 595 982231279 Email: gerencia@inbio.org.py
Producers Organisations	
Federación Nacional Campesina	Ms. Teodolina. Tel: 595 982514309 Email: fncparaguay@gmail.com
Ginners Organisations	
Cámara Algodonera del Paraguay (CADELPA)	Dr. Jose Vargas Peña Email: presidencia@cadelpa.com.py

Peru

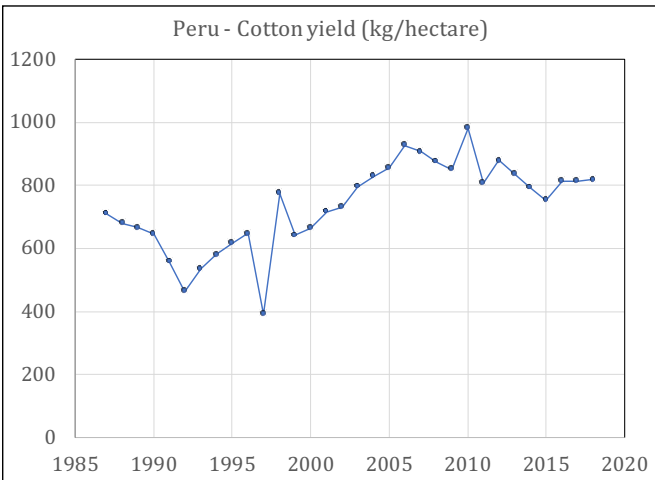
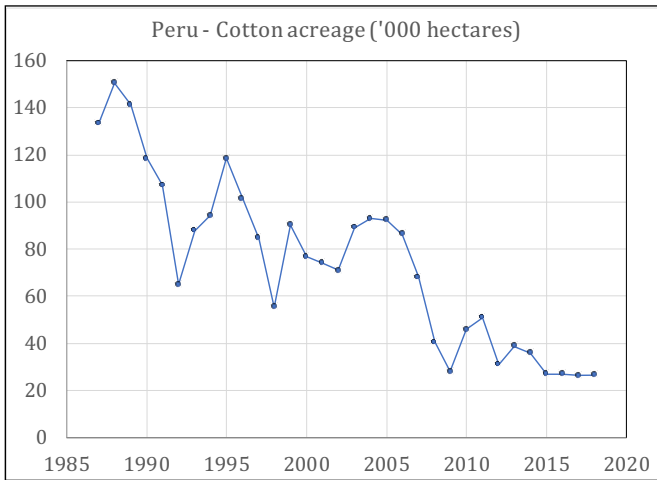
Cotton in Peru

The average cotton acreage during the period 2008 to 2018 was 34,000 hectares at an average lint yield of 838 Kg per hectare.

Structure of Cotton Research

The National Agricultural Innovation Institute (INIA)

(Instituto Nacional de Innovación Agraria) under the Ministry of Agriculture and Irrigation was established in 1978. It is Peru's principal governmental agricultural research agency. Since its establishment INIA has been continuously reorganised. The INIA is responsible for agricultural research, technology transfer, technical assistance, conservation of genetic resources, and production of seeds and breeding of species of high genetic value. The INIA focuses on crop, livestock, and natural resources research.



Poland

Structure of Cotton Research

Gdynia Cotton Association, Gdynia supports cotton R&D. The National Science Centre is another government agency, supervised by the Ministry of Science and Higher Education, set up in 2011 to support basic research in Poland. Textile universities also undertake research on cotton.

The National Centre for Research and Development is the implementing agency of the Minister of Science and Higher Education. It was formed in 2007 as an entity in charge of the performance of the tasks within the area of science and technology and innovation policies. The National Cen-

tre for Research and Development extended its activities with new initiatives and opportunities from September 2011. The functions of the Centre are in three operational programs: Human Capital, Innovative Economy and Infrastructure and Environment, the Centre became one of the greatest innovation Centres in Poland. Funding comes from the national treasury and the European Union. The Centre conducts a wide range of international and national programs supporting innovations at the level of applied research.

Seed supply, fertiliser supply, pesticides and transfer of technology are not related to Poland.

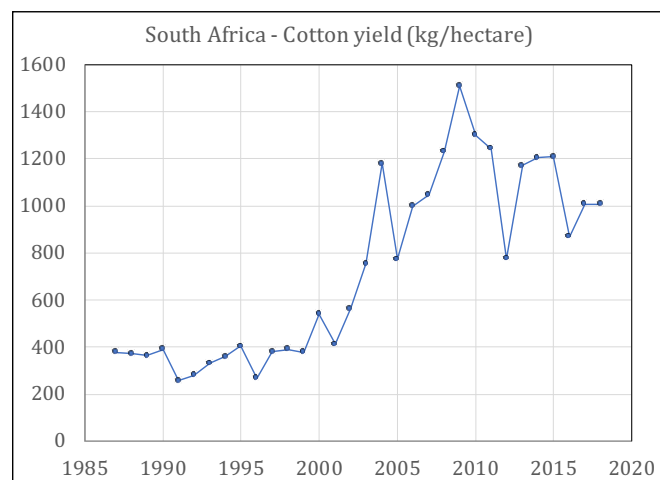
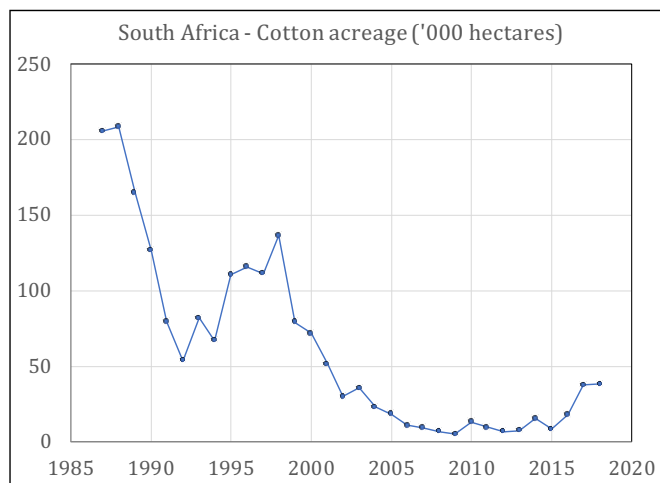
KEY CONTACT IN POLAND

Institution / Mailing Address	Contact Person, Position
Textile Association	
Gdynia Cotton Association	Ignacy Józkowicz, President
ul. Derdowskiego 7, 81-369 Gdynia, Poland	Tel: (48-58) 620-75-98
http://www.bawelna.org.pl	Fax: (48-58) 620-75-97
	Email: ib@gca.org.pl

South Africa

Cotton in South Africa

The average cotton acreage during the period 2008 to 2018 was 15,000 hectares at an average lint yield of 1139 Kg per hectare.



Structure of Cotton Research

The Institute for Industrial Crops (IIC), which is a division of the Agricultural Research Council (ARC), determines research priorities in conjunction with South African cotton growers, ginners and spinners. Cotton South Africa, Pretoria plays an important role in cotton R&D. The Technical Committee of Cotton SA allocates the necessary financial resources for research projects. Research on cotton production in South Africa is conducted by the ARC-IIC. South African universities may occasionally become involved in one or two cotton projects. From time to time, private companies import and evaluate overseas cotton germplasm

and also submit cultivars to be tested in the ARC-IC National Cotton Cultivar Evaluation Program.

The ARC's research on cotton production is jointly funded by the Government and cotton producers. At present, the total cost of cotton research is approximately R 2,5 million (US\$ 0.31m). The cotton industry is expected to make a 50% contribution to cotton research but due to financial restraints it only manages to contribute about 10%.

Variety Approval and Seed Supply

The Directorate Genetic Resources of the Department of Agriculture, Forestry and Fisheries (DAFF) coordinates varietal testing and approval. Two kg of breeder seeds are submitted to the Directorate for testing. Half of this seed is planted by the Department of Agriculture, Forestry and Fisheries for comparison to descriptors (DUS) supplied by the applicant. The remainder is kept in case replanting is necessary. If the seed conforms to the applicable descriptors, then Plant Breeders Rights under Act (Act 15 of 1976) are awarded and the cultivar name is included on the Plant Variety List. If the cultivar contains any biotech traits, the trait contained in it is first approved for General Release under the GMO Act (Act 15 of 1997).

Currently there are three seed companies supplying cotton seed to South African cotton growers, namely Monsanto, Bayer and Pioneer. The seed is supplied by them via the cotton gins and/or appointed agents in the various cotton producing regions.

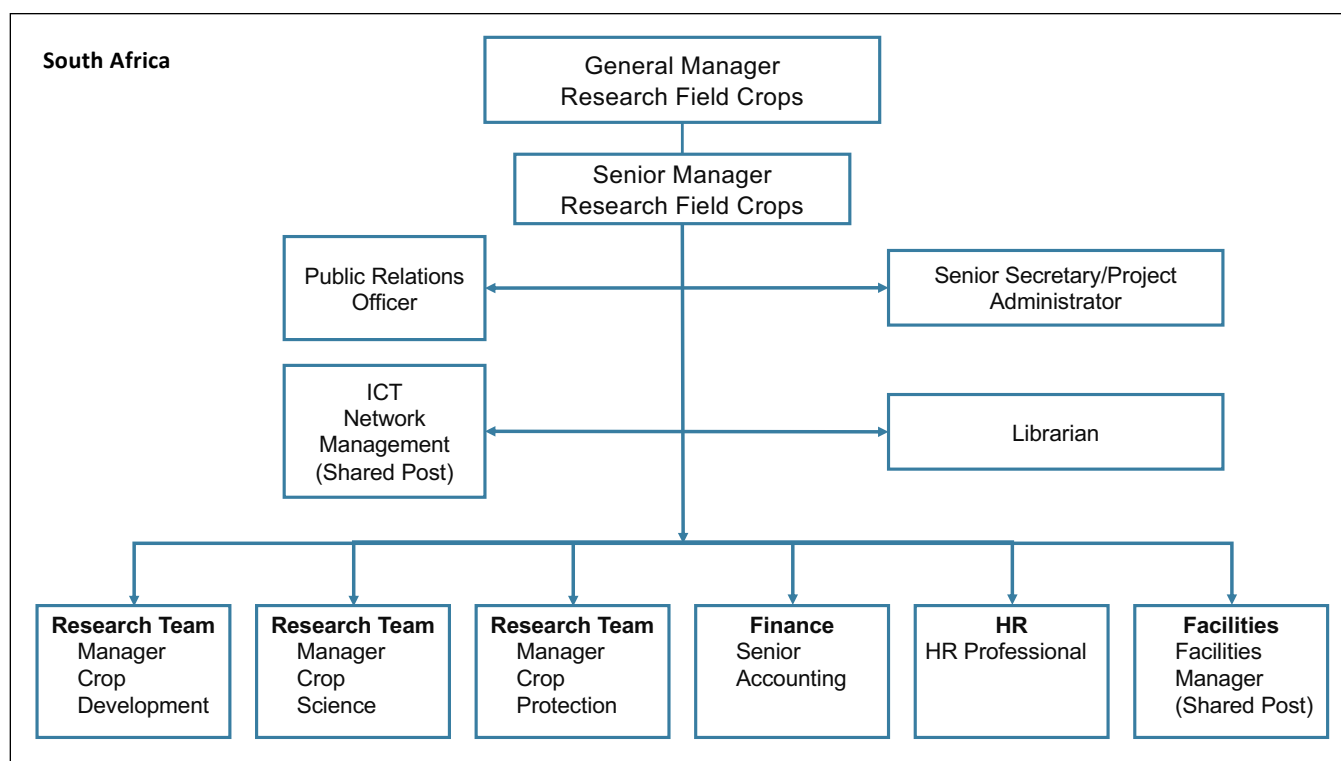
Fertiliser and Pesticide Supply

Cotton farmers obtain fertilisers and pesticides from the cotton gins and/or companies and/or their agents. The major pesticide companies in South Africa are Bayer Crop Sciences, Dow Agrosiences, BASF, Wenkem, Syngenta, Mitsui & Co., Natural Plant Protection, Avima, Farmkem, RT Chemicals, Cropchem, Small Pack Solutions, Hyper Agrochemicals and Universal Crop Protection.

Technology Transfer

Technology is transferred to growers through:

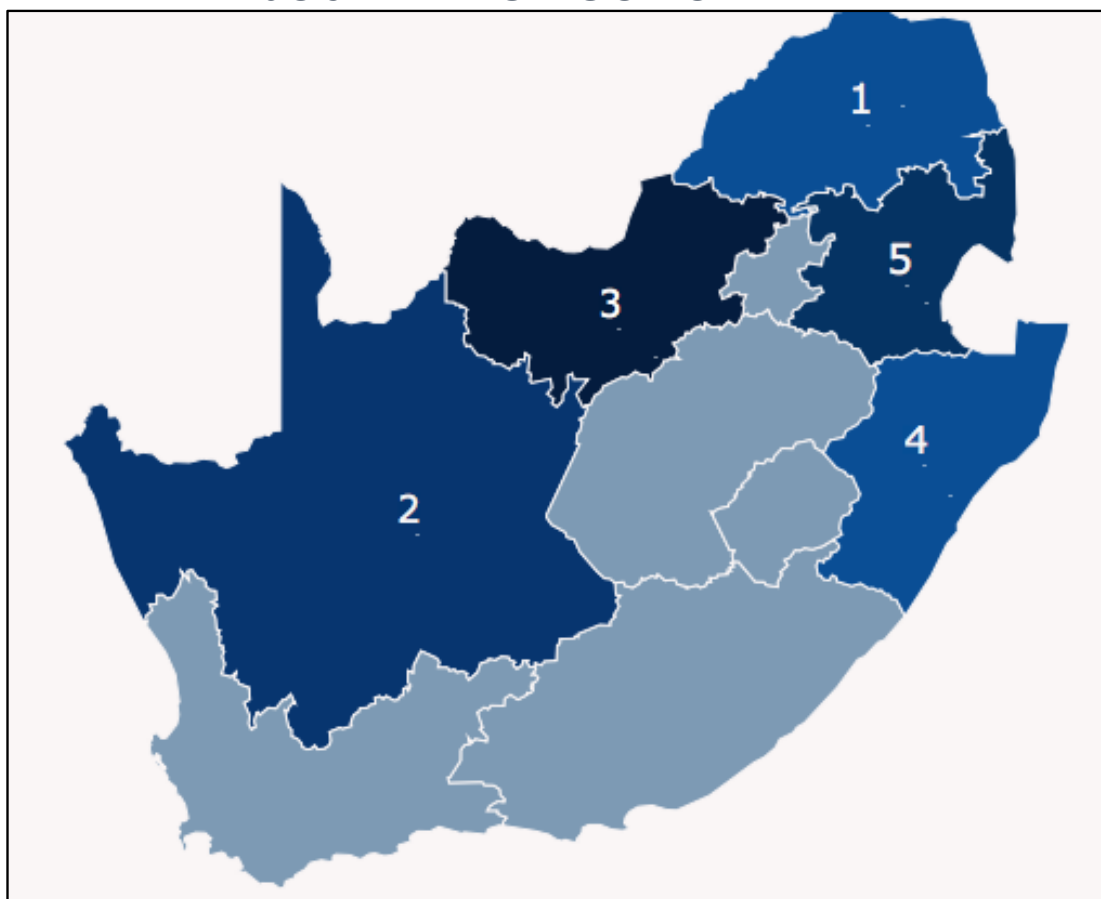
- Farmer information days organised by Cotton South Africa, Pretoria the ARC-IIC and seed companies.
- Cotton SA's Research Committee.
- Annual meetings of regional farmers' producer organisations.
- Cotton South Africa's quarterly magazine.
- Cotton South Africa's website.
- Extension workers from the Departments of Agriculture of the different provinces and articles in the agriculture press.



KEY CONTACTS IN SOUTH AFRICA

Institution / Mailing Address	Contact Person, Position
Research Organization	
Agriculture Research Council - Institute for Industrial Crops	Dr L Owoeye. Senior Research & Development Manager Tel: 27-12 4279999 Fax: 27-12 4279999
Farmers Organisations	
South African Cotton Producers Organization (SACPO)	Mr E Genis. Chairman Tel: 27-13-2612447 Fax: 27-13-2611671 Email: ejgenis@lantic.net
Ginners Organisations	
South African Cotton Ginners Association (SACGA)	Mr J Kempen. Chairman Tel: 27-13-2611621 Fax: 27-13-2612732 Email: joseph@loskopagri.co.za
Spinners Organisations	
South African Cotton Textile Manufacturers' Association (SACTMA)	Mr B Brink. Executive Director Tel: 27-11-4542342 Tel: 27-11-4542654 Email: texfed@jhbmail.co.za
Trade and Textile Associations	
Cotton South Africa. 90 Cycad Place. Off Watermeyer Street. Val De Grace X10 Pretoria. Republic of South Africa. PO Box 912 232. Silverton 0127. Republic of South Africa	Hennie Bruwer, Chief Executive Officer henniebruwer@cottonsa.org.za Tel: +27 (12) 804 1462 Fax: +27 (12) 804 8616 Email: enquiries@cottonsa.org.za

SOUTH AFRICA COTTON MAP

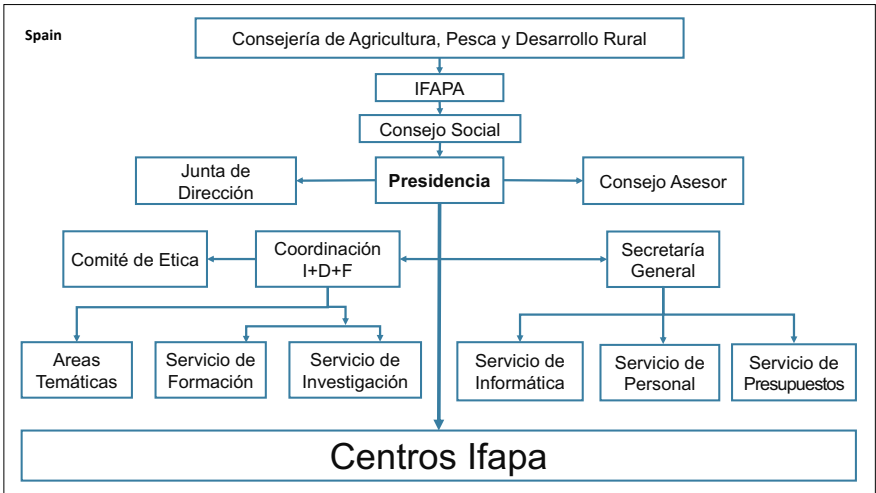
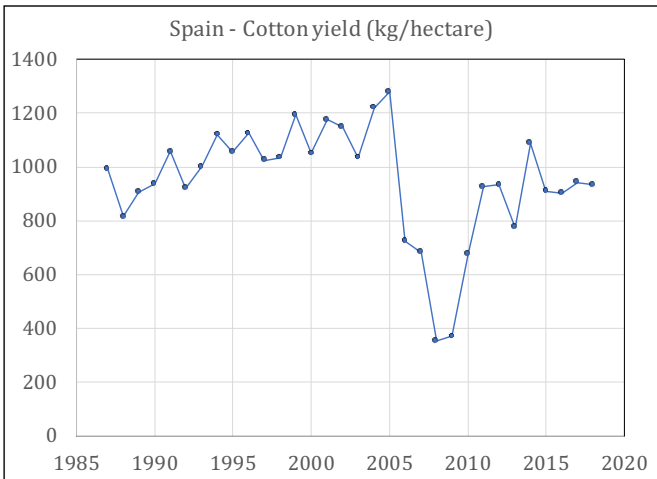
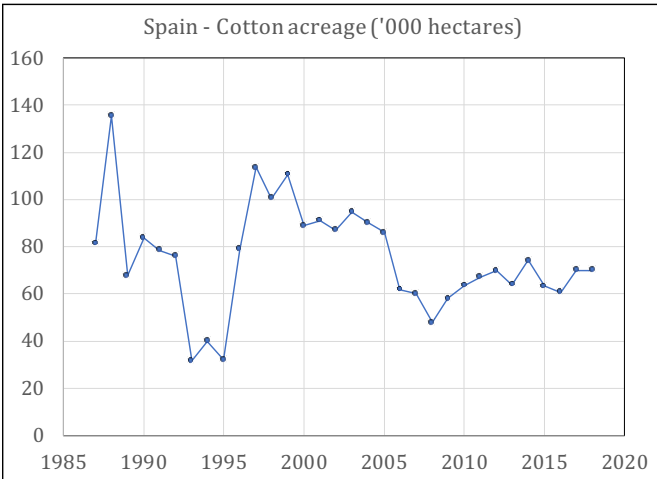
**SOUTH AFRICA: COTTON PRODUCTION DATA 2017-18 (estimates)**

S.No	Provinces	Area ('000 Hectares)	Production (M Tonnes)
1	Limpopo	19.5	0.017
2	Northern Cape	7.3	0.014
3	North West	6.0	0.005
4	Kwazulu Natal	2.7	0.003
5	Mpumalanga	2.0	0.000
	SOUTH AFRICA	37.5	0.039

Spain

Cotton in Spain

The average cotton acreage during the period 2008 to 2018 was 64,000 hectares at an average lint yield of 801 Kg per hectare.



Structure of Cotton Research

Cotton research is coordinated by the Research and Training Institute for Agriculture and Fisheries of the Council of Andalucía (Instituto de Investigación y Formación Agraria y Pesquera-IFAPA, Junta de Andalucía), Plant Health Service of the Ministry of Agriculture and Fisheries of the Government of Andalucía (Servicio de Sanidad Vegetal, Consejería de Agricultura y Pesca, Junta de Andalucía) and the Board for Higher Scientific Research (Consejo Superior de Investigaciones Científicas -CSIC). The main sources of funding are the National Institute for Agricultural Research and Technology and Food (Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria-INIA), the Research and Training Institute for Agriculture and Fisheries of the Council of Andalucía), the Secretariat of Livestock and Fisheries, (Consejería de Agricultura y Pesca), the Council of Andalucía and the European Union. There is no specific structure of cotton research in Andalusia, the major cotton growing state. Currently, there are no R&D projects on cotton funded by the Ministry of Agriculture, Fisheries and Rural Development of Andalusia.

Fertiliser and Pesticide Supply

In accordance with the provisions of Royal Decree 1311/2012, by which the policy framework is established to achieve sustainable use of plant protection products, farmers can purchase plant protection products from only licensed professional suppliers. To obtain a license one must have completed special training.

At the time of sale of plant protection products for professional use, a vendor must provide customers with adequate information concerning the use of plant protection products acquired, risks to health and the environment and safety instructions to manage those risks. The vendor provides information on the collection points for empty containers. The seller is expected to provide proof of suitable training. In addition to the above, the seller must record all sale records of business transactions. The manufacturers and distributors of plant protection products in Spain are available at the following link to the website of MAGRAMA <http://www.magrama.gob.es/es/agricultura/temas/sanidad-vegetal/productos-fitosanitarios/registro/menu.asp>.

Technology is transferred to growers by business activities of inputs provider (machinery, seeds, pesticides, Integrated Production Associations (APIs) and horizontal transfer networks (Plant Information Network Andalusia -RAIF) to Irrigation Advisory Service (SAR) and Virtual Technician Service Servifapa.

Technology Transfer

Technology is transferred to growers by business activities of inputs provider (machinery, seeds, pesticides, Integrated Production Associations (APIs) and horizontal transfer networks (Plant Information Network Andalusia -RAIF) to Irrigation Advisory Service (SAR) and Virtual Technician Service Servifapa.

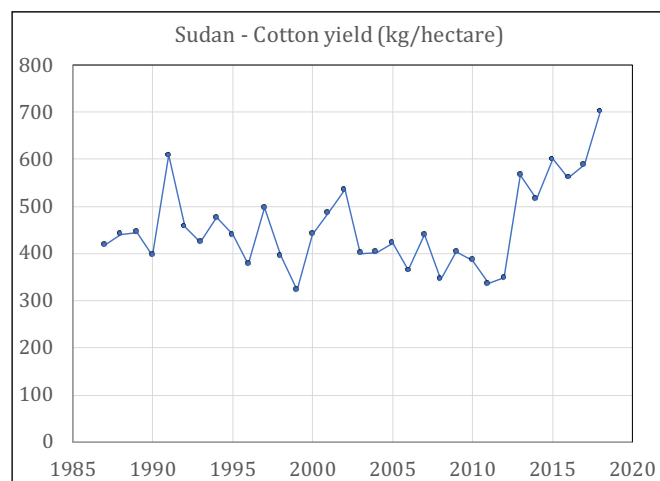
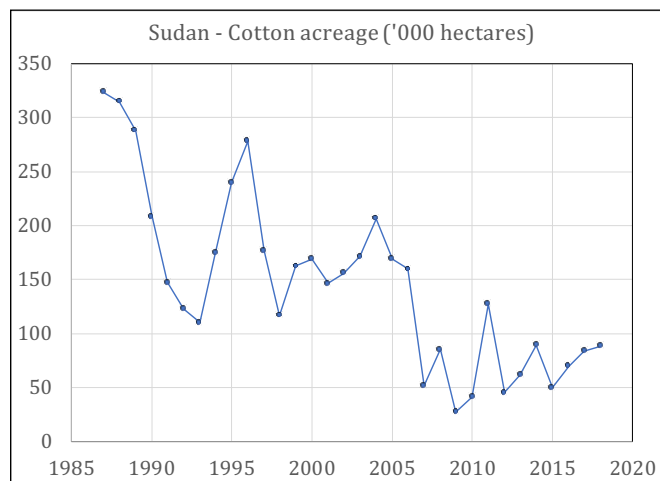
KEY CONTACTS IN SPAIN

Institution / Mailing Address	Contact Person, Position
Research Organizations	
Instituto de Investigación y Formación Agraria y Pesquera (IFAPA) www.ifapa.junta-andalucia.es	Francisco de Paula Rodríguez García (Jefe Servicio de Investigación) Email: investigacion.ifapa@juntadeandalucia.es
Acuicultura y Recursos Marinos	D. Manuel Manchado Campaña. Tel: 671 532 088 Email: manuel.manchado@juntadeandalucia.es
Protección Vegetal Sostenible	D ^a Berta de los Santos García de Paredes Tel: 671 532 866 Email: berta.santos@juntadeandalucia.es
Alimentación y Salud	D. José Manuel Moreno Rojas. Tel: 671 532 758 Email: josem.moreno.rojas@juntadeandalucia.es
Economía de la Cadena Alimentaria	D. Samir Sayadi Gmada Tel: 671 532 131 Email: samir.sayadi@juntadeandalucia.es
Genómica y Biotecnología	D. José Federico Sánchez Sevilla. Tel: 671 532 815 Email: josef.sanchez@juntadeandalucia.es
Agricultura y Medio Ambiente	D. Ignacio Jesús Lorite Torres Tel: 671 532 698 Email: ignacioj.lorite@juntadeandalucia.es
Ingeniería y Tecnología Agroalimentaria	D ^a . Evangelina Medrano Cortes Tel: 671 532 043 Email: evangelina.medrano@juntadeandalucia.es
Producers Organizations	
Asociación Agraria de Jóvenes Agricultores (ASAJA) www.asaja-andalucia.es	Vicente Pérez García de Prado (Director General) Email: info@asaja-andalucia.es
Coordinadora de Organizaciones de Agricultores y Ganaderos (COAG) www.coagandalucia.com	Manuel Izquierdo (responsable sector algodón) Email: coagandalucia@coagandalucia.com
Unión de Pequeños Agricultores y ganaderos (UPA) www.upa-andalucia.es	Juan Sánchez Vargas (Secretario de Agricultura y Mercados) Email: upa-a@upa-andalucia.es
Cooperativas agro-alimentarias	Jesús Valencia Matos (responsable sector algodón) Email: cooperativas@agroalimentarias-andalucia.coop
Organizaciones de Desmotadores	
Agrupación Española de Desmotadores de Algodón (AEDA) http://www.agroalimentarias-andalucia.coop	Dimas Rizzo Escalante (Presidente Ejecutivo) Email: aeda@aeda.es
Asociación de Desmotadores del Sur (ADESUR)	Miguel Ángel Molina (Vicepresidente) Tel: 957421732 Email: eurosemillas@eurosemillas.com
Trade and Textile Associations	
Fundacion Textil Algodonera Gran Via, 637. ES - 08010 Barcelona www.aitpa.es	Salvador Maluquer, Director Tel: (+34-93) 318 9200 Email: maluquer@aitpa.es
National Cotton centre Centro Algodonero Nacional c/ Via Laietana 32-34, 3 ^o 08003 Barcelona	D. Alberto Durbán Monreal, President Tel: +34 933198616 Fax: +34 933198616 Email: can@centroalgodonero.com

Sudan

Cotton in Sudan

The average cotton acreage during the period 2008 to 2018 was 70,000 hectares at an average lint yield of 487 Kg per hectare.



Structure of Cotton Research

Cotton is one of the many commodities that are addressed by the Agricultural Research Corporation-ARC, Wad Medani, under the Ministry of Agriculture. The Agricultural Research is a semi-autonomous national research body. ARC is entrusted with planning and executing applied research in crop production and protection, land conservation forestry and range, water management, pesticide use, environment, genetic resources, radioisotope uses, biotechnology, food processing, economic and social studies and seed production. With regard to cotton, ARC's main activities are focused on inter alia cotton breeding, fibre technology, integrated pest management and agronomy under the umbrella of the Cotton Research Program-CRP.

The Cotton Research Program includes breeders, agronomists, molecular biologists, entomologists, pathologists, fibre technologists, IPM specialists, extension workers, economists, physiologists and technical assistants. The Sudan Cotton Company, in addition to the Government, also provides funds for cotton research.

Variety Approval Seed Supply

Plant-breeders develop experimental lines, conduct preliminary yield trials and after satisfactory results a candidate line is forwarded to the Cotton Research Coordinator for evaluation in the national variety trials that covers all cotton growing areas in the country. Performance data for 2-3 years is analysed and if the new line out-performs the recently released variety a release note is prepared by the coordinator and sent to the National Variety Release Committee-NVRC. The National Variety Release Committee-NVRC of the Federal Ministry of Agriculture approves new cotton varieties.

Varietal maintenance and seed multiplication are joint efforts between ARC and the production schemes. The Cotton Research Program of the ARC is responsible for production of breeder's (pre-basic) seeds, supervision and production of the foundation (basic) seeds. Production of registered and certified seeds is the responsibility of the production schemes where each scheme has its own Seed Production Unit (SPU). Mechanical delinting, seed-dressing and packing of certified seed are performed in the vicinity of the ginneries. Seed certification is the responsibility of the Seed Council of the Ministry of Agriculture. In practice, however, cotton seed certification is performed by breeders and the Gezira Scheme.

Seeds are provided by the public and private sectors in Sudan. Private agencies such as the Chinese centre, China and J-K Agri-Genetics, India provide seeds through a local company called Elaeena.

Fertiliser and Pesticide Supply

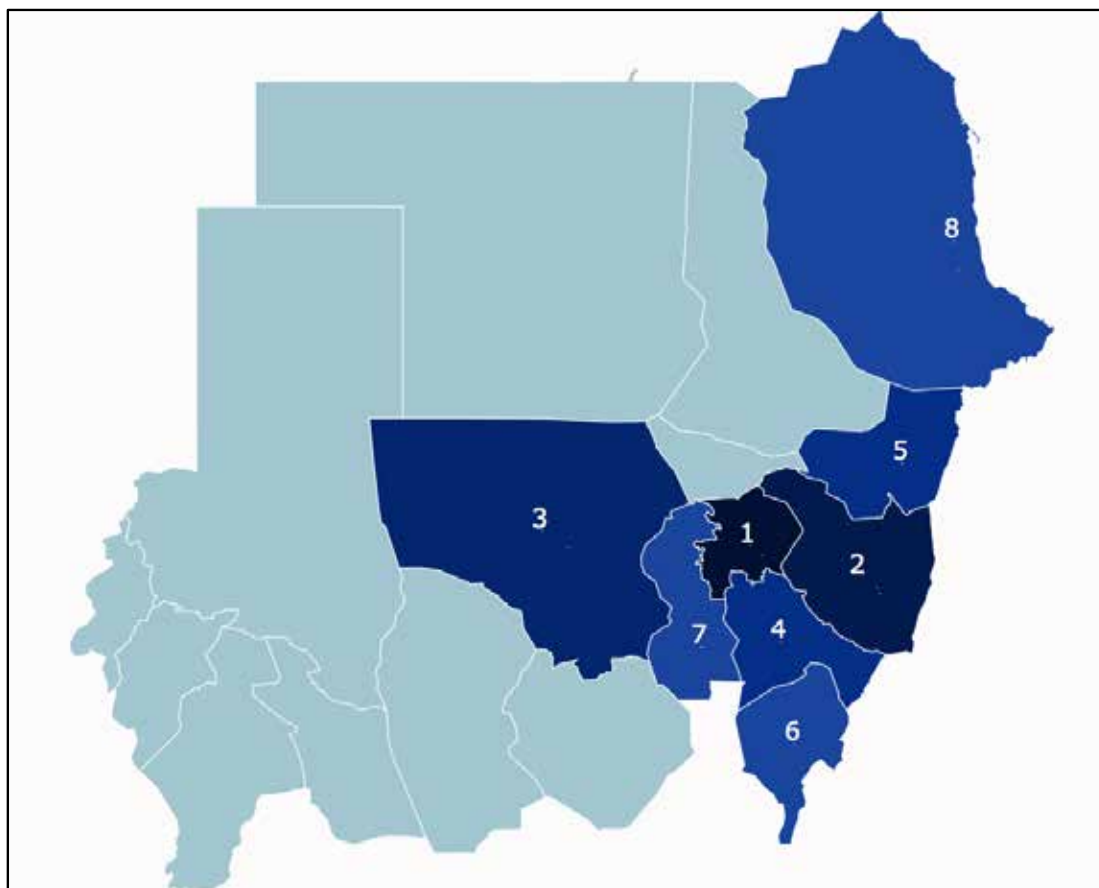
The Sudan Cotton Company Limited (SCCL) plays an indispensable role in providing and facilitating fertilisers to Sudanese farmers in irrigated schemes. The Sudan Cotton Company either directly involves itself in input provision or indirectly intervenes by providing repayment guarantees to international suppliers. Private companies through the Government also share provision of fertilisers. The government through private companies and their international partners controls pesticide flow.

Technology Transfer

Transfer of technology to farmers is a joint responsibility of ARC and Technology Transfer and Extension Administration of the Ministry of Agriculture.

KEY CONTACT IN SUDAN

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Gezira Research Station Agricultural Research Corporation P. O. Box 126 Wad Medani http://www.arcsudan.sd	Mustafa, Ahmed Mohamed National Coordinator Tel: 249-511-843215 Tel: 249-511-543213 Email: ahmedmustafa975@yahoo.com

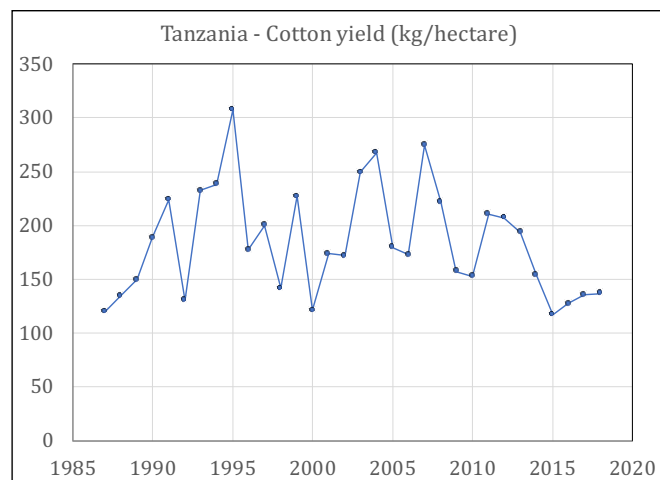
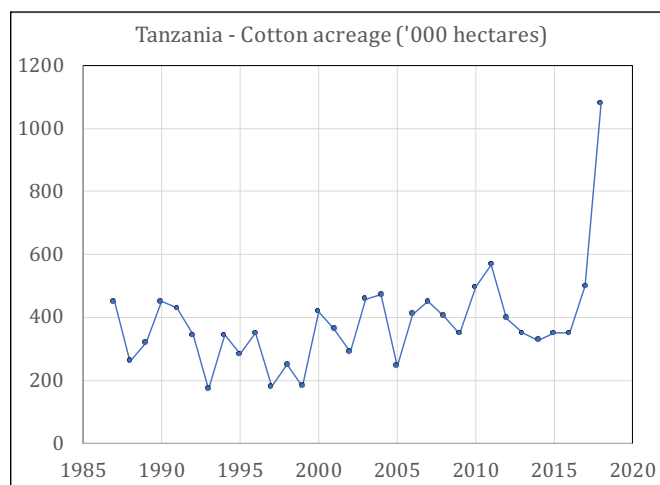
SUDAN COTTON MAP**SUDAN: COTTON PRODUCTION DATA 2017-18 (estimates)**

S.No	Regions	Area ('000 Hectares)	Production (M Tonnes)
1	Gezira	45	0.036
2	Gedaref	40	0.016
3	N. Kordofan	31	0.019
4	Sennar	29	0.016
5	Kassala	13	0.010
6	Blue Nile	11	0.004
7	White Nile	5	0.001
8	Tokar	1	0.000
	SUDAN	175	0.103

Tanzania

Cotton in Tanzania

The average cotton acreage during the period 2008 to 2018 was 470,000 hectares at an average lint yield of 165 Kg per hectare.



Structure of Cotton Research

The British colonial administration promoted cotton cultivation during the early 1940s and 1950s in Tanzania. Two research and development (R&D) stations on cotton were established at Ukiriguru (1932) and Ilonga (1949) to serve the needs of the main cotton growing areas in Tanzania, commonly referred as, western cotton growing areas (WCGA) and eastern cotton growing areas (ECGA). The western cotton growing area, or the Lake Zone encompasses four administrative regions namely Mwanza, Shinyanga, Kagera and Mara. Cash crops include cotton, coffee and sunflower. The Tanzanian Agriculture Research Institute (TARI), Ukiriguru undertakes cotton research in the Lake Zone. The Agriculture Research Institute, Ukiriguru

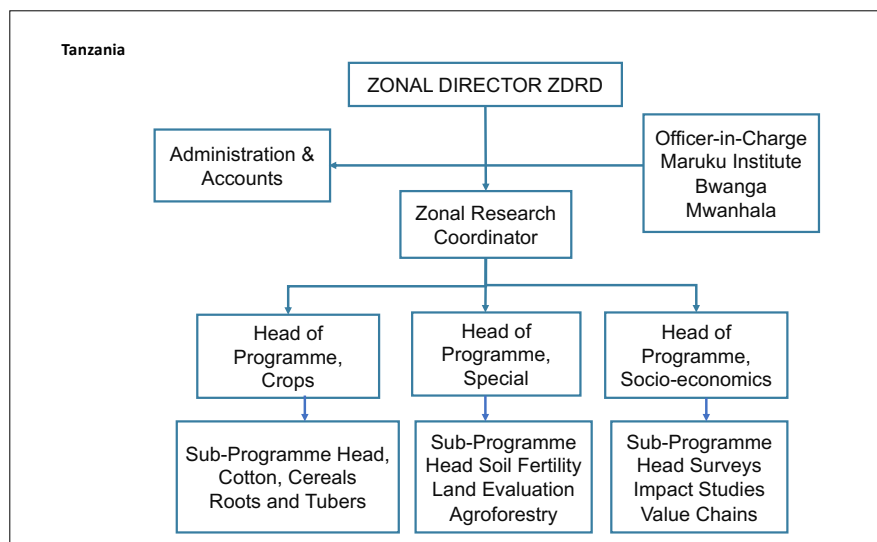
concentrates mainly on cotton, cassava, sweet potatoes, maize, and rice. The Ilonga Agricultural Research institute is located in Morogoro Region, Eastern Cotton Growing Area and mainly deals with cotton, rain legumes, low land maize, sorghum and millet. Other research carried out at the Institute includes projects that deal with socio-economics and soil fertility.

The Agriculture Research Institute in Ukiriguru is located at about 30 km South of Mwanza city. It is one of the oldest research stations in the country, more importantly it is the main cotton research centre in Tanzania. It was established in December 1930 as a Nyanza Native Authority seed farm. Agricultural research activities began in November 1932 dealing with the selection of suitable cultivars from populations of sorghum, groundnuts and cotton. Greater emphasis was given to cotton. In 1939, the institute started a training program to junior agricultural field staff. Research and training programs continued under the administration of the Ministry of Agriculture up to March 1982. From then, the institute was under the administration of Tanzania Agricultural Research Organisation (TARO) until when the organisation became defunct in 1989. Thereafter the agricultural research was re-organised into seven zones, Lake zone being one of them. The Tanzania Agricultural Research Institute (TARI Ukiriguru) is now an Institute directly coordinated and facilitated by TARI under the Ministry of Agriculture.

The mandate area of TARI Ukiriguru covers all areas and regions growing cotton and roots and tubers (cassava and sweet-potato) crops in Tanzania. The zone has a total of 29 districts and a human population of about 12 million, of whom more than 85% in the rural areas depend directly on farming for their livelihood.

TARI Ukiriguru has qualified research staff trained at levels of PhD, MSc, BSc and Diploma in different disciplines. They are allocated in three research programs: Crops, Special and Socio-economics. TARI is mandated to develop appropriate agricultural technologies that contribute to increased agricultural productivity, hence improved income and food security in the zone. Special attention is attached to improved productivity of the agricultural land, crops, environmental management and farm mechanisation. Others include designing labour saving devices, agricultural processing as well as marketing of agricultural products. Participatory research approach is followed through demand-driven research that results in economically viable, socially acceptable and environmentally sound agricultural technologies.

The central government and various donors provide financial support to ARI Ukiriguru through different projects using different modalities. The common modalities are through collaborative activities and research contracts. The major donors include: Government of Tanzania (GOT), Cotton Development Trust Fund (CDTF), Tanzania,



to cotton growers through ginners under the supervision of Tanzania Cotton Board. In Tanzania, Quton seed company is the only agency that deals with cotton de-linting.

Fertiliser and Pesticide Supply

Farmers obtain fertilisers and pesticides at a subsidised price from dealers/stockists. Major pesticide companies are: Bajuta International, Mukpar Tanzania, Suba Agro, Southern Agro, Equatorial Africa, DVA East Africa, Meru Agro, Bambana, Mohere and Bytrade.

Technology Transfer

New developments are transferred to farmers through different stakeholders who work in collaboration with research and local government (extension staff). The Tanzania Cotton Board (TCB) is the main cotton regulating organisation that coordinates all activities related to cotton production at farmers level. Other agencies such as the Cotton Development Trust Fund (CDTF) farmers associations, the Cotton Board and the Tanzania Gatsby Trust Fund (TGT) also provide funds for research and technology transfer.

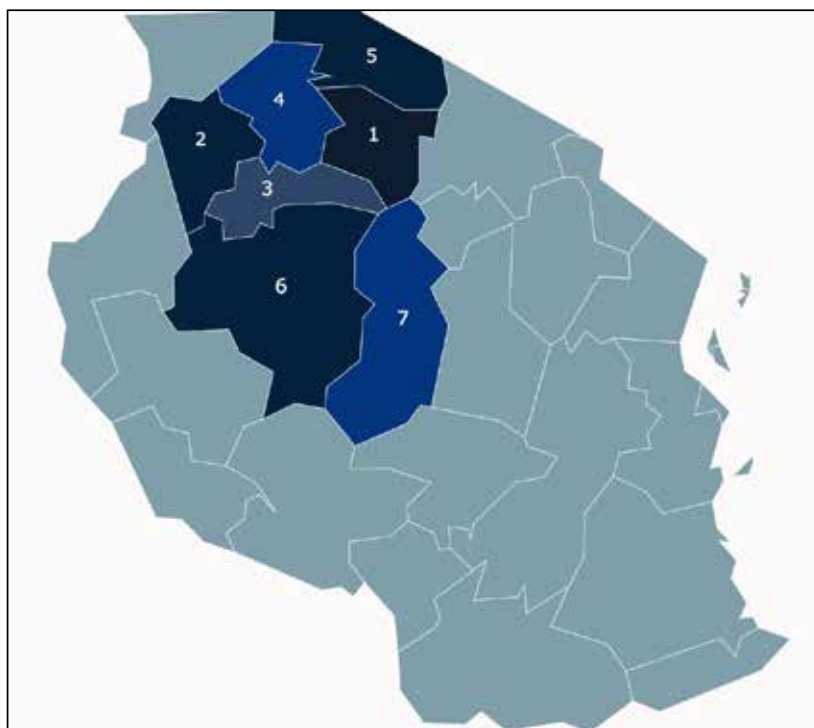
Gatsby Trust Fund (TGT), East Africa Agricultural Productivity Project (EAAPP), Bill and Melinda Gates Foundation (BMGF), Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Forum for Agricultural Research in Africa (FARA), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Alliance for a Green Revolution in Africa (AGRA), Zonal Agricultural Research Development Funds (ZARDEF) and District Councils.

Variety Approval and Seed Supply

After initial pedigree breeding through to single plant selections, the superior genotypes are subjected to rigorous testing in progeny/preliminary yield trials, strain/secondary yield trials, and advanced yield trials (on farm for farmers assessment) under different agro-ecologies to assess the adaptability. From the lines selected and approved by farmers, breeders apply for variety release to the release committee in the country. This is done in collaboration with the Tanzanian Official Seed Certification Institute (TOSCI). Seed is provided to TOSCI for evaluation in National Performance Trial and Distinct, Uniform and Sustainable (DUS) trials. The selected lines go to the technical committee and release committee before variety release.

Seeds are produced at the institute as breeder seed and pre-basic seed. The seeds are then supplied to the seed companies and ginners such as GAKI, Biosustain and Kahama Oil, who are responsible for basic seed multiplication through contract growers who produce certified seeds stage-I and certified seed-II to be supplied

TANZANIA COTTON MAP



TANZANIA: COTTON PRODUCTION DATA 2017-18 (estimates)

S.No	Provinces	Area ('000 Hectares)	Production (M Tonnes)
1	Simiyu	424	0.075
2	Geita	155	0.028
3	Shinyanga	136	0.024
4	Mwanza	130	0.023
5	Mara	100	0.018
6	Tabora	80	0.014
7	Singida	21	0.004
	Others	33	0.006
	TANZANIA	1079	0.192

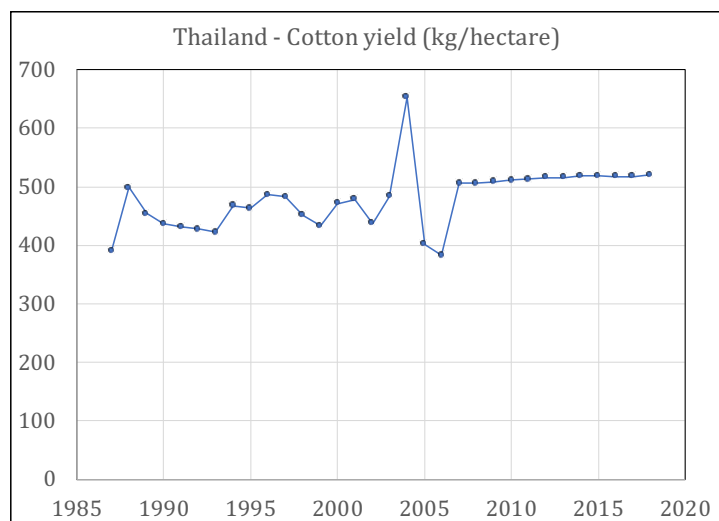
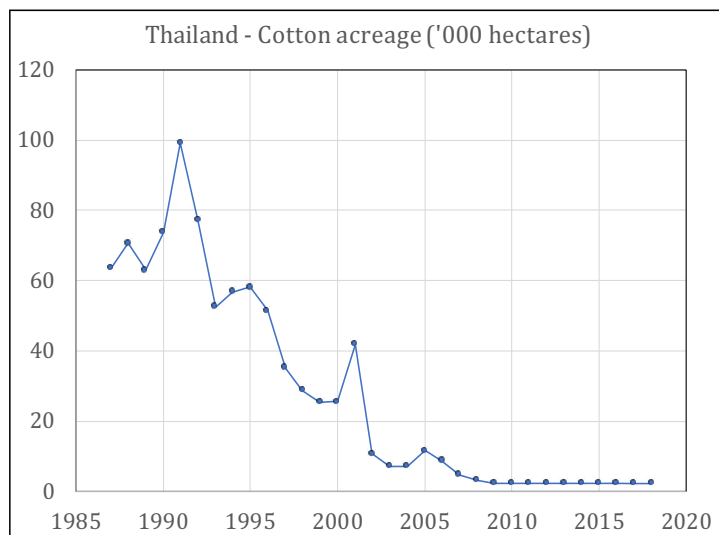
KEY CONTACT IN TANZANIA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Agricultural Research Institute (ARI) Ukiriguru PO Box 1433. Mwanza, Tanzania	Dr. Everina Lukonge Principle Agriculture Research Officer. Tel: +255 754430675 Email: elukonge@yahoo.com
	Epifania Temu Principle Agriculture Research Officer. Tel: +255 754 481998 Email: epytemu@yahoo.com
Agricultural Research Institute (ARI) Ilonga	Dr Geoffrey Mkamilo Zonal Director Tel: +255 627774455 Email: Geoffrey.mkamilo@gmail.com
	Furaha Mrosso Principle Agriculture Research Officer (Head cotton) Tel: +255 784739181 Email: furahamrosso@yahoo.com
Farmers Associations	
Tanzania Cotton Growers Association George Mpanduji (Secr), TACOGA Box 979 Mwanza, Tanzania	Mokiri, Chairman Tel: +255 784 530000 Email: tacogatz@yahoo.com
Ginners Association	
Tanzania Cotton Association (TCA) Po Box 1672 Mwanza, Tanzania	Christopher Gachuma, Chairman Email: tca@tca.co.tz

Thailand

Cotton in Thailand

The average cotton acreage during the period 2008 to 2018 was 2,000 hectares at an average lint yield of 514 Kg per hectare.



Structure of Cotton Research

The Nakhon Sawan Field Crops Research Centre-NSFCRC is under the Field Crops Research Institute (FCRI) of the Department of Agriculture, Government of Thailand. Regarding cotton, the main responsibilities of the Nakhon Sawan Field Crop Research Centre are to conduct multi-disciplinary research, produce breeder's and foundation seed and transfer knowledge and appropriate cotton production technology. The Research Centre also coordinates cotton research with national and international agencies to develop strategies that enable farmers to overcome cotton production constraints. The Thai government provides funding for cotton research.

Variety Approval and Seed Supply

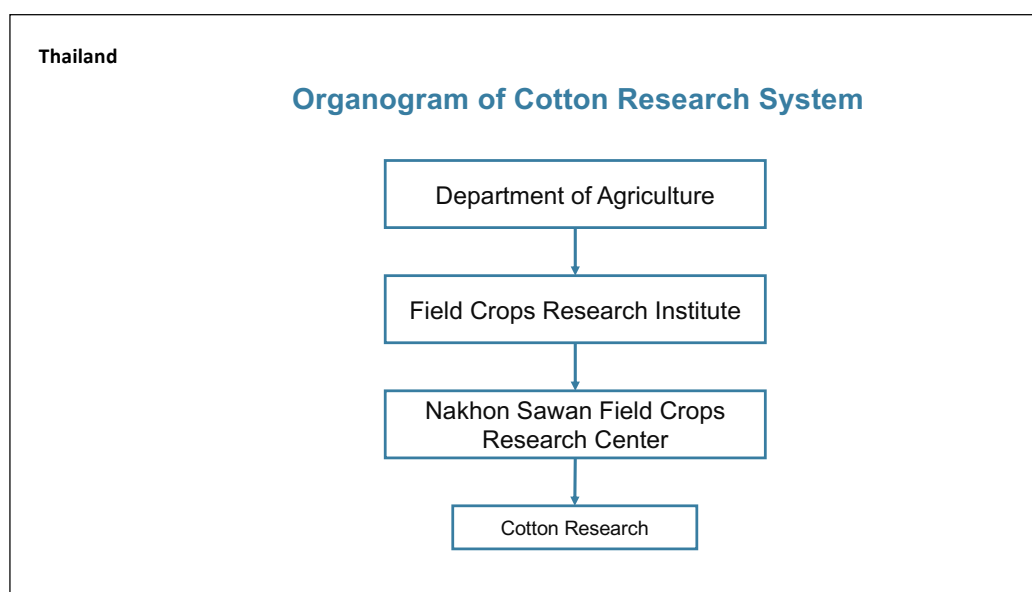
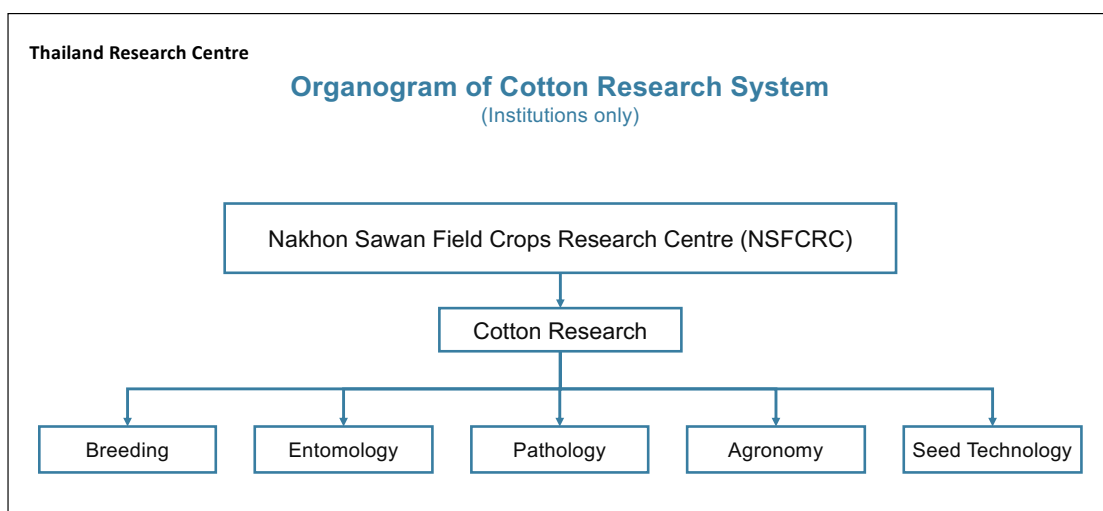
The Department of Agriculture approves new varieties for commercial production. The three important stages in the variety approval process are 1) approval by FCRI Committee, 2) approval by the Crop Variety Improvement Sub Committee of the Department of Agriculture and 3) approval by the Executive Committee/Crop Variety Improvement Committee of the Department of Agriculture. Farmers buy seed from the Nakhon Sawan Field Crop Research, Agricultural Extension Offices and from local dealers/ginneries.

Fertiliser and Pesticide Supply

Farmers buy fertiliser and pesticides from local dealers certified by the department of agriculture. The important pesticide companies are Syngenta, Bayer, Sotus, Thep Watthana, Arawan Chemical and Ladda Limited. Thai companies or dealers also import and trade agro-chemicals from several other countries. Farmers also prepare bio-extracts that are prepared locally.

Technology Transfer

The offices of Agricultural Research and Development, Department of Agriculture and Department of Agricultural Extension as well as those involved in cotton trading transfer new technological developments to farmers.



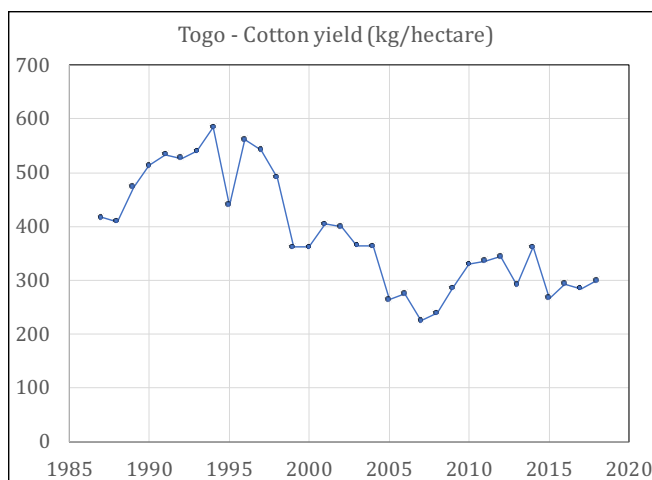
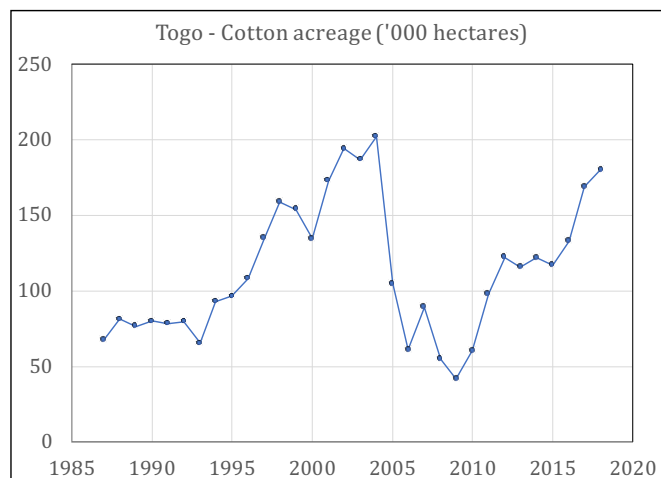
KEY CONTACTS IN THAILAND

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Nakhon Sawan Field Crops Research Centre, Takfa, Nakhon Sawan 60190 Thailand www.nsfcrc@doa.in.th www.doa.go.th	Parinya Sebunruang Email: sebunruangp@yahoo.com
Farmers Organisations	
Fai Gaem Mai www.stri.cmu.ac.th/cotton	Email: faigaemmai@gmail.com
Spinners Organisations	
The Thai Textile Manufacturing Association, Panjit Building, 117/7 Sukhumwit, Klong -Ton-Nuean, Wattana, Bangkok 10110, Thailand www.thaiorc.com	Email: ttma@thaitextile.org

Togo

Cotton in Togo

The average cotton acreage during the period 2008 to 2018 was 110,000 hectares at an average lint yield of 303 Kg per hectare.



(Ecole Supérieure d'Agronomie) are specialised in crop sciences. The Directorate of Plant Protection (Direction de la Protection des Végétaux) deals with pest and disease control and conduct research on all crops including cotton. Cotton research is conducted as dissertation in the two Universities: University of Lome (Université de Lomé) and University of Kara (Université de Kara).

Structure of Cotton Research

Cotton research is conducted in Agricultural research institutions and science departments of Universities. The Togolese institute of agronomic research (Institut Togolais de Recherche Agronomique) and the School of Agronomy

Technology Transfer

National Institute of agricultural training of Tove (Institut National de Formation Agricole de Tové) deals with technology transfer for farmers.

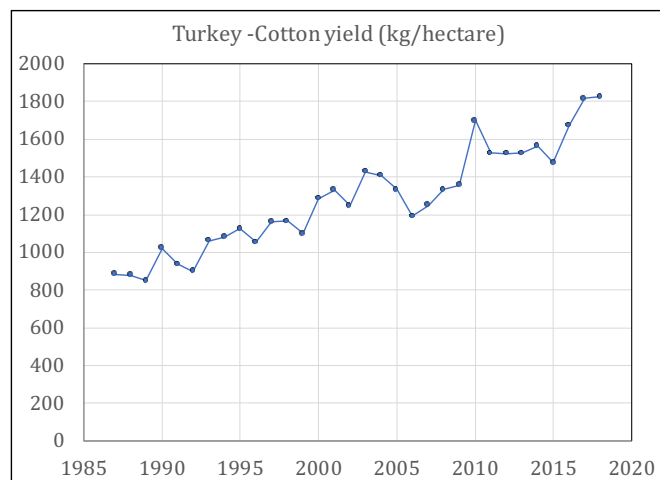
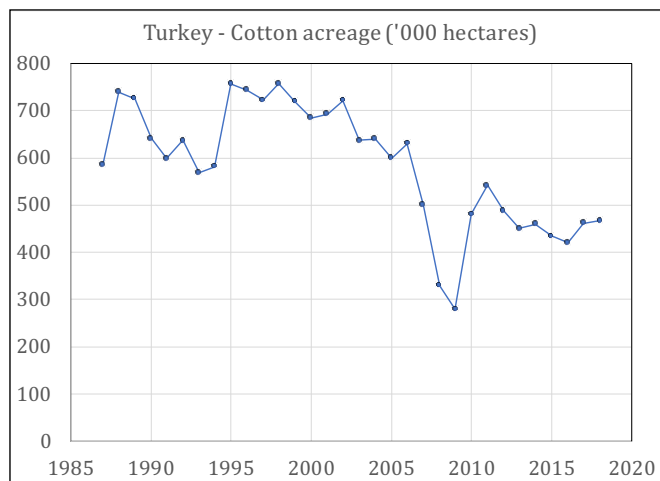
KEY CONTACTS IN TOGO

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Centre de Recherche Agronomique de la Savane Humide (CRA-SH) Kolokopé - Anié	Akantetou, Komlan Pikassalé Head, Cotton Program Tel: 228-90337592 Email: pakantetou@yahoo.fr
Nouvelle Société Cotonnière du Togo – NSCT, Atakpamé nsct_dgat@togo-imet.com	Djagni, Kokou K., Director General Tel: 228-24400153
Ginning Organisations	
Directeur Industriel Usines de la NSCT Atakpamé	Amedgi, Kovi Tel: 228-90042360
Farmers Organisations	
Fédération Nationale des Groupements de Producteurs de Coton du Togo (FNGPC) Atakpamé	Chairman, Management Committee Tel: 228-24456124

Turkey

Cotton in Turkey

The average cotton acreage during the period 2008 to 2018 was 438,000 hectares at an average lint yield of 1574 Kg per hectare.



Structure of Cotton Research

The Ministry has many research institutes. The Cotton Research Station, Nazilli, Aydin is the primary mono crop multidisciplinary research institute. The Ministry of Food, Agriculture and Livestock-MFAL is the main state organisation involved in agriculture and rural development in Turkey. The Ministry coordinates and implements the agricultural R&D activities through the General Directorate of Agricultural Research and Policy-GDARP. The General Directorate of Agricultural Research and Policy is the

headquarters of the national agricultural research system and responsible for determining national research strategy, setting up research priorities and allocating available financial resources to the programs and assisting the government in developing agricultural policy. Other main contributors in cotton research are universities, the Scientific and Technological Research Council-TUBITAK, Scientific Research Project Coordination Department of Universities and the private sector companies. General Directorate of Exports, Ministry of Economy, Ankara supports cotton research.

Variety Approval and Seed Supply

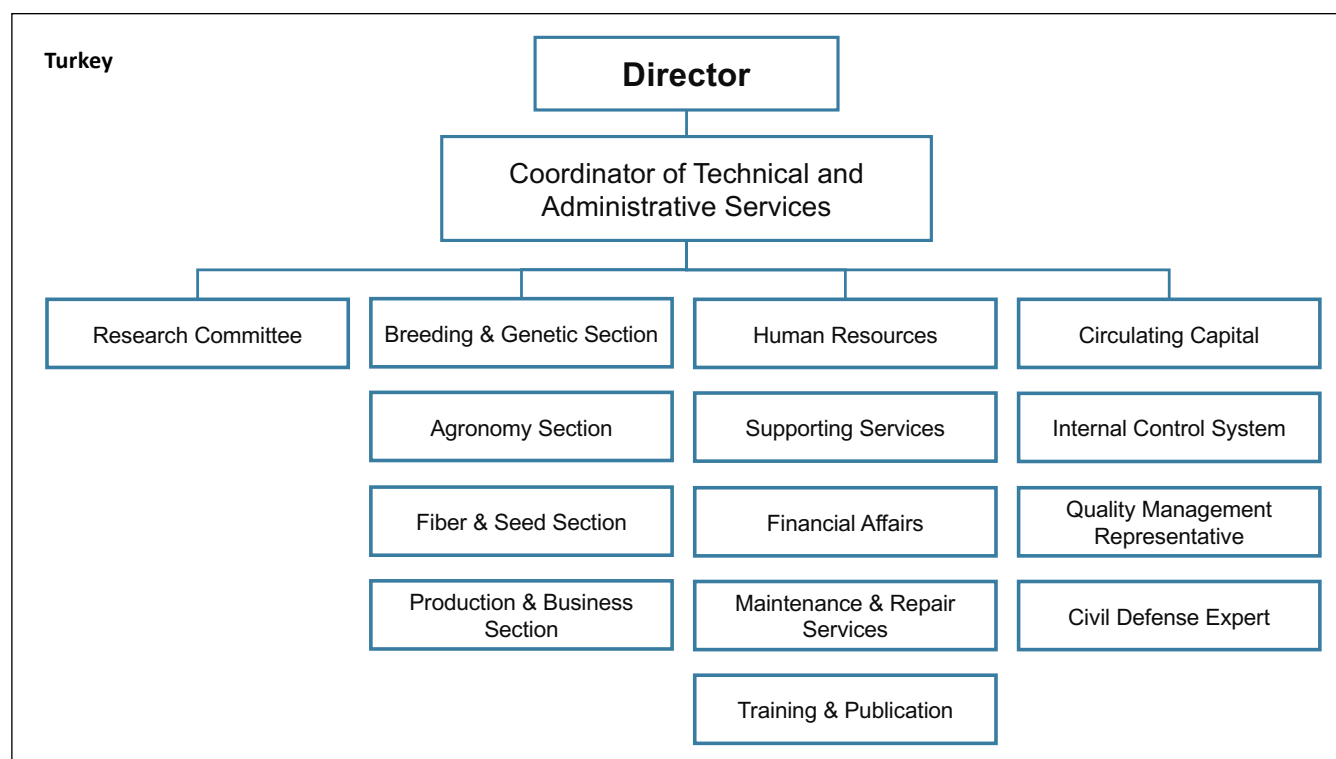
Turkey has been a member of the International Union for the Protection of New Varieties of Plants (UPOV). Variety development and adoption follow the UPOV guidelines. Certificated delinted planting cotton seed is used in Turkey. Breeder seed trials are conducted in a minimum of two locations for one year or in one location two years. The best breeder lines are sent to the Seed Certification and Approving Centre, Ankara for approval. The committee takes a decision on variety registration based on the trial results obtained of two years in a minimum of four locations. The candidate variety is subjected to stability, uniformity and differences test at the same time. Farmers obtain seed from private companies, research institutes, unions of producers, unions of agricultural cooperatives. The major private seed-supplier companies are Progen, Bayer, Özaltın, May-Agro and Birlik.

Fertiliser and Pesticide Supply

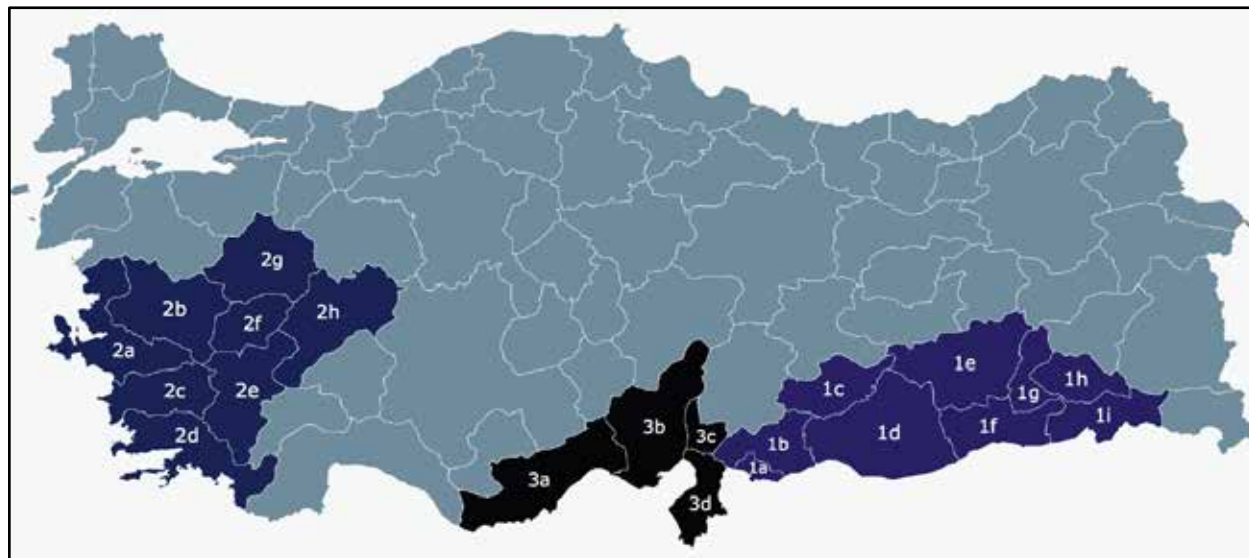
Farmers obtain fertilisers and pesticides from private companies, union of producers and union of agricultural cooperatives. The major pesticide suppliers are Bayer, Hektaş, Agrobrest, Bioagro, Sefa, Cansa, Koruma, Syngenta, Dow-Agro Science and Sumitomo.

Technology Transfer

New developments are transferred to farmers through leaflets, field demonstrations, field days, internet, television and fairs. The Directorate of Agriculture at provincial level under the Ministry of Agriculture and Rural Affairs organises transfer of technology, whereas universities accomplish the objective through farmer conferences and field days. New developments are transferred to farmers by extension services of the provincial directorates of the Ministry of Agriculture and Rural Affairs. New technologies of cotton are announced to relevant growers through farmers' meetings, in-service trainings and through media. Moreover, demonstration plots are also established.



TURKEY COTTON MAP



TURKEY: COTTON PRODUCTION DATA 2018 (estimates)

S.No	Provinces	Area ('000 Hectares)	Production (M Tonnes)
1	GAP (Southeast Turkey)	310	0.56
2	Aegean Region	120	0.22
3	Cukurova Region	90	0.17
	TURKEY	520	0.95

KEY CONTACTS IN TURKEY

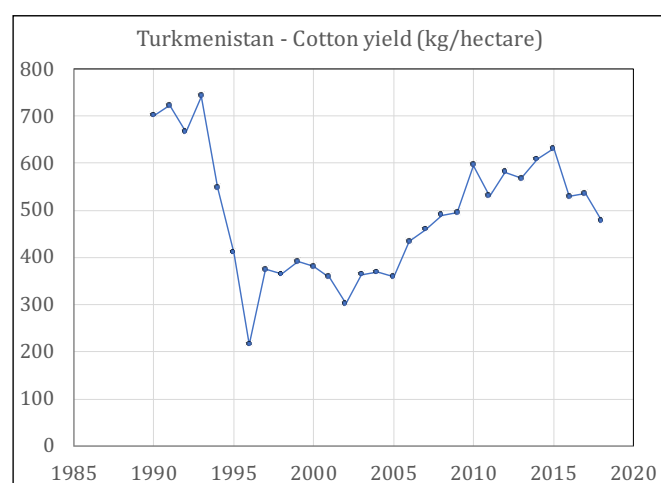
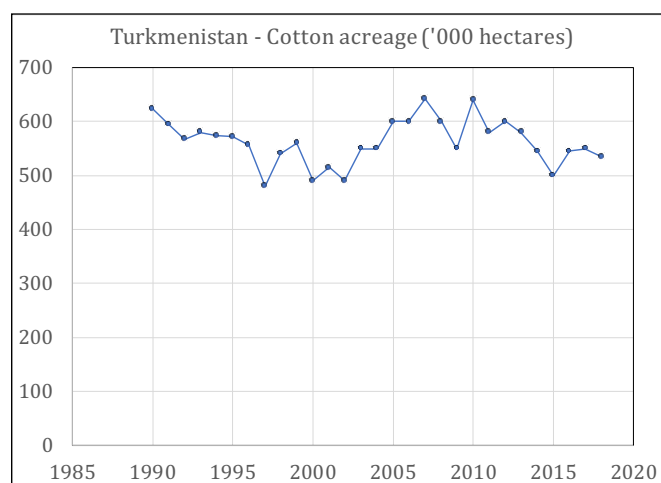
Institution / Mailing Address	Contact Person, Position
Research Organisations	
Cotton Research Institute https://arastirma.tarimorman.gov.tr	Email: pamuk@tarim.gov.tr
Biological Control Research Station Direction Kışla Cad. 01321 Yüreğir, Adana http://www.bmi.gov.tr	Efil, Levent Tel: 90-322-3441784 Email: efil46@hotmail.com
Cotton Research Station, Karatas Yolu 17. Km, PK: 45. Nazilli	Sezener, Volkan Email: volkansezener@hotmail.com
Eastern Mediterranean Transition Zone Agricultural Research Station Aksu Mah. Gazi Mustafa Kemal Bulvarı No:124 PK. (Adana Yolu Üzeri 5. Km) 46060 Kahramanmaraş http://www.dagtim.gov.tr	Gozcu, Dogan Tel: 90-344-2377458 Email: dogangozcu@yahoo.com
East Mediterranean Agricultural Research Institute. Karatas Yolu 17. Km, PK: 45 21110 Diyarbakir http://www.gaputaem.gov.tr	Borzan, Given Tel: 90-412-3261318 Email: guvenborzan@hotmail.com
GAP International Agricultural Research and Training Centre. Silvan Yolu 12.Km, PK: 72 21110 Diyarbakir	Karademir, Cetin Tel: 90-412-3261318 Email: cetin_karademir@hotmail.com
Plant Protection Research Station Silvan Karayolu 7. Km. PK.115, Diyarbakir	Eren, Sedat erensedat64@hotmail.com
Plant Protection Research Station Gençlik cad. No: 6. Bornova, Izmir http://www.bzmae.gov.tr	Guven, M. Ali Tel: 90-232-3880030 Email: mehmetaligoven@hotmail.com
Adnan Menderes University Merkez Kampüsü Aytepe Mevkii 09100 Aydın. http://www.adu.edu.tr	Basal, Huseyin. Professor Tel: 90-256-7727045 Email: hbasal@adu.edu.tr
Agricultural Research Institute of the Western Mediterranean. Demircikara Mah.Paşa Kavakları Cad. No: 11 Pk: 35. Muratpasa http://www.batem.gov.tr	Unlu, Abdullah, Director Tel: 90-242-3216796 Email: abunlu@hotmail.com
Biological Control Research Station Direction Kışla Cad. 01321. Yüreğir, Adana. http://www.bmi.gov.tr	Kukuk, Halil Director Tel: 90-322-3441784.
Cotton Research Institute, Nazilli http://www.arastirma.tarim.gov.tr	Director Tel: 90-256-3131750 Email: sadettin.ozturk@hotmail.com
East Mediterranean Agricultural Research Institute. Karatas Yolu 17. Km, PK: 45 Adana http://www.cukurovataem.gov.tr/	Kilicalp, Numan Director Tel: 90-322-3880030 Email: bilgi@bzmae.gov.tr
Eastern Mediterranean Transition Zone Agricultural Research Station Aksu Mah. Gazi Mustafa Kemal Bulvarı No:124 PK. (Adana Yolu Üzeri 5. Km) 46060 Kahramanmaraş http://www.dagtim.gov.tr	Kisakurek, M. Nefi Director Tel: 90-344-2377458 Email: nefikisakurek@yahoo.com
Ege University, Gençlik Caddesi No: 1235040 Bonova, Izmir http://www.ebilterm.ege.edu.tr	Gurel, Aynur, Professor Tel: 90-232-3742154 Email: agurel@ege.edu.tr
GAP Agricultural Research Institute Paşabağı Mahallesi Recep Tayyip Erdoğan Bulvarı No:106 PK:75. 63040 Şanlıurfa http://gaptkskaem.gov.tr	Arslan, Huseyin Director Tel: 90-414-3135789 Email: huarslan@hotmail.com
GAP International Agricultural Research and Training Centre. Silvan Yolu 12.Km, PK: 72 21110 Diyarbakir http://www.gaputaem.gov.tr	Tekin, Sevkettin Director Tel: 90-412-3261318 Email: tehin-30@hotmail.com

Kahramanmaraş Agriculture Research Institute	Borzan, Guven, Fibre Technology Email: guvenborzan@hotmail.com
Kahramanmaraş Sütçü İmam University Tarla Bitkileri Bölümü. 46060 Kahramanmaraş. http://www.ziraat/ksu.edu.tr	Killi, Fatih, Professor Tel: 90-344-2191520 Email: fakilli@ksu.edu.tr
Plant Protection Research Station Gençlik cad. No: 6. Bornova, İzmir. http://www.bzmae.gov.tr	Guven, M. Ali, Director Tel: 90-232-3880030 Email: mehmetaligoven@hotmail.com
Plant Protection Research Station Silvan Karayolu 7. Km. PK.115 Diyarbakır http://www.dzmae.gov.tr	Bayram, Yunus Director Tel: 90-412-3261106 Email: yunusbayram@dzmae.gov.tr
Spinning Organisations	
Menderes Tekstil Üniversitesi Cad. No: 84 Bornova, İzmir http://www.menderes.com	Chairman Tel: 90-232-4350565
Pure Cotton Tekstil Sanayi ve Ticaret A.Ş. 2. Organize Sanayi Bölgesi, Gaziantep http://www.purecotton.com.tr	Chairman Tel: 90-342-3372910 Email: purecotton@purecotton.com.tr
SÖKTAŞ, Cumhuriyet Mh., Akeller Cd. No. 5409201 Soke, Aydın http://www.soktas.com.tr http://www.sankotextile.com	Degirmendere, Akif Tel: 90-256-5182255
Farmer Organisations	
Cukurova Cotton, Peanut and Oil Seeds Agricultural Sales Cooperatives Unions (CUKOBIRLIK). Mersin Yolu 19. Km. Seyan/Adana	Askar, Ahmet Director General Tel: 90-322-4411500 Email: info@cukobirlik.com.tr
Agriculture Sales Cooperative Union (TARIS) Liman Caddesi No: 1035230 Alsancak, İzmir	Azbazdar, Belig Director General Email: taris@taris.com.tr
Antbirlik Pamuk Ve Narenciye Tarım Satış Kooperatifleri Birliği Genel Müdürlüğü Macun Mah. İplik Yolu Cad.No: 28 Aksu, Antalya	Balaban, Abdullah Director General Email: antbirlik@antbirlik.com.tr Tel: 90-242-4262143
Central Union of Turkish Agricultural Credit Cooperatives. Yukari Bahçelievler Mah. Wilhelm	Teke, İlhami Director General Tel: 90-312-2164252
Thomsen Cad. No.706490 Çankaya, Ankara. http://www.tarimkredi.org.tr	Email: basin@tarimkredi.org.tr
Söke Farmers Associations http://soke.ziraatodasi.org.tr/	Email: soke@tzob.org.tr
Nazilli Farmers Associations http://www.nzob.org.tr/	Email: info@nzob.org.tr
ProGen Tohum A.Ş. http://www.progenseed.com/	Email: info@progenseed.com
Özaltın Tarım A.Ş. http://ozaltintarim.com.tr/en	Email: info@ozaltin.com.tr
Ege İhracatçılar Birliği http://www.egebirlik.org.tr	Email: eib@eib.org.tr
Trade and Textile Associations	
İzmir Commodity Exchange Gazi Bulvarı No:2 KONAK - İZMİR	İşinsu Kestelli Chairperson E-Mail: info@itb.org.tr Tel: +90 (232) 425 13 70 Fax: +90 (232) 484 29 54
Turkish Textile Employers' Association Metrocity A Ofis Blok. Büyükdere Cad. No: 171, Kat: 19. TR - 34330 1. Levent-İstanbul www.tekstilisveren.org.tr	Basar Ay, Secretary General Tel: (+90-212) 344 0777 Fax: (+90-212) 344 0766 Email: info@tektisveren.org.tr

Turkmenistan

Cotton in Turkmenistan

The average cotton acreage during the period 2008 to 2018 was 566,000 hectares at an average lint yield of 549 Kg per hectare.

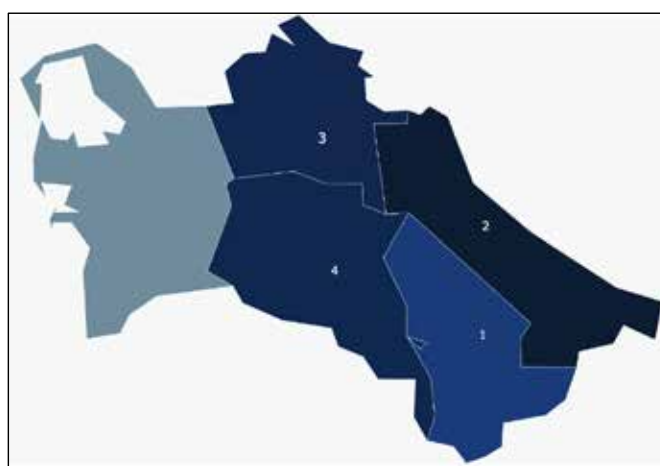


Structure of Cotton Research

The Turkmen Agricultural University at Asgabat, (Turkmen: S.A.Nyýazow adyndaky Türkmen oba hojalyk Uniwersitety) was established initially as an 'Agricultural Institute' in 1930. It was known as Mikhail Kalinin Agricultural Institute until 1998, after which it was upgraded to a University and named after Turkmenistan's first President, Mr. Niyazov. It is the largest higher education institution in agriculture in Turkmenistan. This university only provides studies in the fields of agriculture. It houses the main centre of research on cotton. It conducts research on various aspects of cotton including plant breeding, genetics, agronomy, soil science, physiology, seed technology, entomology, pathology and agricultural engineering. The university consists of 16 departments, including the Department of Ruhnama and the Department of Computer Technology near the rector of the university. The main departments are: agricultural machinery, irrigation and hydraulic engineering, cotton, graining, livestock and processing of agricultural products.

The Turkmen State Agricultural Institute in Daşoguz also conducts research on cotton.

TURKMENISTAN COTTON MAP



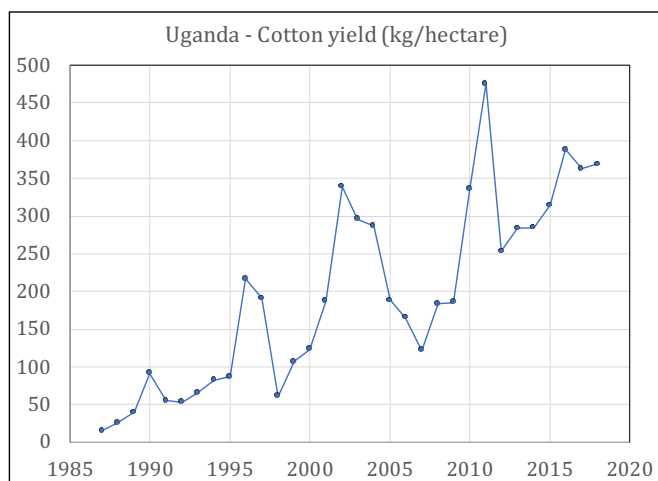
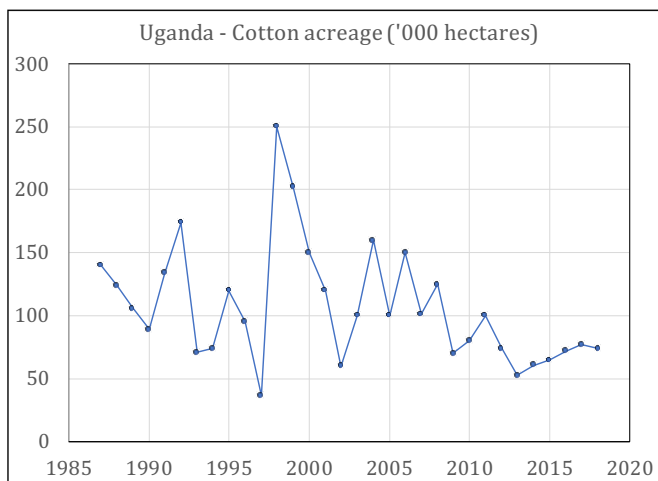
TURKMENISTAN: COTTON PRODUCTION DATA 2017 (estimates)

S.No	Provinces	Area ('000 Hectares)	Production (M Tonnes)
1	Mary Velayats	167	0.084
2	Lebap	152	0.081
3	Dashoguz	120	0.062
4	Ahal	106	0.056
	TURKMENISTAN	545	0.283

Uganda

Cotton in Uganda

The average cotton acreage during the period 2008 to 2018 was 77,000 hectares at an average lint yield of 312 Kg per hectare.



Structure of Cotton Research

The Cotton Development Organisation (CDO) plays a crucial role in cotton R&D in Uganda. The National Agricultural Research Organisation (NARO) is an apex body in the National Agricultural Research Systems (NARS). It is a public institution under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) with mandates on promotion, guidance and coordination of all agricultural research on crops, livestock, fisheries and forestry. The NARO was established in 1993 by the National Agricultural Research Statute Cap205 of 1992. Following reforms in the NARS between 2000 and 2005, a National Agricultural Research Act 2005 was enacted, repealing the 1992 statute. A council comprised of 16 multi-stakeholders mem-

bers governs the NARO. The council operates through four specialised committees for policy guidance. The Council has a secretariat, which is its executive arm responsible for the day-to-day functions of the organisation. Research is conducted at 16 Semi-autonomous Public Agricultural Research Institutes (PARIs), located in appropriate areas of the country, each with a specific research mandate.

There are two categories of the PARIs. The NARIs and the ZARDIs. Seven National Agricultural Research Institutes (NARIs) carry out agricultural research of strategic nature and of national importance. The other nine PARIs are known as Zonal Agricultural Research and Development Institutes, (ZARDIs). Each ZARDI is responsible for conducting applied and adaptive research in one of the nine agro-ecological zones. Research at the ZARDIs is for fine-tuning the technologies developed at the NARI's for adaptation and adoption, when found appropriate, in the specific agro-ecological zones. More technology testing is also done within the ZARDIs' mandated areas at particular sites known as the 'Technology Verification Centres (TVCs)'. This is done to ensure adequate multi-locations and multi-seasonal testing. Further down, research is conducted as "on-farm trials" aiming at farmers' participation in technology development, identification of farmers' preferences of the technology and thus enhancing adoption rates of the new technology.

Each PARI is headed by a Director of Research and guided by an Advisory Committee on policy and research agenda for the Institute, monitoring, budgetary provisions and on the relevance of research out-puts to pertinent farm challenges. The Director of Research (DR) works closely with research program leaders, scientists, technicians and with administration and support staff.

Agricultural research in Uganda is conducted at Universities, both public and private, and to a limited extent by private firms mostly by seed companies and Non-Government Organisations (NGOs). The NARO has a mandate to register all on-going agricultural research and research service providers so as to ensure standard quality of research at such Institutions.

National Semi-Arid Resources Research Institute (NaSARRI) is located 300 km North -East of the Capital Kampala in Serere District. It has a mandate to conduct mainstream research for the development of cotton production technologies for NARO. The NaSARRI also undertakes research on major staple food crops, which are produced in the farming systems in rotation with cotton. These include; Dry land cereals; millet, pearl- millet and sorghum, Oil crops; groundnuts, sesame and sunflower and dry land legumes; cowpeas and pigeon peas. Services research activities include designing animal traction implements and oxen training, socio-economics and marketing and managing agricultural research information.

The Cotton Development Organisation (CDO) initiated a Cotton Research Unit in 2013 by employing research staff to augment the NARO’s efforts in cotton research. The unit presently comprises one full time cotton breeder, (now a Technical Advisor to CDO) and four Research Assistants on Breeding and seed multiplication, Agronomy, Entomology and Pathology. The unit team works in tandem and complementarity with the NARO cotton research team and is based at NaSARRI. Research on cotton at the universities is focused on basic research usually with academic importance.

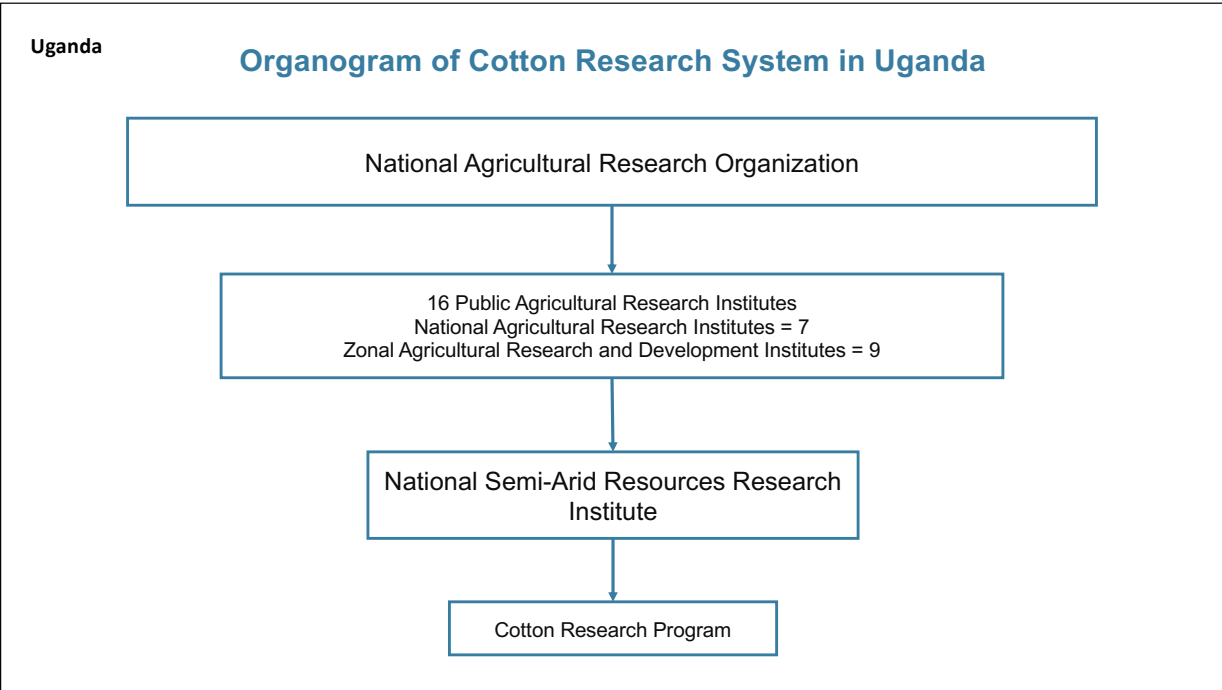
The Government of Uganda (GoU) allocates annual budgetary provisions to NARO. The NARO is entirely responsible for the coordination and management of the funds that are allocated for cotton research in Uganda. The funds come through the MAAIF’s funding Votes. This is currently the main source of funding for cotton research since, the support from the Agricultural Technology and Agribusiness Advisory Services (ATAAS) programme, by the World Bank, came to completion in 2018. In addition to the routine releases from this fund, there are opportunities for cotton researchers to get additional funding from the Government, through a “Competitive Grant System” (CGS), wherein research proposals are evaluated and approved by the CGS assessment Teams.

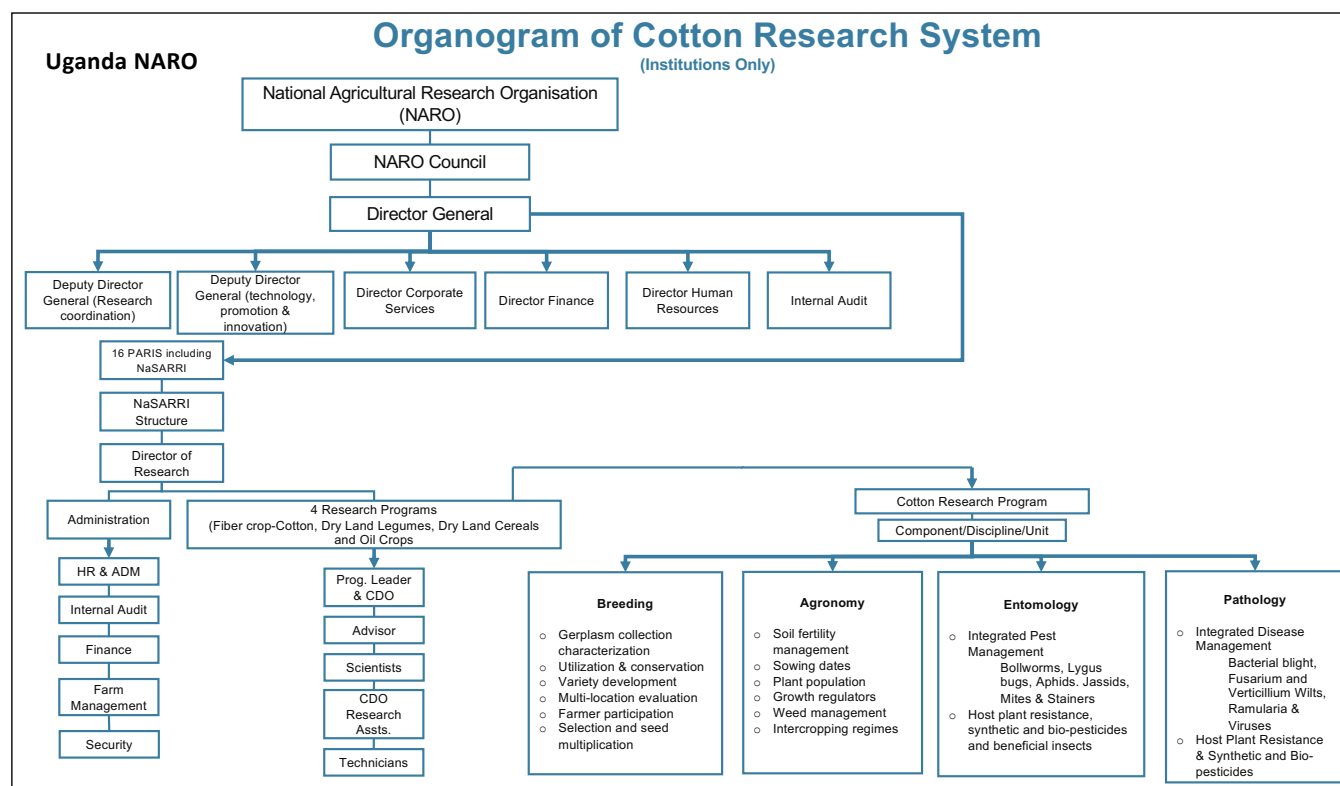
Cotton research is also supported by the Cotton Development Organisation (CDO), which is the Government’s Regulatory Agency on the Cotton Industry. The CDO meets all the remuneration requirements for its research unit staff based at NaSARRI. This is in addition to the financial support which it extends to the cotton research on; field preparations, field and laboratory labour, agricultural in-

puts, and on research and cotton processing equipment (on both laboratory and NaSARRI ginnery) maintenance costs. The CDO also extends free services of its High-Volume Instrument (HVI) facility to cotton researchers to test the fibre quality parameters of experimental cotton lint specimens. The test results enable selection of breeding stocks with improved fibre quality, and of production technology which enhanced fibre quality. The CDO also solicits additional funds for research from the organised stakeholders in the cotton industry such as the Uganda Ginners and Cotton Exporters Association (UGCEA).

The following regional cotton projects were coordinated through collaborations by CDO:

- The International Trade Centre (ITC)’s South-to-South Cooperation Along the Cotton Value Chain programmes.
- The Technical Assistance Programme (TAP) Africa-India, for strengthening the cotton value chain in seven cotton growing countries in Africa, which includes Uganda.
- The second phase of TAP (2017 - 2020) aims to scale-up the production of bio-pesticides for domestics use and also for 12 African countries.
- TAP supported training of cotton research scientists (and value chain stakeholders) on various production and value addition technologies during its first phase (2012 – 2017).
- A Bio-pesticide research laboratory with research equipment was set up at NaSARRI and was inaugurated in August 2017.





- Grants from pooled “basket” funding by the Government of Uganda and Development Partners are accessed through competitive research proposals developed by scientists on Cotton (Competitive Grants) and coordinated by NARO.

The NaSARRI research programmes are incorporated into the National Agricultural Research Agenda through scrutiny by the Directorate of Research Quality Assurance at the NARO secretariat and approved by the NARO council for fitting into NARO’s ten-year Strategic Plan. The current NARO’s Strategic plan is for the period 2008/09 – 2017/18. The NARO research Agenda is further scrutinised by the top management of MAAIF and fitted into the MAAIF’s annual work plans and budgets under the five-year Agriculture Sector Strategic Plan (ASSP). The current ASSP is for the period 2015-2020. The ASSP subscribes, as a chapter, to the objectives and strategy of the five-year National Development (NDP).

Variety Approval and Seed Supply

The Uganda Seeds and Plant Act (2006) requires imported and locally developed varieties to undergo testing in National Variety Performance Trials (NVPT) for at least two growing seasons before being released. The National Seed Certification Services (NSCS), under the MAAIF’s Department of Crop Inspection and Certification, assesses the plant breeders’ data on the varieties intended for release. They scrutinise the data from different locations for stability of trait performance and crop descriptors. The NSCS

officials take some seed samples of the candidate varieties and plant them in their sites to assess the Distinctiveness, Uniformity and Stability (DSU) of the varieties. Then, the breeder submits papers to the National Variety Release Committee (NVRC) for inclusion into the National Variety list. The new variety is released and allowed to go into the seed multiplication program. The approved variety is registered in the National Variety List by a “Registrar” as provided under the “Plant Variety Protection Act” (PVP) of 2014. The National Seed Certification Services (NSCS) under MAAIF’s Department is responsible for Crop Protection. It undertakes inspection of seed multiplication fields each season. It also tests the resultant cotton seeds for physical and genetic purity and for viability (germination percentages) before distribution to farmers by CDO.

From the limited amount of breeder seeds for a given cotton variety, the NaSARRI cotton breeders multiply “nucleus” seed on about 2 hectares. The nucleus seed is planted at NaSARRI main farm to give rise to “foundation” seeds. The foundation seeds are procured by CDO for planting by cotton farmers in the cotton seed multiplication scheme. These starting points of seed multiplication on cotton farms, are protected by geographical barriers such as; river tributaries, rivers, swamps and lakes. The NSCS of MAAIF inspect and certifies the cotton crops at this stage of production. The crop gives rise to certified seeds.

The certified seeds are supplied by CDO for farmers’ to plant in the following season in the larger ginners’ production catchment areas. The crop is given the same attention

by CDO similar to that in the segregated areas. The crop gives rise to “registered” seeds, which then go into the third on-farm season to cover the planting requirements of the rest of the production zones. The crop arising from the registered seed gives rise to commercial seed, which goes into crushing. It is notable that, the naming of planting seed in Uganda is in conformity with the “Standardised Nomenclature in Cotton Planting Seed,” approved by the ICAC in 2013. The processing of cotton planting seeds i.e. delinting, cleaning, grading, conditioning, packaging and labelling, is done at CDO’s plants/ facilities strategically located at ginneries in the production zones. There are no private seed companies involved in Uganda.

Fertiliser and Pesticide Supply

The ginners procure fertilisers for sale to cotton farmers at subsidised prices under the Cotton Farmers’ Production Support Programme (CFPSP). CDO provides technical support for procuring inputs. The ginners and CDO procure seed dressing chemicals appropriately tested and recommended by the Cotton Research Programme at NaSARRI. The seed dressing chemicals must have been registered with the MAAIF’s Agricultural Chemical Committee, under its Department of Crop Protection. Seed dressing is done to protect seedlings from bacterial blight, fungal cotton wilts and early season pests. Ginners procure inputs (pesticides, pumps, fertilisers) under the guidance of CDO, for sale to farmers. The sale of inputs to the ginners is a competitive and a private sector activity.

During the 2016/17 and 2017/18 seasons, over 460,000 cotton farming households were provided with 1.932 million once-acre pesticide packs (registered by MAAIF) based on the recommendations received from the Cotton Research Programme at NaSARRI. Pesticides are registered in the National Agricultural Chemical list after intensive testing for bio-efficacy and bio-safety.

Pesticide companies are chosen by ginners and CDO based on their compliance to the Uganda Agriculture Policy, 2013 and to the Agricultural Chemicals Act. They should also be abiding to the requirements for testing on cotton and registering their products with MAAIF. Some of the potential chemical supplying companies include; Twiga (Ugan-

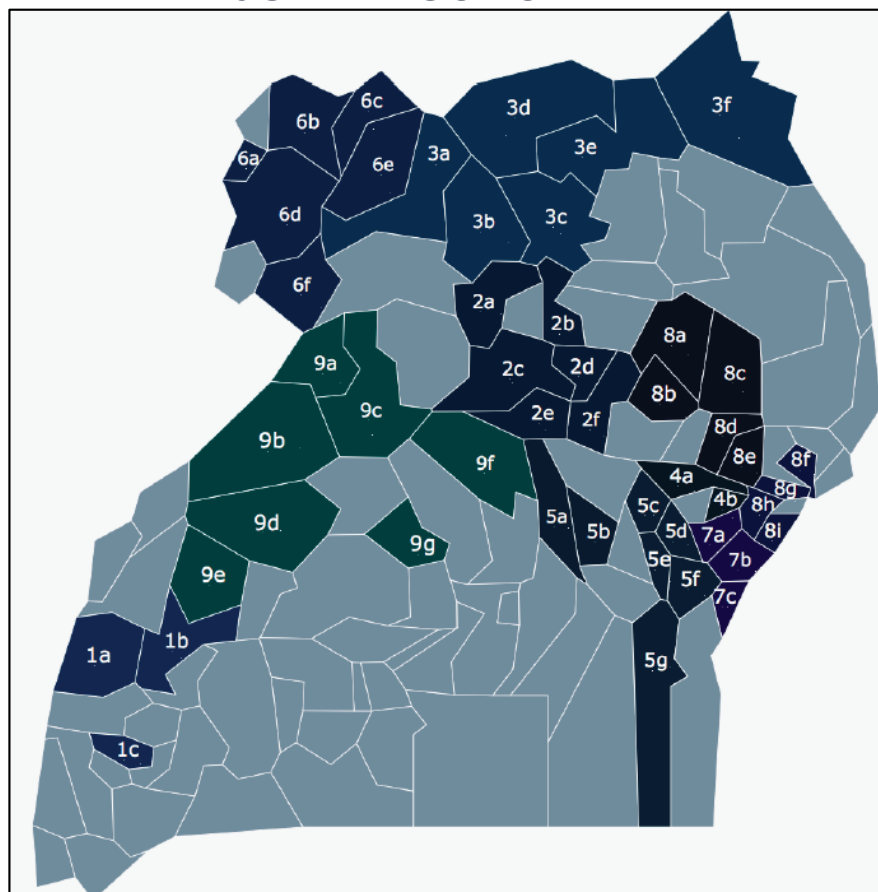
da) Ltd and Balton (Uganda) Ltd. Multinational Chemical Companies, such as Syngenta, supplied “Cruiser Extra Cotton”, a flowable concentrate for seed treatment as a Fungicide and Insecticide, in 2018 in Uganda.

Technology Transfer

The technology transfer process in cotton production operates in three layers:

- The NaSARRI conducts multi location testing of new technology, TVCs, farmer participatory on-farm trials or field days, consultative stakeholders’ workshops and biennial scientific conferences of NARO at the research stage for technology development and dissemination.
- The CDO conducts demonstration plots managed by farmers, CDO and Ginners’ extension staff. The CDO and ginners’ extension staff conduct hands-on- training for farmers on production technology and pest management.
- The CDO and NARO websites provide information material such as annual reports, production guide brochures, radio programs, and news print articles to farmers, processors and exporters.

UGANDA COTTON MAP



UGANDA: COTTON PRODUCTION DATA 2017 (estimates)

S.No	Region	Area ('000 Hectares)	Production (M Tonnes)
1	Lango	28.7	0.008
2	Acholi	22.7	0.010
3	Teso	5.7	0.001
4	North East (Pallisa/Budaka/Bugisu)	6.8	0.002
5	West Nile	17.8	0.006
6	Kazinga Channel (Western)	9.7	0.005
7	South Bukedi (Toror/Busia)	5.0	0.001
8	Busoga	9.7	0.002
9	Mid-West & Central	4.2	0.001
	UGANDA	110.2	0.037

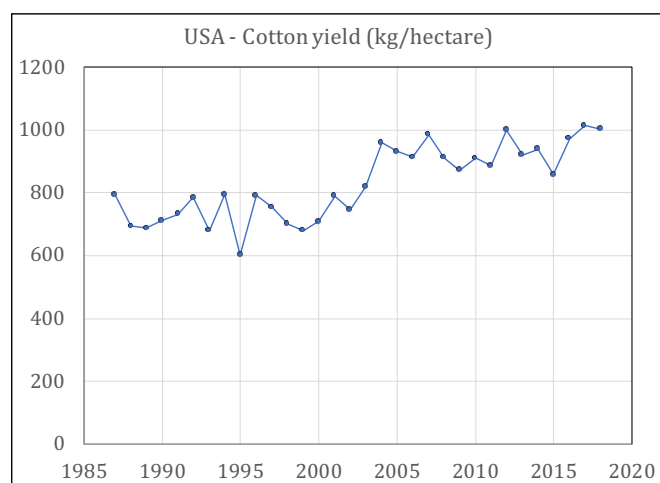
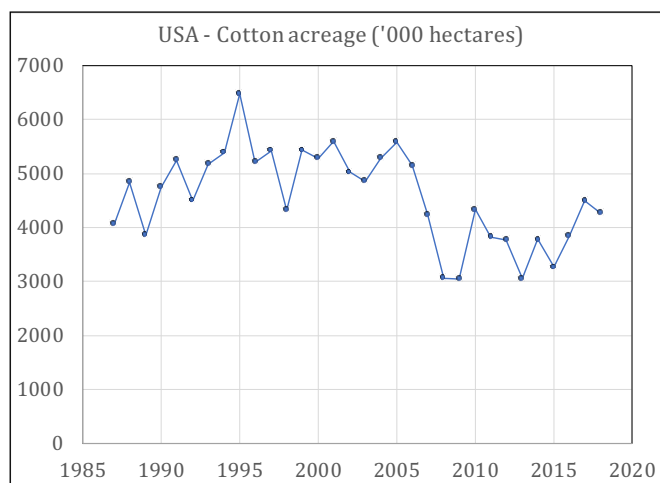
KEY CONTACTS IN UGANDA

Institution / Mailing Address	Contact Person, Position
Research Organisations	
National Semi- Arid Resources Research Institute (NaSARRI), Serere District, P.O Box 56 Soroti. www.nasarri.go.ug	Dr. Michael Ugen, Director of Research Tel: +256 039 250553 Tel: +256 772446739 Tel: +256 756446739 Email: director@nasarri.go.ug Email: michaelugen@gmail.com
	Dr. Martin Orawu Cotton Research Programme Leader. Email: orawum@gmail.com
Cotton Development Organization (CDO) P.O. Box 7018. Kampala, Uganda	Jolly K. Sabune (Mrs.) Managing Director. Tel: +256 772602553 Email: cdo@cdouga.org Email: cdo@africaonline.co.ug Dr. Lastus K. Serunjogi Technical Advisor breeder@cdouga.org Tel: +256 772953112 Email: lastus2006@yahoo.com Ms. Damalie Lubwama, Production, Marketing and Information Manager. Email: agronomist@cdouga.org Email: lubwamadamalie@gmail.com
Ginners Association	
Uganda Ginners and Cotton Exporters Association(UGCEA) P.O.Box 7018 Kampala	Mr. Oyugi Jackson, Chairman Tel: +256 414 232968 Tel: +256 772756988 Email: cginners@gmail.com Email: Oyugijackson@gmail.com Ms. Gorreti Bugunya, Finance and Administration Manager Email: cginners@gmail.com
Spinners Association	
Textile Manufacturers ' Association of Uganda (TEMAU). P.O. Box 7018 Kampala. Uganda	Mr. Anant Parmar Chairman, TEMAU Tel: +256 772 447 404 Email: Sigmaknitting@yahoo.com
Cotton Millers Association	
Uganda Cotton Oil Processing Association (UCOPA)	Mr. Samuel Kanakulya Lubinga Chairman UCOPA Tel: +256 772 426668 Email: ucopa@live.com

United States of America

Cotton in the USA

The average cotton acreage during the period 2008 to 2018 was 3,705,000 hectares at an average lint yield of 935 Kg per hectare.



Structure of Cotton Research

Cotton research in the USA is mainly conducted at Universities, Cotton Research Station, Texas, and Private Laboratories. Research is supported by institutional funding, external sources, the United States Department of Agriculture and the Cotton Incorporated.

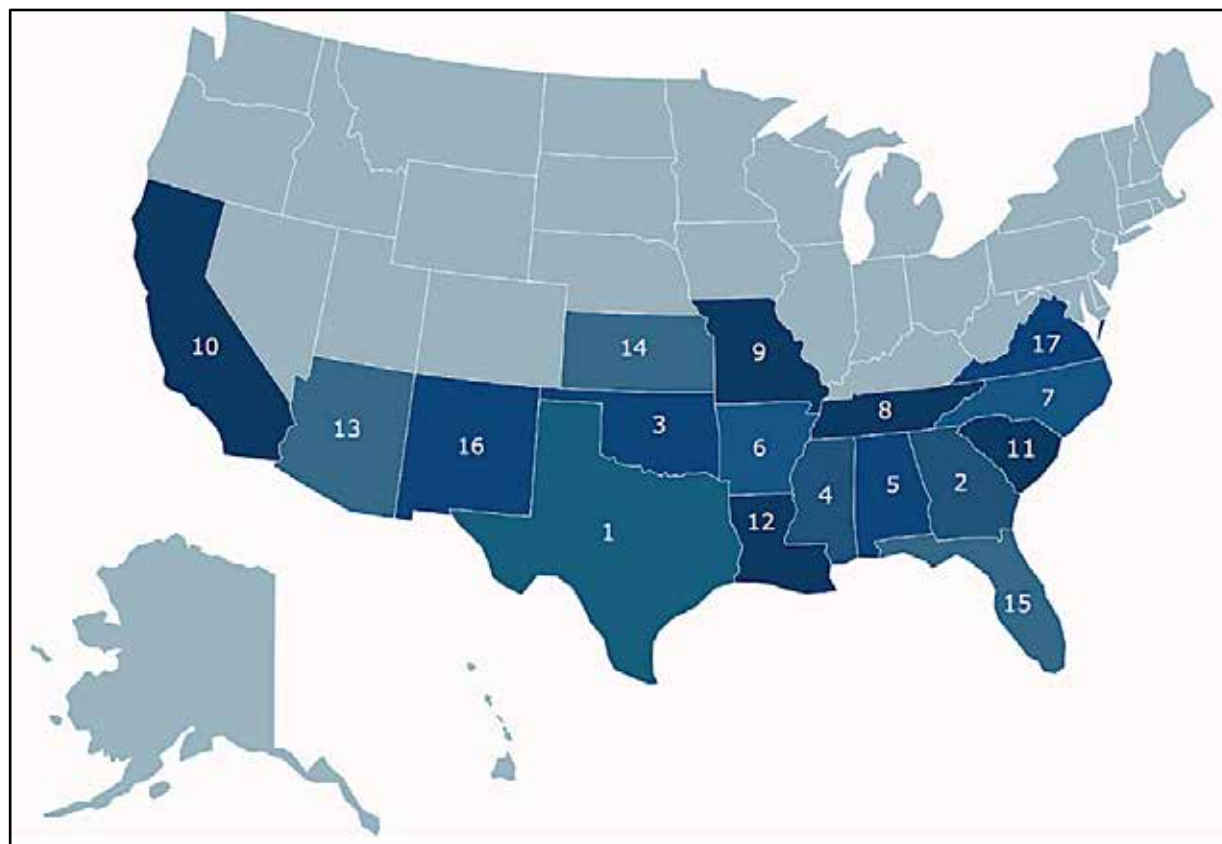
The following universities and institutions conduct projects on cotton research:

- Auburn University, Alabama
- University of Arkansas
- University of Arkansas Cooperative Extension Service
- University of Arizona
- University of California, Davis
- Georgia Cotton Commission
- Auburn University
- Louisiana State University Agricultural Centre
- University of Missouri
- Delta Council
- Mississippi State University
- Mississippi Farm Bureau Federation
- North Carolina State University
- NC Foundation for Soil & Water Conservation, Inc.
- New Mexico State University
- Oklahoma State University
- Clemson University
- Tennessee Farm Bureau Federation
- University of Tennessee
- Texas A&M AgriLife
- Virginia Polytechnic Institute and State University
- Texas Cotton Ginners' Association
- Texas Tech University

KEY CONTACTS IN THE USA

Institution / Mailing Address	Contact Person, Position
National Cotton Council of America 7193 Goodlett Farms Parkway Cordova, TN 38016	Ron Craft, Chairman Gary Adams, CEO Tel: (901) 274-9030 Fax: (901) 725-0510
Cotton Incorporated 6399 Weston Parkway Cary, North Carolina 27513	J. Berrye Worsham, President & CEO Tel: (919) 678-2220
Trade Association	
American Cotton Shippers Association 88 Union Avenue, Suite 1204 Memphis, TN 38103	Raymond Faus, Chairman, Omnicotton, Inc Tel: 901-525-2272 Fax: 901-527-8303

USA COTTON MAP



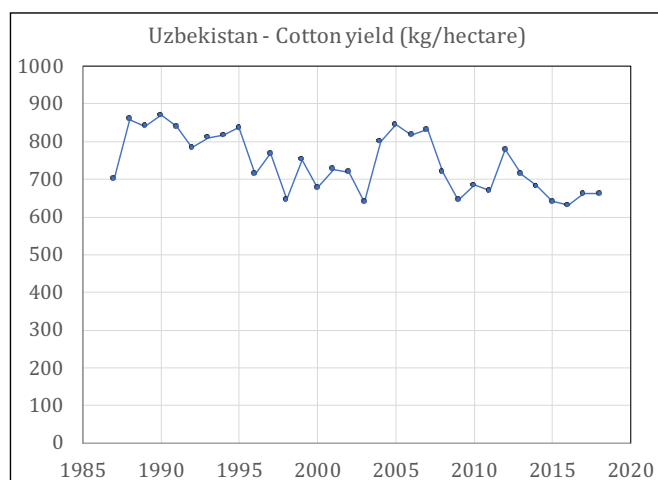
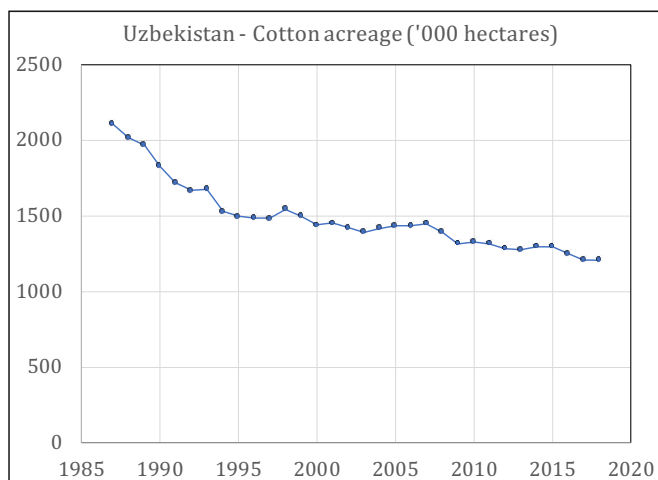
USA: COTTON PRODUCTION DATA 2017-18 (estimates)

S.No	State	Area ('000 Hectares)	Production (M Tonnes)
1	Texas	3,001	2.07
2	Georgia	587	0.49
3	Oklahoma	291	0.23
4	Mississippi	227	0.30
5	Alabama	198	0.18
6	Arkansas	194	0.24
7	North Carolina	178	0.16
8	Tennessee	142	0.16
9	Missouri	140	0.16
10	California	105	0.19
11	South Carolina	105	0.10
12	Louisiana	73	0.09
13	Arizona	66	0.11
14	Kansas	49	0.04
15	Florida	47	0.03
16	Virginia	35	0.04
17	New Mexico	35	0.02
	UNITED STATES	5,473	4.63

Uzbekistan

Cotton in Uzbekistan

The average cotton acreage during the period 2008 to 2018 was 1,289,000 hectares at an average lint yield of 681 Kg per hectare.



Structure of Cotton Research

Following institutions undertake research on cotton:

- Cotton Breeding, Seed Production and Agrotechnologies Research Institute, Tashkent and its scientific and experimental Stations
- Institute of Genetics and Experimental Biology of Plants
- Karakalpakstan Agricultural Scientific Institute
- Scientific Research Institute of Plants
- Tashkent State Agrarian University
- Andijan Agricultural Institute
- Centre for Genomics and Bioinformatics

Funding for research is provided through the annual government budget, foreign grants, business contracts and other sources. The coordinating committee coordinates all research projects for science and technology development under the cabinet of ministers, Ministry of Agriculture and Water Resources, the Academy of Sciences of the Republic of Uzbekistan and the Uzbek Scientific Production Centre of Agriculture.

Variety Approval and Seed Supply

Variety development involves developing of new varieties, advanced variety testing, competitive variety testing, pre-breeding, variety testing in a different soil and climatic conditions, production testing and the recommendation of the commission to the registration. Institutions, plant breeders and elite farms supply original and elite seeds.

Fertiliser and Pesticide Supply

Farmers obtain fertilisers through the governmental institutions. Farmers obtain pesticides mainly through the governmental institutions and private and joint stock companies.

Technology Transfer

New developments are transferred to farmers by research institutions and their branches, universities, farmers and other different organisations.

KEY CONTACT IN UZBEKISTAN

Institution / Mailing Address	Contact Person, Position
Textile Association	
Uzbekistan Textile & Garment Industry Association "O'zto'qimachilik sanoati. 20A, A. Avloniy Str. Tashkent - 100100 www.yengilsanoat.uz	Shahrukh Rakhimov, Chief Officer Tel: (+998-71) 202 2244 (int.103) Fax: (+998-71) 202 2244 (0) Email: info@yengilsanoat.uz

UZBEKISTAN COTTON MAP



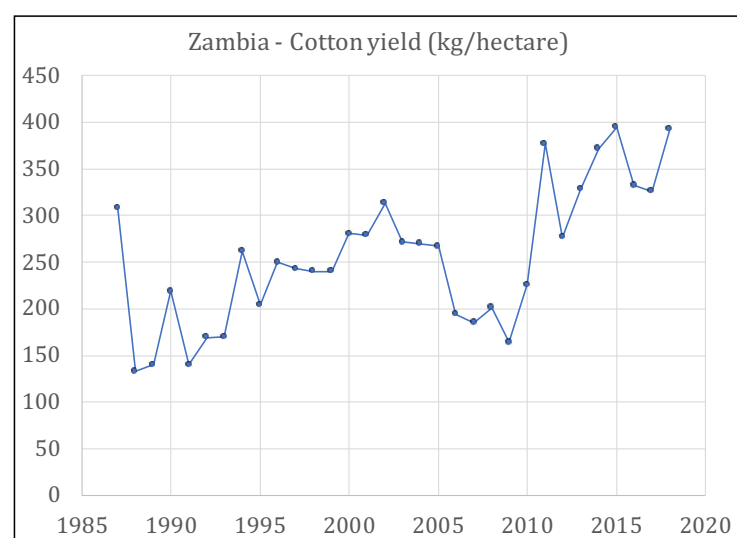
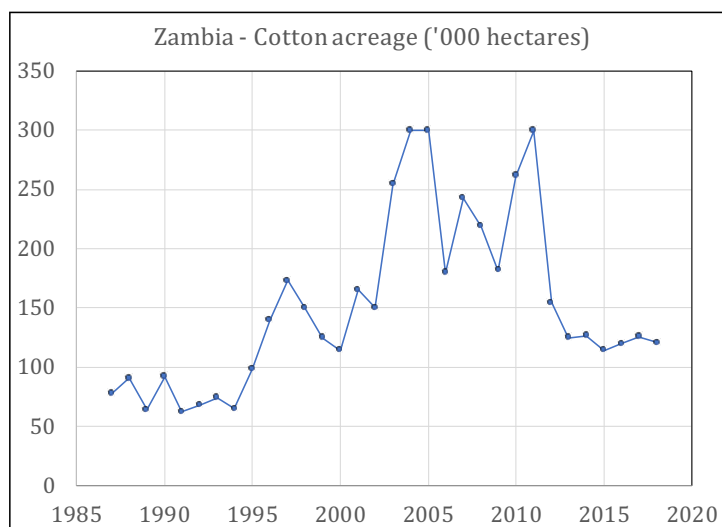
UZBEKISTAN: COTTON PRODUCTION DATA 2017-18 (estimates)

S.No	Provinces	Area ('000 Hectares)	Production (M Tonnes)
1	Kashkadar	153	0.117
2	Bukhara	105	0.095
3	Syrdarya	102	0.066
4	Syrkhandar	100	0.081
5	Ferghana	96	0.081
6	Dzhizak	94	0.062
7	Karakalpak	92	0.053
8	Khorezm	90	0.072
9	Andizhan	90	0.076
10	Tashkent	87	0.066
11	Samarkhand	84	0.060
12	Namangam	79	0.064
13	Navoi	35	0.028
	UZBEKISTAN	1,206	0.922

Zambia

Cotton in Zambia

The average cotton acreage during the period 2008 to 2018 was 168,000 hectares at an average lint yield of 308 Kg per hectare.



Structure of Cotton Research

The Cotton Development Trust (CDT) Magoye, Mazabuka is responsible for research on cotton. CDT is an initiative of the government with the private sector. An autonomous board of trustees under the Ministry of Agriculture governs the CDT. All though the CDT is mandated to carry out

all research, the private sector is also at liberty to conduct independent research.

Funds for cotton research come from government grants through the Ministry of Agriculture, cotton sector funds (a portion of cotton levies goes towards research), royalties, donations and contributions.

Variety Approval and Seed Supply

Varieties are developed through hybridisation and candidate varieties are tested at several locations before approval and release. Selected lines are submitted to the Seed Control and Certification Institute (SCCI) for approval and to the Variety Release Committee (VRC) for release. The Seed Control and Certification Institute undertakes testing for at least two years and enforces the Plant Varieties and Seeds Act (CAP 236) of the laws of Zambia and its statutory instruments. The Act provides for regulation and control of seed production, testing for germination, purity, certification, sale and import and export of seed.

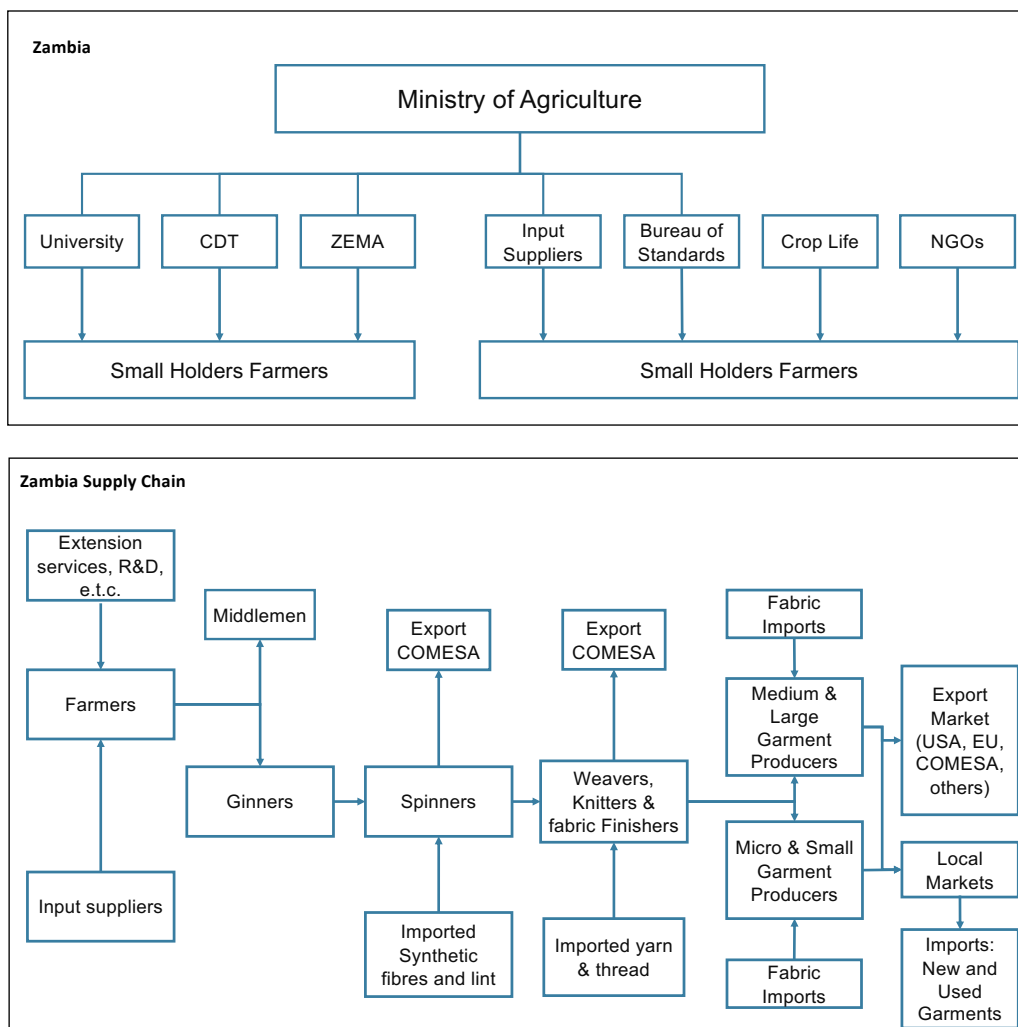
The CDT is responsible for breeder seed, which is passed on to ginning companies for multiplication and distribution to growers. Public companies also produce seed through extension staff in all the cotton growing areas. Important private companies are NWK, GRAFX, Continental ginneries, Alliance ginneries, African Global Development Company, Cargill and China-Africa.

Fertiliser and Pesticide Supply

Fertilisers are supplied through contracts with farming companies, direct purchase from agro-companies and cooperatives through the government input support program. Ginning companies supply pesticides to farmers on credit to recover the costs when farmers sell their seed-cotton to ginning companies. Farmers also obtain pesticides through direct purchase from Agro dealers. Major pesticide companies are Agriculture Technical Services, Crop Serve, Syngenta, Amiran, Crop Life International, Monsanto and integrated Supplies and Services.

Technology Transfer

Technology is transferred through meetings, brochures, cotton production guidebooks, field days, demonstration plots and farmer to farmer discussion.



KEY CONTACTS IN ZAMBIA

Institution / Mailing Address	Contact Person, Position
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Research Organisations

Cotton Development Trust. P. O. Box 670057 Magoye, Mazabuka http://www.cdt.zm	Silwimba, Lwisya. Director Tel: 260-3230777 Tel: 260-3230683 Email: cdt@zamtel.zm, Email: lsilwimba@yahoo.com
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Zambia Agriculture Research Institute http://www.zari.gov.zm	Director Tel: 260-211-290258
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Seed Control and Certification Institute http://www.scci.gov.zm	Director
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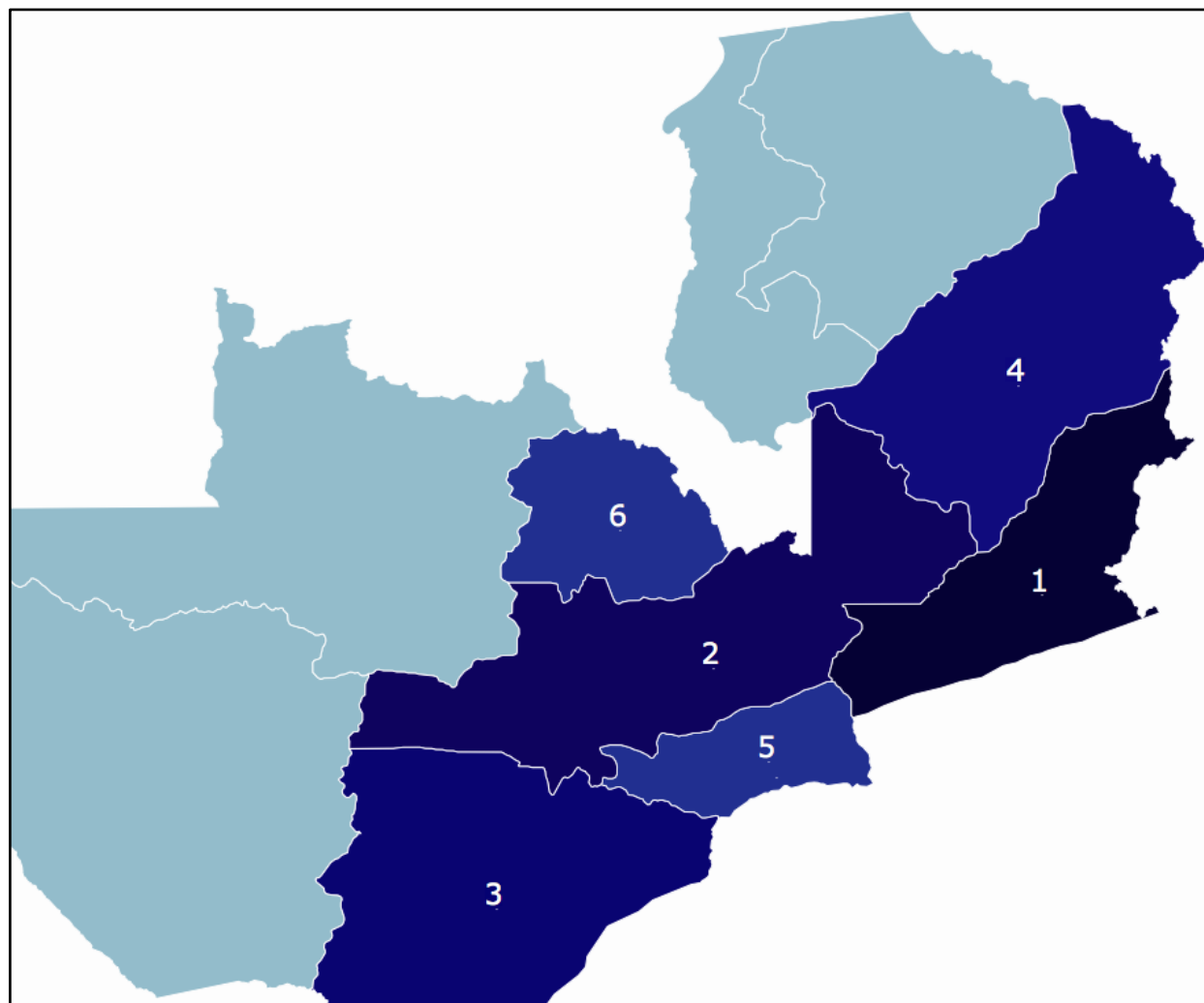
Ginning Organization

Zambia Cotton Ginners' Association	Chooka, Bourbe Executive Secretary Email: Bchoka@yahoo.com Tel: 260-211-237560
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Farmers Organization

Cotton Association of Zambia. Lusaka http://www.cotton.org.zm	Nkole, Joseph. National Coordinator Tel: 260-977776262 Email: josephnkole@cotton.org.zm, Email: nkolejoseph@gmail.com
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ZAMBIA COTTON MAP

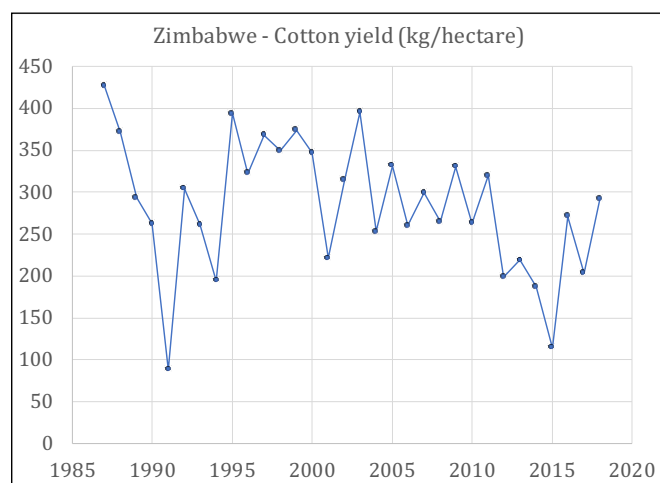
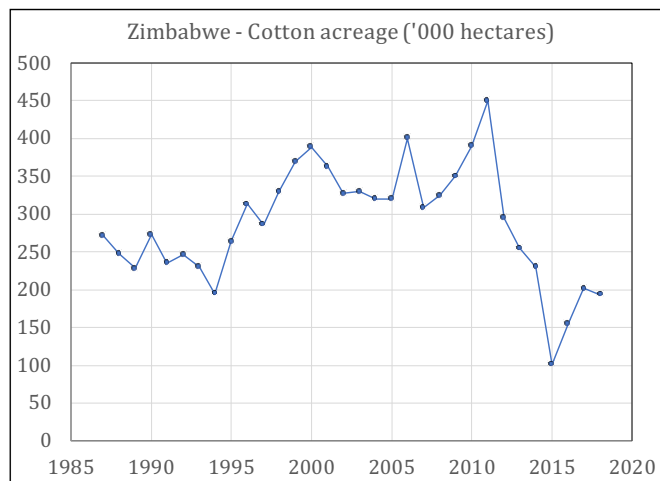
**ZAMBIA: COTTON PRODUCTION DATA 2017-18 (estimates)**

S.No	Regions	Area ('000 Hectares)	Production (M Tonnes)
1	Eastern	55.0	0.022
2	Central	25.4	0.010
3	Southern	18.3	0.005
4	Muchinga	6.5	0.003
5	Lusaka	0.9	0.000
6	Copperbelt	0.3	0.000
	ZAMBIA	106.4	0.040

Zimbabwe

Cotton in Zimbabwe

The average cotton acreage during the period 2008 to 2018 was 268,000 hectares at an average lint yield of 242 Kg per hectare.



Cotton is the most widely grown cash crop in the Midveld and Lowveld areas which constitute about 63 percent of the land area of Zimbabwe. The history of commercial cotton production in Zimbabwe dates back to 1923. The constant expansion and growth were motivated by substantial producer prices and robust government driven research, input support system, extension, and marketing support services.

Structure of Cotton Research

The Cotton Research Institute (CRI), under the Government of Zimbabwe is responsible for cotton research. The CRI functions under the Crops Research Division of the

Department of Research and Specialist Services (DR&SS) in the Ministry of Lands, Agriculture, and Rural Resettlement. The CRI was established in 1925 to provide research-based technologies that promote viable and sustainable cotton production in Zimbabwe. It has been supporting the cotton industry with high value locally adapted cotton varieties. All cotton varieties that were grown in Zimbabwe up until around 2007 were developed only at CRI. In 2007, QUTON released its first variety. Since independence the CRI released 18 cotton varieties.

The CRI is structured into four research disciplines namely, breeding, agronomy, entomology, and pathology. The main objective of the plant breeding section is to develop high yielding varieties of cotton which have lint characteristics suitable for the domestic and export markets. The agronomy section carries out research on improved crop management practices in order to increase cotton production and productivity. Its major challenge is to increase yields from the low national average of 800 kg/ha. The agronomy section works on spacing, plant population, and nutrition for new varieties and also on soil, moisture conservation, irrigation and weed management. The entomology section develops and disseminates appropriate techniques for the control of insect and mite pests of cotton. The pathology section carries out research work on major cotton diseases in the country which are Verticillium wilt, Bacterial blight, Fusarium wilt, and various ailments that affect young cotton seedlings. This section works closely with the breeding section mainly to screen all germplasm (strains, lines, varieties) for tolerance to the major cotton diseases. The variety BC 853 is tolerant to Verticillium wilt.

The Agricultural Marketing Authority (AMA) is a parastatal agency in the Ministry of Lands, Agriculture, and Rural Resettlement. It administers regulations that govern the production and marketing of seed cotton and its products. The AMA supports research on cotton and technology transfer through the Agricultural Marketing Fund (Cotton Industry Development).

Variety Approval and Seed Supply

For a variety to be released, it is mandatory that data are obtained from at least 5 experimental locations. The Cotton Research Institute conducts experiments at about 17 experimental locations in the country, nine of which are in the Midveld and eight in the Lowveld. The experimental locations that are away from CRI are known as on-farm experimental sites or off-station experimental sites. The main purpose of these sites is to enable researchers to carry out research in the farmers' environment, with active participation of the farmer and extension personnel. Research results therefore would be expected to be more representative of the cotton growing areas in Zimbabwe.

Cotton seed production in Zimbabwe is predominantly conducted by private companies. The Seed Registrar and Seed Inspectorate of the Seed Services Institute (SSI) supervises seed production in Zimbabwe. The SSI is responsible for administering the Seeds Act [Chapter 19:13] enacted in 1971, Seeds Regulations and Seeds (Certification Scheme) Notice 2000, and Plant Breeders' Act [Chapter 18:16]. The scope of administering the Seed Act includes seed testing and quality control, recognition of varieties and variety protection and field inspections of seed crops. The legislation basically governs production, processing, labelling and marketing of certified seed. The purpose of the legislative instrument is to promote production and use of high-quality seeds of proven performance.

Traditionally nearly all seed cotton has been produced under contract farming until 2015/16 season when the Government of Zimbabwe (GoZ) through the Cotton Company of Zimbabwe initiated a free input support scheme to benefit all willing cotton growers. The free cotton input support programme for cotton growers is aimed to rescue Zimbabwe's cotton sector from a myriad of challenges that it had faced for several years.

Quton was established in 1998 through transformation of the then 'Cotton Planting Seed Company' of the 'Cotton Company of Zimbabwe'. Quton became a seed multiplication and distribution and cotton research company. The company formed a crop development program focusing on cotton that grew to become an important player in cotton variety development in Zimbabwe. Recently an Indian company called Maharashtra Hybrid Seed Company (Mahyco) acquired 60% stakes in the Quton Seed Company. The development saw Quton release a batch of hybrid cotton varieties in 2018.

Fertiliser and Pesticide Supply

Cotton growers receive fertiliser and pesticide inputs at common input distribution points in a process that is closely monitored by the AMA mainly to promote transparency and to discourage the practice of multiple contracting of farmers. A typical input package comprises of planting seed, fertilisers, and chemicals. Fungicides produced by private companies are evaluated against seedling diseases to determine rates before registration. The CRI makes all rec-

ommendations on input usage. Fertilisers and pesticides that are distributed to farmers are sourced mainly from private companies.

Cotton inputs are supplied by the government of Zimbabwe and private contractors most of whom are ginners. According to the Agricultural Marketing Authority (AMA) (2017), private contractors and the GoZ financed the cotton sector to a total of US\$ 40 million in 2015/16 and US\$ 55.5 million in 2016/17 season. The GoZ's contributions in each of the two seasons were 65% and 75.7% respectively. It was reported elsewhere that in 2017/18 season the GoZ contributed 90 percent of the season input requirements while private contractors contributed 10 percent. Timely intervention by the GoZ improved national seed cotton production from 28,598 metric tonnes (MT) in 2016 to 73,141 MT in 2017. Indications are that the national production could surpass 100,000 MT in 2018.

Technology Transfer

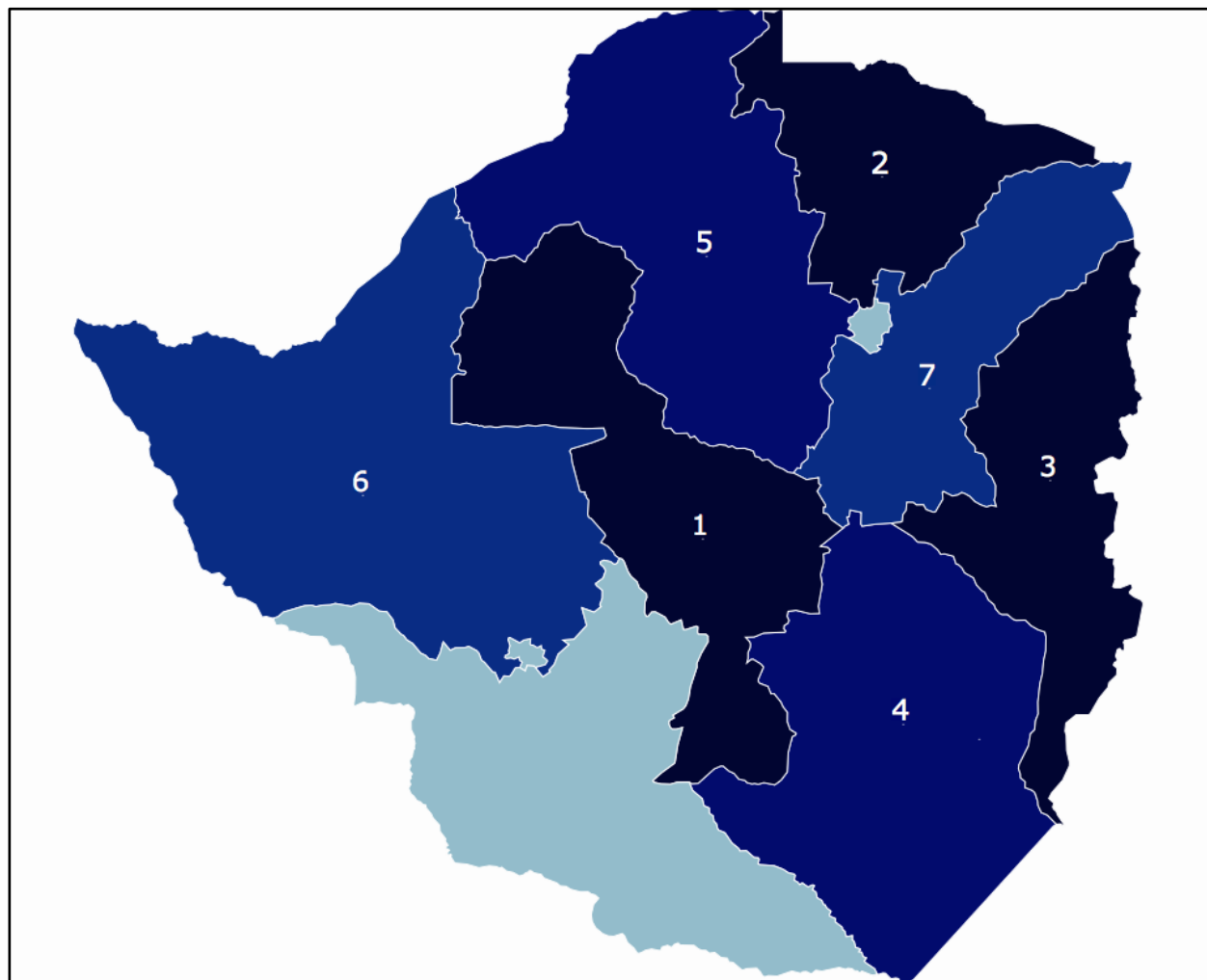
The Ministry of Lands, Agriculture and Rural Resettlement through the Department of Agriculture and Extension Services (AGRITEX) plays a pivotal and primary role of bridging research and farmers. Private contractors have their own extension agents who assist contracted farmers with knowledge and skills to increase cotton productivity.

The CRI plays the primary role of disseminating information, knowledge and technologies that are generated through research. The institute uses several mechanisms including a) publications ranging from manuals, fact sheets, to scientific papers and presentations, b) agricultural exhibitions/shows, c) field days, d) stakeholder workshops, and e) training workshops for public sector and private sector extension staff, agricultural college students, lecturers and lead farmers.

KEY CONTACTS IN ZIMBABWE

Institution / Mailing Address	Contact Person, Position
Research Organisations	
Department of Research and Specialist Services Ministry of Agriculture, Mechanization and Irrigation Development. P.Bag. 765, Kadoma, Zimbabwe	Dr. D. Kutywayo Tel: 0772598903, Email: dumisanikutywayo@yahoo.co.uk
	Washington Mubvekeri Tel: 0773042798, Email: wmubvekerishumba@gmail.com
National Biotechnology Authority	E. Mupanehari Tel: 0773199040, Email: mupanehari@gmail.com
Farmers Organizations	
Zimbabwe Farmers' Union	S. Muchena Tel: 0775063686, Email: smuchena@gmail.com
Zimbabwe Commercial Farmers' Union	J. Tevera Tel: 0778269273, Email: director@zcfu.org.zw

ZIMBABWE COTTON MAP

**ZIMBABWE: COTTON PRODUCTION DATA 2017-18 (estimates)**

S.No	Regions	Area ('000 Hectares)	Production (M Tonnes)
1	Midlands	94	0.023
2	Mashonaland Central	71	0.017
3	Manicaland	18	0.005
4	Masvingo	15	0.004
5	Mashonaland West	12	0.003
6	Matabeleland North	8	0.002
7	Mashonaland East	2	0.000
	ZIMBABWE	220	0.054

INTERNATIONAL ASSOCIATIONS

Institution / Mailing Address	Contact Person, Position
Committee for International Co-operation Between Cotton Associations (CICCA) 6th Floor, Walker House, Exchange Flags, Liverpool L2 3YL, UK	Mr Georges Toby, Chairman Tel: +44 151 236 6041 Email: enquiries@cicca.info
International Cotton Association Ltd. (ICA) 6th Floor, Walker House, Exchange Flags, Liverpool L2 3YL	Bill Ballenden, President Tel: +44 (0)151 236 6041 Fax: +44 (0)151 255 0174 Email: info@ica-ltd.org
Better Cotton Initiative. Ch. de Balexert 7-9 1219 Châtelaine. Switzerland	Alan McClay, CEO Tel: +41 22 93 91 250
International Textile Manufacturers Federation (ITMF) Wiedingstrasse 9 CH-8055 Zürich. Switzerland	Kihak Sung (Korea Rep.), President Tel: +41-44 283 63 80 Fax: +41-44 283 63 89 Email: secretariat@itmf.org
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The Japan Cotton Traders Association 10th Floor Cotton Nissay Building 1 - 8 - 2, Shimamoto - cho, Nishi - ku, Osaka 550 - 0004	Tel: 06-6445-8839 Fax: 06-6445-8893
KOREA REP.	
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Korea Federation of Textile Industries (KOFOTI) 16th Floor Textile Centre, #944-31 Daechi 2-Dong Gangnam-Gu Seoul 135-713 www.kofoti.or.kr	Kihak Sung, Chairman Tel: (+82-2) 528 4085 Fax: (+82-2) 528 4071 Email: rhs9609@kofoti.or.kr
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